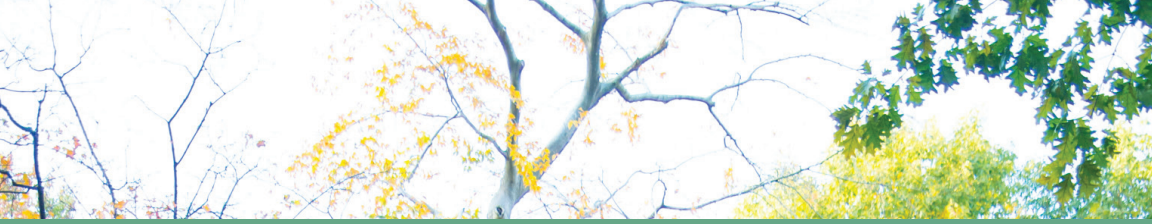

GRADUATE CATALOG

2020-2021

Table of Contents

Graduate Catalog

Click here (http://catalog.manhattan.edu/graduate/2019-20_graduate.pdf) (http://catalog.manhattan.edu/graduate/2019-20_graduate.pdf)for a PDF of the full Graduate catalog.

Welcome to our Graduate online catalog, the College's primary, comprehensive single source of departmental and college-wide information related to academic programs. Courses, degree programs, and policies that govern progress toward completion of a degree are described in this catalog. Students are responsible for knowing and understanding the contents of the catalog year they are following. The catalog provides a broad range of course information in a consistent online format and is searchable and user-friendly.

> While every effort is made to ensure that the course information, applicable policies and other materials presented in the *Catalog* are accurate and correct, the College reserves the right to make changes as circumstances require.

About Manhattan College

The Mission of Manhattan College

Manhattan College is an independent Catholic institution of higher learning that embraces qualified men and women of all faiths, cultures, and traditions. The mission of Manhattan College is to provide a contemporary, person-centered educational experience that prepares graduates for lives of personal development, professional success, civic engagement, and service to their fellow human beings. The College pursues this mission through programs that integrate a broad liberal education with concentration in specific disciplines in the arts and sciences or with professional preparation in business, education and engineering.

Established in 1853 by the Institute of the Brothers of the Christian Schools, the College continues to draw its inspiration from the heritage of John Baptist de La Salle, the innovator of modern pedagogy and patron saint of teachers. Among the hallmarks of this Lasallian heritage are excellence in teaching, respect for human dignity, reflection on faith and its relation to reason, an emphasis on ethical conduct, and commitment to social justice.

Historical Note

In May 1853, five Christian Brothers moved their small Canal Street school to what was then known as Manhattanville, a section of New York City at 131st Street and Broadway. The Brothers brought with them more than their furniture and their students. They were the bearers of a long educational tradition, going back to 17th century France and their founder, John Baptist de La Salle, designated by the Catholic Church as the Patron Saint of Teachers. He formed a community of religious Brothers who, unlike priests, would devote themselves as teachers to work for the well being of the children of the artisans and the underprivileged. In the process he created a new type of school system that would transform teaching school into a profession and a vocation. The Brothers were urged to go beyond rote memory to “touch the hearts” of the students. Practical subjects were taught that would lead to a useful role in society; religion was taught to impart a commitment to Christian ethics.

Between 1853 and 1863, the school changed rapidly, adding college-level courses in 1859 and first using the name Manhattan College in 1861. It was chartered by the Board of Regents on April 2, 1863 and the first catalog stated its goals — to afford young people the means of acquiring the highest grade of education attained in the best American universities or colleges. While classical languages were thoroughly studied, prominence was given to higher mathematics and natural sciences, thus combining the advantages of a first-class College and Polytechnic Institute.

Manhattan College was an unusual institution. Its sponsoring Board of Trustees combined both secular independent members and representatives of the Brothers of the Christian Schools. It also combined excellence in the traditional liberal arts and sciences and excellence in professional and technical education in a single collegiate institution. As the school grew, new quarters were needed. The cornerstone of the “New Manhattan” was laid in 1922 on property bordered by the Hudson River and Van Cortlandt Park, its

present location. The addition of new buildings and student residences has enlarged and enhanced the campus significantly. From this accessible site, the college is able to offer access to the cultural, educational, business and entertainment opportunities of New York City as well as a self-contained suburban campus environment.

Today Manhattan College identifies itself as a Catholic College in the Lasallian tradition. That tradition has continued to characterize the special educational experience offered by the College over its long history. Its constant focus has been the education of the disadvantaged. Manhattan has an enviable record in this regard, albeit engaged in the field of higher education. From its beginning, the College has paid particular attention to educating first-generation college students, and was an early proponent of access to disadvantaged and minority students, establishing special scholarship funds as early as 1938. That still holds true today for the impressive percentage of the student body that come from ethnic minorities. So many of our graduates who later on achieved great things in their careers remember that they might have had to leave school were it not for Manhattan's financial assistance.

The College continues to realize the objectives stated in its first catalog by maintaining a full range of programs in the liberal arts and sciences joined with professional programs in engineering, business, science and education. The quality of the undergraduate programs has been demonstrated by its record as one of the nation's leading undergraduate sources of doctorates in the arts, sciences, engineering and education, and it is recognized by the establishment of chapters of such prestigious honor societies as Phi Beta Kappa, Sigma Xi, and Tau Beta Pi. Manhattan participates in the Consortium of Liberal Arts Colleges, an organization of the nation's leading research colleges, and in the New York Cluster of seven colleges and universities supported by the Pew Charitable Trusts for undergraduate science education (Barnard, Colgate, Cornell, Hamilton, Manhattan, St. Lawrence and Union).

Over the years, an evolution has taken place in faculty representation. The predominantly Christian Brothers faculty has been replaced by predominantly lay teachers, and includes both men and women. The College became coeducational and accepted its first women undergraduate students in 1973. Currently, women number nearly half of the full-time undergraduate student body.

With the opening of Horan Hall (1990) and its twin East Hill (2008), the College now offers a four-year guarantee of resident housing and 80 percent of the student body chooses to live on or near campus, while the rest commutes. Currently, the College has a student body of approximately 3,500: 3,000 undergraduates and 500 graduate students. The student-faculty ratio is twelve to one.

Recognition and Membership

Manhattan College is chartered and empowered to confer academic degrees by the University of the State of New York.

It is accredited by the Middle States Commission on Higher Education, 3624 Market Street, Philadelphia, PA 19104-2680, 215-662-5606, www.msche.org (http://www.msche.org/). The college is approved by the American Chemical Society for the professional training of chemists and by the New York State Department of Health for Radiation Therapy Technology. The School of Business is accredited by AACSB

International, the Association to Advance Collegiate Schools of Business, the premier accrediting agency for business programs globally.

The undergraduate programs in chemical, civil, computer, electrical, environmental, and mechanical engineering and the master of environmental engineering program are accredited by the Engineering Accreditation Commission (EAC) of ABET (www.abet.org).

The teacher education programs at Manhattan College are accredited by the Teacher Education Accreditation Council (TEAC). Formally recognized by the Council for Higher Education Accreditation and by the U.S. Department of Education, TEAC is a nonprofit group dedicated to improving academic degree programs for professional educators. Its primary work is accrediting undergraduate and graduate professional education programs in order to assure the public about the quality of college and university programs. TEAC became part of CAEP (Council for the Accreditation of Educator Preparation) in 2013. CAEP awaits recognition by the Council for Higher Education Accreditation and the U.S. Department of Education.

The College is a member of the Association of American Colleges, the American Council on Education, the Institute of International Education, the National Catholic Educational Association, the Association of Urban Universities, the Association of Governing Boards of Universities and Colleges, the American Association of University Women, the American Society for Engineering Education, Middle Atlantic Association of Colleges of Business Administration, Association of Continuing Higher Education, the National Association of College and University Summer Sessions, American Association of Colleges for Teacher Education, the College Entrance Examination Board, the National Commission for Cooperative Education, Association of Catholic Colleges and Universities (ACCU), Commission on Independent Colleges and Universities (CICU), National Association of Independent Colleges & Universities (NAICU), NY Campus Compact, Lilly Fellows Program, Lower Hudson Valley Consortium of Catholic Colleges & Universities (LHVCC), FSC DENA, International Association of Lasallian Universities (IALU), Annapolis Group. The College is an associate member ofThe Hispanic Association of Colleges and Universities (HACU).

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The Graduate Division seeks to provide the academic and professional needs for those who are already engaged in a profession as teachers, engineers, or those who having completed their undergraduate preparation desire to enter immediately into advanced study.

Because many of its students are pursuing a profession, the Graduate Division provides the opportunity of achieving the master degree on a part-time basis. It is possible to pursue full-time graduate study in most programs. The courses are generally conducted in the late afternoons, early evenings and Saturdays during the fall and spring sessions. The schedule will vary with the degree program. In general, Education courses are offered in the late afternoon and Engineering courses in the evenings.

Family Educational Rights and Privacy Act (FERPA)

The Family Educational Rights and Privacy Act (FERPA) of 1974 is a federal law that was enacted to protect the privacy of students and their educational records. The intent of the legislation is to protect the rights of students and to ensure the privacy and accuracy of 'educational information.' Educational Information refers to any record maintained by an educational institution, including files, documents, and materials of any type which contain information directly related to students, and which allows a student to be identified.

What is *not* considered Educational Information?

- Sole possession records or private notes held by educational personnel which are not accessible or released to other personnel
- Law enforcement or campus security records which are solely for the law enforcement purposes
- Records related to individuals who are employed by the college
- Records related to treatment provided by a physician, psychiatrist, psychologist or other recognized professional
- Records of the college which contain only information about an individual obtained after that person is no longer a student at the college (i.e., alumni records)

Who is protected under FERPA?

Students who are protected under FERPA are those students who are currently enrolled or formerly enrolled, regardless of their age or status in regard to parental dependency. Students who have applied but have not attended the college, and deceased students do not fall under FERPA guidelines.

Student's rights under FERPA

Eligible students have the right to inspect and review their educational records within 45 days of the day Manhattan College receives a request for access. The eligible student should submit the request to the Registrar and identify the record(s) they wish to inspect. The Registrar will make arrangements for access and will notify the student of the time/place where the records may be inspected.

An eligible student may also ask the college to amend a record believed to be inaccurate or misleading. If the school decides to not amend the record, the parent or student then has a right to a formal hearing. If, after the hearing, the school still chooses to not amend the record, the eligible student has the right to place a statement with the record commenting on the contested information.

Lastly, a student may formally request that Manhattan College not release Directory Information on their behalf. This request must be submitted to the Registrar. When this

request is made, a notation will be flagged in the MC Student Information System and every reasonable effort will be made to safeguard the confidentiality of such information.

When is a student's consent not required?

There are several exceptions to releasing information without a student's written approval. Some examples are:

- School officials with legitimate educational interests. A school official is a person employed by Manhattan College in an administrative, supervisory, academic, or support staff position (including law enforcement unit personnel and health staff); a person or company with whom Manhattan College has contracted (such as an attorney, auditor, or collection agent); a person serving on the Board of Trustees; or a student serving on an official committee, such as a disciplinary or grievance committee, or assisting another school official in performing his or her tasks. A school official has a legitimate educational interest if the official needs to review an education record in order to fulfill his or her professional responsibility.
- In connection with Financial Aid
- Other schools to which a student is seeking to transfer/enroll
- Parents of a dependent student, as defined by the IRS. The college may release a student's records upon request, but the parent must submit proof of the student's dependency (via most recent federal tax form) prior to receiving the requested information
- Individuals who have obtained court orders or legally issued subpoenas
- Certain government officials in order to carry out lawful functions
- State and local authorities within a juvenile justice system, pursuant to specific State law
- Health and safety emergencies
- Accrediting organizations or organizations conducting studies for MC

Directory Information

Under FERPA guidelines, a student's record may not be disclosed without written authorization unless the requested information falls under the category of 'Directory Information.' MC may disclose information on a student without violating FERPA if it has designated that information as Directory Information. The following information has been classified as Directory Information by Manhattan College and may be disclosed without a student's written authorization:

- Student name
- Address
- Electronic mail address
- Telephone number
- Dates of attendance
- Date and place of birth
- Major field of study
- Number of credit hours enrolled

- Grade level
- Degrees, honors, and awards received
- Participation in clubs and activities
- Photograph
- Weight and height of members of athletic teams
- Most recent educational institution

The College uses extreme discretion in releasing any student information to an outside source. While MC is legally entitled to release Directory Information, it generally does not disclose more than deemed necessary. The following items are defined as Personally Identifiable Information and can never be disclosed by the College:

- Social Security Number
- Race
- Gender
- Grades
- GPA
- Country of citizenship
- Religion

You have the right to request that any or all of your directory information not be released by Manhattan College. You may contact the Registrar with a written and signed notice not later than 2 weeks of beginning of the semester to withhold the release of any directory information you specify. This request is in effect until you provide written notice to the contrary.

You have the right to file a complaint with the U.S. Department of Education concerning alleged failures by Manhattan College to comply with the requirements of FERPA at:

Family Policy Compliance Office
U.S. Department of Education
600 Independence Avenue. S.W.
Washington, D.C. 20202-4605

Non-Discrimination Policy

Manhattan College has had a longstanding policy of non-discrimination. The College repudiates all discriminatory procedures and specifically those based on race, creed, color, religion, national origin, age, sex, marital status, sexual orientation, veteran status, citizenship status,disability or any other legally protected status. The College does not knowingly support or patronize any organization or business which discriminates.

No person shall be denied admission or access to the programs or activities of Manhattan College, nor shall any person be denied employment at the College, solely because of any physical, mental or medical impairment within reasonable accommodations. Inquiries concerning this policy may be referred to Human Resources.

Auxiliary aids and academic adjustments within the guidelines of the ADA/Section 504 are provided without charge by the Specialized Resource Center, Room 301B, Miguel Hall, Voice: (718) 862-7101, TTY: (718) 862-7885.

The Title IX and Age Act Coordinator is located within the Office of Human Resources, Memorial Hall, Room 305. The ADA/Section 504 Coordinator is located within the Specialized Resource Center, Miguel Hall, 300A.

Veterans

Manhattan College is pleased to announce our continuing commitment to America's veterans through our participation in the Yellow Ribbon Program of the Post 9/11 GI Bill ®. The Yellow Ribbon Program is a partnership between Manhattan College and the Department of Veterans Affairs (VA) to assist eligible students with educational expenses.

The Yellow Ribbon GI Education Enhancement Program (Yellow Ribbon Program) allows degree-granting institutions of higher learning in the United States to voluntarily enter into an agreement with the VA to fund tuition expenses that exceed the highest public in-state undergraduate tuition rate. This tuition-benefit program includes both undergraduate and graduate study and either full- or part-time enrollment. Because of Manhattan College's reasonable tuition rates, this program allows eligible veterans to participate at little or no cost. This significant commitment upholds a long history of Manhattan College support for our veterans
and their academic and career endeavors.

Yellow Ribbon Benefit at Manhattan College

- Up to $24,476.79 per year, per student at the College, not to exceed the cost of tuition.
- The Department of Veterans Affairs will match at the same amount up to 50% of the difference between the student's tuition benefit and the total cost of tuition and fees.
- Including GI Bill-based assistance, admitted Yellow Ribbon Program qualified undergraduate veterans can attend Manhattan College at no out of pocket cost.
- Participation in the Yellow Ribbon Program precludes the student from being eligible for any other institutional awards.
- Yellow Ribbon Program award amounts are based on per-credit-hour tuition and allowable fees.
- Once eligible, a student remains so throughout their education as long as they remain in good academic standing and have remaining entitlement with the VA.

Yellow Ribbon Program Eligibility Requirements

Only individuals entitled to the maximum benefit rate (based on service requirements) may receive Yellow Ribbon Program benefits from Manhattan College and the VA. We strongly encourage you to review the eligibility criteria directly from the VA website.

The general eligibility requirements for the Yellow Ribbon Program include:

- Student served an aggregate period of active duty after Sept. 10, 2001 of at least 36 months.

- Student was honorably discharged from active duty for a service-connected disability and they served 30 continuous days after September 10, 2001.
- Student is a dependent eligible for Transfer of Entitlement under the Post-9/11 GI Bill based on a veteran's service under the eligibility criteria listed above.
- In addition to all other institutional policies and regulations, students who receive education benefits from the VA must comply with the policies of the VA and the State Approving Agency for the training and education of students receiving VA education benefits. These policies include the following requirements:
  - You cannot be certified for receipt of your VA education benefits until you have selected the program of study you intend to pursue, met all admissions requirements and all credentials required by the office of admissions are received and evaluated. You must be admitted as a fully matriculated student.
  - It is your responsibility to immediately inform the College's VA certifying official of any changes in your enrollment (e.g., dropped or added classes, or withdrawal from school). If there is any unreported change in your enrollment, you may not be entitled to the full amount of your educational benefits.
  - It is your responsibility to inform the College's VA certifying official each semester or term of your intent to utilize your education benefits. You must turn in a Request for Certification form and a copy of your course schedule.
  - Only the elective hours required for degree completion, as stated in the catalog for your curriculum, may be certified for benefits. You may not receive benefits for excessive electives or courses already taken and passed. You must achieve satisfactory academic progress toward completion of your degree as stated in the catalog. Unsatisfactory progress, conduct or attendance may result in termination of your educational benefits.
  - Veterans who qualify for both federal financial aid and GI Bill assistance may receive support from either or both sources. However, if both sources are utilized, maximum assistance cannot exceed the total cost of attendance.
  - Based upon eligibility determination by the VA, a student may still have a balance due to the College after receiving payment from the VA.

Veteran benefits information is available in the Office of Financial Aid Administration. Each semester recipients of Veterans Administration funds are required to file an Enrollment Certification in this office, and to report promptly when adding or dropping any courses, as well as being responsible for any overpayments made by the V.A.

Location

The College is situated along Manhattan College Parkway on the heights above Van Cortlandt Park (242nd Street and Broadway) in the Riverdale section of New York City. It is a short distance from the 242nd Street station of the Broadway Seventh Avenue Subway, and can be easily reached from any part of the metropolitan or suburban areas. The exit of the Henry Hudson Parkway (West Side Highway) located at 239th Street several blocks to the west of the College puts the campus within easy reach of New Jersey. The College is also within easy commuting distance from Long Island and Westchester and Rockland counties because of its proximity to the New York State

Thruway and the Major Deegan Expressway (exit at Van Cortlandt Park South or West 240th Street).

Campus Map **(**http://manhattan.edu/admissions/tour/**)**

Directions to Manhattan College

By Car:

From Long Island

Robert F. Kennedy Bridge (Triborough Bridge) (from South)

Follow signs to Major Deegan Expressway North (I-87), exit at Van Cortlandt Park South, bear right off ramp and bear right onto Broadway. At second traffic light, turn left and then left again onto Manhattan College Parkway. Proceed up hill to main gate on right.

Whitestone or Throgs Neck Bridge (from East)

To Cross Bronx Expressway (I-95), to Major Deegan Expressway (I-87) North, exit at Van Cortlandt Park South, bear right off ramp and bear right onto Broadway. At second traffic light, turn left and then left again onto Manhattan College Parkway. Proceed up hill to main gate on right.

From Upstate

Saw Mill River Parkway/Henry Hudson Parkway

Traveling North: Exit at 239th Street. Go to stop sign, cross intersection and bear right onto Manhattan College Parkway. Proceed down hill to main gate on left.

Traveling South: Exit at 246th Street. Turn left at first traffic light, turn right onto Fieldston Road at circle and then turn left onto Manhattan College Parkway. Proceed down hill to main gate on left.

New York State Thruway (I-87) (from North)

Thruway South (I-87) becomes the Major Deegan Expressway. Exit at Van Cortlandt Park South, turn right off ramp and bear right onto Broadway. At second traffic light, turn left and then left again onto Manhattan College Parkway. Proceed up hill to main gate on right.

From New Jersey

George Washington Bridge (from West)

New Jersey Turnpike or Route 80 to George Washington Bridge. Follow signs to Henry Hudson Parkway North to 239th Street Exit (no commercial vehicles). At stop sign, proceed straight across intersection (monument on left), pass traffic light and bear right at fork onto Manhattan College Parkway. Proceed down hill to main gate on left.

From New York City

F.D.R. Drive (from South)

F.D.R. Drive to Major Deegan Expressway North (I-87). Exit at Van Cortlandt Park South, bear right off ramp and bear right onto Broadway. At second traffic light, turn left and then left again onto Manhattan College Parkway. Proceed up hill to main gate on right.

West Side Highway (from South)

West Side Highway to Henry Hudson Parkway North to West 239th Street Exit. At stop sign, proceed straight across intersection (monument on left), pass traffic light and bear right at fork onto Manhattan College Parkway. Proceed down hill to main gate on left.

From New England

New England Thruway West to Cross Westchester Expressway, then onto New York State Thruway South. Exit at Van Cortlandt Park South, turn right off ramp and bear right onto Broadway. At second traffic light, turn left and then left again onto Manhattan College Parkway. Proceed up hill to main gate on right.

Awards

The Fitzpatrick Family Medal

The Fitzpatrick Family Medal is awarded to a student from the Graduate School of Education who exemplifies the Lasallian tradition of academic excellence and service to others.

The Frank Derbenwick Award

This award is given in recognition of superior performance in the Chemical Engineering Graduate Program in memory of Chemical Engineering Professor Frank Derbenwick.

The James Strecansky '62/Air Products Award

This award is given to a graduate student for outstanding service to the Chemical Engineering Department.

The Robert Harris '61 Memorial Award

This award is presented to an outstanding foreign national enrolled in the Chemical Engineering Graduate Program.

The Sigma Xi Medal

This award is given to a graduate student for outstanding research in science.

The Award for Excellence in the Graduate Study of Environmental Engineering

This award is presented to a graduate student for excellence in Environmental Engineering and Science.

Mission & History

The Mission of Manhattan College

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As the school grew, new quarters were needed. The cornerstone of the “New Manhattan” was laid in 1922 on property bordered by the Hudson River and Van Cortlandt Park, in the Riverdale neighborhood of the Bronx, its present location. The addition of new buildings and student residences has enlarged and enhanced the campus significantly. From this

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The College continues to realize the objectives stated in its first catalog by maintaining a full range of programs in the liberal arts (http://www.manhattan.edu/academics/arts/) and sciences (http://www.manhattan.edu/academics/science/), combined with professional programs in engineering (http://www.manhattan.edu/academics/engineering/), business (http://www.manhattan.edu/academics/business/) and education (http://www.manhattan.edu/academics/education/). The quality of the undergraduate programs is demonstrated in many ways, for example, in the presence on campus of chapters of prestigious honor societies (http://www.manhattan.edu/about/national-honor-societies/) such as Phi Beta Kappa, Sigma Xi and Tau Beta Pi.

Over the years, Manhattan College has seen many changes, and yet it maintains its deep commitment to its heritage and ideals. What was a predominantly Christian Brothers faculty has become predominantly lay, and includes a significant percentage of women. The College became coeducational and accepted its first women undergraduate students in 1973. Currently, women comprise almost half of the full-time undergraduate student body.

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The College continues to follow the founding spirit of John Baptist de La Salle by being responsive to the needs of its place and time. Innovation grounded in tradition has always been a hallmark of Lasallian education, and Manhattan College's new strategic plan (http://www.manhattan.edu/about/strategic-plan/), "Renewing the Promise," commits the College to a course of continuous improvement of its programs and facilities in response to emerging needs.

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- Records related to individuals who are employed by the college
- Records related to treatment provided by a physician, psychiatrist, psychologist or other recognized professional
- Records of the college which contain only information about an individual obtained after that person is no longer a student at the college (i.e., alumni records)

Who is protected under FERPA?

Students who are protected under FERPA are those students who are currently enrolled or formerly enrolled, regardless of their age or status in regard to parental dependency. Students who have applied but have not attended the college, and deceased students do not fall under FERPA guidelines.

Student's rights under FERPA

Eligible students have the right to inspect and review their educational records within 45 days of the day Manhattan College receives a request for access. The eligible student should submit the request to the Registrar and identify the record(s) they wish to inspect. The Registrar will make arrangements for access and will notify the student of the time/ place where the records may be inspected.

An eligible student may also ask the college to amend a record believed to be inaccurate or misleading. If the school decides to not amend the record, the parent or student then has a right to a formal hearing. If, after the hearing, the school still chooses to not amend the record, the eligible student has the right to place a statement with the record commenting on the contested information.

Lastly, a student may formally request that Manhattan College not release Directory Information on their behalf. This request must be submitted to the Registrar. When this request is made, a notation will be flagged in the MC Student Information System and every reasonable effort will be made to safeguard the confidentiality of such information.

When is a student's consent not required?

There are several exceptions to releasing information without a student's written approval. Some examples are:

- School officials with legitimate educational interests. A school official is a person employed by Manhattan College in an administrative, supervisory, academic, or support staff position (including law enforcement unit personnel and health staff); a person or company with whom Manhattan College has contracted (such as an attorney, auditor, or collection agent); a person serving on the Board of Trustees; or a student serving on an official committee, such as a disciplinary or grievance committee, or assisting another school official in performing his or her tasks. A school official has a legitimate educational interest if the official needs to review an education record in order to fulfill his or her professional responsibility.
- In connection with Financial Aid
- Other schools to which a student is seeking to transfer/enroll
- Parents of a dependent student, as defined by the IRS. The college may release a student's records upon request, but the parent must submit proof of the student's dependency (via most recent federal tax form) prior to receiving the requested information
- Individuals who have obtained court orders or legally issued subpoenas
- Certain government officials in order to carry out lawful functions
- State and local authorities within a juvenile justice system, pursuant to specific State law
- Health and safety emergencies
- Accrediting organizations or organizations conducting studies for MC

Directory Information

Under FERPA guidelines, a student's record may not be disclosed without written authorization unless the requested information falls under the category of 'Directory Information.' MC may disclose information on a student without violating FERPA if it has designated that information as Directory Information. The following information has been classified as Directory Information by Manhattan College and may be disclosed without a student's written authorization:

- Student name
- Address
- Electronic mail address
- Telephone number
- Dates of attendance
- Date and place of birth
- Major field of study
- Number of credit hours enrolled
- Grade level
- Degrees, honors, and awards received
- Participation in clubs and activities

- Photograph
- Weight and height of members of athletic teams
- Most recent educational institution

The College uses extreme discretion in releasing any student information to an outside source. While MC is legally entitled to release Directory Information, it generally does not disclose more than deemed necessary. The following items are defined as Personally Identifiable Information and can never be disclosed by the College:

- Social Security Number
- Race
- Gender
- Grades
- GPA
- Country of citizenship
- Religion

You have the right to request that any or all of your directory information not be released by Manhattan College. You may contact the Registrar with a written and signed notice not later than 2 weeks of beginning of the semester to withhold the release of any directory information you specify. This request is in effect until you provide written notice to the contrary.

You have the right to file a complaint with the U.S. Department of Education concerning alleged failures by Manhattan College to comply with the requirements of FERPA at:

Family Policy Compliance Office
U.S. Department of Education
600 Independence Avenue. S.W.
Washington, D.C. 20202-4605

Non-Discrimination Policy

Manhattan College is committed to ensuring equal access to its educational programs and employment opportunities without regard to race, color, creed, religion, ethnicity, national origin, sex/gender identity/expression, sexual orientation, marital/partnership status, disability, age, citizenship status, veteran status, predisposing genetic characteristics, caregiver status, credit history, arrest/conviction record, unemployment status, status as a victim of domestic violence, sexual violence, or stalking, or any other legally protected status.

No person shall be denied admission or access to the programs or activities of Manhattan College, nor shall any person be denied employment at the College, solely because of any physical, mental or medical impairment within reasonable accommodations. Inquiries concerning this policy may be referred to Human Resources.

Auxiliary aids and academic adjustments within the guidelines of the ADA/Section 504 are provided without charge by the Specialized Resource Center, Room 300A, Miguel Hall, Voice: (718) 862-7409, TTY: (718) 862-7885.

The Title IX and Age Act Coordinator is located within the Office of Human Resources, Memorial Hall, Room 305. The ADA/Section 504 Coordinator is located within the Specialized Resource Center, Miguel Hall, 300A.

Veterans

Yellow Ribbon Program

Manhattan College is pleased to announce our continuing commitment to America's veterans through our participation in the Yellow Ribbon Program of the Post 9/11 GI Bill. The Yellow Ribbon Program is a partnership between Manhattan College and the Department of Veterans Affairs (VA) to assist eligible students with educational expenses.

The Yellow Ribbon GI Education Enhancement Program (Yellow Ribbon Program) allows degree-granting institutions of higher learning in the United States to voluntarily enter into an agreement with the VA to fund tuition expenses that exceed the highest public in-state undergraduate tuition rate. This tuition-benefit program includes both undergraduate and graduate study and either full- or part-time enrollment. Because of Manhattan College's reasonable tuition rates, this program allows eligible veterans to participate at little or no cost. This significant commitment upholds a long history of Manhattan College support for our veterans and their academic and career endeavors.

Yellow Ribbon Benefit at Manhattan College

- Up to $24,476.79 per year, per student at the College, not to exceed the cost of tuition.
- The Department of Veterans Affairs will match at the same amount up to 50% of the difference between the student's tuition benefit and the total cost of tuition and fees.
- Including GI Bill-based assistance, admitted Yellow Ribbon Program qualified undergraduate veterans can attend Manhattan College at no out of pocket cost.
- Participation in the Yellow Ribbon Program precludes the student from being eligible for any other institutional awards.
- Yellow Ribbon Program award amounts are based on per-credit-hour tuition and allowable fees.
- Once eligible, a student remains so throughout their education as long as they remain in good academic standing and have remaining entitlement with the VA.

Yellow Ribbon Program Eligibility Requirements

Only individuals entitled to the maximum benefit rate (based on service requirements) may receive Yellow Ribbon Program benefits from Manhattan College and the VA. We strongly encourage you to review the eligibility criteria directly from the VA website.

The general eligibility requirements for the Yellow Ribbon Program include:

- Student served an aggregate period of active duty after Sept. 10, 2001 of at least 36 months.
- Student was honorably discharged from active duty for a service-connected disability and they served 30 continuous days after September 10, 2001.
- Student is a dependent eligible for Transfer of Entitlement under the Post-9/11 GI Bill based on a veteran's service under the eligibility criteria listed above.
- In addition to all other institutional policies and regulations, students who receive education benefits from the VA must comply with the policies of the VA and the State

Approving Agency for the training and education of students receiving VA education benefits. These policies include the following requirements:

- You cannot be certified for receipt of your VA education benefits until you have selected the program of study you intend to pursue, met all admissions requirements and all credentials required by the office of admissions are received and evaluated. You must be admitted as a fully matriculated student.
- It is your responsibility to immediately inform the College's VA certifying official of any changes in your enrollment (e.g., dropped or added classes, or withdrawal from school). If there is any unreported change in your enrollment, you may not be entitled to the full amount of your educational benefits.
- It is your responsibility to inform the College's VA certifying official each semester or term of your intent to utilize your education benefits. You must turn in a Request for Certification form and a copy of your course schedule.
- Only the elective hours required for degree completion, as stated in the catalog for your curriculum, may be certified for benefits. You may not receive benefits for excessive electives or courses already taken and passed. You must achieve satisfactory academic progress toward completion of your degree as stated in the catalog. Unsatisfactory progress, conduct or attendance may result in termination of your educational benefits.
- Veterans who qualify for both federal financial aid and GI Bill assistance may receive support from either or both sources. However, if both sources are utilized, maximum assistance cannot exceed the total cost of attendance.
- Based upon eligibility determination by the VA, a student may still have a balance due to the College after receiving payment from the VA.

Veteran benefits information is available in the Office of Financial Aid Administration. Each semester recipients of Veterans Administration funds are required to file an Enrollment Certification in this office, and to report promptly when adding or dropping any courses, as well as being responsible for any overpayments made by the V.A.

Location

The College is situated along Manhattan College Parkway on the heights above Van Cortlandt Park (242nd Street and Broadway) in the Riverdale section of New York City. It is a short distance from the 242nd Street station of the Broadway-Seventh Avenue Subway and can be easily reached from any part of the metropolitan or suburban areas. The exit of the Henry Hudson Parkway (West Side Highway) located at 239th Street several blocks to the west of the College puts the campus within easy reach of New Jersey. The College is also within easy commuting distance from Long Island and Westchester and Rockland counties because of its proximity to the New York State Thruway and the Major Deegan Expressway (exit at Van Cortlandt Park South or West 240th Street).

Campus Map **(**http://manhattan.edu/admissions/tour/**)**

Directions to Manhattan College

By Car:

From Long Island

Robert F. Kennedy Bridge (Triborough Bridge) (from South)
Follow signs to Major Deegan Expressway North (I-87), exit at Van Cortlandt Park South, bear right off ramp and bear right onto Broadway. At second traffic light, turn left and then left again onto Manhattan College Parkway. Proceed up hill to main gate on right.

Whitestone or Throgs Neck Bridge (from East)
To Cross Bronx Expressway (I-95), to Major Deegan Expressway (I-87) North, exit at Van Cortlandt Park South, bear right off ramp and bear right onto Broadway. At second traffic light, turn left and then left again onto Manhattan College Parkway. Proceed up hill to main gate on right.

From Upstate

Saw Mill River Parkway/Henry Hudson Parkway
Traveling North: Exit at 239th Street. Go to stop sign, cross intersection and bear right onto Manhattan College Parkway. Proceed down hill to main gate on left.

Traveling South: Exit at 246th Street. Turn left at first traffic light, turn right onto Fieldston Road at circle and then turn left onto Manhattan College Parkway. Proceed down hill to main gate on left.

New York State Thruway (I-87) (from North)
Thruway South (I-87) becomes the Major Deegan Expressway. Exit at Van Cortlandt Park South, turn right off ramp and bear right onto Broadway. At second traffic light, turn left and then left again onto Manhattan College Parkway. Proceed up hill to main gate on right.

From New Jersey

George Washington Bridge (from West)
New Jersey Turnpike or Route 80 to George Washington Bridge. Follow signs to Henry Hudson Parkway North to 239th Street Exit (no commercial vehicles). At stop sign,

proceed straight across intersection (monument on left), pass traffic light and bear right at fork onto Manhattan College Parkway. Proceed down hill to main gate on left.

From New York City

F.D.R. Drive (from South)
F.D.R. Drive to Major Deegan Expressway North (I-87). Exit at Van Cortlandt Park South, bear right off ramp and bear right onto Broadway. At second traffic light, turn left and then left again onto Manhattan College Parkway. Proceed up hill to main gate on right.

West Side Highway (from South)
West Side Highway to Henry Hudson Parkway North to West 239th Street Exit. At stop sign, proceed straight across intersection (monument on left), pass traffic light and bear right at fork onto Manhattan College Parkway. Proceed down hill to main gate on left.

From New England
New England Thruway West to Cross Westchester Expressway, then onto New York State Thruway South. Exit at Van Cortlandt Park South, turn right off ramp and bear right onto Broadway. At second traffic light, turn left and then left again onto Manhattan College Parkway. Proceed up hill to main gate on right.

From Airports

John F. Kennedy Airport (JFK)
Take Van Wyck Expressway North to Grand Central Parkway to Robert F. Kennedy Bridge (Triborough Bridge), and follow the Long Island directions (above).

LaGuardia Airport (LGA)
Take Grand Central Parkway to Robert F. Kennedy Bridge (Triborough Bridge), and follow Long Island directions (above).

Newark Liberty International Airport (EWR)
Take N.J. Turnpike North to George Washington Bridge and follow the New Jersey directions (above).

Westchester County Airport (HPN)
Go west on Tower Road toward Purchase Street (NY Route 120). Make a left turn onto Purchase Street (NY Route 120). Turn right onto the ramp.Merge onto the Hutchinson River Parkway South. Keep left to take the Cross County Parkway West (Exit 15) toward the George Washington Bridge. Take the Saw Mill River Parkway South exit toward NYC and follow the Saw Mill River Parkway (travelling south) directions above.

By Public Transportation:
MTA Subway
Take the 1 train to Van Cortlandt Park-242 Street (last stop).
Walk up the hill on W. 242nd Street to main gate on right.
For more information on subway schedules, visit mta.info.

Metro North
Take the Hudson Line to Marble Hill.
Exit the Marble Hill station, cross Broadway and enter the 1 train subway station at 231st Street. Then follow the MTA Subway directions above.
For more information on train schedules, visit mta.info.

Amtrak Train
Amtrak trains arrive into New York City's Penn Station located in midtown approximately 12 miles from campus. Once arriving at Penn Station, you can take public transportation to campus per the directions above.

MTA Bus
Bus routes near the College are the 7, 10 and 24, all of which stop at W. 239th Street and Riverdale Avenue.
For more information on city bus schedules, visit mta.info.

Bus from New Jersey
Take bus to Port Authority Terminal at either W. 42nd Street or W. 178th Street.
Take the 1 train to Van Cortlandt Park-242 Street (last stop).
Walk up the hill on W. 242nd Street to main gate on right.

Medals

Awards

The Fitzpatrick Family Medal

The Fitzpatrick Family Medal is awarded to a student from the Graduate School of Education who exemplifies the Lasallian tradition of academic excellence and service to others.

The Frank Derbenwick Award

This award is given in recognition of superior performance in the Chemical Engineering Graduate Program in memory of Chemical Engineering Professor Frank Derbenwick.

The James Strecansky '62/Air Products Award

This award is given to a graduate student for outstanding service to the Chemical Engineering Department.

The Robert Harris '61 Memorial Award

This award is presented to an outstanding foreign national enrolled in the Chemical Engineering Graduate Program.

The Sigma Xi Medal

This award is given to a graduate student for outstanding research in science.

The Award for Excellence in the Graduate Study of Environmental Engineering

This award is presented to a graduate student for excellence in Environmental Engineering and Science.

O'Malley School of Business

Mission

The O'Malley School of Business shares with the rest of Manhattan College a commitment to the development and growth of each student. Inspired by Lasallian tradition, the mission of the O'Malley School of Business is to prepare students from diverse backgrounds for the challenges that they will face as business and community leaders. The faculty of the School, as teachers, scholars and mentors, foster the development of the whole person by engaging students in a values-based education with current business theory, skills and practices.

Degree Programs

Manhattan College offers a general MBA degree that provides a well-rounded business education. The MBA program is open to students of all disciplines who have earned an undergraduate degree from an accredited college or university. The degree can be completed as a full or part-time student.

The program is designed to increase students' awareness of the multifunctional aspects of business and enhance their ability to integrate business knowledge in decision making.

Fifth Year B.S./MBA Degree Program

Manhattan College O'Malley School of Business undergraduate students are eligible to apply for the special five-year B.S./MBA program wherein a student completes both their undergraduate business degree and MBA in five years. Two tracks are available – one for accounting students and one for non-accounting students. Both tracks are described below.

Track 1 - B.S./MBA Professional Accounting

The B.S./MBA Professional Accounting Program offers accounting students the option to complete a CPA licensure qualifying curriculum and is structured to meet the requirement in accordance with the regulations of the State of New York. The successful completion of the five-year program leads to two degrees: a B.S. and an MBA, both in Professional Accounting. The program consists of a total of 153 hours in undergraduate and graduate credits, planned over a five-year period, including coursework during ten semesters and at least one summer session.

Track 2 – B.S. Business / MBA

The B.S. in Business/MBA Program offers students the option to complete a five-year dual-degree program. The successful completion of the five-year program leads to two degrees: a B.S. in Business (in one of six majors) and an MBA. The program consists of a total of 150 hours in undergraduate and graduate credits, planned over a five-year period, including coursework during ten semesters and at least one summer session.

Application Procedures

The MBA program is open to students of all disciplines who have earned an undergraduate degree from an accredited college or university. Admission to the MBA program is done on a rolling basis.

Applicants whose undergraduate degree is not in a business-related discipline may need to take a number of prerequisite courses. These prerequisites can be satisfied by taking the online MBA Foundation Courses (or equivalent undergraduate courses).

Manhattan College students applying to the program should contact Professor Marc Waldman (marc.waldman@manhattan.edu (janet.rovenpor@manhattan.edu), office 418 - De La Salle Hall). Students wishing to join the five-year program are encouraged to apply during the summer prior to their senior year as this will allow maximum flexibility in MBA course scheduling and give the applicant time to remedy any deficiencies in their application. Applications from seniors will be accepted.

O'Malley School of Business Applicants:

- O'Malley School of Business students who were awarded a Presidential, Dean's or Chancellor's scholarship and have a cumulative GPA of at least 3.0 by the end of their junior year are eligible for direct admission into the MBA Program. GMAT exam and recommendations requirements are waived.
- O'Malley School of Business students who have a cumulative GPA of at least 3.20 by the end of their senior year are eligible for direct admission into the MBA Program. GMAT exam and recommendation requirements are waived.

School of Engineering Applicants:

- School of Engineering students who have a cumulative GPA of at least 3.0 by the end of their senior year or have passed the Fundamentals of Engineering (FE) exam are eligible for a GMAT exam waiver.

School of Science Applicants:

- School of Science students who have a cumulative GPA of at least 3.0 by the end of their senior year are eligible for a GMAT exam waiver.

School of Arts or School of Education Applicants:

- School of Arts or School of Education students who have a cumulative GPA of at least 3.3 by the end of their senior year are eligible for a GMAT exam waiver.

Applicants will be assessed according to the following criteria:

1.GPA: Applicants should have a cumulative GPA of a least 3.0 (on a 4.0 scale).

2.Resume: The resume should include examples of academic, co-curricular and extracurricular achievement which can be used to assess personal qualities and ability to complete the program.

3.Recommendations: Applicants must submit two letters of recommendation attesting to the applicant’s intellectual ability, leadership potential and ability to complete the program.

4.Official GMAT scores: A score of at least 500 is preferred.

The GMAT exam requirement will be waived for applicants that meet any of the following criteria:

- The applicant has at least three years of relevant full-time work experience
- The applicant has earned a graduate degree or professional degree (M.D., J.D.) from an accredited college or university
- The applicant has passed the CPA or CFA exam

Applicants from outside Manhattan College must complete the graduate application that is available from the Office of Admissions website. Official transcripts of all undergraduate and graduate courses, GMAT scores, resume and letters of recommendation should be submitted directly to the Office of Admissions.

Official transcripts (not student copies) of all academic records must be sent to the Office of Admissions by the institutions issuing them. Applicants who file an application before the baccalaureate degree has been conferred may be accepted pending the successful completion of their undergraduate work. A final transcript must be received in the Office of Admissions before they register for graduate courses.

BS/MBA in Business

The B.S. Business / Masters of Business Administration Program offers students an option to complete a five-year dual-degree program. The successful completion of the five-year program leads to two degrees: a B.S. in Business (in one of seven majors) and an MBA. The program consists of a total of 150 hours in undergraduate and graduate credits, planned over a five-year period, including coursework during ten semesters and one summer session.

The program is designed to increase students' awareness of the multifunctional aspects of business and enhance their ability to integrate business knowledge in decision making.

The initial admission into the O'Malley School of Business follows the institution's admissions processes. Students are encouraged to apply to the 5th-year MBA program during the summer before their senior year. Applications from seniors will be accepted.

O'Malley School of Business seniors who have earned an overall GPA of at least 3.0 can, with permission of the MBA Program Director and their academic adviser, take select MBA courses.

Summary of Course Requirements

First Year

ENGL 110	First Year Composition	3
English Elective		3
MATH 153	Linear Mathematical Analysis	3
History Elective		3
MATH 154	Calculus for Business Decisions	3
Science Electives		6
PSYC 203	Introduction to Psychology I	3
RELS 110	The Nature and Experience of Religion	3
CIS 110	Introduction to Information Systems	3
Total Credits		30

Second Year

ACCT 201	Principles of Accounting I	3
ACCT 202	Principles of Accounting II	3
SOC 201	Introduction to Sociology	3
BUAN 227	Business Statistics	3
ENGL 211	Written Communication	3
ECON 203	Microeconomics	3
ECON 204	Macroeconomics	3
MGMT 201	Introduction to Management	3
MKTG 201	Essentials of Marketing	3

LAW 203	Business Law I	3
Total Credits		30

Third Year

MGMT 307	Operations and Quality Management	3
ECON 305	Money and Banking	3
FIN 301	Principles of Business Finance	3
PHIL 201	Ethics	3
Arts or Science Electives		6
RELS Elective A		3
Business Major		9
Total Credits		30

Fourth Year

MGMT 406	Strategic Management	3
MGMT 430	Business, Government, and Society	3
Arts or Science Elective		3
RELS Elective B		3
Business Major		12
Two MBA Core Courses		6
Total Credits		30

Summer Term

Two MBA Concentration Courses		6
Total Credits		6

Fifth Year

Four MBA Core Courses		12
MBA Elective		3
Two MBA Concentration Courses		6
MBAC 622	Leadership and Organizational Behavior	3
Total Credits		24

Total Credits: 150

BS/MBA Professional Accounting

The B.S./M.B.A. Professional Accounting program offers students an option to complete a CPA licensure qualifying curriculum and is structured to meet the requirement in accordance with the regulations of the State of New York. The successful completion of the five-year program leads to two degrees: a B.S. and MBA in Professional Accounting. The program consists of a total of 153 hours in undergraduate and graduate credits, planned over a five-year period, including coursework during ten semesters and one summer session.

The program is designed to increase students' awareness of the multifunctional aspects of business and enhance their ability to integrate business knowledge in decision making.

The initial admission into the O'Malley School of Business follows the institution's admissions processes. Students are encouraged to apply to the 5th-year MBA program during the summer before their senior year. Applications from seniors will be accepted.

O'Malley School of Business seniors who have earned an overall GPA of at least 3.0 can, with permission of the MBA Program Director and their academic adviser, take select MBA courses.

Summary of Course Requirements

First Year

ENGL 110	First Year Composition	3
ENGL Elective		3
HIST Elective		3
MATH 153	Linear Mathematical Analysis	3
MATH 154	Calculus for Business Decisions	3
SCI Electives		6
PSYC 203	Introduction to Psychology I	3
RELS 110	The Nature and Experience of Religion	3
CIS 110	Introduction to Information Systems	3
Total Credits		30

Second Year

ACCT 201	Principles of Accounting I	3
ACCT 202	Principles of Accounting II	3
SOC 201	Introduction to Sociology	3
BUAN 227	Business Statistics	3
ECON 203	Microeconomics	3
ECON 204	Macroeconomics	3
ENGL 211	Written Communication	3
MGMT 201	Introduction to Management	3
MKTG 201	Essentials of Marketing	3

LAW 203	Business Law I	3
Total Credits		30

Third Year

MGMT 307	Operations and Quality Management	3
ECON 305	Money and Banking	3
PHIL 201	Ethics	3
Arts or Science Electives		6
RELS Elective A		3
ACCT 301	Intermediate Accounting I	3
ACCT 302	Intermediate Accounting II	3
ACCT 303	Cost Accounting	3
ACCT 350	Accounting Information Systems	3
LAW 304	Business Law II	3
Total Credits		33

Fourth Year

MGMT 406	Strategic Management	3
FIN 301	Principles of Business Finance	3
Arts or Science Elective		3
RELS Elective B		3
ACCT 401	Auditing	3
ACCT 405	International and Advanced Issues in Accounting	3
ACCT 409	Federal Income Taxation I	3
ACCT 410	Federal Income Taxation II	3
MBA Elective		3
MBAP 710	Professional Ethics	3
Total Credits		30

Summer Term

One of the following courses:		3
MBAE 601	Internship	
ACCT 608	Accounting Theory and Research	

Fifth Year

ACCT 609	Information Technology Assurance and Audit	3
ACCT 610	Governmental and Not-for-Profit Accounting	3
ACCT 611	Tax Research	3
MBAC 617	Decision Modeling with Spreadsheets	3
MBAC 618	Financial Management	3
MBAC 621	Reading/Cases in Financial Reporting	3
MBAC 622	Leadership and Organizational Behavior	3

MBAC 635	Managerial Economics	3
MBAC 637	Marketing Strategy and the Consumer Experience	3
MBAP 720	Advanced Strategic Management	3
Total Credits		30

Total Credits: 153

MBA Curriculum & Program

The MBA program requires 36 credit hours of coursework (12 three credit courses). The O'Malley School of Business offers both a general and concentration-based degree program. Both programs require the six core courses, the capstone course and one elective. Concentrations offer the student a targeted MBA curriculum in one of three areas - Business Analytics, Finance & Economics, or Organizations, Markets & Sustainability.

Core:		**18**
MBAC 617	Decision Modeling with Spreadsheets	
MBAC 618	Financial Management	
MBA 630	Accounting for Business Decision Making	
MBAC 635	Managerial Economics	
MBAC 637	Marketing Strategy and the Consumer Experience	
MBAP 710	Professional Ethics	
Capstone:		**3**
MBAC 622	Leadership and Organizational Behavior	
Elective:		**3**
MBAE 603	Entrepreneurship	
MBAE 604	Business Plan Project A and B	
MBAE 606	Doing Business:Study Trip	
MBAE 607	Business Plan Project	
MBAL 642	International Marketing Field Project	
MBAL 644	Employment Law	
MBAL 645	Special Topics in Business	
MBAL 647	International Management Field Project	
Business Analytics Concentration (Four of the following):		**12**
MBAC 611	Advanced Data Analysis	
MBA 615	Computing in R	
MBA 620	Advanced Data & Information Management	
MBAL 646	Project Management	
MBAE 601	Internship	
MBAE 602	Research	
Course approved by MBA Program Director		
Finance and Economics Concentration (four of the following courses):		**12**
MBAC 616	Stock Market & Corp Valuation	
MBAC 626	Environmental Economics and Policy	
MBAC 638	Markets, States, and Policies in the Global Economy	
MBA 639	Corporate Finance	
MBAE 601	Internship	
MBAE 602	Research	
Course approved by MBA Program Director		

Organizations, Markets & Sustainability Concentration (four of the following courses):		**12**
MBAC 624	Going Global: Business and Society	
MBA 625	Creativity for Entrepreneurs	
MBAC 631	Innovation Management	
MBAC 633	Managing/Marketing Service Business	
MBAC 636	Supply Chain Analysis	
MBAP 720	Advanced Strategic Management	
MBAE 601	Internship	
MBAE 602	Research	
Course approved by MBA Program Director		
General MBA, No Concentration		**12**
Four additional MBA courses chosen from the concentration and elective courses		

MBA Foundation Courses

The MBA Foundation Courses are a set of four intensive online courses that are meant to prepare non-business students for the MBA program. Credits earned for MBA Foundation Courses cannot be applied toward the 36 credits required for the MBA program.

MBAF 510	Foundations of Business Statistics	3
MBAF 520	Foundations of Financial and Managerial Accounting	3
MBAF 530	Foundations of Economics	3
MBAF 540	Foundations of Organizational and Operational Management	3

MBA Program Learning Goals

By the completion of the MBA program, students will:

- Gain experience in analytical decision-making.
- Develop an understanding of leadership.
- Demonstrate an understanding of ethical issues in business.
- Demonstrate an understanding of organizations and the competitive environment.

Business Calendar*

2020 Fall Semester

Month	Date	Day	Event
August	31	Monday	Classes Begin
September	07	Monday	Late Registration & Add/Drop Ends
September	07	Monday	Labor Day – No Classes
September	15	Tuesday	Senate Meeting
October	12	Monday	Fall Break – No Classes
October	13	Tuesday	Monday Schedule
October	20	Tuesday	Mid-Term Grades Due
October	20	Tuesday	Senate Meeting
November	02	Monday	Web Registration begins for Spring 2021
November	17	Tuesday	Senate Meeting
November	20	Friday	Last day to withdraw from courses
November	25-27	Wed-Fri	Thanksgiving Holiday – No Classes
December	11	Friday	Last Day of Classes
December	14-19	Mon-Sat	Finals Week - Winter Recess begins after last examination
December	21	Monday	Fall 2020 Online Grading closes

2020-2021 Winter Intersession

Month	Date	Day	Event
December	21	Monday	Classes Begin
December	24-31	Thu-Thu	Christmas Break-College Closed
January	01	Friday	New Year's Holiday-College Closed
January	15	Friday	Last day of Winter Intersession

2021 Spring Semester

Month	Date	Day	Event
January	20	Wednesday	Classes Begin
January	26	Tuesday	Late Registration & Add/Drop Ends
February	02	Tuesday	Deadline to submit incomplete work to Faculty for Fall 2020
February	08	Monday	Deadline for Faculty to submit grades for Fall 2020 incompletes
February	16	Tuesday	Senate Meeting
March	11	Thursday	Mid - Term Grades Due
March	15-19	Mon-Fri	Spring Break
March	16	Tuesday	Senate Meeting
April	01-05	Thu-Mon	Easter Holiday - No Classes

April	06	Tuesday	Web Registration Begins for Fall 2021
April	07	Wednesday	St. De La Salle Day:The Feast of St. John Baptist de la Salle, Patron of Teachers
April	07	Wednesday	Monday Schedule
April	20	Tuesday	Senate Meeting
April	21	Wednesday	Last day to withdraw from courses
May	07	Friday	Last Day of Classes
May	08-09	Sat-Sun	Reading Days
May	10-15	Mon-Sat	Finals Week
May	16-20	Sun-Thu	Senior Days
May	17	Monday	Summer Session I Begins
May	18	Tuesday	Spring 2021 Online Grading closes at 12 noon
May	19	Wednesday	Spring Commencement (GM & SCPS Division)
May	21	Friday	The 179th Undergraduate Commencement
June	29	Tuesday	Deadline to submit incomplete work to Faculty for Spring 2021 incompletes
July	05	Monday	Deadline for Faculty to submit grades for Spring 2021 incompletes

2021 Summer Sessions

Month	Date	Day	Event
May	17	Monday	Summer Session I Begins
July	02	Friday	Summer Session I Ends
July	06	Tuesday	Summer Session II Begins
August	23	Friday	Summer Session II Ends

**Manhattan College reserves the right to make changes as circumstances require.*

School of Education & Health

Mission

The Graduate Education Programs at Manhattan College are committed to the mission of Manhattan College to provide a contemporary, person-centered education that is based on and grounded in the Lasallian traditions of scholarship, excellence in teaching, respect for individual dignity, and commitment to social justice. The goal of the graduate programs that flows from this mission and grounding is to prepare self-directed, reflective, scholarly professionals dedicated to the highest standards for themselves and those they serve. Professionals are prepared in the fields of School and Mental Health Counseling, Marriage and Family Therapy, School Leadership and Childhood/Adolescent/Special Education (Grades 1-6).

Admission Requirements and Application Process

Admission requirements and the application process depend on the graduate education program you want to join. Please see the graduate admissions web page and the graduate education catalog for details about program specific requirements and application process.

- Master’s degree applicants must present an earned baccalaureate degree from an accredited college or institution acceptable to Manhattan College. Advanced Certificate applicants must present a master's degree from an accredited college or institution acceptable to Manhattan College.
- In most cases, an undergraduate and/or graduate grade point average of 3.0 on a 4.0 scale is required
- GRE scores are required for some of the Special Education and Educational Leadership programs. See specific program section of the catalog for more information.
- Other factors will be considered for admission, including, but not necessarily limited to, relevant professional experience, a high grade point average in major field of study, scores on required standardized tests, post-baccalaureate grades, academic development beyond the baccalaureate degree and/or an interview with the program director.
- Admission into a Graduate Education Program will be granted as a matriculated student, i.e., one seeking to fulfill the requirements of a master's degree or an advanced certificate program.
- Students who have earned a master's degree or who are pursuing a master's degree in one of the graduate education programs at Manhattan College and who desire to seek admission into another graduate education program must apply to the new program through the Office of Graduate Admissions.
- Applications for admission will be reviewed by the Director of the program and the Dean of the School of Education and Health.

- Applicants to the School of Education and Health must apply through the ONLINE graduate application through Graduate Admissions.
- Applications are accepted on a rolling basis and will be processed for the next possible application deadline.
- Those interested in being considered for scholarships, grants, and graduate assistantships should apply prior to the suggested application deadline.
- NON-MATRICULATED APPLICANTS: An applicant may be granted permission to take an approved graduate course on a non-matriculated basis or, in special cases, as an auditor. A non-matriculated student is earning graduate credit for a course but is not necessarily working toward a degree. For example, a non-matriculated student may be interested in earning graduate credits, continuing education units, or completing CTLE hours to maintain certification or for other professional reasons. For both non-matriculated and auditing students, tuition and fees are the same as for matriculated students. A non-matriculation fee also applies. Students may not register for more than 12 credits as a non-matriculated student. Students who take graduate courses at Manhattan College on a non-matriculated basis and apply thereafter for admission to a graduate program as a matriculated student will be informed at the time of acceptance which courses may be applied to the desired degree or advanced certificate program.

Suggested Application Deadlines

Spring Semester- December 15

Summer Semester- April 1

Fall Semester- July 1

Questions related to the application process or admission decision should be addressed to the Office of Graduate Admissions at 718-862-8200 or gradadmit@manhattan.edu

International Applicants

The College accepts international students into its full-time Graduate Education Programs at Manhattan College. In general, the College cannot accept international students into a part-time Graduate Education Program. The international student who is accepted and receives a student visa must be enrolled in 9 credits (three 3-credit courses) in each term of the academic year. International students must complete the program within 18 months.

All students applying from another country must take the TOEFL (Test of English as a Foreign Language) and have the test results sent to the Office of Graduate Admissions. A minimum TOEFL score of 80 will satisfy admission requirements to a graduate education department at Manhattan College and the criteria for issuance of the I-20 form.

Graduate Education Programs

The Graduate Education Programs at Manhattan College are committed to the preparation of counseling, leadership, and educational professionals through courses leading to the master degree and/or advanced certificates:

- The Master of Arts in School Counseling is directed toward work in counseling with a view to preparing the candidate for the role of counselor in schools.
- The Master of Science in Mental Health Counseling is directed toward work in agency, hospital, or other service related placements.
- The Master of Science in Marriage and Family Therapy prepares participants to become clinicians who serve individuals, couples, and families in the context of agencies, hospital, and in private practice.
- The Teacher Education Program is directed toward the professional preparation of teachers of individuals with disabilities that may include but need not be limited to intellectual disabilities, emotional disturbance, the physical disability, autistism, multiple disabilities, or specific learning disabilities in grades 1-6 and 7-12 (English or Math or Social Studies).
- The Dual Special Education Program prepares teachers to work with children in grades 1-6 in general and Special Education settings.
- The School Leadership Program is directed toward the professional preparation of school building leaders, administrators, and supervisors, assistant principals, department chairs, coordinators, unit heads, and the like.
- The Advanced Leadership Studies program is directed toward the professional preparation of school district leaders, superintendents, associate and assistant district level personnel, staff developers, curriculum and subject area coordinators, special education directors and coordinators, and those with responsibilities beyond the school level.
- Advanced Certificates are offered to qualifying individuals in both school and mental health counseling, bilingual counseling, bilingual special education and school leadership.

Degree Requirements

To obtain a degree and/or advanced certificate in a Graduate Education Program from Manhattan College, participants must:

- Earn the required number of credits for the program, successfully complete each course, make continued progress in the program, and demonstrate mastery of the professional knowledge, skills, and dispositions for the specific degree and/or certificate with a cumulative index of 3.0 or better.
- Give evidence of having met program standards through periodic performance reviews.
- Undertake a practicum and/or internship, if required. These experiences, including the seminars and reports related to them, are designed to integrate the theory, research, and practice developed throughout the program.
- Undertake and complete a research-based project/paper, if required, under the direction of a graduate education faculty member:

  - The major paper must be completed for a master’s degree in Educational Leadership, Special Education, School and Mental Health Counseling and Marriage and Family Therapy.
  - The topic must be related to the participant's program of study.
  - Candidates must carefully follow the format of the American Psychological Association, 7th edition, for a quantitative or mixed methods research study.
  - Final approval including sign-off by a faculty research advisor is required to be awarded a master’s degree in Counseling, Educational Leaders and Special Education.
- Documentation of practicum/internship/major project/major papers must be submitted and approved, and filed where appropriate for the completed program according to the timeline for graduation: July 15 for a September graduation date, September 15 for the December graduation date, November 15 for February graduation date, and February 15 for a May graduation.
- An Intent to Graduate form must be submitted to the Graduate Education Office by the specified due date during the semester before graduation.
- The online Application to Graduate provided by the Office of the Registrar must be submitted within the Registrar's required timeline. Those students not submitting the online application to graduate during the required time may be delayed until the next graduation date. Requests for extensions must be made to the Office of the Registrar by emailing registrar@manhattan.edu
- Pay and clear all outstanding financial accounts including library, parking, and graduation fees owed the College.

Courses

EDUG 510. Personal Wellness. 3 Credits.
A study of the diversified nature of health as it relates to everyday living by examining vital health areas and issues relevant to the concerns of the student. Identification and reporting of suspected child abuse and maltreatment; instructing students in preventing child abduction and abuse of alcohol, tobacco, and other drugs; and providing safety education including instruction in fire and arson prevention. Satisfies the requirement for S.A.V.E. and Child abuse Recognition and Reporting (Dual M.S. Ed).

EDUG 600. Orientation to School Building Leadership. 3 Credits.
This 0-3 credit course is required for all those admitted to the School Building Leadership (SBL) program and should be taken within the first six credits. This orientation addresses Course Related Leadership Activities (CRLA), the Leadership Experience (the Internship),EDUG 748 Internship/Seminar I, and EDUC 889 Internship/Seminar II, and the required documentation for the SBL program completion.

EDUG 700. Lasallian Educational Practice and Philosophy. 3 Credits.
An examination of the life and educational contributions of John Baptist de La Salle. The course will examine ’The Catholic School’ and specifically ’The Lasallian School.’ Pedagogy, curriculum, spirituality, social action and the training of new teachers will be discussed.

EDUG 704. Introduction to Group Dynamics and Human Relations. 3 Credits.
Experiential study of factors that provide a climate of freedom for personal expression; exploration of feelings; interpersonal communication and diversity through group analysis of current community problems; emphasis on the atmosphere conductive to interaction among group members; dynamics for innovative and constructive behavior; theory and practice in treatment and elimination of conflict, especially in intergroup-intercultural problems.

EDUG 705. Orientation to Alcohol and Substance Abuse Counseling. 3 Credits.
An introduction to alcohol and chemical dependency counseling with an emphasis on major aspects of the field such as the disease concept, the importance of self-help groups in the recovery process, ethical principles that impact on alcohol and substance abuse counseling, Federal and State confidentiality laws, and client HIV status as it pertains to confidentiality.

EDUG 706. Alcohol and Substance Abuse: Evaluation, Treatment Planning and Case Management. 3 Credits.
An in-dept study of the essential components of alcohol and drug assessments, their importance in the treatment planning process, the development and implementation of behaviorally-oriented treatment plans and the coordination of services for clients through case management activities. The variety of treatment opportunities for clients based on their individual needs will be studied. Prerequisite: 705 or permission of Program Director.

EDUG 708. Physical and Psychopharmacological Aspects of Alcohol and Substance Abuse. 3 Credits.
An examination of how alcohol and other substances affect physical health, including the brain and the individual's cognitive functioning. Specific emphasis will be placed on the pharmacological effects of alcohol and other substances of abuse. Specific illness commonly found among this population such as AIDS, tuberculosis and other communicable diseases will be discussed.

EDUG 709. Alcohol and Substance Abuse Counseling Family Issues and Treatment Approaches. 3 Credits.
A comprehensive review of the literature pertaining to the effects of alcoholism and other substance abuse on the family system. Individual and group treatment approaches employed within the family system, including co-dependency groups, Al-Anon, Alateen, and other services for children of alcoholics and substance abusers will be discussed. Prerequisites: 721, 725, or permission of the Program Director.

EDUG 710. Current Issues. 3 Credits.
An examination of how certain influences affect our understanding and treatment of alcohol and substance abuse.

EDUG 711. Multiple Disorders. 3 Credits.
A comprehensive examination of psychiatric disorders and the nomenclature of DSM-IV. Issues pertaining to the ways that various mental disorders complicate the evaluation and treatment of alcohol and substance abuse will be studied. Specific treatment interventions with certain groups of dually-diagnosed individuals will be provided. Specific attention will be paid to the treatment of polysubstance abusers.

EDUG 712. Counseling the Single Parent Family. 3 Credits.
Examination of the needs of children and parents in single parent families; distinctions made among single parent families' problems brought about by divorce, separation, death, annulment and out-of-wedlock children.

EDUG 713. Methods of Educational and Psychological Research. 3 Credits.
In EDUG713, students learn a variety of common research designs in education and psychology, develop the ability to evaluate primary research, and design a research project. Research designs covered include experimental, causal-comparative, correlational, and qualitative, and their applications to needs assessment, program evaluation, outcomes research, and action research. Students would use their knowledge on research designs to evaluate literature related to their research topic and complete the introduction, literature review, and methods sections for their research projects. Research topic must be related to the student's specific program and approved by the course professor. To complete the remaining research project and paper, students in Counseling will take EDUG851 and those in Special Education and School Building Leadership will take EDUG888.

EDUG 714. Psychology of Career Counseling. 3 Credits.
Techniques of counseling different populations in a variety of settings. The course will address the role of work, job seeking techniques, the use of assessments, value clarification methods, and design of programs.

EDUG 715. Marriage and Family Counseling. 3 Credits.
Examination and application of the theory, practice and utilization of marriage and family counseling techniques.

EDUG 717. Stress Reduction Techniques. 3 Credits.
Study of the causes and characteristics of stress. Examination of different approaches and techniques for stress management that can be employed by the counselor.

EDUG 718. Technology, the School Counselor and College Advisor. 3 Credits.
This course gives students the opportunity to learn important technologies related to school counseling including an examination of best practices in use of Naviance; a second component of the course will focus on critical examination of college choice. Examination of software for programming, record keeping, testing, reference, referral, and networking for internal and external communication will be included. Three credits.

EDUG 721. Introduction to Counseling Practices and Theories. 3 Credits.
The student will be introduced to the field of counseling by examining the major theories of counseling. In comparing and contrasting these theories, it will become clear what makes each approach unique and what all of these approaches have in common. Through this process, the student will begin to develop a personal theoretical orientation to counseling. The course will also consider personal qualities needed to be an effective professional counselor and common ethical issues that arise in the practice of counseling. Three credits.

EDUG 722. Techniques in Counseling the Individual. 3 Credits.
Techniques of counseling the individual client will be studied and practiced. The course will examine the full process of counseling from initiation through termination. The student will learn how to establish a rapport with the client and how to work with difficult clients. The student will develop the skills to help the client explore problems, gain insight to those problems, and convert that insight into action. Three credits.

EDUG 723. Life Span Development. 3 Credits.
Comprehensive review of major theories of human development from pre-natal period through senescence. Critical tasks and aspects of growth for each period will be explored. Particular emphasis will be placed on cognitive and psychosocial development and how children, adolescents, and adults are affected differentially by various learning and emotional disabilities. Focus will also center on the link between research and practice of counseling and special education including multicultural research, research satisfies the requirement for S.A.V. E. and child abuse. Three credits.

EDUG 724. Career Development. 3 Credits.
Practical application of major career development theories related to the world of work. Topics include: career assessment tools, information resources and the decision-making process. Trends, exploration of classification systems and, program development for counseling in the schools.

EDUG 725. Practicum in Groups. 3 Credits.
Discussion, evaluation, and demonstration of types of group counseling techniques; analysis of group dynamics; group counseling as it applies to educational, interpesonal and emotional problems, including alcohol, and substance abuse problems. The use of 12-Step self-help groups in recovery.

EDUG 726. Foundations of Mental Health Counseling. 3 Credits.
This class will provide students with an introduction to the roles, functions, and professional identity of mental health counselors in a variety of clinical settings. Students will develop a basic working knowledge of biopsychosocial mental health assessment and diagnosis. Students will develop a basic working knowledge of the principles of current diagnostic tools. Students will develop a basic knowledge of commonly prescribed psychopharmacological medications. In addition, the course will focus on a survey of community agencies, organizations and resources. Three credits.

EDUG 727. Organization and Administration of the Guidance Program. 3 Credits.
Principles and problems in the organization, administration and evaluation of guidance programs at all levels; analysis of the role, responsibilities and duties of administrators, counselors, school psychologists, and teachers; computer applications for the guidance program for student support services including those with disabilities and who are English language learners. Field experience. Satisfies the requirement for S.A.V.E. legislation.

EDUG 728. Alcohol and Substance Abuse Counseling-Internship and Professional Development Seminar. 3 Credits.
Placements will be required within a licensed alcohol or substance abuse treatment agency, either inpatient or outpatient for a minimum of 150 hours. The internship experience will include the evaluation of clients, participation in counseling groups and individual counseling sessions with clients at the chosen treatment setting. A review of treatment sessions will be conducted with the student by the internship supervisor. As part of the internship experience, topics pertaining to the counselor/client professional relationship, transference/counter-transference issues, role boundaries and the use of clinical supervision as an ongoing aspect of practice will be the major focus of the internship experience. Minimum of 150 hours in the field. Prerequisite: Matriculation, 27 credits and permission of the Program Director and Director of Graduate Education.

EDUG 729. Professional Writing. 3 Credits.
This course is designed to enable the student to gain experience in professional writing and refine their writing skills. The emphasis will be on developing the organization and synthesis abilities required for more advanced writing demands in counseling. Focus will be on college advising reports such as the secondary school reports, recommendations, and writing IEP reports. Exposure to grant writing and program evaluations will alos be included. While the course will also address issued related to grammar, and the APA style manual, it will emphasize improvement in writing with clarity and professionalism.

EDUG 730. Curriculum,Strategies & Technology for the At Risk, English Language Learner (ELL) and Disabled. 3 Credits.
A practimum to improve school success of at risk, ELL and disabled students within the inclusionary setting. Review of Common Core Learning standards in ELA and mathematics, NYS Content and Performance Standards for Social Studies and Language Arts; emphasis on teaching strategies; differentiated instruction: modification of curriculum materials; application of instructional technology; a curriculum based project is required. Permission of the Director of Special Education required.

EDUG 731. Counseling the At Risk, Disabled Student and Family. 3 Credits.
Overview of trends and legal rights of the disabled; implication for counseling with regard to the special vocational, educational, social and emotional needs of the disabled; survey of programs, agencies, and services for the disabled.

EDUG 732. Practicum in Counseling. 3 Credits.
Advanced on-site pre-internship counseling practice with clients under the supervision of a qualified supervisor. Integrated seminar with case conferences designed to enable students to develop skills in case conceptualization, consultation, individual and group counseling. Minimum of 100 hours of experience required. Satisfies the requirement for S.A.V.E. and Child Abuse recognition and reporting. Prerequisites: 12 credits and permission of Advisor. Three credits.

EDUG 733. Approaches to Multicultural Education for the At Risk, (ELL) and Disabled Student. 3 Credits.
Introduction to multicultural education, cultural diversity, and equity issues through examination of race, ethnicity, social class, gender, disabilities and sexual orientation and their impact on curriculum and classroom instruction. Best practices and multicultural materials explored. Three Credits.

EDUG 735. Leadership for Learning, Decision Making and Change. 3 Credits.
This is the REQUIRED Leadership course for the Master degree or Advanced Certificate programs in School Building Leadership. The course can also be used for Professional Development and toward CTLE hours to maintain certification. This course considers leadership styles, decision-making models, and their implications for instructional leaders and designers at all levels who will explore what it means and what it takes to be a leader; A variety of strategies including, but not limited to, case studies, simulation, and role play will engage participants in developing or enhancing professional knowledge, decision-making skill, and dispositions to deal with organizational patterns (line and staff), group dynamics (formal and informal); social (power) systems, and digital access to leadership tools. 15-20 hours of course related leadership activities required.

EDUG 736. Issues in Educational Administration and Curriculum. 3 Credits.
This course is an ELECTIVE for the Master degree program in School Building Leadership. It can also be used for professional development, or toward CTLE hours to maintain certification, or as transfer credits. With an interdisciplinary focus, the course applies analysis, discussion, lecture, collaborative learning, intensive study, and integrative experiences to develop or enhance administrative and supervisory leadership for educational, corporate, and not-for-profit personnel with responsibility for administrative, supervisory, financial, training and development functions. Participants will exhibit evidence of knowledge, skills, and dispositions for effective leadership in diverse settings. Course projects that promote collaboration, communication, and planning with stakeholders may include action research, strategic planning, change processes, staff development, computer applications, and/or multimedia presentations.

EDUG 737. Staff Development. 3 Credits.
Concepts, theories, principles of adult learning for application to school based professional development; design and evaluation of new and existing staff development programs; use of staff development programs for team building, succession planning and collaboration; emphasis on school wide technological integration for effective standards based teaching and learning that helps students meet state standards. Developing and enhancing visionary instructional leadership by infusing instructional technology. Designed for school and district administrators, staff developers, counselors, general and special education teachers and professionals from other fields.

EDUG 738. Evaluating School Effectiveness. 3 Credits.
This is the REQUIRED assessment course for the master degree and post-master advanced certificate program. The course deals with models, current practices, strategies, and a variety of data sources for determining school personnel, and program effectiveness. Involving constituencies and staff in assessing program and personnel effectiveness, accountability for helping students meeting state standards; examination of self-study and accrediting agency evaluation processes; authentic; integrated assessment including portfolio assessment, formative and summative assessment, locally made and standardized assessment, understanding and using standardized test results to improve student learning. Course related leadership activities required.

EDUG 739. Administrative and Curricular Concerns of Independent, Faith-Based and Charter Schools. 3 Credits.
This course employs analysis, discussion, lecture, collaborative learning, intensive study related to issues for developing or enhancing administrative and curricular leadership of the private school, for administrators, assistant principals, special educators, counselors, department chairs, and other administrative personnel. Participants present evidence of knowledge, skills and dispositions for effective leadership in urban and suburban settings. Course projects that promote collaboration, communication, and planning with parents, students, staff, and community leaders may include research, strategic planning, change processes, staff development, computer application, and/or authoring professional papers. Satisfies the requirement for Child Abuse Recognition and Reporting and S.A.V.E. legislation.

EDUG 740. Educational Law for Administrators. 3 Credits.
Legal issues concerned with the rights of students, parents, and professional personnel; negligence, equal opportunity, public and private schools court cases analyzed. Exploration of ethical behavior; application of statutes and regulations as required by law and implementation of school policies. Satisfies the requirement for Child Abuse Recognition and Reporting and S.A.V.E. legislation.

EDUG 741. Educational Administration and Supervision. 3 Credits.
Theory and practice of school administration and supervision; organizational patterns of the American elementary, middle and secondary schools; effective practices related to staff, instructional programs, pupil personnel services including guidance, special education, and and mental health; discipline, utilization of school plant, public relations; career guidance. Participants present evidence of knowledge, skills and dispositions for effective leadership in diverse educational settings. Intensive study of planning and design for staff development, school management, supervision of elementary, middle, secondary schools, managing time, paper, people, money. Course projects related to safe, healthy supportive environments, budget and finance may include action research, strategic planning, change design, computer application and/or authoring professional papers. Satisfies the requirement for Child Abuse Recognition and Reporting and S.A.V.E. legislation.

EDUG 743. Personnel Practices. 3 Credits.
Theory and practice for administrators, department chairs, supervisory personnel regarding the recruitment, selection, assignment, and orientation of personnel; and the impact of collective negotiations.

EDUG 744. Contemporary Management Functions in the School. 3 Credits.
This course is required for the master degree and post-master program in School Building Leadership. Included are management techniques providing administrative and managerial leadership for planning, programming, budgeting; utilizing facilities, security, physical plant and materials management; scheduling; financial management; legal issues related to contract, negligence, state law, commissioner's regulations, and safe environment legislation. Satisfies the requirement for Child Abuse Recognition and Reporting and safe schools legislation, Course related leadership activities required.

EDUG 745. Curriculum Development and Adaptation. 3 Credits.
This is the REQUIRED curriculum course for the Master degree and post-master advanced certificate in School Building Leadership. The course can also be used for professional development and toward CTLE hours to maintain certification. This course considers principles, trends, and techniques of curriculum planning for early childhood through secondary schools; adaptation of curriculum to differentiate instruction and meet special needs including those for whom English is a new language; the role of the teacher, district, local supervisor, instructional designer, and principal in meeting state curriculum standards and adapting curriculum for effective instructional delivery; providing instructional leadership including appropriate application of technology enhancements. Emphasis on standards based teaching and learning that assists students to meet state standards. Course related leadership activities required.

EDUG 746. Administration and Supervision of Early Childhood Programs. 3 Credits.
Theory and practice of the administration and supervision of early childhood programs; review of legislation and requirements; discussion of developmentally appropriate practice; effective practices related to the selection and supervision of personnel; training and supervision of paraprofessional personnel; and policies, records, reports, instructional methods, materials and programs. Includes Child Abuse and Reporting. This course is suitable as an elective for aspiring leaders at the school and district level and for CTLE hours.

EDUG 747. Supervision for the Improvement of Instruction. 3 Credits.
This is the REQUIRED supervision course for the Master degree or Advanced Certificate programs in School Building Leadership. The course can also be used for professional development and toward CTLE hours to maintain certification. This course considers the role of district personnel, principals, supervisors, unit heads, department chairs and school leaders at all levels for improving the learning process; review, analysis, and critique of existing models of instruction and supervision; techniques for providing instructional leadership through laboratory processes and simulations; planning with college personnel to provide experiences for pre-service teachers to enhance student learning. 15 - 20 hours of course related leadership activities required.

EDUG 748. Internship/Seminar I in School Building Leadership. 3 Credits.
The seminar that accompanies the administrative activities of the internship integrates previous learning experiences of the core courses in school building leadership, uses a problem-solving approach to issues affecting administrators in elementary and secondary schools in diverse settings. EDUG 748 is the first of two courses of internship that require a total of 15 weeks full time or 30 weeks part time in administrative practice. Pre-requisites: EDUG 600, 18 credits in core courses taken at Manhattan College with a minimum 3.0 GPA, 100 hours of course related field experiences completed during the six core courses, approval/sponsorship by a site mentor, collaborative approval of an improvement initiative to be conducted during the internship, and permission of Program Director. Participants are advised to schedule time for this course so that site visits and internship activities equal to 250 hours of leadership practice can be completed within the semester of registration.

EDUG 749. Computer Applications for School Administrators. 3 Credits.
The application of basic computer functions to administrative tasks of planning, budgeting and communication; issues in computer managed and computer assisted instruction; computer hardware and software for school administration and management. This course is suitable as an elective for aspiring and practicing educational leaders at the school and district level and for CTLE hours.

EDUG 750. Principles and Practices of Reading for the At Risk, English Language Learner (ELL) and Disabled. 3 Credits.
Psychological principles of learning underlying reading instruction for diverse students (English Language Learners [ELL], disabled and gifted); methods of instruction and classroom organization for general, special education, and ELL students; materials, testing procedures, differentiated instructional strategies and computer applications in reading instruction. Three credits.

EDUG 753. Teaching Reading in Content Areas for At Risk, English Lang Learner(ELL) & Disabled (Grades K-12). 3 Credits.
Techniques for integrating reading and thinking skills into instruction in English, Social Studies, Science and Mathematics for grades K-12. Focus on the Common Core Learning Standards in ELA and Mathematics, NYS Content and Performance Standards for Social Studies and Language Arts. Formal and informal assessemnt of word recognition, vocabulary development, comprehension, study skills. Emphasis on differentiated instructional practices for the At Risk, ELL and disabled student. Three credits.

EDUG 754. Literature for the At Risk, (ELL) and Disabled (Grades K-8). 3 Credits.
Examination of literature. Inter relationship of dramatization, story telling, speaking, reading and writing explored for grades K-8. Study of authors and illustrators. Focus on Common Core Standards for Literacy differentiated instruction and strategies for integrating literature into curriculum areas such as Social Studies, Science and Math for the At Risk, (ELL) and disabled student. Three credits.

EDUG 756. Organization, Administration and Supervision of Reading Programs. 3 Credits.
Organizational and supervisory practices for all levels of reading instruction and literacy. Examination of: procedures for conducting a needs assessment of the school reading program; supervision of reading teachers; organization and implementation of a staff development program; development of funded programs; evaluation of reading instructional materials; training and supervision of paraprofessionals and other auxiliary personnel; computer applications that assist ENL and ELL learners and those with diverse or special learning needs in reading. This course is suitable as an elective for aspiring and practicing educational leaders at the school and district level and for CTLE hours.

EDUG 757. Organization, Administration and Supervision of Math, Science, and Technology Programs. 3 Credits.
Theory and practice of administration and supervision of Mathematics and Science instruction in elementary and secondary schools emphasizing on hands-on, multisensory, problem-based, project-based, maker space type learning experiences that integrate technology, math, science, and engineering topics to help students meet Next Generation Science standards that incorporate STEM at all levels. Participants will consider developmentally appropriate practice related to mathematics and science learning, especially in young children, those with special needs, ENLs and ELLs; effective practices related to the selection, training, and supervision of personnel; integration of lifelong learning and use of current developments in Mathematics and Science related to careers, economy, and environment; state and national curriculum standards for elementary, middle, and secondary schools. This course is suitable as an elective for special educators, academic counselors, curriculum area specialists, staff developers, department chairs, leaders at the school and district level, and for CTLE hours.

EDUG 760. Mentoring. 3 Credits.
Theories, principles, concepts and practice related to direction and supervision of student teachers, new and experienced professionals for mentors and principals; principles of adult learning; collaboration and team planning for a productive educational environment; use of technology for monitoring and assessing student progress; application of diverse instructional strategies; interdisciplinary teaching; succession planning. Collaboration of elementary, middle/secondary school and college faculty for effective teaching and learning. Use of technology for meeting learning standards. Course related leadership experience required.

EDUG 766. Literacy Instruction for At Risk, English Language Learner (ELL) and Disabled Student.. 3 Credits.
Study of the physiological, psychological, and emotional development of exceptional students in relation to listening, speaking, reading and writing achievement; Common Core Learning Standards in ELA; techniques of diagnostic evaluation; differentiated instruction; modifications of curriculum and methods of teaching reading and communication skills to students - ELL, disabled, as well as gifted. Three credits.

EDUG 768. Integrated Curriculum: Math, Science & Technology I for the At Risk, ELL and Disabled Student K-8. 3 Credits.
Examination of Science, Math and Technology curriculum based upon the Common Core Learning Standards for Math and the NYS Content and Performance Standards for Science and frameworks for grades K-8. Focus on constructivism and inquiry based problem solving. Review of N.Y.S. assessments, alternative assessments and curriculum adaptations for the disabled. Overview of current research in the field. Focus on, methods, materials, questioning techniques and best practices based upon the inquiry approach. Opportunities for hands on experience with materials and software and use of cooperative learning strategies to explore concepts.

EDUG 773. Communication Skills for the Learning Disabled. 3 Credits.
Identification, diagnosis and etiology of specific learning disabilities; legislative trends; services; overview of methods employed in the remediation of communication problems; emphasis on differentiated instructional practices that can be used in the special education or inclusive setting.

EDUG 775. Mathematics Instruction for At Risk, English Language Learner (ELL) and Disabled (Grades K-8). 3 Credits.
Review of the Common Core Learning Standards for Math and curriculum K-8 and current and research. Emphasis on problem solving skills and curriculum integration; methods, materials and instructional technology appropriate for the At Risk, ELL and disabled student. Opportunity for hands-on experience, use of cooperative learning strategies and technology applications to explore concepts.

EDUG 776. Science Instruction for the At Risk, English Language Learner [ELL] and Disabled. 3 Credits.
Examination of the New Generation of New York State Learning Standards in Science and core curriculum K-8; interpretation of the Elementary Science Program Evaluation Test (ESPET). Examination of inquiry and problem solving skills; curriculum integration; and methods, materials and technology appropriate for the at risk, ELL and disabled student. Opportunity for hands-on experience with materials. Three Credits.

EDUG 778. Nature and Needs of the Exceptional Individual. 3 Credits.
Overview of the historical social and legal foundations of Special Education. Survey of the nature and needs of students with intellectual disabilities, emotional/behavioral disorders, autism, physical disabilities, and gifted students; curriculum, methodology, assistive technology. Introduction to agencies, programs, facilities and employment opportunities which support the disabled individual and family. Minimum of 25 hours of observation/ field work in schools serving the disabled and their families. Satisfies the requirement for Autism. Three credits.

EDUG 779. Ind Sty:Inst Tech AtRisk&Disab. 3 Credits.
Designed to allow the student with background and experience with instructional technology to pursue an area of interest. An overview and outline of the proposed project is required prior to registration. Permission of Director of Special Education.

EDUG 780. Psychopathology. 3 Credits.
Major syndromes of childhood, adolescence, and adulthood as seen within the context of normal development; consideration of various theoretical, diagnostic, etiological, and therapeutic viewpoints; practice with rating scales and inventories: Assessment integrating the DSM-IV. Three credits.

EDUG 781. Management Techniques and Curriculum for the At Risk, English Language Learner [ELL] & Behave Disord. 3 Credits.
Study of models for the management of teaching and learning of the At Risk ELL and the behaviorally disordered student; review of informal assessment techniques; emphasis on planning and management of teaching and learning; methods for developing positive social skills and DASA. Examination of support services in the school and community which strengthens family partnerships. Curriculum issues for students in inclusive or special education settings explored. Minimum of 25 hours of observation/fieldwork. Meets the three hour in person requirement for DASA. Students must complete and pass DASA online program to meet the additional three hours. Three Credits.

EDUG 782. Psychology and Education of Students with Intellectual Disabilities. 3 Credits.
Analysis of biological, psychological, and social factors associated with intellectual disabilities; etiology, definition, and classification treated; problems in differential diagnosis explored; and emphasis on exemplary programs and curriculum, methods and materials for the intellectually disabled. Three credits.

EDUG 783. Technological Applications for the At Risk and Disabled. 3 Credits.
Examination of the use of technology in the general, special education and inclusive classroom. Experiences will include: development of websites and e-portfolios, accessing educational database sites; the use of software across the curriculum; development and implementation of curriculum based projects using technology. Opportunities for hands-on experience with instructional software.

EDUG 785. Life Science for At Risk, English Language Learner (ELL) and Disabled Student (Grades K-8). 3 Credits.
Basic concepts of Life Science as aligned with New Generation, the N.Y.S. Learning Standards and Curriculum K-8. Emphasis on inquiry and problem solving skillsand differentiation of content. Examination of scientifically validated methods and materials for the at risk, ELL and disabled in the special education or inclusive setting. Provision for hands on activities and use of cooperative learning strategies.

EDUG 787. Psycho-Educational Assessment for the At Risk, English Language Learner [ELL] and Disabled Student. 3 Credits.
Formal and informal techniques for assessing academic skills applicable to the at risk, ELL and disabled student; observational and interviewing procedures; inventories, rating scales, standardized tests; and instruments assessing language arts and math. Students must demonstrate competence in selection, administration, scoring and interpretation of psycho-educational tests, and conferencing. Opportunity for hands on experience with data analysis. Course conducted in the Manhattan College Learning Center or field site. Minimum of 12 hours of supervised clinic/fieldwork. Three Credits.

EDUG 789. Methods of Teaching the At Risk, English Language Learner [ELL] and Disabled Student (Grades K-8). 3 Credits.
Examination of Common Core Learning Standards in ELA and Math, N.Y.S. Content and Performance Standards in Science and Social Studies, curriculum, methods, and materials applicable to at risk, ELL and special education students grades K-8; emphasis on the modification of materials and strategies for instruction in general, special education and inclusive classrooms. Students must demonstrate competence in the writing and implementation of an individual educational plan, and conferencing skills. Opportunities for hands-on experiences with materials and instructional software. Course conducted in Manhattan College Learning Center or field site. Minimum of 14 hours of supervised teaching. Three Credits.

EDUG 791. Independent Study in Special Education. 3 Credits.
Independent project in area of Special Education conducted under the guidance of faculty member. Student must submit outline of proposed study prior to registration. Permission of the Director of Special Education Program required.

EDUG 798. The Education of the Gifted. 3 Credits.
Evaluation of the research in identifying and teaching the gifted; examination of model programs in language, mathematics and science; and study of program implementation.

EDUG 799. Administration and Supervision of Special Education Programs. 3 Credits.
Theory and practice of special education administration and supervision; review of legislation and regulations regarding Committee on Special Education, Individualized Education Program, inclusion and placement; effective practices related to supervision of teachers; and staff policies, records reports, pupil personnel, instructional programs. Statisfies the requirement for Child Abuse and S.A.V.E. legislation.

EDUG 800. Internship in Community Counseling. 3 Credits.
Participation in onsite counseling experiences under the supervision of agency personnel and faculty of Manhattan College. The nature of the experience will be determined by the area of specialization and agency placement. Prerequisite: Matriculation in P.D. Program, 21 credits and permission of Program Director.

EDUG 802. Foundations, Theory and Practice of Bilingual General and Special Education. 3 Credits.
This course examines the basic foundations, theories and practices related to bilingual education including the historical, political and legal foundations. Theories, literature and research related to multicultural practices as educators and /or counselors will be explored.

EDUG 804. Multimedia in Educational Settings. 3 Credits.
Use, design, and production of digital tools for formal instruction and professional development; issues of digital tool design and implementation including knowledge representation and interaction models that promote visual learning and awareness of social media and gaming as elements in the design of learning. Participants will engage in a digital tool development process and assess effectiveness of such tools. (Field work required for those seeking NYS certification).

EDUG 805. Integrated Learning I:Social Studies & Language Arts Instruction for the At Risk, ELL & Disabled Stu. 3 Credits.
American history, civics and geography, integrated with the development of literacy skills and exploration of literary genres. Incorporation of skills pertinent to Social Studies and Language Arts. Utilization of technology, Internet and software as instructional tools. Curriculum based upon the New York State Content and Performance Standards in the areas of Social Studies, and Common Core Learning Standards in English Language Arts. Latest research on teaching the at risk and disabled student. Learning presented utilizing the constructivist approach for integrated instruction. Highlighted are best practices for differentiated instruction. Use of cooperative learning strategies to explore concepts. Emphasis on the importance of understanding and respecting cultural differences stressed. Opportunities for field trips to explore concepts. Emphasis on investigation of issues from different cultural perspectives. Three Credits.

EDUG 806. Inclusive Practices. 3 Credits.
Examination of: research and legislation; different models; effective practices of collaboration, team building, management, grouping, instruction; adaptation of materials and differentiated instruction to facilitate learning for the disabled student.

EDUG 807. Measurement and Assessment for Counselors. 3 Credits.
Theoretical, methodological, sociocultural, and ethical factors in the interpretation of psychological test data will be studied. An examination of basic measurement fundamentals such as types of tests and scores, reliability and validity, and essential statistical concepts will be followed by a focus on the assessment of intelligence, abilities, achievement, and personality. Specific emphasis will be on the interpretation and integration of test scores for individuals. Ethical considerations in appraisal will also be addressed. Three credits.

EDUG 808. Integrated Learning II:Social Studies&Language Arts Ins for the At Risk, ELL & Disabled Student. 3 Credits.
World history, civics, and geography, integrated with the development of literacy skills and exploration of literacy genres. Incorporation of skills pertinent to Social Studies and Language Arts. Utilization of instructional technology as an instructional tool for learning. Curriculum based upon the New York State Content and Performance Standards in Social Studies and Common Core Learning Standards in English Language Arts (ELA). Review of research on teaching the at risk, ELL and disabled student. Learning presented utilizing the constructivist approach for interdisciplinary instruction. Highlighted are best practices for differentiated instruction. Use of field trips to explore concepts. Emphasis on investigation of issues from different cultural perspectives. Three Credits.

EDUG 809. Organization, Administration and Supervision of Physical Education Programs. 3 Credits.
Theory and practice of administration and supervision of physical education instruction for general and special education students in elementary and secondary school; review of physical education legislation and requirements; discussion of developmentally appropriate practice; effective practices related to the selection, training, and supervision of personnel; integration of lifelong learning and practice of healthful behavior including nutrition and exercise. Participants will consider policies, record keeping, reporting, instructional strategies, materials, and programs. Satisfies the requirement for Child Abuse Recognition and Reporting. This course is suitable as an elective for special educators, academic counselors, physical educators, staff developers, department chairs, leaders at the school and district level, for professional development and for CTLE hours.

EDUG 810. Bilingual and Multicultural Assessment of Linguistically and Culturally Diverse Students. 3 Credits.
This course will focus on the development of competencies in multidisciplinary assessment of linguistically and culturally diverse students with a specific emphasis on general and special education with limited English proficiency.(LEP) The course will aslo focus on the relationship between the linguistic and cultural influences of major racial and/or ethnic groups and their communication patterns. Format and informas assessment of behavioral functioning is included. 10 hour clinical req.

EDUG 811. Brain Compatible Learning for the At Risk and Disabled Student. 3 Credits.
Overview of brain development research and theory; impact on learning; and application to classroom instruction for the at risk, ELL, and disabled student. Opportunity for hands-on experience with materials and methods of brain compatible instruction. Three credits.

EDUG 812. Integrated Curriculum II:Math,Sci & Tech for At Risk ELL and Disabled (Grades K-8). 3 Credits.
Examination of Science, Math and Technology NYS Content and Performance Standards and curriculum for at risk ELL and disabled students. Review of research on teaching and learning presented utilizing the constructivist approach. Utilization of instructional technology, as an integral component of the instructional process. Focus on best practices for differentiated instruction to meet the needs of the at risk, ELL and disabled student. Use of cooperative learning strategies and technology to enhance teaching and learning. Exploration of concepts and strategies for enhancing instructional leadership. Opportunities for hand-on experience with materials and instructional technology. Three Credits.

EDUG 813. Curriculum, Methods, and Materials in Core Subjects for Billingual, General, & Special Education. 3 Credits.
Focus on instructional methods, material and strategies for teaching standards based Social Studies, Language Arts, Math and Science for English Language Learners in General, Special Education, Bilingual and Teaching English as a Second Language (TESOL) settings. Emphasis on the use of subject matter content for improving second language acquisition. Exploration of instructional practices that meet the developmental and educational needs of the English Language Learner (ELL). Attention to cross cultural learning style that impacts instruction with emphasis given to differentiating and adapting instruction to meet educational and linguistic characteristics of bilingual general and special education students. (10 hours of observation in a bilingual/TESOL general or special education setting.) Three credits.

EDUG 814. Curriculum, Assessment and Methods of Teaching Native Language Arts in Gen & Spec Education. 3 Credits.
Exploration of teaching methods, material and assessment for teaching Language Arts using native language and English. Examination of strategies incorporating listening, speaking, reading, and writing in native language to facilitate the transition to English. Commercial and student made materials and assessment instruments explored. Attention to cross cultural learning style that impacts instruction with emphasis given to differentiating and adapting instruction to meet educational and linguistic characteristics of the Bilingual English Language Learner in general and/or special education. (15 hrs of field experience in an appropriate general education and/or special education bilingual setting) Three credits.

EDUG 815. Curriculum, Assessment and Methods of Teaching English as a Second Language in Gen and Spe Ed. 3 Credits.
Examination of instructional practices to enhance the acquisition of English Language Proficiency focusing on listening, speaking, reading and writing to meet ESL and Common Core Learning Standards in ELA. Commercial and student made materials explored. Focus on informal and formal assessment instruments, such as NYSESLAT. Attention to cross cultural learning style that impacts instruction with emphasis given to differentiating and adapting instruction to meet educational and linguistic characteristics of bilingual, general and special education students. (15 hours of field experience in an appropriate general education, special education, TESOL or bilingual setting). Three credits.

EDUG 816. Approaches to Counseling Linguistically and Culturally Diverse Student. 3 Credits.
This course will focus on the development of general techniques for counseling and the use of techniques specifically applicable to diverse populations and populations who are linguistically different. A case study approach will be used.

EDUG 817. Cross Cultural Counseling. 3 Credits.
This course will focus on issues in multicultural counseling in urban multiethnic educational and human services settings. Awareness of and sensitivity to social and cultural influences in counseling and in consultation services provided by counselors will be emphasized. Included will be exploration of characteristics of clients from diverse ethnic groups and their impact on counseling strategies. Course will include an experimental assessment component and consultation.

EDUG 818. Internship: Bilingual Counseling. 3 Credits.
Provides the student with an experience in gaining more knowledge of and experience in providing appropriate interventions to culturally and linguistically diverse clients.

EDUG 819. Internship in MHC Counseling I. 3 Credits.
Participation in on-site counseling experiences at a college counseling center, agency or hospital under a qualified supervisor who is licensed or registered in New York State to practice mental health counseling or medicine. Supervision and integrating seminar including knowledge of clinical diagnosis with DSM. Prerequisite: Matriculation in Mental Health Master's or Advanced Certificate in Mental Health Counseling program, completion of EDUG 732, 30 credits and permission of MHC Program Advisor. Three credits.

EDUG 820. Consultation in the Schools. 3 Credits.
Consultation skills for the general bilingual, Teaching English as a Second Language (TESOL) and special education teacher, support staff and school administrator. Analysis of various theories and models of school consultation. Review of current research strategies and supervised practice of observational, interactive communication, and collaborative problem solving skills for systems change. Laboratory and/or field experience required. Prerequisite: Permission of the Director of Special Education.

EDUG 821. Internship in School Counseling I. 3 Credits.
Internship I provides on site experience in the application of theory to practice and development of counseling and case conceptualization skills. The integrated seminar will focus on the role of the ASCA National model for school counselors. Issues related to human development, wellness, cultural competence, and social justice advocacy will also be addressed. The experience consists of 300 hours of experience on site including 120 direct hours with clients individually and in groups. A weekly integrated seminar with a faculty supervisor is required. Upon completion of the requirements, students proceed to Internship II, which also includes 300 hours.

EDUG 822. Differentiated instruction for At Risk, English Language Learner (ELL) and Disabled (Grades K-8). 3 Credits.
Review of the Common Core Learning Standards in ELA and Mathematics, NYS Content and Performance Standards in Science and Social Studies and sequence of curriculum for grades K-8. Techniques for adapting curriculum to meet the needs of the at risk, ELL and disabled student; strategies for bridging the gap between curriculum and methodology in special education and general education; and use of technology as a tool for learning and teaching. Strategies for grouping and individualization. Fundamentals of lesson planning stressing differentiated instructional practices. Provision for hands-on experience with materials and software.

EDUG 823. Theory and Practice in Early Childhood Schools for At Risk Disabled Student. 3 Credits.
Emphasis on research and theory relevant to the physical, cognitive, social and emotional development of the early childhood student. Examination of developmentally appropriate practices in the Early Childhood School. Overview of organizational patterns that take into account the developmental needs of the At risk and disabled Early Childhood student in today's multicultural society. Different approaches to grouping and differentiating instruction. Strategies that facilitate parental involvement explored. Review of innovative practices and current issues in Early Childhood education. A minimum of 25 hours of clinical and/or field work required. 3 credits.

EDUG 824. Early Childhood Curriculum & Pedagogy for At Risk, English Language Learner(ELL)& Disabled Student. 3 Credits.
Examination of standards based Early Childhood curriculum with emphasis on an integrated approach to instruction for the At Risk, ELL and disabled student. Exploration of learning and teaching within a multucultural context. Emphasis on developmentally appropriate methods, and instructional materials to enhance learning. Study of techniques and differentiated instructional strategies to adapt curriculum to meet the at risk needs of the At Risk, ELL and disabled students in general education, special education and inclusive setting. A minimum of 50 hours of field work is required.

EDUG 825. Sem/Int:Earl Chld Gen&Sped. 3 Credits.
Observation and student teaching to gain proficiency in teaching early childhood at risk and disabled students in the general education,special education and/or inclusive classroom. Twenty days of student teaching. Students must demonstrate teaching competence under the supervision of the teacher in the field and a faculty member. Seminar sessions include discussion of Common Core Standards, behavior management, teaching strategies, i.e. differentiated instruction, diversity and current issues in the field of Early Childhood. Pre-requisite:Matriculation in the graduate education childhood/special education programs, minimum gpa 3.0 and meet the physical, mental, speech, language, and other standards established for the profession and permission of Director of Graduate Childhood/Special Education programs.

EDUG 826. Improvement of Instruction for Teachers of At Risk, English Language Learner (ELL) and Disabled. 3 Credits.
Exploration of Common Core Learning Standards with emphasis on ELA and alignment with grade-appropriate learning tasks and standards-based rubrics. Use of multiple data sources to monitor student achievement, plan and deliver differentiated tiered instruction to meet the needs of Special Education, English Language Learners (ELL) and at risk students. Use of multiple data sources to construct SMAT goals for IEPs. Training in participation and facilitation of teacher teams and collaborative analysis of student work to improve instruction. Training in the use of the research-based Danielson model to promote reflection on current pedagogy and determine strategies to improve teacher effectiveness. Utilization of the peer coaching/tunkey model to enable teachers to assume leadership roles in their learning communities to build capacity. Opportunities provided for teachers to practice facilitation skills.

EDUG 827. Internship in School Counseling II. 3 Credits.
Students in the counseling program proceed through a well-thought out experiential component in the program over two semesters in a school. Internship in school counseling II builds upon Internship in school counseling I and is the last of the experiential components. Internship in school counseling II provides the student with an experience in learning to facilitate further professional development including self-reflection and leadership of a team. The focus is on an integration of all facets of the counseling role including a review of special areas of importance and in personal development. Practical application of counseling theories and techniques to diagnosis, ethics and law, and the work of counselors with special populations will be emphasized. The experiential component consists of direct service work with clients and consultation work in the school. The Internship includes 300 hours of structured field experiences, of which 120 is required to be direct counseling with clients individually or in groups.

EDUG 828. Process of Counseling the Individual in Mental Health Counseling. 3 Credits.
An experiential course where students learn skills of counseling intake assessment and counseling intervention and then practice those skills in videotaped counseling dyads in which they enact the roles of counselor and client. The emphasis is on counseling process over an extended period of time and across multiple sessions. Students will gain knowledge and skills in addressing issues related to beginning, maintaining, and terminating a therapeutic relationship, in conducting intake assessment, case conceptualization, and theory-based intervention, and in writing progress notes (using the DAP note format) and intake report. Students will also heighten self and interpersonal awareness and explore the ways that individual differences may manifest themselves in communication and connection.

EDUG 829. Practicum in Teaching At Risk, (ELL) & the Disabled. 3 Credits.
Examination of Common Core and N.Y.S. Content and Performance Standards, curriculum, methods, and materials applicable to at risk, English Language Learner and special education students grades 7-12; emphasis on the modification of materials and strategies for instruction in general, special education and inclusive classrooms. Students must demonstrate competence in the writing and implementation of an Individual Educational Plan, and conferencing skills. Opportunities for hands-on experiences with materials and instructional software. Course conducted in Manhattan College Learning Center or field site. Minimum of 14 hours of supervised teaching. Three credits.

EDUG 830. Curriculum Adaptation & Content Strategies for At Risk, (ELL) & the Disabled. 3 Credits.
Examination of curriculum, methods, and materials applicable to teaching the at risk, English Language Learner and special needs adolescent student. Emphasis on adaptation of materials, infusion of technology, strategies for instruction and management in diverse general, self-contained, and inclusion classrooms. IEP requirements, process, and implementation addressed. Role of related service personnel and collaboration explored. Common Core Learning Standards and New York State Standards for the content area to accommodate the special education student individually and in a group setting examined. Different models of inclusive practice analyzed. (Field requirement: minimum 12 hours) 3 credits.

EDUG 831. Principles of Instructional Design. 3 Credits.
This foundation course provides the participant with background about the key principles of instructional design; hands-on opportunities to design instruction that is effective, efficient, and engaging. Course content will focus on determining learner needs, defining the goals of the instruction, and creating a process that may take place in an increasingly technological environment. E-tools and e-learning will be integrated into learning strategies and curriculum. Participants will produce deliverables that can be used for online, distance, and/or blended learning. This course is for educators in the broadest sense training professionals who seek proficiency in designing technology enhanced learning experiences at all levels of skill, preparing participants to apply instructional systems design and theory to lead learning with technology. (Field work required for those seeking NYS certification).

EDUG 832. Seminar & Internship in Secondary Special Education (not employed). 3 Credits.
Observation and student teaching/internship to meet specific requirements to gain proficiency in teaching disabled students in the Special Education and/or Inclusive classroom. (Full-time student teaching/internship for one semester.) Students must demonstrate teaching competence under the supervision of the teacher in the field and a faculty member. Seminar sessions include the discussion of: field placement, diversity, behavior management, differentiated instructional strategies, collaborative consultation, Common Core Learning Standards, effective teaching models, Autism, Child Abuse, SAVE and DASA. Student teaching/internship logs, reflective journals, and special education program e-portfolio required. Prerequisite: Matriculation in the Adolescent Students with Disabilities program, minimum G.P.A. 3.0 and meet the physical, mental, speech, language and other standards established for the profession. Permission of the Director of Special Education. Satisfies the requirement for Autism, S.A.V.E., Child Abuse Recognition and Reporting and DASA Training. Three credits.

EDUG 833. Seminar & Internship in Secondary Special Education (5 Year students). 3 Credits.
Observation and student teaching/internship to meet specific requirements to gain proficiency in teaching disabled students in the Special Education and/or Inclusive classroom. (Full-time student teaching/internship for one semester.) Students must demonstrate teaching competence under the supervision of the teacher in the field and a faculty member. Seminar sessions include the discussion of: field placement, diversity, behavior management, differentiated instructional strategies, collaborative consultation, Common Core Learning Standards, effective teaching models, Autism, Child Abuse, SAVE and DASA. Student teaching/internship logs, reflective journals, and special education program e-portfolio required. Prerequisite: Matriculation in the Five-Year Dual Adolescent/Students with Disabilities program, minimum G.P.A. 3.0 and meet the physical, mental, speech, language and other standards established for the profession. Permission of the Director of Special Education. Satisfies the requirement for Autism, S.A.V.E., Child Abuse Recognition and Reporting and DASA Training. 3 credits.

EDUG 834. Seminar & Practicum in Secondary Special Education(Teachers in the Field). 3 Credits.
Analysis of current problems in special education, diversity, legal issues, differentiated instructional strategies, collaborative consultation, Common Core Learning Standards, effective teaching models, Autism, Child Abuse, S.A.V.E and DASA. Students must complete a minimum of 50 hours of teaching at the 7-12 grade levels in Special Education/inclusive classroom. Logs, reflective journals, project and special education program e-portfolio required. Prerequisite: Matriculation in the Adolescent Students with Disabilities program, minimum G.P.A. 3.0 . Permission of the Director of Special Education. Satisfies the requirement for Autism, S.A.V.E. Child Abuse Recognition and Reporting and DASA. Three credits.

EDUG 835. Proficiencies for Educational Leadership. 3 Credits.
Skills and strategies for creating the learning community that characterizes the quality school; group processes for shared decision-making and collaboration with staff and parents; communication skills for dealing with the school constituencies; case studies, simulations; promotion of professional learning communities and group efficacy for decision-making. Based on NYS Essentials for School Leaders, Professional Standards for Education Leaders, this course is suitable as an elective for special educators, academic counselors, staff developers, department chairs, aspiring and practicing leaders at the school and district level, for professional development, and for CTLE hours.

EDUG 836. Issues in School Based Management, Supervision and Curriculum. 3 Credits.
This interdisciplinary course will employ case studies, simulations, role play, and web resources for best practices in management, administration, and supervision. Participants will plan strategies to deal with pertinent issues arising from questions, advantages, and obstacles to school based management, including but not limited to, school choice, parent and teacher involvement, goal driven instruction and delivery of instructional services; use of technology for budgeting; financial and strategic planning. Practicing and potential school business managers, principals, assistant principals will develop processes with which to direct, guide, and influence the behavior and work of others towards the accomplishment of specific educational goals. Educational and business leaders/managers acquire knowledge of processes and strategic business and management skills to confront complex challenges faced by high performing organizations. The course will offer a learning environment that includes case studies; 'in-boxes'; and other informational assessments with regard to leadership styles and roles over several departments including, but not limited to education, business management (MBA), counseling, non-profit organizations, and government. This course is suitable as an elective for special educators, academic counselors, staff developers, department chairs, aspiring and practicing leaders at the school and district level, for professional development, and for CTLE hours.

EDUG 837. Organizational Development. 3 Credits.
Exploration of change factors and their effect on human behavior and interrelationships; effect on the school social system; leadership skills required for participatory decision-making; dealing with conflict and strategies for conflict resolution; power issues related to empowerment, authority, responsibility and accountability; and creating and developing the learning community. School wide development plans, school leadership teams, data-based strategic planning. Course related leadership experience required.

EDUG 838. Evaluating Leadership Effectiveness. 3 Credits.
This course deals with leadership skills and strategies to assess needs, effectiveness of outcomes, program and personnel effectiveness. Efficacy of leadership that involves constituencies goal setting and evaluation; assessing student achievement, values promotion, ethics, accountability, staff participation. Leadership that promotes parent and local board inclusion in mission and goal setting; a supportive educational environment and school climate; exploration of the essential characteristics of school leaders in assisting students to make state standards. This course is suitable as an elective for special educators, academic counselors, staff developers, department chairs, aspiring and practicing leaders at the school and district level, for professional development, and for CTLE hours.

EDUG 839. School Finance. 3 Credits.
Issues for administrators, business managers, and other school personnel related to budget, finance and accounting. This course is suitable as an elective for special educators, academic counselors, staff developers, department chairs, aspiring and practicing leaders at the school and district level, for professional development, and for CTLE hours.

EDUG 840. School Finance + Field Experience. 4 Credits.
Issues for district level administrators, business managers, and other school personnel related to budget, finance and accounting. This course includes 10 hours of course related field experience. Participants may use this course to eligible for school district certification. This course is also suitable as an elective for special educators, academic counselors, staff developers, department chairs, aspiring and practicing leaders at the school and district level, for professional development, and for CTLE hours.

EDUG 841. Leadership, Administration and Supervision of the Middle School. 3 Credits.
Theory and practice of school administration and supervision; organizational characteristics and components of the successful American middle school; effective practices related to advisement, staff collaboration, teaching teams, developmentally appropriate instructional programs for the middle school child, standards based teaching and learning, authentic assessment, guidance of the early adolescent, student engagement, parent involvement, safety and discipline issues, evaluation of student progress, career guidance.

EDUG 842. Leadership, Administration and Supervision of the Secondary School. 3 Credits.
Theory and practice of school administration and supervision; organizational characteristics and components of the successful secondary schools; consideration of cross cultural and international practices related to student achievement and involvement in learning; scheduling, advsiement, collaboration, teaming, apprenticeships for the secondary school student; standards based teaching and learning, authentic assessement, guidance of the adolescent, safety and discipline issues, evaluation of student progress career guidance/ internships/ developmentally appropriate service projects.

EDUG 843. Total Quality Managment for Educational Leaders. 4 Credits.
Course participants engage in reflective practice on ways to provide leadership for quality management in the school or district setting. With ’real life’ needs to attend to, potential and practicing school and district administrators will design strategies for data driven decision making based on TQM concepts, principles, and techniques for school and district wide improvements of student learning. Participants may use this course to be eligible for school district certification. This course is also suitable as an elective for special educators, academic counselors, staff developers, department chairs, aspiring and practicing leaders at the school and district level, for professional development, and for CTLE hours. This 4-credit course includes 10 hours of district level field experience. 4 credits.

EDUG 844. School Based Management Functions. 3 Credits.
Analysis, discussion, intensive study of the evolution of educational reform movements leading to site based management for administrative and supervisory personnel; theory, principles and practices for team building, shared decision-making and relationships at the local, district, and system levels. Participants present evidence of knowledge, skills and dispositions for school building leadership. Course project integrates theory, concepts, principles and application of content to elementary, middle, or secondary school leadership in urban and suburban settings; including strategic planning, colaboration and evaluation of outcomes for school leadership teams, board relationships, mentoring, and program development. Course related leadership experience required.

EDUG 845. Computer and Technology Utilization for Instructional Delivery. 3 Credits.
This course is a survey course intended to provide learners with generalized knowledge of Web design, aspects of visual literacy, and usability as well as accessibility concerns. With more online learning opportunities, and customized learning built into Learning Management Systems, this course will provide learners with an understanding of usability principles to be able to communicate with Web designers and build their own pages. Learners will gain basic knowledge of HTML in order to develop learning programs online.

EDUG 846. Managing the Quality School. 3 Credits.
Applying concepts, principles, and techniques of Total Quality Management with emphasis on application to managing a school or district; using TQM to enhance management of the educational enterprise on the local or district level and administrative leadership. Course related leadership experience required.

EDUG 847. Total Quality Management for Educational Leaders + Field. 4 Credits.
Course participants engage in reflective practice on ways to provide leadership for quality management in the school or district setting. With 'real life' needs to attend to, potential and practicing school and district administrators will design strategies for data driven decision making based on TQM concepts, principles, and techniques for school and district wide improvements of student learning. Course related leadership experience required.

EDUG 848. Using Technology in the Management and Assessment Process. 3 Credits.
Participants will explore how to assess specific types of knowledge, using technology to enhance the process. Explore innovative tools and means of assessment that helps learning specialists individualize and differentiate instruction to improve learning. Develop technology-enhanced assessments for effective learning.

EDUG 849. Advanced Computer Applications for School Administrators. 3 Credits.
Computerizing school offices; the selection and evaluation of interactive computer software for professional development, supervision, and improvement of instruction; use of technology for data based decision making. Selection of software and hardware for networking, internal and external communication. Prerequisite: EDUG 749 or permission of Program Director.

EDUG 850. Advanced Practicum for Counselors in Group Procedures. 3 Credits.
Advanced counseling practice with groups under the supervision of the faculty; seminars, supervisory conferences and consultation; group experiences. Prerequisite: EDUG 725, 33 credits and permission of Program Director.

EDUG 851. Data Analysis and Report Writing in Educational & Psychological Research. 3 Credits.
The course provides students the opportunity to complete their required Master's major paper while continuing their learning about design, data analysis, and report writing in educational and psychological research. EDUG851 builds on the research design skills introduced in EDUG713. A primary requirement of the course includes the development of SPSS data analysis skills including both descriptive and inferential statistics. Students are provided with a student version of SPSS, which they use through-out the completion of their major paper. In addition, students further their skills in reviewing the results presented in primary research in the fields of counseling and psychology. Upon completion of the major paper, students are encouraged to submit their work for presentation at a conference or for publication.

EDUG 852. Internship in Counseling I. 3 Credits.
Participation in on-site counseling experiences under supervision of pupil personnel services staff of host school, agency or hospital and faculty of Manhattan College. Prerequisite: Matriculation in P.D. program, 21 credits and permission of Program Director.

EDUG 853. Counseling the College Applicant. 3 Credits.
Examination of the necessary components in the college admissions selection process, i.e. high school preparation, standardized test scores, advanced placement credit, career preparation and counseling, financial aid, special programs, academic criteria, and personal statement. Review of the various guides and technological information available to the counselor and applicant, i.e Internet, Rezun, College Board, Peterson's College View and College Link.

EDUG 854. Supervised Fieldwork in Counseling. 3 Credits.
Opportunity for students to strengthen their knowledge and skills in the counseling setting. Students work under the supervision of a faculty member in an approved placement with individualized supervision regarding cases. Minimum of 90 hours in the field, project and supervision required. Matriculation in the Counseling program; EDUG 721, 722; and permission of Program Director.

EDUG 855. Supervised Fieldwork in Special Education. 3 Credits.
Opportunity for students to strengthen their knowledge & skills in the special education or inclusive setting. Students work under supervision of a faculty member in an approved placement. Minimum of 75 hours in the field and project required. Matriculation in the Special Education Program, and permission of the Director of Special Education.

EDUG 856. Supervised Fieldwork:General and Special Education. 3 Credits.
Opportunity for students to strengthen their knowledge & skills in the special education or inclusive setting. Students complete fieldwork in an approved placement. Minimum of 50 hours in the general education classroom and 25 hours in the special education/inclusive classroom required. Matriculation in the Special Education Program, and permission of the Director of Special Education.

EDUG 857. Sup Fldwk Alchol &SubAbuseCoun. 3 Credits.
Opportunity fo students to strengthen their knowledge and skills in an alcohol/substance abuse setting. Students must work under the supervision of a faculty member and appropriate on site staff in an approved setting. Minimum of 100 hours in the field and project required. Matriculation in the Alcohol/Substance Abuse program. EDUG705,721,722 and permission of Program Director. and Director of Graduate Education.

EDUG 858. Seminar, Observation and Internship in Special Education (5 year Program). 3 Credits.
Observation and practice teaching to meet specific requirements to gain proficiency in teaching disabled students in the Special Education and/or Inclusive classroom. (Full-time student teaching for one semester.) Students must demonstrate teaching competence under the supervision of the teacher in the field and a faculty member. Seminar sessions include the discussion of: Behavior Management, Common Core Standards for Math and Literacy, differentiated instructional strategies, Child Abuse Recognition and Reporting and SAVE requirements, diversity and current issues in the field of Special Education. Student Teaching logs, journals, and special education portfolio required.Prerequisite: Matriculation in the five-year program, minimum G.P.A. 3.0 and meet the physical, mental, speech, language and other standards established for the profession. Permission of the Director of Special Education. Satisfies the requirement for S.A.V.E. and child abuse.

EDUG 859. Approaches to Multicultural Counseling:Theory and Practice. 3 Credits.
An examination of the theories and practices of multicultural counseling in urban multiethnic educational and human services settings. Awareness of and sensitivity to cultural factors in counseling and in consultation services provided by counselors will be emphasized. Course will include an experiential component and consultation.

EDUG 860. Teaching Literacy for Understanding to At Risk and Disabled (Grades K-8). 3 Credits.
Examination of the knowledge and skills to implement standards-based literacy instruction with the at-risk and disabled student. Opportunities provided to discuss and create literacy curriculum which address issues such as identifying what students need to understand; how to help develop the understandings; how to gauge student progress; and how to provide feedback to students.

EDUG 861. Standards Based Performance Assessment + Field. 4 Credits.
This advanced assessment course for school and district administrators, chairs, subject area coordinators at the district and local level, considers the effectiveness of school programs and teachers in meeting common core standards. Relates student outcomes to common core state standards, school programs, and performance assessment of teaching: aligns common core standards, curriculum, and assessment to design student learning experiences. An additional 10 hours of field experience required.

EDUG 862. Seminar/Practicum in Teaching: The Student with Disabilities 1-6. 3 Credits.
Analysis of current problems, diversity, legal issues, differentiated instructional strategies, Autism, child abuse, S.A.V.E and issues in Special Education. Students must demonstrate satisfactory teaching competency under supervision of appropriate personnel in the field. Minimum of 50 hours of teaching at the 1-6 grade levels in Special Education/inclusive classroom. Logs, reflective journals, project and special education program e-portfolio required. Prerequisite: Matriculation in the Childhood/Students with Disabilities program, minimum G.P.A. 3.0 . Permission of the Director of Special Education. Satisfies the requirement for Autism, S.A.V.E., and Child Abuse Recognition and Reporting. Three credits.

EDUG 863. Seminar/Internship in Teaching: General and Special Education 1-6. 3 Credits.
Observation and practice teaching to meet the specific requirements to gain proficiency in teaching general and special education. A minimum of 20 days of student teaching in grades 1-3 or 4-6 in the special education or inclusive classroom is required. A minimum of 20 additional days of student teaching, at a different level (1-3 or 4-6), in the general education classroom is required, for a total of 40 days. Students must demonstrate teaching competence under the supervision of the teacher in the field and a faculty member. Seminar sessions include the discussion of: field placement, diversity, behavior management, differentiated instructional strategies, autism, Child Abuse and SAVE and current issues in special education. Internship reflective journals, logs and special education program e-portfolio required. Prerequisite: Matriculation in the Dual Childhood/Students with Disabilities program, minimum G.P.A. 3.0 and meet the physical, mental, speech, language and other standards for the profession. Permission of the Director of Special Education. Satisfies the requirement for Autism, S.A.V.E., and Child Abuse Recognition and Reporting. Three credits.

EDUG 864. Counseling the College Student. 3 Credits.
This course is designed to focus on the theory, research and practice related issues relevant to the psychological; development of college students. Focus on intellectual, psychosocial, moral and vocational development with attention to the needs of special populations. Students will examine a service model including collaboration within and outside the institution and including examination of the legal and ethical issues related to counseling the college student.

EDUG 865. Instructional Design, Technology & Information Processing+Field. 4 Credits.
Focus on instructional design and the role of cognitive processing theory in the development of technologies for learning environments. Emphasis on curriculum and how participants best learn from multimedia technologies. Knowledge and understanding of adult learning theory provides the foundation for the development and implementation of collaborative strategies appropriate for adult learners. Designed for district level administrators, staff developers, counselors, general and special education teachers and professionals at the district level to integrate technology into professional practice that provides optimal learning experiences. An additional 10 hours of field experience required.

EDUG 866. Practicum in Leadership, Supervision and Consultation in Counseling. 3 Credits.
Leadership, supervision and consultation provides the student with an experience in learning to facilitate the further professional development of a counselor-in-training. Although one goal is to prepare the experienced counselor in skills to supervise, the primary focus is on the ability to establish and develop counselor-supervisor relationships, case conceptualization and consultation, and understanding of leadership and organizational roles in relation to counseling sites.

EDUG 867. Professional Orientation to Counseling:Standards, Law, Ethics, and Evaluation. 3 Credits.
This course is designed for the beginning practitioner to provide exposure to issues related to professional functioning. Emphasis will be on ethical and legal issues as they relate to the profession of counseling and to each other. In addition the legal and ethical factors related to program development and evaluation will be considered.

EDUG 868. Integrated Curriculum: Math/Science/Technology. 3 Credits.
For school and district level personnel, department chairs, grade level and subject area coordinators, curriculum and staff developers, special education and counseling leadership, this content based course incorporates content and performance standards from Math, Science, Engineering, and Technology (STEM), as well as Next Generation and literacy standards for differentiating instruction for a diverse student population including ENLs and ELLs. Participants will consider data based learning and evaluation strategies, system wide decision making based on NYS content areas. This course is also suitable as an elective for special educators, academic counselors, staff developers, department chairs, aspiring and practicing leaders at the school and district level, for professional development, and for CTLE hours.

EDUG 869. Integrated Curriculum: Social Studies/Language Arts. 3 Credits.
For District and School Administration,Dept. Chairs, grade level and subject area coordinators, curriculum, and staff developers, this content base course incorporates content and performance standards from English, Language Arts, Social Studies and Physical Education/Home Ec/ Careers, and literary standards for differentiating instruction for a diverse student population including the gifted, those with special needs, ENLs, and ELLs. Participants will consider data based learning and evaluation strategies to include grade, school, district, and system wide decision making based on NYS content areas. This course is also suitable as an elective for special educators, academic counselors, staff developers, department chairs, aspiring and practicing leaders at the school and district level, for professional development, and for CTLE hours.

EDUG 870. TQM: Quantitative Process Control in Education. 3 Credits.
This course for district and school lenders and educators identifies key data analysis processes, roles of components and variations present in them. Using Pareto charts, histograms, control charts and other data mining tools, participants measure and count key data to develop a Plan. Do, Study, Act methodology to improve the administrative and educational process in the school and district. Course related leadership experience required.

EDUG 871. Quantitative Process Control in Education + Field Experience. 4 Credits.
This course for district level school leaders and educators identifies key data analysis processes, roles of components and variations present in them. Using Pareto charts, histograms, control charts and other data mining tools, participants measure and count key data to develop a Plan. Do, Study, Act methodology to improve the administrative and educational processes in the schools of the district and the district itself. 10 hours of course related field experience are required.

EDUG 872. Probability and Statistics Using Technology. 3 Credits.
This is a content course in Probability and Statistics for teachers. Topics include descriptive statistics, rules of probability, sampling distributions, statistical inferences, regression and correlation. Technological tools used include calculators, spreadsheet package Excel, the computer algebra Maple, and the classroom management system Blackboard.

EDUG 873. Theory and Practice in Middle Schools for the At Risk and Disabled Student. 3 Credits.
Emphasis on research and theory relevant to the physical, cognitive, social and emotional development of the Middle School adolescent. Examination of developmentally appropriate practices in the Middle School. Overview of organizational patterns that take into account the developmental needs of the At Risk and disabled Middle School student in today's multicultural society. Different approaches to scheduling, advisement and grouping analyzed. Strategies that facilitate parental involvement explored. Review of innovative practices and current issues in Middle School education.

EDUG 874. Curriculum and Pedagogy in the Middle Schools for At Risk and Disabled Student. 3 Credits.
Examination of standards based Middle School curriculum with emphasis on an integrated approach to instruction for the At Risk and disabled student. Exploration of learning and teaching within a multicultural context. Emphasis on developmentally appropriate methods, and instructional materials to enhance learning. Study of techniques and differentiated instructional strategies to adapt curriculum to meet the at risk needs of the At Risk and disabled students in the special education, inclusive and general education classrooms. A minimum of 30 hours of clinical and/or field work required.

EDUG 875. Foundations in Learning and Teaching with Technology. 3 Credits.
Designed as a foundational course to prepare effective learning tools, for preparing tools for effective learning, this course provides participants with background for integrating technology into education (societal issues, learning theories, planning, and implementation); principles and strategies for choosing appropriate software, media tutors and tools (instructional and productivity software). Participants will learn to identify the appropriate use of technologies into learning environments. (Field work required for those seeking NYS certification).

EDUG 876. Integrating Technology in Adult Learning and Collaboration. 3 Credits.
Participants in this course will gain knowledge and understanding of adult learning theory and the ability to collaborate with key professionals in an organization to support and enhance learning using digital tools. This course provides learners with the skills needed to effectively communicate with clients, including those of large and small corporations, working with global partners and widespread teams. Drawing on real-world case studies, students will learn how to do comprehensive needs analysis for any potential client, the art of persuasion, and how to satisfy a client despite budget and methodology restrictions. (Field work required for those seeking NYS certification).

EDUG 877. Instructional Design, Technology and Information Processing. 3 Credits.
Focus on instructional design and the role of cognitive processing theory in the development of technologies for learning environments. Emphasis on curriculum and how to best learn from digital technologies. Knowledge and understanding of adult learning theory provides the foundation for the development and implementation of collaborative strategies appropriate for adult learners. Designed for all levels of educators wanted to learn the process of learning and apply to a continuum of learning. (Field work required for those seeking NYS certification).

EDUG 878. Advanced Group Counseling:Practice. 3 Credits.
An experiential course that focuses on application of group process to different counseling situations. Team projects will include facilitating and cofacilitating techniques, appropriate interventions and peer feedback. Participants will run outside groups and receive feedback and analysis. Group leadership styles will also be reviewed.

EDUG 879. Integrative Project and Seminar in Instructional Design and Delivery. 3 Credits.
This capstone course synthesizes the theoretical and technology components of the program. Participants will present a major project that includes a research component conducted at a field site that demonstrates their understanding of teaching and learning with technology. This guided project development course will be a culmination of sixty hours of field work integrated in to a real world scenario for the Advanced Certification and will be the proposal presentation for the Masters. Seminar sessions will provide support for effective needs assessment and strategic planning for the improvement of instruction. (Field work required for those seeking NYS certification).

EDUG 880. Nature and Needs of Students with Autism Spectrum Disorder. 3 Credits.
Focus on etiology, major trends and issues concerning Autism Spectrum Disorder. Emphasis on: collaboration, inclusion, service delivery models, roles of special and general education teachers, individualized educational programs, family involvement, and community resources. Satisfies the requirement for Autism.

EDUG 881. Psychoeducational Assessment of Autism Spectrum Disorder. 3 Credits.
Focus on the educational assessment of students with Autism Spectrum Disorder. Analysis of formal and informal assessment instruments. Emphasis on gathering and analyzing information in order to plan meaningful instruction, evaluate interventions, select appropriate learning curricula and materials, and make appropriate educational decisions for individuals with Autism Spectrum Disorder. Satisfies the requirement for Autism.

EDUG 882. Behavior Management and Counseling of Families of Individuals with Autism Spectrum Disorder. 3 Credits.
Focus on models for the behavior management of students with Autism Spectrum Disorders. Emphasis on management techniques, classroom and family organization, conferencing issues based on student needs and development. Satisfies requirement for Autism.

EDUG 883. Curriculum, Methods, Social Skill Development and Instructional Design for Students Autism. 3 Credits.
Curriculum, methods and materials for social integration and teaching children with Autism Spectrum Disorder in self-contained and inclusive settings with attention paid to NYS Content and Performance Standards (K-8). Design of individualized educational plans and creation of lesson plans. Demonstration of teaching skills emphasized in order to accommodate instruction and materials to the Autism Spectrum Disorder student. Satisfies requirement for Autism.

EDUG 884. Independent Study-Autism Spectrum Disorder. 3 Credits.
Project in area of Autism Spectrum Disorder conducted under the guidance of Faculty member. Student must submit an outline of proposed study prior to registration. Permission of the Director of Special Education required. Satisfies requirement for Autism.

EDUG 885. Internship: Teaching Students with Autism Spectrum Disorder. 3 Credits.
The internship experience and seminar provide the opportunity to apply knowledge, skills and strategies related to teaching children with Autism Spectrum Disorder in the classroom setting. Each internship is guided by a certified teacher and college supervisor. Students will develop teaching competencies while experiencing the personal and professional roles of a teacher of students with Autism Spectrum Disorder. The seminar is an opportunity for students and faculty to discuss current issues and ideas related to Autism Spectrum Disorder and to examine the relationship between these ideas and the classroom experiences. Internship portfolio, logs and journals required. Satisfies requirement for Autism.

EDUG 887. Mentored Research. 1 Credit.
Designed to provide mentoring for the collection of data, analysis of findings, discussion,conclusions and recommendations of the research paper. Students must have completed sections I,II and III of their major paper. Does not apply to degree. Pre-requisite: EDUG713 or a previous major paper that meets program research requirements. Permission of Director. One credit. Pass/Fail.

EDUG 888. Independent Study in Research. 1 Credit.
Designed to provide mentoring for the collection of data, analysis of findings, discussion, conclusions and recommendations of the research paper. Students must have completed sections I, II and III of their major paper. Special Education and School Leadership participants register for the section designated for their program. Does not apply to the degree. Prerequisite: EDUG 713. Permission of the Program Director.

EDUG 889. Internship/Seminar II in School Building Leadership. 3 Credits.
Designed for ongoing supervision of the capstone leadership experience for completion of the internship improvement initiative and accompanying report, portfolio, and exhibit of competencies. Participants complete the remaining 150 hours of the leadership experience. Pre-requisite: Completion of requirements for EDUG 748, permission of Program Director. Note: To acquire certification as a School Building Leader issued by NYSED, participants pass the NYSED SBL examination, apply for NYS certification via TEACH with the assistance of Manhattan College's Certification Liaison in the Dean of Education office.

EDUG 890. Supervised Fieldwork in Administration. 3 Credits.
Designed to provide mentoring for completion of internship documentation, including but not necessarily limited to, the collection of documentation, analysis of evidentiary data, final draft of the impact statement of the internship improvement initiative, reflection on course based applications and leadership field experience. Participants must have completed the six required SBL core courses (18 credits), submitted documentation of 100 hours of course related leadership activities, have enrolled in Internship/Seminar I and II (EDUG 748 and 889) but not completed within three semesters. Does not apply to degree. Permission of Program Director. 3 credits. Pass/Fail.

EDUG 891. Foundations in Evaluation, Assessment, and Diagnosis. 3 Credits.
This foundation course is aimed at providing a theoretical and practical basis for individual assessment of personality, intelligence and aptitude, such as WISC-IV, WAIS-III, WIAT-II and TAT. Concepts of intelligence, applications to the educational settings, social and ethical issues of individual testing will be considered. Initial practice in administering major instruments of psychological assessment will allow students to develop an understanding of their diagnostic and therapeutic value. Theory of projective psychology and its application to personality assessment is combined with supervised practice in administering and interpreting projective tests. Special attention to figure drawings and TAT, but projective component of Bender-Gestalt Visual Perceptual Test is also included. The course provides initial experience in evaluation, assessment, diagnosis and treatment planning. Students will practice by administering the instruments to each other. Focus will be on integrating test material into comprehensive reports having meaning for the referral source and the client. Prerequisite: 18 credits in P.D. program.

EDUG 892. Organizational Development + Field. 4 Credits.
For school district leaders, staff developers, and other district level personnel, this course provides an exploration of change factors and their effect on human behavior and interrelationships, effect on the educational social systems: leadership skills required for participatory decision-making: dealing with conflict and strategies for conflict resolution:power issues related to empowerment, authority, responsibility and accountability, and creating and developing the learning community. School improvement plans, district and school leadership teams: data-based strategic planning. An additional 10 hours of field experience required.

EDUG 893. Internship/Seminar III in School District Leadership. 3 Credits.
Completion of the district level internship requires 250 hours of administrative activity related to an improvement initiative, logged and signed by the district mentor/partner. Prerequisite: 57 credits beyond the baccalaureate degree, SBL certification or eligibility for same, permission of the Program Director. A prerequisite for the Leadership Experience (internship) in Advanced Leadership Studies is acceptance by a school district for an administrative internship experience in partnership with a certified district level administrator on-site. The internship consists of sustained administrative experience in diverse settings planned collaboratively and in partnership with university and district personnel in substantive, appropriate, and approved administrative and supervisory tasks and an impact report of the internship improvement initiative.

EDUG 894. Internship MHC Counseling II. 3 Credits.
Continued participation in on-site counseling experiences at a college counseling center, agency or hospital under a qualified supervisor who is licensed or registered in New York State to practice mental health counseling or medicine. Particular emphasis on case assessment, analysis, diagnosis with the DSM, recommendations for services, and the delivery of planned interventions. Prerequisite: Matriculation in Mental Health Master's or Advanced Certificate in Mental Health Counseling program, successful completion of EDUG 819, and permission of MHC Program Advisor. Three Credits.

EDUG 896. Concepts of Wellness. 3 Credits.
A study of the diversified nature of health as it relates to everyday living by examining vital health areas and issues relevant to the concerns of students. An introduction to identification and reporting of suspected child abuse and maltreatment; instruction in preventing child abduction and abuse of alcohol, tobacco and other drugs; and providing safety education including instruction in fire and arson prevention. (Dual M.S.Ed.).

EDUG 897. Principles and Practices of Education. 3 Credits.
Crucial issues in education: curricula objectives and designs, drug and child abuse, types of schools, special education programs, moral and spiritual values, community resources, educational law and school finances. 15 hours field visitation required. (Dual M.S. Ed.).

EDUG 898. Language and Literacy. 3 Credits.
Introduction to first and second language acquisition and development with emphasis to teaching and learning. Examination of psycho-linguisitc principles for teaching monolingual and linguistically and culturally diverse learners. Instructional approaches and practices for developing listening, speaking, reading, and writing skills in the general, English as a Second Language(ESL) and special education setting. Exploration of different models of instruction for students who are in Teaching English as a Second Language(TESOL) and/or bilingual settings. 10 hours of field required. (Dual M.S. Ed) Three credits.

EDUG 899. Physical Science for the Teacher of the At Risk and Disabled (Grades K-8). 3 Credits.
Introduction to basic principles and concepts of physical science as aligned with the N.Y.S. Learning Standards for grades K-8. Emphasis is on constructivist inquiry based problem solving, questioning skills, methods and materials appropriate for the at risk ELL, and disabled student. Appropriate hands-on activities to illustrate fundamental concepts. Three credits.

EDUG 900. Current Issues in Instructional Design: Global and Ethical Perspectives. 3 Credits.
This course focuses on the impact of globalization on training and development in multinational, corporate and educational environments. Students explore culture and how to use methodologies to research, assess, and adapt content to meet the needs of learners from around the world. Students also gain an understanding of the best practices used to create effective learning in various multicultural environments while evaluating ethical values in the design and deployment of technologies.

EDUG 901. STEAM: Methods for Teaching, Sci, Tech, Engineering, Art & Math for the At Risk, ELL & Dbld Student. 3 Credits.
Introduction to basic concepts of science, technology, engineering, the arts and math aligned with Common Core and N.Y.S. Learning Standards. This course will focus on constructivist inquiry based problem solving methods. Appropriate hands-on activities to illustrate fundamental concepts will be addressed. Emphasis will be placed on integrated lessons, projects, and strategies for instructional delivery in STEAM for at risk, ELL and disabled students.

EDUG 902. Dignity for All Students(DASA). 0 Credits.
For those taking the DASA program at Manhattan College, registration for this course confirms six hours of training on the Dignity Act: how school climate impacts students achievement and behavior, understanding diversity and multi-cultural environments, and understanding bullying, harassment and discrimination, including indicators, early warning signs, prevention and intervention and how to interact with families and victims and aggressors. Pre-requisites: EDUG 600 and EDUG 744.

EDUG 903. Contemp. Couples Therapy. 3 Credits.
This course will provide students with an in-depth examination of contemporary theories and practices in Couple Therapy. Couple assessment and intervention across the life cycle will be studied. Couple dissolution, separation, divorce and re-marriage will be examined from the viewpoint of the work of the practicing couples/family therapist. Couple issues including commitment, decision-making, confliect, gender differences, sexuality, infertility, intergenerational relationships, work, money, migration, technology, illness and death of a spouce, affairs, and physical violence will be addressed in a family systems context and contemporary 'best practice' models of Couple Therapy.

EDUG 904. Introduction to Family Therapy Models. 3 Credits.
The family, no matter the structure, is the context for our lives. This course will provide a focus on the major theories, practice, and issues in Family Systems Therapy. Students will be introduced to not only traditional theoretical frameworks, but also exposure to evolving models of practice. Methods for assessing and intervening with contemporary couples and families in urban settings will be emphasized, including the family's relationship with Larger Systems. A resillience-based model of family functioning will be highlighted. Students will begin to critically examine and develop their own theory of change, based on course material.

EDUG 905. Foundations of Mental Health & Family Therapy. 3 Credits.
This class will provide students with an introduction to the roles, functions, and professional identity of mental health counselors and marriage and family counselors in a variety of clinical settings. The Biopsychosocial model will be described. Students will develop a basic beginning knowledge of mental health and family assessment, diagnosis, and case formulation with incorporating the aspects of culture and ethncity that impact assessment and treatment. Students will develop a basic working knowledge of systems theory as it pertains to the assessment and case formulation of families while incorporating the aspects of culture and ethnicity that impact the family system. Students will develop a basic working knowledge of the principles of current diagnostic tools. Students will develop a basic knowledge of commonly prescribed psychotropic medications.

EDUG 906. Family Assessment. 3 Credits.
This course will explore various approaches to conceptualizing assessment of families and couples. It introduces the family as a system, family assessment through a variety of means, includling early recollections, and their meaning; family structure; family process and communication; triadic process; the genogram, family life cycle and its many cultural and social class variations. Ethical, legal, and other professional issues related to family counseling will be covered.

EDUG 907. Practicum in Marriage and Family Counseling. 3 Credits.
This course is designed to train the beginning family therapy student in the practical aspects of systemic therapy. This course aims to provide skills in conducting thorough family and couples interviews. We will begin to formulate the presenting problems of families in a systemic way from which systemic interventions will follow. Special attention is paid to the strengths and resilience of families using a developmental perspective and to working collaboratively with families and couples. Students will develop the skill of reading from original articles. This course is required prior to entering internship I.

EDUG 908. Family Therapy&Family Law. 3 Credits.
Comprehensive exploration of the interface between family systems and the legal system. Students will gain a working knowledge of common issues confronting modern day families. These issues will be explored from a legal as well as therapeutic perspective. Course assignments follow the book's organization which is developmental.

EDUG 909. Family Systems Therapy: Practicum in Techniques. 3 Credits.
Family therapy theory and techniques includes application to marital counseling and common family issues. Focus on assessments unique to family counseling. Students will become familiar with the strengths and weaknesses of various treatment models and will be able to identify the appropriateness of techniques from a cultural and diversity context. Students will also gain exposure to School-Based including Community Based Organization (CBO) Family Counseling. This course runs concurrently with Internship I and practicum assignments here will be based on experience in Internship I.

EDUG 910. Internship I and Seminar in MFT. 3 Credits.
This course is a supervision and integrating seminar including experience in assessment and diagnosis. Diagnosis and treatment of psychopathology from a family system and relational perspective will be emphasized inlcuding the application of systematic and relational theories in the diagnosis and treatment of individuals, couples, and families. Connection to and understanding of the use of DSM-V in Marriage and Family Therapy will also be included. Total hourse for Internship I and II is 500 hrs on site (including 300 direct hours); Internship I students are expected to complete 250 hours during Internship I. Internship sites must be approved by Manhattan College's Clinical Professor of Record according to the schedule sent to all students regarding all internship/practica placements. Seminar/MC group supervision includes an additional 30 hourse per semester.

EDUG 911. Internship II and Seminar II in MFT. 3 Credits.
Internship II and concurrent clinical seminar extends the Internship experience provided in Internship I building on that experience and on the practicum experience. A primary focus is on refinement of skills in conceptualizing, assessing, and providing treatment plans for clients in a marriage and family counseling setting including the use of assessment measures and diagnosis. Students will also be required to run team seminars and present cases for discussion. Practical application of counseling and family counseling theories and techniques to diagnosis, ethics and law, and the work of counselors with special populations will be covered as well. The Planning Guide, application process, and description of supervisor responsibilities are similar to that done in Internship I; the forms are contained in the Boylan text below. Total hours for Internship II is 250 on site (including 150 direct hours) + MC hours (30 classes). The total hours required in site experience during both internships = 500 hours.

EDUG 912. MBK Seminar, Observation, and Mentored Internship in Special Education. 3 Credits.
Internship for My Brother’s Keeper (MBK) initiative to meet specific requirements to gain proficiency in teaching students with disabilities in the Special Education and/or Inclusive classroom (Full-time internship for two semesters). Students must demonstrate teaching competence under the supervision of the teacher in the field and a faculty member. Seminar sessions include the discussion of: field placement, diversity, behavior management, differentiated instructional strategies, autism, Child Abuse and SAVE and current issues in special education. Student teaching logs, reflective journals, and special education program e-portfolio required. Prerequisite: Matriculation in the five-year program or dual/childhood, minimum G.P.A. 3.0 and meet the physical, mental, speech, language and other standards established for the profession. Permission of the Director of Special Education. Satisfies the requirement for Autism, S.A.V.E. and Child Abuse Recognition and Reporting. Three credits.

EDUG 914. Special Education Mentored Research. 2 Credits.
Designed to provide mentoring for the collection of data, analysis of findings, discussion, conclusions and recommendations of the research paper. Students must have completed sections I, II and III of their major paper. This mentoring is for graduate Special Education students. Does not apply to the degree. Prerequisite: EDUG 713. Permission of the Program Director. Two credits.

Counseling & Therapy

Ian Levy, Ed.D.
Program Director, School Counseling
718-862-7156
ilevy01@manhattan.edu (corine.fitzpatrick@manhattan.edu)

Jennifer Gullesserian, Ph.D.
Program Director, Mental Health Counseling
718-862-7478
jennifer.gullesserian@manhattan.edu

Sharon Marianetti-Leeper, Ph.D.
Program Director, Marriage & Family Therapy
718-862-7388
smarianettileeper01@manhattan.edu (http://catalog.manhattan.edu/graduate/schoolofeducation/counselingprograms/smarianettileeper01@manhattan.edu)

- Master of Arts in School Counseling
- Master of Science in Mental Health Counseling
- Master of Science in Marriage and Family Therapy
- Advanced Certificate in School Counseling
- Advanced Certificate in Mental Health Counseling
- Advanced Certificate Bilingual Extension with Master of Arts in School Counseling
- Advanced Certificate in Bilingual Pupil Personnel Services
- Recommended electives for Alcohol and Substance Abuse Counseling
- Recommended electives for College Advising

Masters Program in School Counseling (Leads to Certification in School Counseling)

The program is concerned with fostering the intellectual, social, spiritual, vocational, personal, and professional development of individuals throughout the life span. It is grounded in research and is also shaped by the needs of schools, community agencies, and colleges that require the services of professional counselors. While a theoretical thread is evident in the core coursework, an experiential thread also begins in the first semester. At the end of their preparation, it is expected that counselors-in-training will emerge with certain knowledge, skills and dispositions. They will be able to: assess, facilitate, and guide individual development; enhance the experiences that further human development and ameliorate those that hinder optimum development; work with individuals from diverse ethnic, cultural, and socioeconomic backgrounds; and engage in inquiry with respect to emerging professional thought and practice. Most importantly, counselors-in-training will enhance their ability to be empathetic, caring human service providers.

Program participants are responsible for giving evidence of having acquired the required competencies and met standards through periodic performance reviews, completion of

course and program requirements and for maintaining a B or better average in course work.

Admission

Applicants for admission into the master degree program in School Counseling must have earned a baccalaureate degree and a suitable preparation in the behavioral sciences. Consideration will be given for teaching experience and for other applicable experience. Students who possess a bachelor degree but do not have relevant background may be required to take prerequisite courses for admission. A Narrative Statement of Interest in the counseling program is required. Two letters of reference are also required. An interview with the Director is recommended prior to admission.

Program Planning

The approved degree program for Counseling consists of 48 credits of course work. The program requires a major paper and a one semester practicum and two semester internship. Periodic consultation with an advisor is required to assure proper sequence and progress in developing competencies as a counselor. The programs prepare students for counseling in schools and in other agencies.

Degree Program School Counseling

Required courses: Students in the 48 credit M.A. program seeking school counseling certification must take all the required courses listed below. Students should consult with the Advisor for courses most suitable for their purpose.

EDUG 713	Methods of Educational and Psychological Research	3
EDUG 721	Introduction to Counseling Practices and Theories	3
EDUG 722	Techniques in Counseling the Individual	3
EDUG 723	Life Span Development	3
EDUG 724	Career Development	3
or EDUG 714	Psychology of Career Counseling	
EDUG 725	Practicum in Groups	3
EDUG 727	Organization and Administration of the Guidance Program	3
EDUG 732	Practicum in Counseling	3
EDUG 780	Psychopathology	3
EDUG 807	Measurement and Assessment for Counselors	3
EDUG 821	Internship in School Counseling I	3
EDUG 827	Internship in School Counseling II	3
EDUG 851	Data Analysis and Report Writing in Educational & Psychological Research	3
EDUG 853	Counseling the College Applicant	3
EDUG 859	Approaches to Multicultural Counseling:Theory and Practice	3
or EDUG 817	Cross Cultural Counseling	

EDUG 867	Professional Orientation to Counseling:Standards, Law, Ethics, and Evaluation	3
Total Credits		48

Masters Program in Mental Health Counseling (Licensure Qualifying in New York)

The mental health counseling program is a 60 credit master's degree program that prepares students to work in mental health settings such as: mental health centers, hospitals, college counseling centers, and residential treatment centers. The Master of Science in Mental Health Counseling is a rigorous program designed to meet the requirements for an independent mental health care license in New York. The primary objective of this program is to train masters level practitioners in assessment and intervention in the mental health care settings. Together with a post-graduate experience requirement (3000 hours) and successful completion of a licensure exam, graduates will be able to provide direct clinical and counseling services to patients in a wide range of medical, research, mental health and independent practice settings.

Admission

Applicants for admission into the master degree program in Mental Health Counseling must have earned a baccalaureate degree. Consideration will be given for applicable experiences. Students who possess a bachelor degree but do not have relevant background may be required to take a prerequisite course for admission. A Narrative Statement of Interest in the Mental Health Counseling program is required. Two letters of reference are also required. An interview with the Director is recommended prior to admission.

Program Planning

The Mental Health Program consists of 60 credits. The program requires a major paper and a one semester practicum and two semester internship (300 hours per semester). Periodic consultation with the academic advisor is required to assure proper sequence and progress in developing competencies as a counselor. Program participants are responsible for giving evidence of having acquired the required competencies and met standards through periodic performance reviews, completion of course and program requirements and for maintaining a B or better average in course work.

Degree Program Mental Health Counseling

Students preparing for mental health counseling must earn 57 credits of core courses and 3 credits of an elective course. Students should consult with the academic advisor for 3 credits of an elective course most suitable for their goals. Students must complete a research paper.

Required courses

Elective		3
EDUG 713	Methods of Educational and Psychological Research	3
EDUG 715	Marriage and Family Counseling	3

or EDUG 904	Introduction to Family Therapy Models	
EDUG 721	Introduction to Counseling Practices and Theories	3
EDUG 722	Techniques in Counseling the Individual	3
EDUG 723	Life Span Development	3
EDUG 724	Career Development	3
or EDUG 714	Psychology of Career Counseling	
EDUG 725	Practicum in Groups	3
EDUG 726	Foundations of Mental Health Counseling	3
EDUG 732	Practicum in Counseling	3
EDUG 780	Psychopathology	3
EDUG 807	Measurement and Assessment for Counselors	3
EDUG 850	Advanced Practicum for Counselors in Group Procedures	3
EDUG 851	Data Analysis and Report Writing in Educational & Psychological Research	3
EDUG 819	Internship in MHC Counseling I	3
EDUG 859	Approaches to Multicultural Counseling:Theory and Practice	3
EDUG 866	Practicum in Leadership, Supervision and Consultation in Counseling	3
EDUG 867	Professional Orientation to Counseling:Standards, Law, Ethics, and Evaluation	3
EDUG 891	Foundations in Evaluation, Assessment, and Diagnosis	3
EDUG 894	Internship MHC Counseling II	3
Total Credits		60

New York State Certification/Licensure

School. Upon the completion of the Master of Arts degree, SAVE, Child Abuse Recognition and Reporting requirements and DASA training, the student will fulfill the requirements for Provisional certification as a school counselor. The student must file an application on line with the State Education Department and then contact the office of the Dean of Education in order to be recommended for certification. Application should be submitted prior to graduation.

Mental Health. Manhattan College's program meets the State of New York requirements and graduates are license eligible with 3,000 post degree supervised hours and the passage of a state license exam.

Masters Program in Marriage and Family Therapy (Licensure Qualifying in New York)

The marriage and family therapy program is a 60 credit program, registered in the New York State Office of Professions. It is designed to educate and train clinicians in the profession of Marriage and Family Therapy. The program includes studying, understanding, and developing the skills for providing therapy based on an integration of a contextual, cultural and relational perspective. Factors included in this perspective include among others: life span development, family of origin, family configuration,

culture, gender, living and schooling environment, and ethnicity. The program meets the requirements to qualify for an independent Marriage and Family Therapy license in New York State. Together with a post – graduate experience requirement (1500 hours) and successful completion of a licensure exam, graduates will be able to provide direct clinical therapy services to clients in a wide variety of settings and private practice.

Admission

Applicants for admission into the master degree program in Marriage and Family Therapy must have earned a baccalaureate degree. Consideration will be given for applicable experiences. Students who possess a bachelor degree but do not have relevant background may be required to take a prerequisite course for admission. A Narrative Statement of Interest in the Marriage and Family Therapy is required. Two letters of reference are also required. An interview with the Director is recommended prior to admission.

Program Planning

The Marriage and Family Therapy consists of 60 credits. The program requires a major paper and a one semester practicum and two semester internship (300 hours per semester). Periodic consultation with the academic advisor is required to assure proper sequence and progress in developing competencies as a counselor.

Marriage and Family Therapy Licensure. Manhattan College's program meets the State of New York educational requirements and graduates are license eligible. Upon graduation, students will also need to meet the requirements for licensure by passing the national MFT exam and by acquiring the post-graduate clinical experience and supervision. The requirements in other states may vary so students should discuss licensure in other states with their academic advisor.

Degree Program Marriage and Family Therapy

Students preparing for Marriage and Family Therapy must earn 54 credits of core courses and two electives. Students should consult with the academic advisor for 6 credits of courses most suitable for their goals. Students must complete a research paper.

Required Courses

EDUG 713	Methods of Educational and Psychological Research	3
EDUG 723	Life Span Development	3
EDUG 905	Foundations of Mental Health & Family Therapy	3
EDUG 904	Introduction to Family Therapy Models	3
EDUG 867	Professional Orientation to Counseling:Standards, Law, Ethics, and Evaluation	3
EDUG 780	Psychopathology	3
EDUG 851	Data Analysis and Report Writing in Educational & Psychological Research	3
EDUG 907	Practicum in Marriage and Family Counseling	3
EDUG 903	Contemp. Couples Therapy	3
EDUG 725	Practicum in Groups	3

EDUG 817	Cross Cultural Counseling	3
EDUG 709	Alcohol and Substance Abuse Counseling Family Issues and Treatment Approaches	3
EDUG 910	Internship I and Seminar in MFT	3
EDUG 908	Family Therapy&Family Law	3
EDUG 909	Family Systems Therapy: Practicum in Techniques	3
EDUG 906	Family Assessment	3
EDUG 911	Internship II and Seminar II in MFT	3
EDUG 850	Advanced Practicum for Counselors in Group Procedures	3
Electives		6

Advanced Certificate in School Counseling

Admission

Students must have a master's degree from an approved educational institution and possess provisional certification in school counseling or its equivalent. A Narrative Statement of Interest in the counseling program, and two letters of recommendation are required prior to admission.

Students who have obtained the M.A. Degree in Counseling from Manhattan College within the last five years and who plan to apply to the Advanced Certificate program in Pupil Personnel Services (School Counseling) may submit a 1 page simplified application form for approval to their M.A. advisor who will then send it to the Director of the Counseling Programs for approval. That form is available through the faculty advisors for the program. The form will then be sent directly to Admissions.

Program

The Advanced Certificate consists of 21 credits of course work. It emphasizes broader preparation in counseling and related services for advanced responsibilities, including intervention, and in the conduct, supervision, and evaluation of counseling practice. Upon completion of 21 credits, students may apply for New York State permanent certification if they have worked as a school counselor for 2 years.

Required courses

EDUG 723	Life Span Development	3
EDUG 850	Advanced Practicum for Counselors in Group Procedures	3
EDUG 859	Approaches to Multicultural Counseling:Theory and Practice	3
EDUG 866	Practicum in Leadership, Supervision and Consultation in Counseling	3
EDUG 867	Professional Orientation to Counseling:Standards, Law, Ethics, and Evaluation	3
Electives		6
Total Credits		21

Students must consult with the Program Director to determine appropriate courses for the 6 elective credits.

Advanced Certificate in Mental Health Counseling (Licensure Qualifying in New York)

The Advanced Certificate in mental health counseling program is a 27 credit post master's degree program that prepares students who already have a Master's degree in Counseling to work in mental health settings such as: mental health centers, hospitals, and residential treatment centers. The Advanced Certificate in Mental Health Counseling is a rigorous program designed to meet the requirements for an independent mental health care license in New York and other states. The primary objective of this program is to train practitioners in assessment and intervention in the mental health care settings. Together with a post degree experience requirement (3000 hours) and successful completion of a licensure exam, graduates will be able to provide direct clinical and counseling services to patients in a wide range of medical, research, mental health and independent practice settings.

Admission

Applicants for admission into the Advanced Certificate program in Mental Health Counseling must have earned a master's degree in counseling or counseling psychology. Consideration will be given for applicable experiences. A Narrative Statement of Interest in the Mental Health Counseling program is required. Two letters of reference are also required. An interview with the Director is recommended prior to admission.

Students who have obtained the M.A. Degree in Counseling from Manhattan College within the last five years and who plan to apply to the Advanced Certificate Program in Mental Health Counseling may submit a 1 page simplified application form for approval to their M.A. advisor who will then send it to the Director of the Counseling Programs for approval. That form is available through the faculty advisors for the program. The form will then be sent directly to Graduate Admissions.

Program Planning

The Mental Health Program consists of a minimum of 27 credits depending on the appropriateness of the courses already taken on the master's level. Since the advanced certificate and the master's degree in mental health programs are registered in New York State, guidelines in determining which courses and how many must be taken in the advanced certificate will follow that model. These programs require a major paper (if not taken on the master's degree level) and a practicum and two semester internship. Periodic consultation with an advisor is required to assure proper sequence and progress in developing competencies as a counselor.

Please see the course listing under the M.S. degree in Mental Health Counseling for the courses that are required. Students in the Advanced Certificate program must review with an advisor which master's level courses they have already taken that fulfill the requirements for the M.S. degree and which courses they need to take.

New York State Licensure

Mental Health. Manhattan College's advanced certificate in mental health counseling program meets the State of New York requirements and graduates are license eligible with 3,000 post degree supervised hours and the passage of the state exam.

Advanced Certificate in School Counseling Bilingual Extension

The advanced certificate bilingual extension (ACT CBE) may be taken as part of the M.A. in School Counseling program and/or the Advanced Certificate in School Counseling. in order to earn eligibility to pursue provisional certification as a bilingual counselor in preschool, elementary and secondary schools. The ACT CBE is 15 credits but students may take 1 of the 5 courses within their 48 credit master's course work. With the Extension, students will need a total 60 combined credits and pass the expressive language fluency exams.

Advanced Certificate in Bilingual Pupil Personnel Services

Applicants must have a master's degree in school counseling, social work, or school psychology. By completing the Advanced Certificate in Bilingual Pupil Personnel Services (ACT BPPS) program, which consists of 15 credits of coursework, and passing expressive language fluency exams, students may be eligible to pursue certification to work as a bilingual school counselor, school psychologist or social worker.

Students in both the ACT CBE and ACT BPPS programs must independently pass the Bilingual Education Assessment examination in order to complete the requirements for their certificate.

Both the ACT CBE and ACT BPPS programs are registered with the State of New York.

Required Courses

EDUG 802	Foundations, Theory and Practice of Bilingual General and Special Education	3
EDUG 810	Bilingual and Multicultural Assessment of Linguistically and Culturally Diverse Students	3
EDUG 816	Approaches to Counseling Linguistically and Culturally Diverse Student	3
EDUG 817	Cross Cultural Counseling	3
or EDUG 859	Approaches to Multicultural Counseling:Theory and Practice	
EDUG 818	Internship: Bilingual Counseling	3
or EDUG 732	Practicum in Counseling	
Total Credits		15

Recommended electives for Alcohol and Substance Abuse Counseling

The electives consist of 9 credits of coursework specifically designed to prepare students for Alcohol and Substance Abuse Counseling. It is also appropriate for those human service professionals who want to enhance their skills as mental health or school counselors.

Required Courses

EDUG 708	Physical and Psychopharmacological Aspects of Alcohol and Substance Abuse	3
EDUG 709	Alcohol and Substance Abuse Counseling Family Issues and Treatment Approaches	3
EDUG 706	Alcohol and Substance Abuse: Evaluation, Treatment Planning and Case Management	3
Total Credits		9

Recommended electives for College Advising

The electives consist of 12 credits of coursework specifically designed to prepare college advisors to gain additional expertise in working with students who aspire to go to and be successful in college. The courses were designed with funding from a grant and represent the best research and practice ideas.

Required Courses

EDUG 729	Professional Writing	3
EDUG 718	Technology, the School Counselor and College Advisor	3
EDUG 853	Counseling the College Applicant	3
Other course chosen based on focus of advisor		3
Total Credits		12

Educational Leadership Programs

Sister Remigia Kushner, Ph.D.
Program Director

The graduate programs Educational Leadership leading to NYS school building and school district certification are based on

- NYS knowledge and skills for School Building Leaders (SBL), School District Leaders (SDL), and School District Business Leaders (SDBL),
- NYS content areas proposed by the NYSED Commissioner's Regulations
- the knowledge, dispositions, and performances based on the Professional Standards for Education Leaders (PSEL) and the National Educational Leadership Preparation (NELP) standards
- Association for Advancing Quality Educator Preparation (AAQEP) Standards for accreditation.

The Educational Leadership programs invite competent and caring professionals to develop and/or enhance skills to lead self, to lead others to lead themselves, and to lead with others to transform their organizations.

These goals help participants become qualified for administrative positions in New York State with school building or school district certification awarded by the New York State (NYS) Office of Teaching Initiatives (OTI).

Program completers serve as teacher leaders, grade and subject coordinators, assistant principals, staff developers, department chairs, heads of schools, and other similar administrative positions. Special Educators and Counselors with leadership certification serve on administrative teams to advocate for the educational needs of students, faculties, and families. District level completers serve in a variety of positions in district-level educational services.

Educational Leadership Programs

School Building Leadership Program

Option 1: Master Degree in School Building Leadership (MS Ed in SBL)

- leading to eligibility for **School Building Leader Certification**
- 33 credits (11 courses)
- ***Choose this option if you are seeking a first master degree or an additional master degree.***

Option 2: Advanced Certificate in School Building Leadership (AdvCert in SBL)

- a post-master accelerated program leading to eligibility for **School Building Leader Certification**

- 24 credits (8 courses)
- ***Choose this option if you already have a master degree and want an accelerated program for SBL certification.***

Advanced Leadership Studies Program

leading to School District Certification

Option 1: Master Degree in Advanced Leadership Studies (MS ED in ALS)

- a post-graduate program leading to eligibility for **School District Leader Certification**
- 30 credits (6 courses)
- ***Choose this option if you want a master degree in School District Leadership***

Option 2: Advanced Certificate in Advanced Leadership Studies (AdvCert in ALS)

- a post-graduate accelerated program leading to eligibility for **School District Leader Certification**
- 11 credits (3 courses)
- ***Choose this option if you have 50+ post-graduate credits and seek an accelerated program for SDL certification.***

Participants in an Educational Leadership Program meet the objectives of:

- continuous improvement of schools and districts through their course related leadership activities, the internship, and continuous improvement initiative(s)
- continuous improvement of their crafts through reflective practice and plans for professional learning beyond the classroom
- developing and/or enhancing leadership knowledge, decision-making skill, and professional dispositions through course-related leadership activities and their personal/professional learning plans
- acquiring eligibility for a NYS leadership position through successful completion of coursework based on the design and frameworks of the NYSED certification examination(s)
- developing or enhancing their knowledge, performance, and dispositions of the National Educational Leadership Program (NELP) standards
- providing a quality education, based on and grounded in excellence, dignity, and connectedness that is delivered in a supportive environment through reflective practice, responsible self-direction, collaboration, and leadership in the positions they hold.

School Building Leadership

Admission Requirements

- bachelor or master degree in an appropriate field
- initial or provisional or permanent or professional certificate ***or*** the equivalent of such ***or*** give appropriate and acceptable evidence of potential for educational leadership
- certificates of completion from approved providers of NYSED required workshops in
    - Child Abuse Prevention and Reporting
    - Schools Against Violence Education (SAVE)
    - Dignity for All Students Act (DASA)
- GRE scores for those seeking admission to their **first graduate program**.
    - the **GRE is not required** of an applicant who has completed a graduate program
- recommendation from an immediate or current supervisor
- recommendation from a higher ed professional attesting to potential for post-graduate studies
- Statement of Interest that includes evidence of leadership for learning and future professional plans for using the degree
- meet with the Program Director -- preferably before beginning course work to consult and design a program plan for courses and competencies appropriate to the position or certification they seek.

Course Work in School Building Leadership (SBL)

The **Master degree and accelerated Advanced Certificate** programs both require an orientation course, six core courses that include 15-20 hours of course related leadership activities (CRLAs) per course, and two internship courses that include on- and off-campus seminars.

EDUG 600	Orientation to School Building Leadership	3
EDUG 735	Leadership for Learning, Decision Making and Change	3
EDUG 738	Evaluating School Effectiveness	3
EDUG 740	Educational Law for Administrators	3
EDUG 744	Contemporary Management Functions in the School	3
EDUG 745	Curriculum Development and Adaptation	3
EDUG 747	Supervision for the Improvement of Instruction	3
EDUG 748	Internship/Seminar I in School Building Leadership	3
EDUG 889	Internship/Seminar II in School Building Leadership	3

The Master Degree also requires

EDUG 713	Methods of Educational and Psychological Research	3
EDUG 837	Organizational Development	3

The Internship for the MS Ed and AdvCert in SBL

Prerequisites for the Internship:

- completion of the orientation course
- six core courses (18 credits) with an earned GPA of 3.0 or better
- 100 hours of course related leadership activities completed in the field during the six core courses
- acceptance by a school or district for an administrative internship
- sponsorship/mentoring by a certified on-site administrator.

The internship in School Building Leadership requires (but may not be limited to):

- two 3-credit internship courses and accompanying seminars
- 400 hours of administrative practice completed in
    - 30 weeks part time (3-4 hours per day) **OR**
    - 15 weeks full-time (6-8 hours per day)
- monthly on-campus internship seminars
- monthly off-campus seminars in diverse schools and settings
- an internship improvement initiative
- an electronic internship portfolio
- report of the impact of the internship improvement initiative
- digital video of an administrative activity
- chronological and cumulative logs and journals
- submission of all required internship documentation

SBL Program Completion

Participants in the **Master degree or accelerated Advanced Certificate** program in School Building Leadership meet these program completion requirements:

- appropriate and continuous progress throughout coursework based on college requirements to maintain matriculation
- maintain a 3.0 (B) or better average in coursework
- complete all program requirements for assignments and internship according to the program completion schedule in the Letter of Acceptance
- maintain matriculation while completing internship and/or research and/or other completion requirements
- meet calendar dates for submitting approved, accepted, and graded documentation

New York State Certification as a School Building Leader

Those seeking NYS certification in School Building Leadership must:

- present three-years experience as a teacher, counselor, special educator, or pupil personnel service as a school psychologist, social worker, or attendance teacher at the time of applying for NYS certification
- complete the School Building Leadership Program registered with NYSED
- present a cumulative GPA of 3.0 or better
- **pass the examination** for NYS SBL certification
- meet the NYS certification requirements in place at the time of applying for certification
- apply for NYS SBL certification with the assistance of the Manhattan College Certification Officer at 718-862-7373

Advanced Leadership Studies

Admission Requirements

leading to eligibility for certification as a School District Leader

- a graduate GPA of **3.5 or better**
- two years of administrative experience ***or*** the equivalent
- **two letters** of recommendation from:
    - a current professional supervisor attesting to potential for leadership
    - a higher ed professional attesting to potential for post-graduate studies
- sponsorship/mentoring by a certified school district leader
- certificates of
    - Child Abuse Recognition and Reporting
    - Safe Schools and Violence Prevention Legislation
    - Needs of Children with Autism
    - Dignity for All Children Act (DASA)

Course Work in Advanced Leadership Studies (ALS)

The **Master of Science degree (MS Ed. in ALS) and the accelerated Advanced Certificate** programs in Advanced Leadership Studies require 10 hours of field work with each course under the supervision/sponsorship/mentoring of a district certified administrator.

Those with more than 30 but less than 50 hours of postgraduate credits, may seek the master of science degree in Advanced Leadership Studies in School District Leadership. The **MS Ed in ALS** consists of 24 credits of coursework and 6 credits of internship/seminar:

EDUG 840	School Finance + Field Experience	4
EDUG 871	Quantitative Process Control in Education + Field Experience	4
EDUG 847	Total Quality Management for Educational Leaders + Field	4
EDUG 861	Standards Based Performance Assessment + Field	4

EDUG 865	Instructional Design, Technology & Information Processing +Field	4
EDUG 892	Organizational Development + Field	4

- `two 3-credit internship courses`

EDUG 889	Internship/Seminar II in School Building Leadership	3
EDUG 893	Internship/Seminar III in School District Leadership	3

- mentoring by a certified district-level administrator
- completion of an internship improvement initiative
- report of the impact of the internship improvement initiative.

Course Work for the Advanced Certificate in ALS

Those applying to the post-graduate Advanced Certificate leading to School District certification participate in the **Advanced Leadership Studies** program and must present a minimum of 50 post-baccalaureate credits in an appropriate field.

The accelerated post-graduate program in Advanced Leadership Studies leading to School District Leadership certification consists of 3 courses:

EDUG 840	School Finance + Field Experience	4
EDUG 871	Quantitative Process Control in Education + Field Experience	4
EDUG 893	Internship/Seminar III in School District Leadership	3

- mentoring by a certified district-level administrator
- completion of an internship improvement initiative
- report of the impact of the internship improvement initiative.

The district level internship requires

- acceptance by a school district for a district level administrative internship experience
- sponsorship/mentoring/partnership with an on-site certified district administrator
- a proposal for an internship improvement initiative in partnership with the district
- at least 250 hours of district-level administrative practice and seminar
- sustained administrative experience in diverse settings that is
    - planned collaboratively and in partnership with college and district personnel in substantive, appropriate, and approved district level administrative and supervisory tasks.
- an impact report of the district level improvement initiative

NYS Certification as a School District Leader

Candidates for NYS certification as a School District Leader (SDL) must:

- complete the NYS registered master degree or post-graduate program in Advanced Leadership Studies in School District Leadership at Manhattan College
- acquire a total of 60 or more post-baccalaureate credits by the end of the program
- have a GPA of 3.5 or better
- pass the examination for NYS certification as a school district leader
- apply for SDL certification through the Manhattan College Certification Officer at 718-862-7373

New York State certifies school building and school district leaders, Manhattan College does not certify participants.

Candidates for NYS certification are responsible for knowing and meeting NYS requirements for the specific certification they seek, for meeting NYS certification requirements in place at the time of applying for certification, knowing and scheduling certification test dates.

Changes in NYSED requirements for School Building and School District certification replace those in this catalog.

Special Education

Elizabeth M. Kosky, Ed.D.
Program Director

- Master of Science in Education - Students with Disabilities Grades 1-6
- Master of Science in Education - Childhood / Students with Disabilities Grades 1-6
- Masters of Science in Education - Adolescence / Students with Disabilities Grades 7-12
- Bachelor of Science/Master of Science in Education - Dual Childhood / Students with Disabilities Grades 1-6 (Five Year Program)
- Bachelor of Arts//Master of Science in Education - Dual Adolescence/Students with Disabilities Generalist 7-12 Ext. English; Math; Social Studies (Five Year Program)
- Advanced Certificate- Bilingual Education

Master of Science in Education

Admission

For admission into the master degree Students with Disabilities programs, applicants must have earned a baccalaureate degree and must have suitable preparation in the behavioral sciences. For Special Education programs, SAT/ACT scores may be submitted if they were taken within the last five years. These can be used in lieu of GRE scores. Candidates with earned Master's degree are exempt from the GRE. Applicants must submit Graduate Record Examination (GRE) scores if it has been longer than five years since the date of the SAT/ACT or they do not hold a Master's degree. The applicant will be able to register for admission into a graduate program without the exam, but must submit evidence of having taken the GRE within the first 12 credits. If the results of the GRE are not submitted to “Graduate Admissions,” by the completion of the first twelve graduate credits, the student will not be allowed to enroll for further coursework until the evidence of having taken the exam is officially submitted. The results will be considered in combination with other materials required for admission by the program. If an applicant has taken the exam in the past, GRE test scores are valid for five years after the testing year. If the exam was taken over five years ago, the applicant will need to take the test again. If the applicant is enrolled in or has completed a graduate-level program in teacher education and is applying to another program, s/he must take the GRE for admission into the new program unless scores are within the last five years. Consideration will be given for teaching experience and other applicable experience. They must also meet the New York State Education requirements in English, Math, Science, Foreign Language and Social Studies. Students will be required to fulfill these requirements as a prerequisite for certification.

A Narrative Statement of Interest in the Student with Disabilities Program, recommendation and resume are required. An interview with the Director of Graduate Special Education is recommended prior to admission.

Program

The program for candidates in the M. S. Ed. Students with Disabilities program consists of required courses for the specific programs, seminar, major paper and Students with Disabilities program e-portfolio.

The program provides a broad base of knowledge and experience to enable students to teach at risk, intellectual disabilities, learning disabilities, emotional disturbance, autism, physical disabilities, and multiple disabilities in special education or inclusive settings. The individual courses are designed to develop certain knowledge, dispositions, and skills required to meet Next Generation Learning Standards in English Language Arts (ELA), Math and Science and NYS standards for Social Studies. Students are expected to consult with the Program Director regarding courses and progress.

Course participants are responsible for giving evidence of meeting course objectives and standards through periodic performance reviews, e-portfolio, completion of course and program requirements and for maintaining a B or better average in course work.

New York State Certification

At the time of publication of this catalog, the Master of Science degree (Students with Disabilities) fulfills all the academic requirements for certification as a Students with Disabilities teacher. Upon completion of the Master of Science in Education degree, DASA, Autism, SAVE and Child Abuse Recognition and Reporting requirements the student will fulfill the academic requirements for initial teacher certification. Students who do not possess initial certification are required by the New York State Education Department to pass the Educating All Students test (EAS) and edTPA. When students have completed the degree requirements and passed the required CST exams, they will be recommended for a initial certification or professional certification if they have met the NYS regulations for appropriate length of time for teaching experience and mentoring. The student must file an Application for Certificate form with the N.Y.S. Department of Education (online) and contact the Office of the Dean of Education in order to be recommended for certification. This application should be filed upon graduation.

Changes in certification requirements issued by the New York State Education Department (NYSED) will take precedence over and replace those presented in this catalog.

Those seeking New York State certification are responsible for knowing and meeting all State requirements for their specific programs.

Job Opportunities for Teacher Education Graduates

According to the National Center for Education Statistics Predictions (45th Ed.) the total number of elementary and secondary teachers is projected to increase 7 percent between 2014 and 2026 The US Department of Labor, Bureau of Labor Statistics, indicates the overall employment of special education teachers is projected to grow 8 percent from 2016 to 2026.These increases are due to teacher turnover, retirement, and rising student enrollment.

Degree Programs

M.S. Ed - Students with Disabilities - Grades 1-6 (38 credits)

Prerequisites

Provisional or initial certification in Childhood general education (Grades 1-6) or Students with Disabilities (Grades 1-6)

Coursework

Core Requirements (23 credits)		23
EDUG 713	Methods of Educational and Psychological Research (3 cr.)	
EDUG 733	Approaches to Multicultural Education for the At Risk, (ELL) and Disabled Student (3 cr.)	
EDUG 778	Nature and Needs of the Exceptional Individual (3 cr.)	
EDUG 781	Management Techniques and Curriculum for the At Risk, English Language Learner [ELL] & Behave Disord (3 cr.)	
EDUG 787	Psycho-Educational Assessment for the At Risk, English Language Learner [ELL] and Disabled Student (3 cr.)	
EDUG 789	Methods of Teaching the At Risk, English Language Learner [ELL] and Disabled Student (Grades K-8) (3 cr.)	
EDUG 862	Seminar/Practicum in Teaching: The Student with Disabilities 1-6 (3 cr.)	
EDUG 914	Special Education Mentored Research (2 cr.)	
Content Requirements (12 credits)		12
ONE of the following Math and ONE of the following Science Content courses (768, 812, 901 may act as either a Math or a Science)		
EDUG 785	Life Science for At Risk, English Language Learner (ELL) and Disabled Student (Grades K-8) (3 cr.)	
EDUG 768	Integrated Curriculum: Math, Science & Technology I for the At Risk, ELL and Disabled Student K-8 (3 cr.)	
EDUG 775	Mathematics Instruction for At Risk, English Language Learner (ELL) and Disabled (Grades K-8) (3 cr.)	
EDUG 812	Integrated Curriculum II:Math,Sci & Tech for At Risk ELL and Disabled (Grades K-8) (3 cr.)	
EDUG 901	STEAM: Methods for Teaching, Sci, Tech, Engineering, Art & Math for the At Risk, ELL & Dbld Student (3 cr.)	
EDUG 899	Physical Science for the Teacher of the At Risk and Disabled (Grades K-8) (3 cr.)	
ONE of the following Social Studies courses:		
EDUG 805	Integrated Learning I:Social Studies & Language Arts Instruction for the At Risk, ELL & Disabled Stu (3 cr.)	
EDUG 808	Integrated Learning II:Social Studies&Language Arts Ins for the At Risk, ELL & Disabled Student (3 cr.)	

ONE of the following Language Arts courses:		
EDUG 753	Teaching Reading in Content Areas for At Risk, English Lang Learner(ELL) & Disabled (Grades K-12) (3 cr.)	
EDUG 754	Literature for the At Risk, (ELL) and Disabled (Grades K-8) (3 cr.)	
EDUG 766	Literacy Instruction for At Risk, English Language Learner (ELL) and Disabled Student. (3 cr.)	
EDUG 815	Curriculum, Assessment and Methods of Teaching English as a Second Language in Gen and Spe Ed (3 cr.)	
EDUG 826	Improvement of Instruction for Teachers of At Risk, English Language Learner (ELL) and Disabled (3 cr.)	
Elective courses:*		3
EDUG 802	Foundations, Theory and Practice of Bilingual General and Special Education (3 cr.)	
EDUG 813	Curriculum, Methods, and Materials in Core Subjects for Billingual, General, & Special Education (3 cr.)	
EDUG 783	Technological Applications for the At Risk and Disabled (3 cr.)	
EDUG 830	Curriculum Adaptation & Content Strategies for At Risk, (ELL) & the Disabled (3 cr.)	
Total Credits		38

* Others with approval of Program Director

M.S. Ed Dual Childhood/Students with Disabilities - Grades 1-6 (50 Credits)

Prerequisites

Individuals who are not certified must:

- Meet N.Y.S. Education requirements for undergraduate core which includes courses in History, Foreign Language, Science, Math, and English.
- Completed Undergraduate major (30 credits) in the Arts or Sciences.

Candidates with deficiencies will be required to take specific courses to meet these requirements for certification.

Coursework

Core Requirements (35 credits)		35
EDUG 713	Methods of Educational and Psychological Research (3 cr.)	
EDUG 723	Life Span Development (3 cr.)	
EDUG 733	Approaches to Multicultural Education for the At Risk, (ELL) and Disabled Student (3 cr.)	
EDUG 778	Nature and Needs of the Exceptional Individual (3 cr.)	
EDUG 781	Management Techniques and Curriculum for the At Risk, English Language Learner [ELL] & Behave Disord (3 cr.)	

EDUG 787	Psycho-Educational Assessment for the At Risk, English Language Learner [ELL] and Disabled Student (3 cr.)	
EDUG 789	Methods of Teaching the At Risk, English Language Learner [ELL] and Disabled Student (Grades K-8) (3 cr.)	
EDUG 826	Improvement of Instruction for Teachers of At Risk, English Language Learner (ELL) and Disabled (3 cr.)	
EDUG 856	Supervised Fieldwork:General and Special Education (3 cr.)	
Either 863 or 912		
EDUG 863	Seminar/Internship in Teaching: General and Special Education 1-6 (3 cr.)	
EDUG 912	MBK Seminar, Observation, and Mentored Internship in Special Education (3 cr.)	
EDUG 897	Principles and Practices of Education (3 cr.)	
EDUG 914	Special Education Mentored Research (2 cr.)	
Content Requirements (15 credits)		15
TWO of the following Literacy courses:		
EDUG 898	Language and Literacy (3 cr.)	
EDUG 753	Teaching Reading in Content Areas for At Risk, English Lang Learner(ELL) & Disabled (Grades K-12) (3 cr.)	
EDUG 754	Literature for the At Risk, (ELL) and Disabled (Grades K-8) (3 cr.)	
EDUG 815	Curriculum, Assessment and Methods of Teaching English as a Second Language in Gen and Spe Ed (3 cr.)	
EDUG 766	Literacy Instruction for At Risk, English Language Learner (ELL) and Disabled Student. (3 cr.)	
ONE of the following Math and ONE of the following Science content courses (768, 812 901 may act as either a Math or a Science):		
EDUG 785	Life Science for At Risk, English Language Learner (ELL) and Disabled Student (Grades K-8) (3 cr.)	
EDUG 899	Physical Science for the Teacher of the At Risk and Disabled (Grades K-8) (3 cr.)	
EDUG 775	Mathematics Instruction for At Risk, English Language Learner (ELL) and Disabled (Grades K-8) (3 cr.)	
EDUG 768	Integrated Curriculum: Math, Science & Technology I for the At Risk, ELL and Disabled Student K-8 (3 cr.)	
EDUG 812	Integrated Curriculum II:Math,Sci & Tech for At Risk ELL and Disabled (Grades K-8) (3 cr.)	
EDUG 901	STEAM: Methods for Teaching, Sci, Tech, Engineering, Art & Math for the At Risk, ELL & Dbld Student (3 cr.)	
ONE of the following Social Studies/Language Arts content courses:		
EDUG 805	Integrated Learning I:Social Studies & Language Arts Instruction for the At Risk, ELL & Disabled Stu (3 cr.)	

EDUG 808	Integrated Learning II:Social Studies&Language Arts Ins for the At Risk, ELL & Disabled Student (3 cr.)	
Total Credits		50

M.S. Ed - Adolescence Education Students with Disabilities Generalist Extension in English or Math or Social Studies - Grades 7-12 (38 credits)

Prerequisites

Initial certification in Adolescence Education (Grades 7-12) in English or Math or Social Studies

Coursework

Core Requirements (26 credits)		26
EDUG 713	Methods of Educational and Psychological Research	
EDUG 733	Approaches to Multicultural Education for the At Risk, (ELL) and Disabled Student	
EDUG 778	Nature and Needs of the Exceptional Individual	
EDUG 781	Management Techniques and Curriculum for the At Risk, English Language Learner [ELL] & Behave Disord	
EDUG 787	Psycho-Educational Assessment for the At Risk, English Language Learner [ELL] and Disabled Student	
EDUG 829	Practicum in Teaching At Risk, (ELL) & the Disabled	
EDUG 830	Curriculum Adaptation & Content Strategies for At Risk, (ELL) & the Disabled	
EDUG 834	Seminar & Practicum in Secondary Special Education(Teachers in the Field)	
EDUG 914	Special Education Mentored Research	
Content Requirements (12 credits)		12
Any FOUR of the following:		
EDUG 753	Teaching Reading in Content Areas for At Risk, English Lang Learner(ELL) & Disabled (Grades K-12)	
EDUG 754	Literature for the At Risk, (ELL) and Disabled (Grades K-8)	
EDUG 766	Literacy Instruction for At Risk, English Language Learner (ELL) and Disabled Student.	
EDUG 815	Curriculum, Assessment and Methods of Teaching English as a Second Language in Gen and Spe Ed	
EDUG 826	Improvement of Instruction for Teachers of At Risk, English Language Learner (ELL) and Disabled (3 cr.)	
Total Credits		38

Five Year Programs

Bachelor of Science and Master of Science in Education

Dual Certification Childhood Education/Students with Disabilities - Grades 1-6

This Five Year program is designed for the undergraduate student seeking dual certification for Childhood/Students with Disabilities Grades 1-6.

Students who complete the first semester of sophomore year with a cumulative index of 3.00 or better and grades of B or better in all Education courses may apply for admission into the five year BS/MS Ed program which leads to dual certification in Childhood Education/Students with Disabilities (Grades 1-6). Upon satisfactory completion of specific program requirements, and successful completion of the New York State Educating All Students test (EAS), edTPA and required CST exams, students will be recommended for initial certification.

Degree Program (152/153 credits)

Students complete the required sequence of undergraduate courses during freshman, sophomore, junior and senior year. In the fourth year they are enrolled in four graduate courses. In the Fifth year, students complete 23 graduate credits. Five year participants complete an internship in a Special Education setting full days during the Fall or Spring semester of the fifth year. Twelve credits need to be completed in a content area that covers Math, Science, Social Studies and Language Arts. Six credits of these content required courses may be taken in the Fourth Year.

FOURTH Year - GRADUATE COURSES (12 Credits)

FIFTH Year - GRADUATE COURSES (23 Credits)

Coursework

Core Requirements (23 credits)		23
EDUG 713	Methods of Educational and Psychological Research (4th yr. - 3 cr.)	
EDUG 733	Approaches to Multicultural Education for the At Risk, (ELL) and Disabled Student (4th or 5th year - 3 cr.)	
EDUG 778	Nature and Needs of the Exceptional Individual (4th or 5th year - 3cr.)	
EDUG 781	Management Techniques and Curriculum for the At Risk, English Language Learner [ELL] & Behave Disord (4th or 5th year - 3cr.)	
EDUG 787	Psycho-Educational Assessment for the At Risk, English Language Learner [ELL] and Disabled Student (5th year - 3 cr.)	
EDUG 789	Methods of Teaching the At Risk, English Language Learner [ELL] and Disabled Student (Grades K-8) (5th year - 3 cr.)	

EDUG 858	Seminar, Observation and Internship in Special Education (5 year Program) (5th year - 3 cr.)	
EDUG 914	Special Education Mentored Research (5th year - 2 cr.)	
Content Requirements (12 credits)		12
ONE of the following Math and ONE of the following Science (768, 812, 901 may act as either a Math or a Science) 4th or 5th year		
EDUG 775	Mathematics Instruction for At Risk, English Language Learner (ELL) and Disabled (Grades K-8) (3 cr.)	
EDUG 768	Integrated Curriculum: Math, Science & Technology I for the At Risk, ELL and Disabled Student K-8 (3 cr.)	
EDUG 899	Physical Science for the Teacher of the At Risk and Disabled (Grades K-8) (3 cr.)	
EDUG 812	Integrated Curriculum II:Math,Sci & Tech for At Risk ELL and Disabled (Grades K-8) (3 cr.)	
EDUG 901	STEAM: Methods for Teaching, Sci, Tech, Engineering, Art & Math for the At Risk, ELL & Dbld Student (3 cr.)	
ONE of the following Social Studies (4th or 5th year)		
EDUG 805	Integrated Learning I:Social Studies & Language Arts Instruction for the At Risk, ELL & Disabled Stu (3 cr.)	
EDUG 808	Integrated Learning II:Social Studies&Language Arts Ins for the At Risk, ELL & Disabled Student (3 cr.)	
ONE of the following Language Arts (4th or 5th year)		
EDUG 753	Teaching Reading in Content Areas for At Risk, English Lang Learner(ELL) & Disabled (Grades K-12) (3 cr.)	
EDUG 754	Literature for the At Risk, (ELL) and Disabled (Grades K-8) (3 cr.)	
EDUG 766	Literacy Instruction for At Risk, English Language Learner (ELL) and Disabled Student. (3 cr.)	
EDUG 815	Curriculum, Assessment and Methods of Teaching English as a Second Language in Gen and Spe Ed (3 cr.)	
EDUG 826	Improvement of Instruction for Teachers of At Risk, English Language Learner (ELL) and Disabled (3 cr.)	
Total Credits		35

Bachelor of Arts and Master of Science in Education

Dual Certification Adolescence/Students with Disabilities Generalist 7-12 Ext. English or Math or Social Studies

This program is designed for the undergraduate student seeking dual certification in Adolescence English or Math or Social Studies and Students with Disabilities Generalist Extensions in English or Math or Social Studies for Grades 7-12.

Students who complete the first semester of sophomore year with a cumulative index of 3.00 or better and grades of B or better in all education courses may apply for admission into the Five Year BS/MS Ed program which leads to dual certification in Adolescence/

Students with Disabilities Generalist 7-12 Ext. English or Math or Social Studies). Upon satisfactory completion of specific program requirements, and successful completion of the required New York State Teacher Certification Exams: Educating All Students test (EAS), edTPA and required CST exams will be recommended for initial certification in each area.

Degree Program (156/159 credits)

Students complete the required sequence of undergraduate courses during freshman, sophomore, junior and senior year. In the fourth year they are enrolled in four graduate courses. In the Fifth year, students complete 23 graduate credits. Five year participants complete an internship in a Special Education setting full days during the Fall or Spring semester of the fifth year.

FOURTH YEAR (12 Graduate Credits)

FIFTH YEAR (23 Graduate Credits)

Coursework

Core Requirements - 26 credits		26
EDUG 713	Methods of Educational and Psychological Research (4th year - 3 cr.)	
EDUG 733	Approaches to Multicultural Education for the At Risk, (ELL) and Disabled Student (4th or 5th year - 3 cr.)	
EDUG 778	Nature and Needs of the Exceptional Individual (4th or 5th year - 3cr.)	
EDUG 781	Management Techniques and Curriculum for the At Risk, English Language Learner [ELL] & Behave Disord (4th or 5th year - 3 cr.)	
EDUG 787	Psycho-Educational Assessment for the At Risk, English Language Learner [ELL] and Disabled Student (5th year - 3cr.)	
EDUG 829	Practicum in Teaching At Risk, (ELL) & the Disabled (5th year - 3 cr.)	
EDUG 830	Curriculum Adaptation & Content Strategies for At Risk, (ELL) & the Disabled (4th or 5th year - 3cr.)	
EDUG 833	Seminar & Internship in Secondary Special Education (5 Year students) (5th year - 3 cr.)	
EDUG 914	Special Education Mentored Research (5th year - 2 cr.)	
Content Requirements (9 credits)		
THREE of the following (4th or 5th year):		
EDUG 753	Teaching Reading in Content Areas for At Risk, English Lang Learner(ELL) & Disabled (Grades K-12) (3 cr.)	
EDUG 754	Literature for the At Risk, (ELL) and Disabled (Grades K-8) (3 cr.)	
EDUG 766	Literacy Instruction for At Risk, English Language Learner (ELL) and Disabled Student. (3 cr.)	

EDUG 815	Curriculum, Assessment and Methods of Teaching English as a Second Language in Gen and Spe Ed (3 cr.)	
EDUG 826	Improvement of Instruction for Teachers of At Risk, English Language Learner (ELL) and Disabled (3 cr.)	
Total Credits		35

Advanced Certificate

Bilingual Education Advanced Certificate (15 credits)

The Advanced Certificate in Bilingual Education leads to a New York State Bilingual Education Certification. The program consists of 15 credits of coursework to prepare educators to specifically work with general and special education bilingual students.

Admission

Students must have earned a masters degree from an approved educational institution and possess initial certification in Students with Disabilities, Reading, Elementary Education or its equivalent. A Manhattan College graduate application, Narrative Statement of Interest in the Bilingual Education Program, recommendation, and resume are required. An interview with the Director of Graduate Special Education is recommended prior to admission.

Certification

Students can apply for Bilingual certification upon completion of the required courses and successfully passing the Bilingual Education Assessment test (BEA).

Required Coursework

Required Coursework		15
EDUG 802	Foundations, Theory and Practice of Bilingual General and Special Education	
EDUG 810	Bilingual and Multicultural Assessment of Linguistically and Culturally Diverse Students	
EDUG 813	Curriculum, Methods, and Materials in Core Subjects for Billingual, General, & Special Education	
EDUG 814	Curriculum, Assessment and Methods of Teaching Native Language Arts in Gen & Spec Education	
EDUG 815	Curriculum, Assessment and Methods of Teaching English as a Second Language in Gen and Spe Ed	
Total Credits		15

Education Calendar*

Fall 2020 Semester

Month	Date	Day	Event
August	26	Wednesday	Orientation
August	31	Monday	Graduate Classes begin
September	01	Tuesday	Last Day to submit Intent to Graduate form to graduate Dec. 2020
September	07	Monday	Late Registration & Add/Drop Ends
September	07	Monday	Labor Day – No classes
September	11	Friday	SBL/SPED Major Paper/Internship/ Practicum documentation due to graduate Dec. 2020
October	12	Monday	Fall Break - Classes will be held
November	02	Monday	Registration begins for Spring 2021; Last day to submit Intent to Graduate form to graduate Feb. 2021
November	20	Friday	SBL/SPED Major Paper/Internship/ Practicum Documentation to Graduate Feb. 2021 due
November	20	Friday	Last Day to Withdraw from graduate courses
November	25 - 27	Wed-Fri	Thanksgiving Holiday (No Classes)
December	17	Thursday	Last day of Graduate classes
December	21	Monday	Fall 2020 Online Grading closes

2021 Spring Semester

Month	Date	Day	Event
January	20	Wednesday	Classes Begin
January	26	Tuesday	Late Registration & Add/Drop Ends
January	28	Thursday	Deadline to submit incomplete work to Faculty for Fall 2020
February	01	Monday	Last day to submit Intent to Graduate form to graduate May 2021
February	01	Monday	Deadline for Faculty to submit grades for Fall 2020 Incompletes
February	01	Monday	SBL/SPED Application/Major Paper/ Internship/Practicum Documentation to Graduate in May 2021
April	01 - 02	Thurs-Fri	Easter Holiday - No Classes
April	05	Monday	Easter Monday - Classes being held
April	06	Tuesday	Web Registration begins for Fall 2021

April	21	Tuesday	Last Day to Withdraw from Graduate Courses
May	06	Thursday	Last Day of Graduate classes/Deadline for Major Paper sign off by Faculty for May 2021 graduation
May	18	Tuesday	Spring 2021 Online Grading closes at 12 noon
May	19	Wednesday	Spring Commencement (Graduate & SCPS Division)
June	01	Tuesday	Last date to submit Intent to Graduate form to graduate Sept. 2021
June	29	Tuesday	Deadline to submit incomplete work to faculty for Spring 2021
July	06	Tuesday	Deadline for Faculty to submit grades for Spring 2021 Incompletes

Summer 2021 I & II

Month	Date	Day	Event
May	17	Monday	Summer Session I begins
July	02	Friday	Summer Session I ends
July	06	Tuesday	Summer Session II begins
July	15	Thursday	SBL/SPECED Major Paper/Internship/ Practicum Documentation to Graduate in September 2021 due
August	23	Monday	Summer Session II ends

* *Manhattan College reserves the right to make changes as circumstances require.*

PLEASE NOTE: Students are responsible for knowing and observing the following due dates. The date of graduation may be delayed if the due dates are not met. Forms are available from the Program Directors, the Graduate Education office, and online.

School of Engineering

Mission

The mission of the Manhattan College School of Engineering is to prepare each student for a productive and rewarding career in engineering or a related profession.

Through Engineering Graduate Degree Programs and the individual graduate engineering courses, the School of Engineering seeks to provide for the academic and professional needs of those who are already engaged in engineering (or related) professions or those who, having completed their undergraduate preparation, desire to enter immediately into advanced study. Post-baccalaureate programs offered by the School of Engineering are intended to prepare professionals for advanced level technical and administrative positions or for admission to doctoral programs at other institutions. All these programs lead to the Master's Degree and are available on a full-time or a part-time basis and also through the School of Engineering Seamless Master's Program. Courses are generally conducted in the late afternoons or early evenings during the fall and spring semesters or terms. Continuing Education Hour (CEH) opportunities for PE license renewal are also available.

Application Procedures

Application admission to all programs in the School of Engineering is through the Office of Admissions. An on-line application can be accessed via the Office of Admissions Web page.The completed form accompanied by the application fee (non-refundable) must be submitted to the Office of Admissions. Applicants for admission are responsible for having official transcripts of all undergraduate and graduate courses mailed directly to the Office of Admissions, paying the application fee, submitting letters of recommendation, and submitting required standardized test scores.

Official transcripts (not student copies) of all undergraduate and graduate records must be sent to the Office of Admissions by the institutions issuing them. Applicants who file an application before the baccalaureate degree has been conferred may be accepted pending the successful completion of their undergraduate work. A final transcript must be received in the Office of Admissions prior to course registration.

Graduates of Manhattan College should write to the Office of the Registrar requesting that an official transcript be sent to the Office of Admissions.

An application is not complete until all the necessary materials and application fee have been received by the Office of Admissions. Incomplete applications cannot be processed. Students who file an application and whose official transcripts arrive after the deadline date cannot be assured that their application will be processed in time for the semester for which they are applying.

For best consideration, filing of the graduate application should be completed before May 1st for summer session application; August 10th for fall session applicants, and January 7th for spring session applicants; however, applications are reviewed on a continuous basis. Students seeking admission into the full-time engineering programs must have

their application for the fall session completed by March 1st if they are applying for a fellowship or scholarship for the fall semester.

The director of the graduate engineering program to which a person is applying and the Dean of Engineering review the application and supportive documents and forward their recommendations to Admissions. The Office of Admissions informs the applicant of the decision. Accepted students will receive the instructions for registration at the beginning of the session for which they have been accepted.

The documents submitted in support of application cannot be returned to the applicant nor can they be duplicated for any purpose. All documents received are part of the records of the College.

Admission

Applicants for admission into any graduate program in the School of Engineering must hold, before beginning graduate courses, a baccalaureate degree from an accredited college or institution acceptable to Manhattan College. In addition, they must meet the specific requirements as stated in the introduction to the respective programs**. An undergraduate cumulative grade point average (GPA) of 3.00 on a 4.00 scale is normally required for admission to all engineering graduate programs, although other factors can be considered in the decision for admission.** Applicants are not required to submit results of the Graduate Record Examination (GRE). However, the GRE may enhance the application.

Admission into graduate engineering programs will be granted as a matriculated student, one seeking to fulfill the requirements for a degree. A student may be granted permission to take an approved graduate course on a non-matriculated basis or, in special cases, as an audit. A non-matriculated student is one earning graduate credit for a specific course but not necessarily working for a degree. For both non-matriculated and auditing students, tuition and fees are the same as for matriculated students.

A student who lacks undergraduate prerequisites for a specific program may be asked to satisfactorily complete certain undergraduate (bridging) courses as a non-matriculated student. When these courses are completed satisfactorily, the student may be matriculated after a review by the graduate program director and the Dean of the School of Engineering.

Students requesting to take graduate courses as a non-matriculated student must have the necessary prerequisites for those courses. Students may not register for more than 12 credits as a non-matriculated student.

All students must comply with immunization regulations as previously stated in the introductory section of the catalog.

Students who take graduate courses at Manhattan College on a non-matriculated basis and apply thereafter for admission to a graduate program as a matriculated student will be informed at the time of acceptance which courses may be applied to that degree program.

Students who have earned a master's degree or who are pursuing a master's degree in one engineering program from Manhattan College and desire to seek admission into another program must file a new application with the Office of Admissions.

All documents of applicants who have been accepted and who for extenuating circumstances cannot register for courses during the session for which they were admitted will be kept on file for two years. The documents will be destroyed if the applicant does not register for courses within that period.

Seamless Master's Degree Program

Academically qualified undergraduate students may be invited to participate in a Seamless Master's Degree program in chemical, civil, computer, electrical, environmental, or mechanical engineering. Qualified students who enter Manhattan College with Advanced Placement and/or undergraduate college credit will generally be in a position to take graduate courses during their senior year at Manhattan College while completing the requirements for the Bachelor's degree. It may then be possible to obtain a Master's degree with only an additional year of study.

Undergraduate students who have earned a minimum of 3.20 cumulative GPA by the end of the first semester of their junior year are eligible to apply for the Seamless Master's Degree program upon the recommendation of a member of the engineering faculty. Transfer students may be considered after completing courses at Manhattan College. All students participating in the Seamless Master’s Degree program are required to submit an application for admission to that graduate program. The application must be submitted in the senior year through the Office of Admissions. The application is online. Students are required to complete the baccalaureate degree with a cumulative GPA of 3.00, or better, prior to continuing for the additional year of graduate study.

Students admitted into the Seamless Master's Degree program may enroll in 500, 600, or 700 level courses while completing the requirements for the Bachelor's Degree. These courses will count for either undergraduate or graduate credit but not for both degree programs. Because some required graduate courses are offered on a two-year rotation, admitted students must meet with the chair of the major department prior to their senior year in order to select appropriate 500, 600, and 700-level courses to satisfy the Master's Degree requirements. There is no tuition increase for enrolling in graduate courses during the senior year provided the student does not exceed the total number of credits permitted for the academic year.

After completing the undergraduate degree requirements, financial support may be available from individual departments for the additional year of graduate study. This support typically includes research assistantships, graduate assistantships, academic scholarships and grants, and industrial fellowships.

Visiting Students

Students who are matriculated in a graduate program at another institution and who wish to take a course (or courses) at Manhattan College may do so as non-matriculated students for individual courses for which they have the prerequisites. For non-matriculated students, tuition and fees are the same as for matriculated students.

Applicants from Foreign Countries

The College accepts students from foreign countries for its full-time graduate programs in the School of Engineering. Application procedures and admission criteria and information

can be found in the individual sections of the catalog. In general, the College cannot accept these students into its part-time graduate programs. The student who is accepted and receives a student visa must be enrolled in each term of the academic year for a minimum of 9 credits. Such students must complete the program within 18 months.

Applicants from foreign countries should submit their admission application, official transcripts, and the admission fee four months before the beginning of the session they wish to enter. In addition, they must submit a notarized statement that they have sufficient funds to finance their education and their maintenance. Many of the sources of financial assistance are limited to the residents of the United States.

Unless exempted, all students applying from foreign countries must take the TOEFL (Test of English as a Foreign Language) and have the test results sent to the Office of Admissions. A minimum TOEFL score of 80 (internet based test), 213 (computer based exam), or 550 (paper based exam) will satisfy Manhattan College admission requirements and criteria for issuance of the I-20 form. However, admission and issuance of an I-20 form is also possible for students with TOEFL scores below 80, 213 or 550 levels for the internet, computer and paper based exams, respectively, provided they successfully complete an approved English as a Second Language course at another institution or an acceptable substitute at Manhattan College. The School of Engineering will also accept IELTS (International English Language Testing System) scores with a minimum of 6.5 on the 9.0 scale. Additionally, the School of Engineering will accept TOEIC (Test of English for International Communication) scores with minimum score of 690.

Some foreign students are exempted from the TOEFL requirement based on where the undergraduate degree was awarded. Foreign students graduating from a four-year undergraduate engineering program in the United States accredited by the Engineering Accreditation Commission (EAC) of ABET (www.abet.org) will not need to submit a TOEFL exam score. Graduates of undergraduate engineering programs in English speaking countries that are signatories to the Washington Accord along with the USA (http://www.washingtonaccord.org/), specifically Australia, Canada, Ireland, New Zealand, and the United Kingdom, will not need to submit TOEFL, IELTS, or TOEIC scores. A complete list of exempted countries is available from Graduate Admissions.

A student from another country who is informed of acceptance must deposit $300 which will be credited toward tuition. This fee is non-refundable if the student does not register but will be credited to his/her account for two years. When the $300 is received, the student will be sent an I-20 form which must be presented to the United States authority to arrange for an F1 student visa.

Degree Requirements

All engineering graduate programs require a minimum of thirty credit hours of graduate course work. A minimum cumulative grade point average of 3.00 in all courses in the program of study is also required. A student must remain in good academic standing, as described earlier in this graduate catalog, or the student will be subject to dismissal from the college. Other degree requirements are detailed under each graduate program description.

The Graduate Engineering Core Courses

Modern engineering practice increasingly demands integration of knowledge and expertise from more than one engineering discipline. It is often desirable for the practicing engineer to acquire specific knowledge outside their area of expertise without devoting the time and effort to earn an advanced degree. To address these needs, the School of Engineering offers a Graduate Engineering Course Focus Areas through which various combinations of related courses from the Engineering Graduate Core and from departmental offerings can be used to complete the requirements for the focus in a particular area of study. While a Graduate Engineering Course Focus Area is not an engineering degree, it does allow an individual, who is qualified to take the courses and meets any prerequisite requirements, an opportunity to acquire knowledge and expertise in a focused area of engineering in a relatively short period of time. Typically, an individual will be required to complete successfully three or four courses in a particular topical area for a Focus. While approval of a Department Chair or Graduate Program Director is required to enroll in a graduate course, admission to the Graduate Program is not required to participate in the focused courses. It is expected, however, that individuals desiring to take graduate-level courses will have a baccalaureate degree in either an engineering field, a science or applied science field, or mathematics. Specific information regarding Graduate Engineering Course Focus Areas is available from the Engineering Dean's Office or from individual Department Offices on the School of Engineering website, www.manhattan.edu/academics/engineering/ (http://www.manhattan.edu/academics/engineering/).

Graduate Engineering Course Concentrations

Modern engineering practice increasingly demands integration of knowledge and expertise from more than one engineering discipline. It is often desirable for the practicing engineer to acquire specific knowledge outside their area of expertise without devoting the time and effort to earn an advanced degree. To address these needs, the School of Engineering offers a Graduate Engineering Course Concentration Program through which various combinations of related courses from the Engineering Graduate Core and from departmental offerings can be used to complete the requirements for a Graduate Engineering Course Concentration in a particular area of study. While the Graduate Engineering Course Concentration is not an engineering degree, it does allow an individual, who is qualified to take the courses and meets any prerequisite requirements, an opportunity to acquire knowledge and expertise in a focused area of engineering in a relatively short period of time. Typically, an individual will be required to complete successfully three or four courses in a particular topical area to earn a Graduate Engineering Course Concentration. While approval of a Department Chair or Graduate Program Director is required to enroll in a graduate course, admission to the Graduate Program is not required to participate in the Course Concentration Program. It is expected, however, that individuals desiring to take graduate-level courses in the Course Concentration will have a baccalaureate degree in either an engineering field, a science or applied science field, or mathematics. Specific information regarding Graduate Engineering Course Concentration is available from the Engineering Dean's Office or from individual Department Offices on the School of Engineering website, www.manhattan.edu/academics/engineering/ (http://www.manhattan.edu/academics/engineering/).

Continuing Education Hours

The School of Engineering is a New York State approved provider of Continuing Education Hours (CEH) for PE license registration. The School of Engineering offers a variety of short courses in a variety of formats (e.g., on-campus, on-site) for Professional Engineers to earn Continuing Education Hours. In addition, graduate courses and other offerings will also generally count as CEH's to be used for professional license registration. For details concerning short course offerings and schedules, contact the Office of the Dean of Engineering (718-862-7281).

Chemical Engineering

Dr. Sasidhar Varanasi
Chair, Department of Chemical Engineering

Dr. Richard Carbonaro Director, Graduate Program

Mission

The mission of the Master of Science (M.S.) degree in Chemical Engineering is to emphasize practice-oriented knowledge, detailed engineering analysis and design to prepare students for leadership roles in chemical engineering practice. In aid of this mission, the curriculum offers traditional graduate courses complimented by a diverse selection of elective courses taught by industry leaders through the New York Tri-State Area.

Objectives

The objectives of the program are to:

- Expand students' understanding of the fundamentals and principles of chemical engineering;
- Expose students to contemporary advances in the areas of separation processes, alternative energy, water purification, pollution prevention, engineering management, cosmetic engineering, biopharmaceutical engineering, petroleum engineering, and advanced computer modeling and analysis skills;
- Provide opportunities for students to conduct fundamental and/or applied research, and to improve their oral and written communication skills.

Admission Requirements

Applicants must possess:

- A baccalaureate degree from a chemical engineering program accredited by the Engineering Accreditation Commission of ABET, Inc., or from a recognized foreign institution; or
- A baccalaureate degree in another area of engineering, chemistry, or closely-related field. Applicants with baccalaureate degrees from these programs will be considered for admission if they present satisfactory grades in Calculus I and II, Chemistry I and II, and Physics I. These students can expect to be admitted as non-matriculated and then matriculate when they have successfully completed the following undergraduate courses with a minimum grade point average of B (3.00) and no grade lower than C (2.00):

First Year

Fall	Credits	Spring	Credits
CHML 207: Process Calculations	3	CHML 208: Principles I (Fluids)	3
CHML 305: Principles II (Heat Transfer)	3	CHML 209 (Chemical Thermodynamics)	3
CHML 306: Separation Process Design I	3	CHML 316: Computer Simulations & Design	3
CHEM 319/323: Organic I Lecture/Lab[1]	5	CHML 321: Chemical Reaction Engineering	3
MATH 286: DIfferential Equations[1,2]	3		
	17		12

Total Credits: 29

Footnotes

1 Required if not completed as part of student's undergraduate degree program.

2 This course is offered fall, winter, spring, and summer sessions. It should be taken as early as possible in the program.

The order in which these courses are taken will be determined by the graduate director on a case-by-case basis. These courses will not satisfy any requirements for the Master of Science in Chemical Engineering degree. Students must complete prerequisite courses before they are permitted to register for graduate courses. Exceptions require the recommendation of the department chair and the approval of the dean of engineering.

Degree Requirements

All students must complete a minimum of 30 credit hours of graduate course work with a cumulative GPA of 3.0 or better. These hours include three core courses (nine credit hours) and seven additional courses (21 credit hours). The core courses are only offered once per year during the semesters specified below. The engineering electives may be chosen from any of the graduate chemical engineering courses offered within the school of engineering for which the prerequisites have been completed. The elective courses may also be used to complete either the cosmetic engineering, biopharmaceutical, or petroleum engineering concentrations offered by the department of chemical engineering. Graduate courses from outside the department may be allowed on a case-by-case basis with approval from the Graduate Program Director.

Required Courses (three courses, 9 credits)

CHMG 713	Chemical Reactor Design (Fall)	3
CHMG 722	Elements of Transport Phenomena (Fall)	3
CHMG 707	Process Thermodynamics (Spring)	3
Total Credits		9

Additionally, students select a total of seven elective courses (21 credits) to complete the degree requirement.

Research Option

Students may replace two electives with a research project (CHMG 735) or thesis (CHMG 736). Students choosing the research project/thesis option are required to:

1. complete two semesters of research, and
2. present a written report/thesis at the end of the two semesters. All student presenting a thesis will need to follow procedures to archive a copy in the Manhattan College Library.

The program offers a number of general electives as well as electives specific to cosmetic, biopharmaceutical, or petroleum engineering concentrations.

General Electives

The general electives offered within the program vary from year to year, but typically include:

CHMG 501	Adv Engineering Mathematics	3
CHMG 611	Environmental Impact Assess.	3
CHMG 708	Advanced Heat Transfer Applications	3
CHMG 710	Advanced Transport Phenomena	3
CHMG 727	Air Pollution Control Design	3
CHMG 739	Introduction to Design Project	3
CHMG 740	Design Project	3
CHMG 746	Advanced Chemical Processes for Water Purification	3
CHMG 747	Pollution Prevention	3

Cosmetic Engineering Electives

The Chemical Engineering Department offers a concentration in cosmetic engineering at the graduate level. The Cosmetic Engineering concentration, the only one of its kind in the nation, will prepare students for a variety of roles in the cosmetic and consumer product industries, including product formulation and development, process engineering, and research and development. Coursework will provide students specialized training in product formulation, polymers and emulsions, complex fluids, and regulatory issues relevant to cosmetic and consumer product industries. In addition to the three required chemical engineering core courses, students are required to complete at least four of the following cosmetic engineering electives for a total of 12 credits:

Required Courses:

CHMG 752	Advanced Processing Theory	3
CHMG 753	Advanced Processing Techniques	3
CHMG 758	Formulations I	3
CHMG 759	Formulations II	3
CHMG 760	Emulsion & Polymer Tech	3
CHMG 763	Industrial Regulations&Quality	3

Total Credits: 12

The remaining *nine* elective credits for the cosmetic engineering concentration can be chosen from the available general electives, cosmetic engineering electives, biopharmaceutical engineering electives, and/or petroleum engineering electives (see the following).

Biopharmaceutical Engineering Electives

The Chemical Engineering Department offers a concentration in biopharmaceutical engineering at the graduate level. The Biopharmaceutical Engineering concentration will prepare students for a variety of roles in the biopharmaceutical and biotechnology sectors, including discovery, development, formulation and production of pharmaceutical products and therapeutic agents. Coursework will provide students with specialized training in microbial and cell growth, polymers and emulsions, biospearation processing, bioprocess design, formulation of pharmaceutical products, and regulatory issues relevant to the biopharmaceutical field. In addition to the three required chemical engineering core courses, students are required to complete at least four of the following biopharmaceutical engineering electives for a total of 12 credits:

Required Courses:

CHMG 759	Formulations II	3
CHMG 760	Emulsion & Polymer Tech	3
CHMG 761	Industrial Practice in Pharmaceutical Industry	3
CHMG 762	Manufacturing and Analysis of Pharmaceutical Products	3
CHMG 763	Industrial Regulations&Quality	3
CHMG 770	Bioseparations	3
CHMG 772	Bioreaction Engineering	3

Total Credits: 12

The remaining *nine* elective credits for the biopharmaceutical engineering concentration can be chosen from the available general electives, cosmetic engineering electives, biopharmaceutical engineering electives, and/or petroleum engineering electives (see the following).

Petroleum Engineering Electives

The Chemical Engineering Department offers a concentration in petroleum engineering at the graduate level. This concentration covers topics of interest to engineers in the refining, fuels, natural gas mining and processing, and petrochemical industries. The focus is on the production of gaseous and liquid hydrocarbons, the physical chemistry of these hydrocarbon resources and the downstream processing to provide valuable chemical intermediates and products. In addition to the three required chemical engineering core courses, students must complete two additional petroleum core courses and two additional petroleum engineering electives for a total of 12 credits:

Required Courses

CHMG 748	Petroleum Refinery Processing I	3
CHMG 749	Natural Gas Processing I	3

Select two of the following three courses:		6
CHMG 754	Petroleum Refinery Processing II	3
CHMG 755	Natural Gas Processing II	3
CHMG 756	Oxidative Conversion of Shale Gas Components	3

Total Credits: 12

The remaining nine elective credits can be chosen from the general chemical engineering graduate electives, biopharmaceutical engineering electives, cosmetic engineering electives, and/or petroleum engineering electives.

Courses

CHMG 501. Adv Engineering Mathematics. 3 Credits.
This course covers the various mathematical methods of importance in chemical engineering modeling and analysis. Topics include the development of analytical and numerical solutions of linear and nonlinear ordinary and partial differential equations, use of the Newton-Raphson method to solve systems of non-linear equations, application of Fourier transforms, and use of optimization and minimization methods. Prerequisites: All Math courses required for an undergraduate degree in Chemical Engg.

CHMG 510. Introduction to Polymer Science and Engineering. 3 Credits.
Introductory polymer science and engineering course with in-depth coverage of the structure-property-performance relationship of polymer solutions and melts. Topics to be covered will include- synthesis, and polymerization kinetics,characterization of molecular weight, morphology, microstructure & rheology. Polymer processing technologies and development of commercial products based on optimization of structure-property-performance relationships will additionally be covered. A thorough understanding of polymer concepts and definitions, characterization techniques and instrumentation,and equations to calculate properties will be developed through this course. Spring: Pre-requisites: ENGS 201, ENGS 202.

CHMG 529. Fuel Cell Systems and Technology. 3 Credits.
This course will review the technical and design aspects associated with various stationary and transportation fuel cell applications. Course material will focus on electrochemical kinetics, electrode catalysis, system thermodynamics, fuel processing, and H2 storage. Topics to be covered will include basic electronchemical principles of a unitized electrode assembly the combination of multiple unitized assemblies into a cell stack assembly, the design of fuel and oxidizer supply systems, and safety issues related to the design and operation of fuel cell power plants. Prerequisite: Mass and energy balances, general electrochemistry and basic transport phenomena (momentum, heat and mass transfer).

CHMG 539. Industrial Catalysis. 3 Credits.
Fundamentals and application of catalysts used in the chemical, petroleum and environmental industries. Students will learn: the application of chemistry, materials, surface science, kinetics, reactor design and general engineering as applied to making everyday products; how catalysts allow the effective production of transportation fuels, modern catalytic converters for automobiles, bulk chemicals, polymers, foods, fertilizers, etc. Industrially-oriented course for engineers and chemists. Prerequisite: Physical Chemistry.

CHMG 549. Advanced Combustion and Fuel Process Technology. 3 Credits.
Advances in combustion and fuel process technologies. The course will cover fundamentals and advances in flame theory, combustion, fuels, and oxidizers;experimentation, simulation and modeling;emission controls, toxicology, clean fuel conversions and alternative fuels.

CHMG 575. Contemporary Food Engineering. 3 Credits.
This course examines the application of chemical engineering unit operations to food manufacturing. Topics include heating, cooling and freezing of foods; mass transfer in foods; reaction kinetics; chemical, microbiological and biochemical aspects of food engineering; dehydration, thermal and non-thermal processing; food handling, public health and sanitation; green and sustainable technologies in food processing; food packaging, transport, storage and shelf-life. Prerequisites: CHML 208, 305, 306, 321.

CHMG 611. Environmental Impact Assess.. 3 Credits.
Environmental Impacts and other Legal Aspects of Engineering (3 cr). An examination of the various impacts that engineering projects may have on the environment. Areas of study include water resources as well as alternatives and mitigation measures.. Relevant laws and regulations (with a specific focus on NEPA, SEQRA, CEQR and ULURP), as well as case studies are considered. In the second half of the course, products liability with a focus on pharmaceuticals and bioengoineering devices will be addressed as well as Intellectual Property with a particular focus on Patent Law. 3 Credits.

CHMG 707. Process Thermodynamics. 3 Credits.
Emphasis on the application of thermodynamics to process design; development and use of thermodynamic principles in single-phase and multi-phase processes; applications in reactor design. Prerequisite: CHML 209 or equivalent.

CHMG 708. Advanced Heat Transfer Applications. 3 Credits.
This course will cover heat transfer mechanisms and models for unsteady state and transient conduction, convection, and radiation in engineering systems. Applications include novel thermal and fluidic components and heat-exchange systems in the areas of alternative energy, green materials, food technology and bio-processing. Prerequisite: Undergraduate heat transfer course. Three credits. Prerequisite: CHML 305 or equivalent.

CHMG 710. Advanced Transport Phenomena. 3 Credits.
Topics include continuum and molecular theories of matter; non-dimensionalization; velocity, temperature and concentration distributions in flow; boundary layer analysis; simultaneous momentum, energy and mass transport; mathematical analogies; simultaneous diffusion and chemical reaction. Prerequisite: CHML 411 or equivalent.

CHMG 712. Introduction to Biomedical Engineering. 3 Credits.
Development of the mass, energy and momentum transport equations as they relate to biomedical systems such as natural and artificial organs. Flow characteristics of blood are studies and compared to conventional Non-Newtonian flouids. The use of traditional transport equations, modified for biomedical systems are covered and applied to the body and associated biomedical machinery. Three lectures. Senior year offered. Prerequisites: CHML 208,CHML 305,CHML 306, MATH 286.

CHMG 713. Chemical Reactor Design. 3 Credits.
Application of engineering analysis, computer design and optimization of chemical reactor systems. Prerequisite: Undergraduate reaction engineering course.

CHMG 714. Modern Separation Processes. 3 Credits.
Mass transfer principles and design techniques applied to absorption and adsorption systems; gas-liquid, gas-solid and liquid-solid separation processes; mass transfer with chemical reaction; thermal effects; multi-component transfer. Prerequisite: CHML 339 or equivalent.

CHMG 717. Process Simulation and Design. 3 Credits.
Applications of contemporary computer software to increase speed, improve comprehension, and enhance presentation; of results when analyzing, modeling and solving a wide variety of process design problems. Topics include design of fired heaters, bubble column reactors, generalized shell-and-tube exchangers, and multi-component condensers; FUG calculations for sloppy splits; and plate-to-plate calculations.

CHMG 722. Elements of Transport Phenomena. 3 Credits.
This course covers the development of the mass, energy and momentum transport equations used to solve problems in chemical engineering. Prerequisites: CHML 208, CHML 305, CHML 306, MATH 286 (or MATH 203) or Instructor's approval.

CHMG 726. Separation and Recovery Processes. 3 Credits.
Emphasis on non-thermal separation and recovery processes used primarily for solid-liquid separations. Topics include crystallization, precipitation, sedimentation, centrifugation, particle filtration, and microfiltration. Applications in chemical processing, industrial wastewater treatment and biological processing. Prerequisite: CHML 339 or equivalent.

CHMG 727. Air Pollution Control Design. 3 Credits.
Emphasis on particulate control. Industrial sources and regulatory codes for particulate emissions; review of fine particle technology; development of performance equations and design procedures for gravity settlers, cyclone-electrostatic precipitators, baghouse and venturi scrubbers; atmosphere dispersion adn stack design; overview of gaseous control equipment.

CHMG 729. Hazardous Waste Incineration. 3 Credits.
Stoichiometric and thermochemical calculations; legislation, permitting adn siting; other options; incineration of solid waste, sludge, liquid waste, and gases; land-based and ship-borne incineration; design of incinerators, quenchers, waste heat boilers, fans and gaseous control equipment; design project application.

CHMG 735. Independent Project Or Thesis. 3 Credits.
Chemical engineering project or thesis on selected topics, involving experimental research, process design, computer simulation, and/or authoring technical papers. Written report or publication, and oral presentation are required. Topic to be selected by the student with approval of a faculty advisor and the Chair.

CHMG 736. Independent Project or Thesis. 3 Credits.
Chemical engineering project or thesis on selected topics, involving experimental research, process design, computer simulation, and/or authoring technical papers. Written report or publication, and oral presentation are required. Topic to be selected by the student with approval of a faculty advisor and the Chair.

CHMG 739. Introduction to Design Project. 3 Credits.
Reaction path screening; exploratory technical and economic process evaluations; process synthesis; preliminary process flow diagram; material and energy balances; quick sizing design techniques and factored cost estimate; material selection. Written report or publication and oral presentation are required. Prerequiste: CHML 406 or equivalent.

CHMG 740. Design Project. 3 Credits.
Preliminary equipment design techniques; computer-aided process optimization studies; hazards and safety evaluation; site location and layout studies; detailed economic evaluation. Written report or publication and oral presentation are required. Prerequisite: CHMG 739.

CHMG 741. Special Topics. 3 Credits.
Special topics of current interest to graduate students; subject matter will be announced in advance of semester offering. Written report or publication and oral presentation are required.

CHMG 742. Seminar in Selected Chemical Engineering Topics. 3 Credits.
Seminar course in specialized and contemporary topics not covered in regular chemical engineering classes with an emphasis on written and oral communication skills. Topic examples are nanotechnology, genetic engineering, carbon trading, climate change, water and disease, financial engineering.

CHMG 743. Advanced Fluid Mechanics. 3 Credits.
A course focused on differential equations of motion for incompressible fluids. Major topics include tensor notation and vector calculus, linear and angular momentum conservation, scaling, Stokes flow, inviscid flow, boundary layer, vorticity, potential flow and lubrication. Prerequisites: MATH 286, CHML 208 or equivalent.

CHMG 746. Advanced Chemical Processes for Water Purification. 3 Credits.
Advanced study of the processes used for water treatment and purification with an emphasis on design principles and process modeling. Processes covered include carbon adsorption, ion exchange, chemical oxidation of inorganic and organic chemicals, disinfection using chlorine, ozone and ultraviolet light, strategies for control of disinfection byproducts, and chemical precipitation Spring: Prerequisite CHML 321.

CHMG 747. Pollution Prevention. 3 Credits.
Regulations, advantages and disadvantages of pollution prevention: EPA'S pollution prevention hierarchy, including source reduction, recycling, control and ultimate disposal; Multimedia approaches and total systems analysis of pollution prevention options; applications to specific processes and industries from various engineering disciplines. Three Credits: Instructor Consent.(cross-listed with ENGG 670).

CHMG 748. Petroleum Refinery Processing I. 3 Credits.
Overview of a modern, integrated petroleum refinery:feedstock properties, product slate, and processes used to convert crude and intermediate streams into desirable products. Topics include hydrocarbon chemistry, crude oil properties, fuel product quality, impacts of worldwide environmental legislation, and overall operability and economic performance of refineries. Three lectures.Fall. Pre-requisite: CHEM320. Pre-requisite or Co-requisite: CHML405.

CHMG 749. Natural Gas Processing I. 3 Credits.
Overview of natural gas industry with emphasis on gas plant operations. Students will develop a working knowledge of the major processes for gas compression, dehydration, acid gas removal and tail gas cleanup, sulfur recovery, cryogenic extraction of natural gas liquids (NGL), as well as LNG production, storage, and transportation. Three lectures. Pre-requisite: CHEM320. Pre-requisite or Co-requisite: CHML405.

CHMG 752. Advanced Processing Theory. 3 Credits.
The theory of multiphase and reactive flow processes, including: non-newtonian and time-dependent flow, heat transfer at boundaries, powder and solids processing, surface forces, phase transitions, ripening and sintering, flow with chemical transformations. Applications include cosmetics, personal care products, adhesives, food technology, pharmaceutical and advanced coating formulations. Prerequisite: CHML 411 or CHMG 710.

CHMG 753. Advanced Processing Techniques. 3 Credits.
Applications of advanced processing techniques for multiphase processes, including: multiphase flow, pumping, mixing, homogenization, atomization, drying. Applications include cosmetics, personal care products, adhesives, food technology, pharmaceutical and advanced coating formulations. Prerequisite: CHML 403, CHML 404 or equivalent.

CHMG 754. Petroleum Refinery Processing II. 3 Credits.
Continued discussion of a modern, integrated petroleum refinery: topics include energy audits, environmental aspects, societal impacts. Topics also include linear programming, dynamic modeling and control of refinery processes using general process simulators. Three lectures. Spring. Prerequisite: CHMG 748.

CHMG 755. Natural Gas Processing II. 3 Credits.
Continued discussion of the natural gas industry with emphasis on mining and pretreatment of natural gas and its components, environmental and societal impacts, novel conversion chemistry, including gas-to-liquids processes and dynamic modeling. Three lectures. Spring. Prerequisite: CHMG 749.

CHMG 756. Oxidative Conversion of Shale Gas Components. 3 Credits.
Methane and ethane from shale gas reserves may prove to be an attractive alternative feedstocks for the production of hydrocarbon intermediates and liquid fuels. In this course all of the oxidative conversion technologies will be developed, modeled and evaluated. Special focus will be on the calculation and study of the production economies and sustainability indices as compared to conventional technology. Fall. Prerequisite: Senior Status and approval by department chair.

CHMG 757. Topics in Biomolecular Engineering. 3 Credits.
This course will introduce students to the function of select biomolecules in vivo, from both an isolated and systems perspective. Fundamental cellular and molecular biology concepts will be reviewed to provide a foundation for engineers. Example topics include cell adhesion, platelet thrombosis, blood and blodd substitutes, and RNA/DNA engineering. Three hours a week. Fall.

CHMG 758. Formulations I. 3 Credits.
This is the first of two formulations courses which are focused on developing the knowledge and skills set necessary to carry out effective formulation design and engineering of complex fluids to develop products for the cosmetic and consumer industry. This course will focus on skin care formulations with the aim to develop formulation design rules to enhance performance attributes such as hydration, photoprotection, tactile and visual sensory. This will be done through effective engineering of the microstructure-processing-performance linkages for emulsions, complex fluid gels and creams utilized in skin care. Co-requisite: CHMG 737.

CHMG 759. Formulations II. 3 Credits.
This is the second of two formulations courses which are focused on developing the knowledge and skills set necessary to carry out effective formulation design and engineering of complex fluids to develop products for the cosmetic and consumer industry. This course will focus on hair care and make-up formulations with the aim to develop formulation design rules to enhance performance attributes such as hair conditioning, tactile and visual sensory. This will be done through effective engineering the microstructure-processing-performance linkages for structured fluids and semi-solids utilized in producing hair-care and make-up products. Pre-requisite: CHMG 737.

CHMG 760. Emulsion & Polymer Tech. 3 Credits.
This is an introductory complex fluids course with a particular emphasis on emulsions and polymer technologies. The following topics as applied in an engineering context will be covered: advanced characterization including rheology and scattering, physico-chemical aspects and stability of suspensions, emulsions, surfactants, and micelles. Polymer science fundamentals required for applications will additionally be covered. Applications include cosmetics, personal care products, adhesives, food technology, pharmaceutical and advanced coating formulations. Students in this course will be expected to submit a special topic assignment. Pre-requisites: CHEM 310, 320; CHML 308.

CHMG 761. Industrial Practice in Pharmaceutical Industry. 3 Credits.
Advanced study of the principles used for pharmaceuticals production with an emphasis on physiochemical processes governing development and manufacturing of pharmaceuticall agents and drugs. Technologies covered include aseptic, vaccines, injectables, ophthalmics, ingestible and Oncology. Analysis of quality control processes in conformance with government oversight and regulations, especially the FDA. Students in this course will be expected to submit a special topic assignment Pre-requisite: Approval of Graduate Director.

CHMG 762. Manufacturing and Analysis of Pharmaceutical Products. 3 Credits.
Systematic study of the unit operations, practices and analysis techniques that are important to the pharmaceutical products industry. Topics covered include agitation, aeration, crystallization, mixing of solids, mixing of complex fluids, analysis of particle size distributions, granulation and blending, pelletizing, encapsulation, principles and practice of freeze drying, and quality assurance and testing. Students in this course will be expected to submit a special topic assignment. Pre-requisite: CHMG 761 or CHML 461.

CHMG 763. Industrial Regulations&Quality. 3 Credits.
Discussion of a variety of aspects of regulated and quality-driven industries: Regulations - CFR, regulating authorities, regulatory inventories, applications, compliance, and recalls; Quality Systems - Six Sigma@, GXP, and TQM, documentation, measurement, safety, training, and cleanliness; Quality Control Techniques - Validation, ASTM testing, run rules, control charts. Pre-requisites: Approval of Graduate Director.

CHMG 765. Biopharmaceutical Formulations. 3 Credits.
This course is focused on effective product and formulation design for the biopharmaceutical industry. The course will cover key aspects of biotherapeutic product development including: Formulation design for liquid dosage forms; Development of analytical control strategy such as stability indicating (QC) assays; and Characterization assays through various biophysical techniques. Co-listed with CHML 465.

CHMG 770. Bioseparations. 3 Credits.
Bioseparations consists of a sequence of recovery and separations steps that maximize the purity of the bioproducts while minimizing the processing time, yield losses, and costs. Topics include: centrifugation and filtration, extraction, membrane separations, electro-kinetic separations, precipitation, crystallization, and chromatography. Students in this course will be expected to submit a special topic assignment. Pre-requisites: CHML306 and CHML339.

CHMG 772. Bioreaction Engineering. 3 Credits.
Application of engineering principles to biological processes. Topics include enzyme-catalyzed reactions, kinetics of cell growth and product formation; aeration, agitation and oxygen transfer; bioreactor design and scale-up; biological waste treatment, and fermentation laboratory experiments. Three lectures. Prerequisites: CHML 306, CHML 321.

Civil Engineering and Construction Management

Dr. Anirban De
Chair, Department of Civil and Environmental Engineering

Dr. Moujalli Hourani
Director, Graduate Program

Mission

The Master of Science in Civil Engineering degree program, with a strong emphasis on design, is intended for practicing civil engineers, as well as those who wish to pursue doctoral studies. Programs of study include structural engineering, geotechnical engineering, and construction management.

Objectives

The objectives of the program are:

1. to provide knowledge of advanced topics related to the structural engineering and geotechnical engineering and construction management areas of civil engineering
2. to provide a practice-based knowledge founded on application of advanced techniques in analysis and design

Admission Requirements

Applicants possessing a baccalaureate degree in Civil Engineering from a program accredited by the Engineering Accreditation Commission of ABET, Inc., or from a recognized foreign institution, and also have the minimum grade point of 3.00 on a 4.0 scale will normally be ordinarily to the graduate program.

Applicants with baccalaureate degrees in other engineering disciplines, having a minimum grade point average of 3.00, will normally be admitted to the program upon completion of specific prerequisite courses assigned by the Graduate Program Director with a grade point average of 3.00 and no grade lower then C.

These prerequisite courses will not satisfy any requirement for the Master of Science in Civil Engineering degree. Generally, students must complete all prerequisite courses before they are permitted to register for graduate courses. Exceptions require the recommendation of the Graduate Program Director and the approval of the Dean of Engineering.

Civil Engineering Degree Requirements

A student must complete a minimum of thirty credits hours of graduate course work. Specific requirements follow:

Structural Engineering

CIVG 777	Advanced Structural Analysis I	3
CIVG 778	Advanced Structural Analysis II	3

CIVG 779	Design Steel Structures	3
CIVG 789	Advanced Geotechnical Applications: Foundations	3
CIVG 797	Advanced Soil Mechanics	3
CIVG 784	Reinforced Concrete Structure I	3
CIVG 785	Reinforced Concrete Structure II	3

One course from:

ENGG 612	Finite Element Methods	3
ENGG 614	Engineering Mathematics	3
CIVG 796	Elastic and Inelastic Stability of Structures	3
CIVG 799	Theory of Plates and Shells	3

Two approved departmental and Graduate Core electives or a thesis.

Geotechnical Engineering

CIVG 777	Advanced Structural Analysis I
CIVG 778	Advanced Structural Analysis II
CIVG 786	Ground Improvement
CIVG 789	Advanced Geotechnical Applications: Foundations
CIVG 791	Advanced Geotechnical Applications: Earth-Retaining Structures
CIVG 792	Slope Stability
CIVG 797	Advanced Soil Mechanics

One course from:

CIVG 784	Reinforced Concrete Structure I
CIVG 785	Reinforced Concrete Structure II

Two approved departmental and Graduate Core electives or a thesis.

Construction Management Degree Requirements

The program requires 33 credit hours and may be completed entirely by taking all courses in Construction Management courses, or by taking a minimum of seven courses in Construction Management and the other courses in approved engineering electives. All coursework is approved in consultation with the Graduate Program Director.

Admission to the program requires:

a) a baccalaureate degree in an engineering, science or business field from an accredited institution of higher education plus work experience in construction and construction management

b) Grade Point Average of at least 3.00/4.00 for the junior and senior year courses

c) Complete official transcripts for all undergraduate and any graduate coursework

d) Letters of recommendation.

Approval of any transfer credits will be made by the Program Director prior to enrolling in the program. *Up to 6 graduate credits can be transferred toward a Master's degree.*

English proficiency exam scores for international applicants of TOEFL 80 (internet based test) or IELTS with a minimum of 6.5 on the *9.0 scale.*

Minimum of six approved courses in construction from the list shown below:

COMG 602	Introduction to Construction Management	3
COMG 605	Construction Planning and Scheduling	3
COMG 606	Building System Design	3
COMG 608	Construction Quality and Safety	3
COMG 609	Engineering Risk and Decision Analysis	3
COMG 610	Construction Law	3
COMG 611	Environmental Impact Assessment for Construction Projects	3
COMG 612	Marketing and Finance of Engineering Projects	3
COMG 614	Contracts and Specifications	3
COMG 615	Project Controls	3
COMG 616	Construction Estimation	3
COMG 617	Fire Protection Piping System Design	3
COMG 618	Safety and Environmental Issues in Construction for Engineers	3
COMG 619	Temporary Works in Heavy Construction	3
COMG 620	Construction Project Delivery	3
COMG 621	Managing Civil Infrastructure System	3
COMG 622	Construction Accounting and Finance for Development	3
COMG 623	Capstone Construction Management	3
COMG 624	Leadership in Civil Engineering	3
COMG 625	Special Topic: Construction Management	3

Four or less courses in structural and geotechnical engineering

With the approval of the Graduate Program Director, a student may take a maximum of three courses offered in other School of Engineering graduate programs. Electives may also be selected from the Graduate Core courses with the advice and approval of the Graduate Program Director.

Civil Engineering Graduate Courses

CIVG 501. Introduction to Geoenvironmental Engineering. 3 Credits.
Application of geotechnical engineering in the design and analyses of environmental systems. Waste Disposal, waste containment systems, waste stabilization. Engineering design of solid and hazardous waste landfills. Groundwater monitoring at landfill sites. Use of geosynthetics in containment system design. Slurry walls and other containment systems. Three lectures. Spring.

CIVG 505. Wood Structures. 3 Credits.
Mechanical properties of wood; orthotropic nature of wood as a material, dimensional instability, susceptibility to biological deterioration, implications of duration and types of load. Design of solid, laminated and composite beams, columns, shear walls, diaphragms, roofs, and trusses. Behavior and design of mechanical connections. Introduction to light framed wood structures, arches, bridges, and other timber structures. Prerequisite: senior standing and permission of the Chair. Three credits.

CIVG 506. Tunneling. 3 Credits.
This course provides analysis, design and construction issues for the tunneling in soils and/or rocks. The specific areas covered include planning, rock mass classification, rock failure mechanisms, initial excavation supports, design considerations for permanent linings,tunnel excavation methods,groundwater control, ground control measures, and tunnel security.The design considerations of high pressure water tunnels are also discussed including selection of permanent liners, coupled hydromechanical behavior of jointed rock mass and evaluation of hydrojacking potential. Finally, tunnel security against earthquake, fire, and explosion, which is one of the Nation's current important concerns, is discussed. Prerequisite: SCI 301 and CIVL 310. Corequisite: CIVL 409 and CIVL 410. Three credits.

CIVG 507. Introduction to Engineering Investigations/Forensic Engineering. 3 Credits.

CIVG 508. Structural Renovation. 3 Credits.
In renovation, repair, retrofit, or adaptive reuse projects on existing structures, practicing engineers are faced with unique challenges that often require a combination of in-depth knowledge of material properties and durability, construction practice and detailing (including historic construction systems), and structural analysis and design. This course will offer a review of various aspects of structural repair and rehabilitation projects, while examining structures, components, and systems of various types and materials. The students will learn about challenges of investigation, typically the first step in any repair and rehabilitation project on existing structures. Use of visual, non-destructive, and destructive investigative methods will also be discussed. Then, focus will shift to a review of available information sources, known deterioration mechanisms, recognized repair techniques, as well as typical strengthening and alteration options as they apply to repair and rehabilitation projects involving various structure types (concrete, steel, wood, and masonry). Finally, the course will focus on a review of options for repair and retrofit of building lateral systems and facades.

CIVG 509. Preservation Engineering - Theory and Practice. 3 Credits.
The course explores the inherent roles of precedent and existing constructions for design within the urban context-a synthesis of the built past and the envisioned future, of analysis and design. While ideas of sustainability become more and more relevant to our design approach and decisions, this course explores the inherent sustainability of maximizing the use of what we already have through the reuse and revitalization of existing construction work. Work with existing and new construction becomes mutually beneficial as we learn from the past to inform our new designs, and as we apply modern materials and techniques to sustain or revitalize the structures we have.

CIVG 510. Restoration of Historic Buildings. 3 Credits.
In renovation, repair, retrofit, or adaptive reuse projects on existing structures, practicing engineers are faced with unique challenges that often require a combination of in-depth knowledge of material properties and durability, construction practice and detailing (including historic construction systems), and structural analysis and design. This course will offer a review of various aspects of structural repair and rehabilitation projects, while examining structures, components, and systems of various types and materials. The students will learn about challenges of investigation, typically the first step in any repair and rehabilitation project on existing structures. Use of visual, non-destructive, and destructive investigative methods will also be discussed. Then, focus will shift to a review of available information sources, known deterioration mechanisms, recognized repair techniques, as well as typical strengthening and alteration options as they apply to repair and rehabilitation projects involving various structure types (concrete, steel, wood, and masonry). Finally, the course will focus on a review of options for repair and retrofit of building lateral systems and facades.

CIVG 520. Bridge Engineering. 3 Credits.
Planning and design of highway bridge projects. Bridge Engineering will include analysis and design of both superstructure and substructure. Design will be based on LRFD and the specifics of bridge loading according to AASHTO specifications. Design project. One three-hour period. 3 credits. Prerequisites: CIVL 309, CIVL 409, CIVL 410 and CIVL 412 all with a grade of B or better.

CIVG 532. Advanced Strength of Material. 3 Credits.
Stresses in two and three dimensions; symmetrical and unsymmetrical bending; shear center; curved beams; beams on elastic foundation; thin plates and shells; torsion of non-circular sections; thick-walled cylinders. Three lectures. Prerequisite: ENGS 230, CIVL 312 with a minimum of C grade.

CIVG 533. Advanced Mechanics for Civil Infrastructure. 3 Credits.
This course is designed to apply advanced engineering mechanics techniques to solve the infrastructure's problems. The students will be able to create the model, understand the mathematical formulation and use computer modeling to analyze infrastructure's problems dealing with structural, geotechnical and materials challenges. General purpose finite element packages will be used throughout the semester. Pre-requisite: The course is open to graduate students or a senior student with the instructor permission.

CIVG 732. Thesis. 1-6 Credit.
A technical paper under faculty supervision based upon original study or research, an original design or a thorough analysis of an existing or proposed system of either a scientific or engineering nature. The grade for the year-long course must reflect the progress of the student at the end of each semester. The progress grade can be P (pass) or F (failure). This is a year long course.

CIVG 746. Coastal Engineering. 3 Credits.
This is an introductory course in coastal engineering. It blends environmental and civil engineering topics and has a strong focus on design. Topics covered include: Tides, Waves, Storm Surge, Shore Protection, Breakwaters, Harbors, Beach Protection, Sediment Transport, Beach Restoration, Floodwalls, Levees.

CIVG 756. Fracture and Fatigue. 3 Credits.
Comprehensive study of fracture and fatigue failures of structural system; fracture mechanics of steel structures; fatigue crack initiation and propagation; fatigue of welded structures; corrosion and nondestructive investigation.

CIVG 757. Advanced Study in Civil Engineering. 3 Credits.
Individual study of selected advanced topics in civil engineering under the supervision of a faculty member.

CIVG 770. Geotechnical Earthquake Engineering. 3 Credits.
The course will cover topics in Geotechnical Earthquake Engineering by focusing of the following topics: Seismic Hazard; Site Response, including soil amplification, liquefaction, Codes ASCE7 and AASHTO; Soil-Structure Interaction; Geo-Retrofit and Mitigation. In addition, the course will cover case histories of major earthquakes.

CIVG 772. Hydrology. 3 Credits.
Hydrologic cycle, interception, infiltration, evapotranspiration, measurement an analysis of precipitation; design hyetograph, unit hydrographs-analysis, synthetic generation of unit hydrograph; measurement and analysis of runoff, synthetic generation of flow, analysis of stream gages, statistical and probabiltiy analysis of stream flow, regional frequency analysis; probable maximum precipitatation, probable maximum floods; flood routing methods and applications; hydrologic study of complex stream network.

CIVG 773. Hydropower Engineering. 3 Credits.
Fundamentals of water power equation, schemes of water power development, analysis of stream flow data, flow duration curve, power duration curve, mass curve, firm power; selection of turbine, passages and power houses; appurtenances for hydro plants; conservation, economic and environmental aspects.

CIVG 777. Advanced Structural Analysis I. 3 Credits.
Analysis of structural system subjected to loadings, temperature, settlement, and elastic support using classical methods, flexibility method and the stiffness method. Indeterminate arches and cables. Study of 3-D modeling using the flexibility and the stiffness methods.

CIVG 778. Advanced Structural Analysis II. 3 Credits.
Analysis of frameworks under dynamic loads; computation of mode shapes and frequencies; calculation of response using model superposition and numerical methods; the use of response spectra for seismic analysis; buckling of structures using the geometric stiffness matrix. Prerequisite: CIVG 777 or equivalent.

CIVG 779. Design Steel Structures. 3 Credits.
Review of load specifications and design philosophy; design of single and multistory rigid frames; behavior of connections and the influence of connections on member behavior; moment-rotation curves; composite construction; light gage steel. Prerequisitie: CIVG 777 or equivalent.

CIVG 780. Long Span Metal Structures. 3 Credits.
Classical forms of long span bridges; loads on bridges; suspension systems; cable-stayed bridges; space frameworks; orthotropic bridge decks; box girder bridges. Prerequisitie: CIVG 779 or equivalent.

CIVG 781. Special Topics in Structural Engineering. 3 Credits.
Special topics in structural engineering of current interest to graduate students; subject matter will be announced in advance of particular semester offering.

CIVG 784. Reinforced Concrete Structure I. 3 Credits.
Research on the concrete stress-strain curve: specimen-testing machine interaction; micro-cracking; time-dependent strain in concrete; creep and shrinkage; ultimate strength analysis of reinforced concrete members; diagonal tension failure of reinforced concrete beam, design of two-way slab.

CIVG 785. Reinforced Concrete Structure II. 3 Credits.
Design of determinate and indeterminate pre-stressed concrete structures. Theory of pre-stressing, buildings and bridges applications using PCI and AASHTO specifications. Prerequisite: CIVG 777 or its equivalent.

CIVG 786. Ground Improvement. 3 Credits.
Comprehensive coverage of technologies used to modify the engineering properties of earth and non-earth materials both in situ and artificially placed. Overviews of the use of water and manufactured non-earth materials as alternatives for backfills and fills, and the use of geosynthetic tensile reinforcement. Prerequisite: CIVL 308 or equivalent.

CIVG 787. Special Topics in Geotechnical and Geoenvironmental Engineering. 3 Credits.
Special topics in geotechnical and/or geoenvironmental engineering of current interest to graduate students and engineers in practice. Subject matter will be announced in advance of particular semester offering. Permission of the instructor.

CIVG 789. Advanced Geotechnical Applications: Foundations. 3 Credits.
Detailed consideration of the application of geomechanics principles to the analysis and design of shallow and deep foundations including footings, mats, piles, drilled shafts, and modern hybrids (piled rafts). Overviews of site characterization, criteria for selection of foundation alternatives, allowable settlements, construction and constructability. Prerequisite: CIVL 310, 410 or their equivalents.

CIVG 791. Advanced Geotechnical Applications: Earth-Retaining Structures. 3 Credits.
Detailed consideration of the application of geomechanics principles to the analysis and design of earth-retaining structures including basement walls, rigid retaining walls, modern internally-reinforced structures (MSEW, SRW, soil nailing), cantilever and anchored bulkheads, braced excavations, and cellular structures under both gravity and seismic loading. Introduction to state-of-art concepts such as controlled yielding using geofoam compressible inclusions. Prerequisite: CIVL 308, 438, or their equivalents.

CIVG 792. Slope Stability. 3 Credits.
Detailed consideration of the application of geomechanics principles to the analysis and design of unsupported slopes including natural slopes, cut slopes, embankments, earth dams, and levees. Introduction to the use of geosynthetic tensile reinforcement. Prerequisite: CIVL 310, 410, or their equivalents.

CIVG 796. Elastic and Inelastic Stability of Structures. 3 Credits.
Elastic and inelastic buckling of axially loaded members; lateral buckling of beams; energy methods; flexural-torsional buckling of centrally and eccentrically loaded columns of open cross section in the elastic and plastic ranges.

CIVG 797. Advanced Soil Mechanics. 3 Credits.
Advanced topics in soil mechanics including effective stresses under partially saturated conditions, advanced constitutive models, vibratory loading, and seismic liquefaction. Prerequisite: CIVL 308 or equivalent.

CIVG 798. Geotechnical Site Characterization. 3 Credits.
Detailed consideration of the processes and methodologies for determining soil and rock properties for a wide variety of geotechnical applications using both in-situ and laboratory methods. The role of pre- and post-construction design verification including instrumentation. Prerequisites: CIVL 310, 410 or their equivalents.

CIVG 799. Theory of Plates and Shells. 3 Credits.
Analysis of plates loaded transversely and in their plane; general theory of shells of revolution; shallow shells; membrane theories of shells; Levy's method; theory of folded plates; solutions using finite difference methods.

Construction Management Courses

COMG 602. Introduction to Construction Management. 3 Credits.
Techniques for the decisions and actions of the various participants involved in the design and construction of civil engineering projects; techniques used in estimating, planning, coordinating and controlling time, cost, quality and usage.

COMG 605. Construction Planning and Scheduling. 3 Credits.
This course deals with the planning and control of construction projects.This course will cover topics on time schedules for materials, labor, equipment, expediting material delivery and bar charts. Emphasis on the theory behind the scheduling techniques used in the construction industry such as Critical Path Methods (CPM),precedence diagrams and Program Evaluation Review Techniques (PERT). Three credit.

COMG 606. Building System Design. 3 Credits.
In this course, students will gain familiarity with the various systems required within buildings. Students will gain knowledge of various code issues as they relate to buildings and building construction. Systems covered will include, Mechanical & HVAC, Electrical, Plumbing/Sanitary, Fire Production, and Life Safety. The course will also address the interaction between building systems as they relate to the Architectural and Structural components of buildings. The course will also address the evolution of building systems, and what to expect in the coming years. At the completion of this course, students will be able to identify as well as understand the purpose of the major components of building systems and understand how they relate to the overall building.

COMG 608. Construction Quality and Safety. 3 Credits.
In this course, students will take a practical look at project safety issues, OSHA 1926, site specific Health and Safety Plan (HASP) Quality Plan, Quallity Assurance, Quality Control.

COMG 609. Engineering Risk and Decision Analysis. 3 Credits.
Development and implementation of computational procedures such as Linear, Integer, Multi-objective and Dynamic Programming to assist construction/engineering managers predict the consequences of proposed alternatives and to select an optimal alternative. Decision Tree analyses and other criteria for decision making on construction projects involving elements of risk and/or uncertainty. Solutions using spreadsheet and other commercially available microcomputer software are stressed. 3 credits.

COMG 610. Construction Law. 3 Credits.
The American Jurisprudential System as it applies to the management of the construction process; principals of contract formation, subcontracts and contract documents; public works bidding and the Wicks Law; contract performance, suspension and termination; surety bonds; changed conditions, extra work, change orders and claims; time of performance, delay and acceleration; mechanic's liens and trust funds; design professionals' duties and liabilities; insurance and warranties; Alternative Dispute Resolution, including mediation and arbitration.

COMG 611. Environmental Impact Assessment for Construction Projects. 3 Credits.
To provide the student with an introductory overview of the environmental law system including the legal & regulatory process. To acquaint the student with the major Federal (e.g. NEPA), state (e.g. SEQRA), & local (e.g. CEQR, ULURP, zoning) environmental impact legislation and procedures affecting the practice of engineering. To provide the student with the tools necessary to find, understand, use and comply with relevant laws, regulations, codes, forms, premitting, etc. To familiarize the student with real world practice applications of environmental laws and regulations to major construction projects. To enhance understanding of the interaction of the environmental law system with engineering through case studies.

COMG 612. Marketing and Finance of Engineering Projects. 3 Credits.
Formulation of financial techniques for solution of viability of engineering projects; typical subject material includes development and use of Internal Rate of Return and Net Present Value. Presenting an understanding of marketing, its components and how the construction manager/engineer fits into the corporate marketing equation.

COMG 614. Contracts and Specifications. 3 Credits.
Fundamental concepts of contract law. Types and selection of contracts, e.g. construction. Procedures for advertising, awarding and administering contracts. Specifications and their cost impacts. Liability of engineers. Engineering professional services.

COMG 615. Project Controls. 3 Credits.
The course will start with a discussion of Project controls systems involved in Design and Construction of Projects. It will then move into an introduction and examination of two specific Control Systems. First CPM Scheduling including Cost/Resource loading. The student will become intimately familiar with the industry's leading methodology of scheduling for design and construction. The student can expect to become conversant with the terminology, calculations and computer reporting utilized in CPM Scheduling. Finally the course will examine Cost Engineering aspects for Design and Construction Industry. The student can expect to become conversant in Labor Budgeting and Variance Analysis for a Design/construction firm's effort and the Cost Engineering aspects for Construction of a project.

COMG 616. Construction Estimation. 3 Credits.
A key parameter for all types of construction emerges from the answer to the fundamental question: 'How much is the work expected to cost?' This course examines the process used by the construction industry to arrive at an answer and how the result fits into the overall construction process. Key concepts covered include quantity and quality takeoffs, assigning costs, and finalizing estimates and proposals. Implementation of classic estimating approaches via spreadsheet models will be stressed using examples of particular interest to Civil, Environmental, and construction Management students.

COMG 617. Fire Protection Piping System Design. 3 Credits.
Design Fire Protection Piping Systems with an emphasis on water based piping systems. Analyze occupancy and construction classifications for existing and new buildings using the New York State and the New York City Building Code. Determine appropriate system type to be installed in specific hazards environments. Design fire protection piping systems to meet the architectural and structural requirements. Determine design area of applications for the systems being installed. Understand type of piping configurations and advantages of each. Determine water supplies required for each type of building occupancy.

COMG 618. Safety and Environmental Issues in Construction for Engineers. 3 Credits.
This course presents an overview of safety and environmental issues related to construction. Included is the Occupational Safety and Health Administration (OSHA) 30 Hour Construction Industry Outreach Training course that is a comprehensive orientation to the federal safety and health standards as well as an introduction of specific safety and environmental construction related issues.To receive the OSHA Certification, the student cannot miss more than one class period during the semester.

COMG 619. Temporary Works in Heavy Construction. 3 Credits.
Course provides an overview of contractors temporary works means in heavy underground construction. This course will include the engineering design of these temporary works. Temporary works are normally the full responsibility of the contractor. However, an understanding of the selection and design of temporary works by contractors is also vital to owners and consulting engineers because they directly influence the constructability and cost of their projects. This course will include: geotechnical parameters and design loadings in temporary works; the design of support of excavation systems including soldier pile and lagging, sheet piling, concrete diaphragm (slurry wall) and secant wall; monitoring and settlement analysis of structures adjacent to excavations; soil improvements and grouting; dewatering; underpinning, and initial supports in rock and soft ground tunnels.

COMG 620. Construction Project Delivery. 3 Credits.
This course will address the fundamentals of completion of a Construction Project. It will provide guidance on the setting up of a project, developing a project plan, putting together a team from the various groups, such as legal, environmental, real estate, public affairs, all associated engineering disciplines, estimating, scheduling, construction management, procurement, quality assurance, safety, financing, operations and associated stake holders. The course will describe how budgets and schedules are established and used to drive the project. The course will also cover what should be included in a project plan and in monthly reports. At the completion of the course, the students will have an understanding of the various aspects of Project Management and how the Project Manager is able to bring them together so they function as one, much as a conductor does with an orchestra.

COMG 621. Managing Civil Infrastructure System. 3 Credits.
Examination of the fundamentals of infrastructure planning and management with a focus upon the application of rational methods that support infrastructure decision-making; institutional environment and issues; decision-making under certainty and uncertainty; capital budgeting and finance; group decision processes and elements of decision and finance theory.

COMG 622. Construction Accounting and Finance for Development. 3 Credits.
This course gives an overview of the uses of accounting and financial analysis in decision making in a construction and development environment. The course will help construction professionals – both those who are working in the construction industry and those seeking degrees in construction management – learn how the principles of accounting and financial management can be adapted to and used in the management of construction companies and project management. Students will review accounting concepts, rules, regulations and report requirements as they apply to construction and development and discuss the financial tools needed to understand the financial statements and financial positions of development and construction projects. This course requires minimal proficiency in the use of the Hewlett-Packard HP 12C calculator and EXCEL or their equivalents.

COMG 623. Capstone Construction Management. 3 Credits.
This capstone course examines the full range of services which constitute professional construction management as defined by the Construction Management Association of America (CMAA). The CMAA Construction Management Standards of Practice will be utilized as a framework for further development of student core competencies in Cost, Time, Quality, Safety, Contract and Project Management as well as in the roles and responsibilities of the Construction Manager as a Professional. By taking this course, students planning to pursue CM certification will be in position to better gauge their respective areas of strength versus those that may need additional concentration to successfully complete the certification process.

COMG 624. Leadership in Civil Engineering. 3 Credits.
This course covers principles of self-management and leadership. Its focus is on knowledge and skills needed for an engineer to successfully manage and lead oneself, then a project team, and finally, an organization. By better knowing and understanding oneself, defining what one wants to do, effectively communicating it to others, and behaving in an ethical manner, students and civil engineers will have a working knowledge of how to be an authentic manager and leader. Students are required to research, investigate and present case studies on leadership and ethical practices in civil engineering.

COMG 625. Special Topic: Construction Management. 3 Credits.
Construction Management project on selected topics, involving the application of the state-of- the-art practices in construction management in the public and private sectors. Written report or publication, and oral presentation are required. Topics to be selected by the student with approval of a faculty advisor and the Program Director.

COMG 626. Strategic Planning in Construction. 3 Credits.
This course presents the strategic planning process as it applies to Construction Management firms operating in the New York Metropolitan Area. It will provide a short history of strategy, definitions, current market analysis, value chain considerations, context in which competitive strategy is formulated; the strategic planning process, including but not limited to SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis, vision and mission statements, goals and objectives, strategies, and action plans that tie strategy to operations. At the completion of this course, students will have a working understanding of the importance of strategic planning and a practical knowledge of the elements of the strategic planning process in order to be able to participate substantively in the development of a strategic plan in a Construction Management (or A/E) company.

COMG 627. Green Facilities Management. 3 Credits.
In this course, students will learn the energy consumption process and how to perform an energy audit of buildings and other structures. Students will gain knowledge of the effectiveness of energy management through economic analysis on the life cycle of the structure. Various sources of energy will be examined, including understanding the production, the bill and the rate schedule. The course will address process energy management with particular emphasis on the following: production, lighting, HVAC, boilers, steam distribution, insulation and control systems. Interaction of these systems as they apply to total heat gains and losses in the building will be studied. New technologies and control systems will also be discussed.

COMG 628. Public Private Partnerships & Design Build: Opportunities & Risks for the Consulting Engineer. 3 Credits.
This course presents an in-depth study of the opportunities and risks presented to the key participants on Public Private Partnership (PPP or P3) and Design Build (DB) projects, particularly the consulting engineer. Specific topics will include: discussion of the varying accepted definitions for the P3 and DB methods; an overview of the history of each method for domestic projects; and an examination of issues related to risk management, risk allocation, professional liability and insurance, and dispute resolution.

COMG 630. Research Methods in Construction. 3 Credits.
The course explores the scientific research process including its methodologies, challenges and organization. It is designed to support construction management graduate students in developing responsible research projects and assist them in defining appropriate research methodologies. Topics include research proposal development, review of relevant literature, selection of research methodology, development of specific hypothesis, collection of data, data analysis, and preparation of research reports and presentations.

COMG 631. Cost Engineering. 3 Credits.
This course teaches the cost engineering tools that are typically encountered in construction management, and is based on the Construction Financial tools in Procore-one of the leading providers of cloud-based applications for construction. Students develop a thorough understanding of cost management theory, workflows, calculations, documentation, and reporting, and the intricate role of user permissions. Topics include cost control, budget, prime contract, commitments (subcontracts and purchase orders), change events, rough estimates, proposals, change orders, trade allowance tracking, budget transfers, prime invoices, commitment invoices, sub jobs, reporting, and internal auditing. The payment application process and retainage calculations are thoroughly explained. Transition to a Guaranteed Maximum Price (GMP) contract structure with associated holds and allowances. Learn to develop change management workflows based on sound cost engineering rules.

COMG 632. Building Information Modeling in Construction. 3 Credits.
The course will introduce the students to the applications of BIM in construction. In this course the student will learn the following. 1. How technology is used in construction, specifically for coordination, logistical, estimating and cost purposes (3D, 4D and 5D). 2. BIM and VDC Processes and Workflows during the construction phase. 3. Past, new and upcoming standards used to coordinate buildings and how technology keeps shaping the way we collaborate. 4. Tools and Applications used in construction that support BIM and VDC (Virtual Design and Construction).

Electrical and Computer Engineering

Dr. George C. Giakos
Chair, Department of Electrical and Computer Engineering
Director, Graduate Program

Mission

The Master of Science in Electrical Engineering and the Master of Science in Computer Engineering degree programs are designed to provide a higher degree of mastery of electrical and computer engineering fundamentals, emphasizing practical applications, thereby expanding the students' technological horizons and preparing professionals for advanced level positions and for admission to doctoral programs.

Objectives

The objective of these programs is to prepare graduates for successful and dynamic professional careers through a course of study that provides:

1. a strong grasp of electrical engineering and computer engineering fundamentals through a diverse and flexible curriculum
2. skills in practical applications, contemporary industrial needs and emerging technologies
3. a foundation for increasing professional responsibilities or continued study at the doctoral level

Admission Requirements

Electrical Engineering Degree

Applicants must possess one of the following:

1. A baccalaureate degree in electrical engineering from a program accredited by the Engineering Accreditation Commission of ABET, Inc., or from a recognized foreign institution.
2. A baccalaureate degree in another area of engineering, physics, or mathematics.

Applicants who have a baccalaureate degree in another area of engineering, physics, or mathematics may be admitted into the program provided they complete undergraduate prerequisites specified by the Graduate Program Director. These courses must be completed with a minimum grade point average of 3.00 with no grade lower than C. These courses will not satisfy any requirements for the Master of Science in Electrical Engineering degree. Generally, students must complete prerequisite courses before they are permitted to register for graduate courses. Exceptions require the recommendation of the Graduate Program Director and the approval of the Dean of Engineering.

Computer Engineering Degree

Applicants must possess one of the following:

1. A baccalaureate degree in computer (or electrical) engineering from a program accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology or from a recognized foreign institution.
2. A baccalaureate degree in another area of engineering, physics or mathematics.

Applicants who have a baccalaureate degree in another area of engineering, mathematics, or physics may be admitted if they have a background which includes nine credits of calculus and three credits of probability. They must also complete undergraduate courses in Computer Programming, Introduction to Digital Systems, and Microcomputers with a minimum grade point average of 3.0 with no grade lower than C (these courses will not satisfy any requirements for the Master of Science in Electrical Engineering degree). Generally, students must complete prerequisite courses before they are permitted to register for graduate courses. Exceptions require the recommendation of the Graduate Program Director and the approval of the Dean of Engineering.

Degree Requirements

A student must complete a minimum of thirty credit hours of graduate course work. Specific requirements follow:

Electrical Engineering Degree

One of the following:	3
ECEG 702 Signals, Systems and Transforms II	
ECEG 701 Signals, Systems and Transforms I	
ECEG 710 Probability and Stochastic Processes	
Three electrical engineering courses	9
Four courses chosen from Electrical and Computer Engineering Department	12
Two courses from any offerings by the Electrical and Computer Engineering Department, or any Graduate Core course	6
Six course credits can be substitited by Masters Thesis option under the direction of a Thesis Advisor.	
Total Credits	30

Electives may also be selected from the Graduate Core courses with the advice and approval of the Graduate Program Director.

Any modifications to program requirements must be approved by the Graduate Program Director.

Computer Engineering Degree

One of the following:	3
ECEG 520 Computer Architecture I	
ECEG 727 Computer Networks	
ECEG 721 Embedded Systems	
Three computer engineering courses	9
Four courses chosen from Electrical and Computer Engineering Department	12

Two courses from any offerings by the Electrical and Computer Engineering Department, or any Graduate Core course	6
Six course credits can be substituted by Masters Thesis option under direction of a Thesis Advisor	
Total Credits	30

Any modifications to program requirements must be approved by the Graduate Program Director.

Master of Science Degree Description and Options for Electrical Engineering and Computer Engineering

Master of Science students may elect to complete a Master of Science by coursework or by thesis. The coursework option entails 30 course credits; the thesis option entails 24 course credits and 6 master's thesis research credits, ECEG 799. In both cases, the minimum number of total credits is 30. At this level, research undertaken under the thesis option should exhibit a thorough understanding of advanced scientific thought and an ability to apply advanced engineering design principles, and planning.

Manuscript Presentation

Degree candidates must present their research to the appointed guidance committee in final manuscript form for official acceptance no later than two weeks before the end of the semester.

Graduate students registered for thesis credits must submit four final bound copies to the Electrical and Computer Engineering Department for necessary signatures one week before the end of the semester.

Concentration Programs

Graduate concentration programs, which consist of prescribed courses in a specific concentration area, are available through the Electrical and Computer Engineering graduate program as follows:

Applied Bioinformatics

Bioelectric Engineering

Robotic Vision, Imaging, and Computer Graphics

Unmanned Autonomous Guided Systems

Cybersecurity Systems

Embedded Computing

High Performance Computing

Power Systems

Big Data, Data Mining, and Analytics

Unless otherwise noted, courses in these programs may be applied to a Master's of Science Degree in the Electrical and Computer Engineering. While approval of the

Graduate Program Director is required to enroll in a graduate course, admission to the Graduate Program is not required to participate in a Concentration Program. It is expected, however, that individuals desiring to take graduate-level courses in a Concentration Program will have a baccalaureate degree in either an engineering field, a science or applied science field, or mathematics, and will meet the pre-requisite requirements of the courses they wish to take in a Concentration Program. Specific information regarding Graduate Electrical and Computer Engineering Concentration is available on the Electrical and Computer Engineering website (https://manhattan.edu/academics/schools-and-departments/school-of-engineering/.electrical-computer-dept/graduate/).

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Courses

ECEG 500. Wireless & RF Technology. 3 Credits.
Investigation of wireless and radio frequency technology including propagation characteristics, receivers and transmitters, circuit and devices. Nonlinear and noise analysis and non-ideal components. Measurement techniques including network and spectral analysis. Communications systems are emphasized but radar and RFID systems are also covered.

ECEG 521. Applied Parallel Computing. 3 Credits.
A software engineering centric course covering traditional parallel computing with message passing protocols, programming patterns for multi-core processors, application development on graphics processing units, and wide scale distributed computer systems.

ECEG 547. Optical Information Processing Systems. 3 Credits.
Response of linear spatially invariant systems; signal detection by matched filtering, mutual coherence, transform properties of linear optical imaging systems; optical information processing and filtering; linear holography.

ECEG 548. Fiber Optics Communication. 3 Credits.
Optical fiber structures and physical characteristics; electromagnetic waveguiding properties and modes, fiber materials, loss mechanisms, and dispersion. Semiconductor laser and LED sources and photodetectors. Connectors,Fiber measurements,communication aspects of fiber transmission. Fiber system examples and design procedures. Three credit.

ECEG 591. Advanced Special Topics. 3 Credits.

ECEG 592. Power Electronics. 3 Credits.
The course provides a knowledge of circuitry for the control and conversion of electrical power with high efficiency. Applications include electronic power supplies, aerospace and vehicular power systems, and renewable energy systems. Pre-requisite: Senior ECE or Graduate Status.

ECEG 700. Industrial Electric Drives. 3 Credits.
Hands-on experiments and demonstrations in industrial electric drives, requirements placed by mechanical systems on electric drives, and their various applications such as flexible production systems, energy conservation, renewable energy and transportation. Power electronics in drives using switch-mode converters and pulse width modulation to synthesize the voltages in dc and ac motor drives. Design of a controller using Matlab/ Simulink.

ECEG 701. Signals, Systems, and Transforms I. 3 Credits.
Description and analysis of continuous-time signals and systems in the time and the frequency domains' Laplace transforms:inversion of transforms by coplex integrative; application to lumped and distributed parameter systems;analysis of continuous-time linear systems using state space techniques; controllability and observability : stability analysis.

ECEG 702. Signals, Systems and Transforms II. 3 Credits.
Discrete-time signals and systems; discrete convolution; sampling and quantizing;Z-transform;discrete Fourier transform; Fast Fourier transform; state space techniques for discrete-time systems; controllability and observability; stability. Three credit.

ECEG 704. Bioinstrumentation. 3 Credits.
Design principles of biomedical devices, bioelectronics, medical nanodevices, transducers, sensors, interface electronics, microcontrollers, and engineering programming. Signal modalities, bioelectrical signal monitoring, acquisition, analysis, and processing. Case studies and platform-based designs of medical devices, and instrumentation.

ECEG 705. Applied Data Mining for Engineers. 3 Credits.
This course will provide students with an understanding of fundamental data mining methodologies and with the ability to formulate and solve problems with them. Special emphasis attention will be paid to practical, efficient and statistically sound techniques. Hands-on experience with data mining software, primarily R, to allow development of basic execution skills.

ECEG 706. Radiation and Optics. 3 Credits.
Radiation and simple radiating systems, wave optics, interference and diffraction: first order and higher order coherence functions; Fourier optics, properties of coherent optical beams. Three credit.

ECEG 709. Linear Mathematical Methods. 3 Credits.
Matrix calculations; linear systems and linear vector spaces; operators and their representation; function of operators and matrices; systems of differential equations; Eigen function representations; electrical engineering applications.

ECEG 710. Probability and Stochastic Processes. 3 Credits.
Random variables, distribution and density functions: functions of random variables;random processes'stationarity, ergodicity, correlation functions and power spectra' noise theory'system analysis with stochastic inputs: Gaussian, Markoff and Poisson processes.

ECEG 715. Power Electronics. 3 Credits.
Electronic converters for DC-DC, & AC-DC rectification, HVDC inversion techniques, Production of variable frequency AC power for motor drive applications. Techniques for connecting distributed energy sources to the AC power grid. High efficiency power electronics for hybrid electric vehicles. Electronic techniques for Power Factor Correction. Use of laboratory experiences and PSpice computer simulations to supplement analytical circuit solution methods.

ECEG 716. Fuzzy Systems. 3 Credits.
A study of the concept of fuzzy set theory including operations on fuzzy sets, fuzzy relations, fuzzy measures, fuzzy logic, with emphasis on engineering applications.

ECEG 717. Mobile Applications and Cybersecurity. 3 Credits.
The proliferation of smart, consumer mobile, and medical devices provide new security vulnerabilities. This course will focus on the security features and limitations on smartphones, mobile telecommunication systems, portable healthcare monitoring devices, and sensor networks. Materials will cover smartphone security, mobile location privacy, wireless sensor security, and security challenges in medical device industry.

ECEG 721. Embedded Systems. 3 Credits.
Design of embedded systems including system level modeling/specification, and architecture synthesis, compilation for area/power/performance, code compression, scheduling and real-time operating systems, and verification and functional validation of embedded systems. Case studies and platform-based design encompassing microcontrollers/digital signal processors, distributed computing and peripherals.

ECEG 722. Switching & Automata Theory. 3 Credits.
Analysis and synthesis of finite state machines; Turing and universal machines; information lossless machines; modular realization of machines; introduction to machine languages and computability.

ECEG 723. Software Engineering. 3 Credits.
The evolution of programming from art to science. Program design tools and techniques; structured programming and modular design; complexity, storage, and processing-time analysis; program testing and debugging; software reliability, repair and availability. Three credit.

ECEG 724. Computer Architecture II. 3 Credits.
Computer Systems; multi processors and pipelined processors; array processors; computer networks; techniques for analysis of computer systems.

ECEG 725. Microprocessor Systems. 3 Credits.
Detailed study of the 8086 and 68000 families of 16-bit microprocessors, including their architecture, instruction sets, programming, interfacing, and interrupt handling. Applications to communications, control, and instrumentation. Selected additional topics such as bit-slice microprocessors and graphics processors.Prerequisite or Co-requisite:ECEG 520 or equivalent or approval of Instructor.

ECEG 726. Transmission of Digital Data. 3 Credits.
The Architecture of Digital DataTransmission Systems. The protocols:TCP/IP models.The physical layer:Wire, cable, fiber, terrestrial microwave and satellite microwave.The key concepts: bandwidth, noise, channel capacity and error detection and correction. The applications:modulation and modems. Multiplexing: FDM, slotted TDM, and statistical TDM.The data link: asynchronous and synchronous transmission, circuit switching, packet switching.

ECEG 727. Computer Network Operations. 3 Credits.
A structured coverage of Data and Computer Communications Networks. Protocols from the physical and data link layers to the applications layer. Network modeling and fundamentals of performance analysis. Time delay and reliability. Design issues, tools,and procedures regarding capacity assignments, terminal assignment, and switching node location. Routing. Examples from high speed Local Area Networks.

ECEG 728. Operating Systems. 3 Credits.
A study of the modular design of operating systems; the concept of interrupts, multiple processors and I/O programming; memory management techniques, demand paging and virtual memory; job scheduling algorithms, race conditions between processes; file systems, analytic tools for the evaluation of operating systems. Prerequisite:ECEG 520 or equivalent.

ECEG 729. Artificial Intelligence. 3 Credits.
Computer-based systems with the potential to learn, understand, interpret and arrive at conclusions in a manner considered intelligent if a person was making decisions. Topics will be taken from expert systems, fuzzy logic and neural nets with emphasis on machine applications.

ECEG 730. Modern Portable Wireless Devices. 3 Credits.
Wireless communication systems for mobile and autonomous devices, healthcare monitoring devices, with emphasis on: cellular concept & trunking, spread spectrum systems security and multiple access techniques, speech coding, power control. Antennas and channel propagation characteristics and techniques for mitigation of propagation-related degradation factors. Analysis & design of systems following standards & protocols for the latest generation of wireless networks. Key examples of mobile portable devices, medical devices, system characteristics, and architecture design. Pre-requisites: EECE 303, EECE 315. Co-requisite: EECE 304.

ECEG 731. Control Systems. 3 Credits.
Multivariable systems; controllability and observability; observer design and pole assignment; stability analysis.

ECEG 732. Optimal Control Theory. 3 Credits.
Performance measures: dynamic programming and its application to optimal control problems; calculus of variations; minimum principle; numerical techniques for finding optimal controls and trajectories. Prerequisite:ENGG 630.

ECEG 733. Digital Control System Analysis and Design. 3 Credits.
State space representation of discrete-time systems. Stability, observability, controllability. Digital controller design using transform techniques. State space design methods.

ECEG 734. Bulk Power System Operation. 3 Credits.
Operation of the bulk electric power system in North America. Basic types of high voltage equipment and station configurations. Methods and equipment to control power flow and voltage levels on the power systems.

ECEG 735. Direct Energy Conversion. 3 Credits.
Principles of energy conversion; thermoelectric, photovoltaic, and thermionic generators; magneto hydrodynamic power generators: solar and nuclear energy conversion. Three credit.

ECEG 736. Power & Energy Systems. 3 Credits.
Overview of modern interconnected power system and smart grid operation. Develop appropriate models for an interconnected power system, and perform power flow and short circuit analysis. Students will write a basic power flow computer program.

ECEG 737. NERC Standards & Operation. 3 Credits.
North American Electric Reliability Corporation (NERC) standards and related compliance concerns in relationship to operational principles of the power systems.

ECEG 738. Protective Relays. 3 Credits.
Analysis of faulted power systems, symmetrical and asymmetrical systems, transient stability, emergency control and system protection.

ECEG 739. Relay Systems. 3 Credits.
Power system operation, three-phase system calculations and modeling of power system elements. Protective devices and their principles of operation. Pilot protection of transmission lines, generator protection and transformer protection.

ECEG 740. Electro-Optics. 3 Credits.
Propagation of rays and beams, optical resonators; theory of laser oscillation; modulation of laser beams; optical detection.

ECEG 741. Quantum Electronics. 3 Credits.
Interaction of radiation with matter, spontaneous and simulated emission and absorption; semi-classical theory of lasers; traveling wave and cavity lasers; laser saturation; noise limitation of light detectors and amplifiers.

ECEG 742. Computer Vision & Imaging. 3 Credits.
Detection, image formation, and engineering design of vision and imaging sensors and systems. Unmanned aerial and underwater imaging systems, biomedical image recognition, medical image understanding, inspection, and robotics applications.

ECEG 743. Biomedical Imaging Systems. 3 Credits.
Engineering and physical principles of biomedical modalities, as applied to clinical diagnostics and pharmaceutics, gene arrays and Omics imaging technologies central to the detection process, system design, data analysis and classification. Clinical examples.

ECEG 744. Signal Detection & Estimation. 3 Credits.
Hypothesis testing; decision criteria: North and Wiener filtering; detection and estimation of signals with known and random parameters in white and colored Gaussian noise; recursive estimation of constant and time-varying signal parameters; Kalman-Bucy filtering; applications to communication systems, radar and biological signal processing. Prerequisite: ECEG 710.

ECEG 745. Medical Device Miniaturization. 3 Credits.
Engineering design of miniaturized medical devices, operating on electrical, and quantum principles, with reduced form factor and weight, while reducing power consumption and boosting performance. Integration trends, functionality, scalability, reconfigurability. Case studies and platform-based designs of miniaturized medical devices, such as medical implantable devices, heart monitors, pacemakers, video cameras.

ECEG 746. Digital Signal Processing. 3 Credits.
Discrete time signals and systems analysis' infinite and finite impulse response digital filter design techniques, random discrete time signals and spectral analysis, detection and estimation of signals in noise Kalman filters.

ECEG 747. Image Processing and Pattern Recognition. 3 Credits.
Digital image processing for manipulation and enhancement of images, development of advanced techniques for object recognition, object classification, image reconstruction, image compression, and feature extraction. Computational analytic and interpretive approaches to optimize extraction and use of imaging data. Engineering, robotic, industrial, medical, and remote sensing applications.

ECEG 748. Applied Machine Learning. 3 Credits.
Design of systems that learn from data and improve with experience. Fundamental concepts and methods of machine learning, including the description and analysis of several modern algorithms, their theorectical basis, and the illustration of their applications. Supervised and unsupervised machine learning.

ECEG 749. Unmanned Autonomous Vehicles. 3 Credits.
History of the UAV, basics of mechatronic design, common sensor payloads, high-definition cameras, sonars, lidars, vision and imaging design parameters. Major design challenges, laws and regulations, operations and safety.

ECEG 750. Antenna Engineering. 3 Credits.
Analysis and design of various antenna types such as dipoles, horns, reflectors, apertures, microstrip and wire antennas. Electronically scanned arrays. Radiation pattern antenna impedance, gain, directivity, bandwidth, beam width, and frequency dependence. Reciprocity between receiving and transmitting antennas. Amplitude tapering to achieve desired sidelobe characteristics.

ECEG 751. Microwave Circuits. 3 Credits.
Transmission lines and waveguides; circuit representation of waveguide systems using impedance and scattering formulation , impedance transformation and matching; Faraday rotation in ferrites; passive microwave devices; terminations; attenuators; couplers, circulators, the magic tee; emphasis on developing a circuit view point for analyzing microwave devices.

ECEG 752. Pharmaceutical Bioinformatics. 3 Credits.
Computer based technologies and informatics and computational methods that interfaces with all areas related to the discovery and development drugs, for understanding their functions, mapping processes of the cells and understanding how to use these properties to effectively develop novel drugs.

ECEG 753. Applied Bioinformatics. 3 Credits.
Bioinformatics principles applied to microscopic and biomedical image acquisition methods and applications, methods and applications of image analysis and related machine learning, pattern recognition and data mining techniques, image oriented multidimensional. Methods and applications for the analysis of post-translational modifications, proteomic, mass spectroscopic, and chemoinformatic data.

ECEG 755. Bionanophotonics. 3 Credits.
Nanoparticles for optical bioimaging, optical diagnostics and light guided and activated therapy. Use of nanoparticles platforms for intracellular diagnostics and targeted drug delivery, PEBBLE nonsensors.

ECEG 756. Drug Delivery Systems. 3 Credits.
Instrumentation, devices, and techniques to characterize the physiochemical, optical properties, and in vitro immunological, biological, and stability characteristics of drugs delivery, proteins, and nanomaterials.

ECEG 757. Bioinspired Robotic Vision Systems. 3 Credits.
Introduction to autonomous computer vision systems. Vision-based bio-inspired systems, guidance, and control, for unmanned aerial vehicles (UAVs), unmanned underwater vehicles (UWVs), medical robotic surgery, and robotic applications.

ECEG 758. Cybersecurity Systems. 3 Credits.
Cybersecurity as it relates to systems and then on the engineering principles for secure systems. The course focuses on the differences between threats and vulnerabilities, examples of cybersecurity attacks and events, frameworks, requirements and principles for securing systems.

ECEG 759. Quantum Cryptography. 3 Credits.
Methods that seeks to solve the problem of how to securely send cryptographic keys between two parties by encoding them within light particles, or photons. Quantum cryptography and key distribution technique.

ECEG 760. Data and Applications Security. 3 Credits.
Principles, technologies, tools and trends for data and applications security. Biometrics; digital forensics; secure e-commerce; secure sensor information management.

ECEG 761. Network Security Systems. 3 Credits.
Theoretical and practical aspects of network security. Security of TCP/IP applications; firewalls; wireless LAN security; denial-of-service defense.

ECEG 762. Modeling and Simulation. 3 Credits.
Review of probability distributions;random number testing and generation; mathematical models; Markov chains; simulation methods; data analysis; Monte Carlo methods.

ECEG 763. Data Struct & Cmpt Algorithms. 3 Credits.
Sequential and parallel algorithms for non-numerical and numerical applications. Algorithm complexity analysis, basic data structures, searching, sorting graph and numerical algorithms. 3 credits.

ECEG 764. Data Base Mgmt Systems(DBMS). 3 Credits.
Software and hardware design problems for DBMS; an overview of data base systems, data manipulation languages, normal forms, machine architectures.

ECEG 765. Computer Graphics. 3 Credits.
Basic concepts of computer graphics systems including display devices, graphics software and the display of solid object. Point plotting procedures; line drawing algorithms and circle generators. Displays and controllers; storage and refresh devices. Two dimensional transformations; clipping and windowing. Graphics software; windowing functions, display files; geometric models. Interactive raster graphics. Three dimensional graphics including surface display, perspective and hidden surface removal.

ECEG 766. Mobile Communication Networks. 3 Credits.
This course provides an overview of the latest developments and trends in wireless mobile communications, and addresses the impact of wireless transmission and user mobility on the design and management of wireless mobile systems. In addition to study the technical issues and state-of-the-art techniques in the operation and management of mobile communications networks; To learn the engineering principles and system evaluation methods used in the design of mobile communications networks. This course will cover selected Mobile Communications Networks topics in each of the following areas: Overview of wireless communications, Cellular wireless networks, 2G, 2.5G and 3G cellular networks, Long Term Evolution (LTE) - 3.5G, Future of 5G cellular networks, Wireless local area networks (Wi-Fi), Wireless personal area networks (Bluetooth, UWB, ZigBee), and Mobility management and radio resource management.

ECEG 767. Big Data, and Deep Learning. 3 Credits.
Neural-fuzzy networks, big data analysis, classification, clustering, pattern discovery and prediction. Extraction of useful information from spatio-temporal data. Industrial, healthcare, and commercial applications.

ECEG 768. Green Energy Sources. 3 Credits.
This course presents basic information on Energy outlook, interconnection issues of distributed alternate energy resources, efficiency of power production, electric energy conversion and storage (fossil fuel, nuclear, hydro, solar, fuel cells, wind, and batteries). This course also explores the different energy link integration methodologies using Matlab/Simulink.

ECEG 769. Introduction to Remote Sensing. 3 Credits.
This course is intended to provide an introduction to remote sensing of objects with applications in defense and environment. The course covers the basic principles of image sensors and techniques, image interpretation, remote sensing theory, and digital image analysis in relation to optical, thermal and microwave remote sensing systems. Examples of remote sensing applications will be presented along with methods for obtaining quantitative information from remote sensing imagery. Students will be expected to engage in a special topic evaluation.

ECEG 770. Intro to Space Systems. 3 Credits.
This course is intended to provide the fundamental principles of space systems, in terms of electro-optical sensing, robotic vision, and imaging. Critical space missions such as monitoring of the integrity of spacecraft structures, detection of debris, object recognition and classification will be presented and discussed. Defense and commercial applications will be introduced and discussed. Students will be expected to engage in a special topic evaluation.

ECEG 771. Cloud Computing & Physical Sys. 3 Credits.
This course provides a comprehensive study of computer cloud concepts, architectures, and physical systems, technical challenges and advantages across the varied cloud service models. The course covers the essentials necessary to leverage cloud computing in a pragmatic way so that computational efficiency, cost, global scale, and productivity can be fully realized. Industrial and consumer applications and services, such as e-commerce, Industry 4, Internet of Things (IoT), video and audio streaming, will be presented.

ECEG 779. Remote Sens Sys Techniques. 3 Credits.
This course is intended to provide the engineering and physical principles to remote sensing of objects. This course covers the principles of image sensors and techniques, image formation, interpretation and analysis, interpretation, remote sensing theory, digital image analysis. Machine learning and deep learning techniques will be applied for object recognition and classification. Defense, commercial and environmental applications will be introduced and discussed.

ECEG 780. Space Systems Engineering. 3 Credits.
This course is intended to provide the engineering and physical principles for the design of space systems. Enhanced understanding of the big picture of space systems engineering processes and their application in the mission life cycle will be presented; with emphasis on the electro-optical sensing, detection, classification, monitoring of space resident objects (SRO)s. Advanced machine learning and deep learning techniques will be presented for object detection, tracking, recognition and classification. Defense, and commercial applications will be introduced and discussed.

ECEG 781. Computer Architecture I. 3 Credits.
Evolution of computer architecture spanning from the CISC machines to the RISC machines, from the pipelined to superscalar architectures; from multithreaded to parallel processors. Hardware and software processor design trade-off and performance evaluation; Data representation and instruction sets. Control design: Hardware and microprogrammed. Memory organization: Virtual segmentation and cache; system organization: Bus control and 1/O. Pre-requisite: Senior Status.

ECEG 792. Adv Proj Electrical/Comp Engr. 3 Credits.

ECEG 793. Advanced Study in Electrical or Computer Engineering. 3 Credits.
Individual study of a selected topic in electrical engineering under the supervision of a staff member.

ECEG 794. Special Topic: in Electrical Engineering. 3 Credits.
Topics of current interest to graduate Electrical Engineering students; subject matter will be announced in advance of semester offering.

ECEG 795. Special Topic: in Computer Engineering. 3 Credits.
Topics of current interest to graduate Computer Engineering students; subject matter will be announced in advance of semester offering.

ECEG 796. Special Topic: in Electrical and Computer Engineering. 3 Credits.

ECEG 797. Sustainable Energy Sources. 3 Credits.
This course presents basic information on Energy outlook, interconnection issues of distributed alternate energy resources, efficiency of power production, electric energy conversion and storage (fossil fuel, nuclear, hydro, solar, fuel cells, wind, and batteries). This course also explores the different energy link integration methodologies. Pre-requisite: Senior Status.

ECEG 799. Master's Thesis Research. 1-6 Credit.
A Master of Science thesis option entails 24 course credits and 6 master’s research credits, namely, ECEG 799. Research undertaken under the thesis option should exhibit a thorough understanding of advanced scientific thought and an ability to apply advanced engineering design principles, and planning.

Environmental Engineering

Dr. Anirban De
Chair, Department of Civil and Environmental Engineering

Dr. Robert Sharp, P.E.
Director, Graduate Program

Mission

The Master of Engineering (Environmental Engineering) and the Master of Science in Environmental Engineering programs are designed to provide engineers and scientists with advanced training in environmental process engineering, water quality assessment modeling, geoenvironmental engineering, and environmental management. Emphasis is placed on both current applications and the underlying theoretical basis for sound engineering practice, in keeping with the societal need for maintaining and improving environmental quality and public health.

Objectives

Educational Objectives for Environmental Engineering Graduate Program state that 'Environmental Engineering graduates will be recognized for (1) their leadership, achievement and involvement in engineering and related professions, through service in private and public agencies and in research and academic institutions; (2) their dedication to enhance the engineering profession through continuous self-improvement; (3) their commitment to working towards engineering a sustainable environment for new York and the world; and (4) their ethical practices and professionalism.

Admission Requirements

Master of Engineering (Environmental Engineering) Degree: Applicants must possess a baccalaureate degree in engineering from a program accredited by the Engineering Accreditation Commission of ABET, Inc., or from a recognized foreign institution. A minimum grade point average of 3.0 is normally required. In addition, applicants must present adequate preparation in two courses in chemistry, one course in calculus-based physics, three courses in calculus, differential equations, and one course in computer applications, statistics, fluid mechanics, a biological science, an earth science, and principles of environmental engineering. These undergraduate courses must be completed with a minimum grade point average of 3.00 with no single course grade lower than a C.

Master of Science in Environmental Engineering Degree: Applicants must possess a baccalaureate degree in engineering or science. A minimum grade point average of 3.0 is normally required. In addition, applicants must present adequate preparation in two courses in chemistry, one course in physics, three courses in calculus, differential equations, one course in computer applications, statistics, fluid mechanics, a biological science or an earth science, and principles of environmental engineering. These undergraduate courses must be completed with a minimum grade point average of 3.0 with no single course grade lower than a C.

Prerequisite courses will not satisfy any requirements for the Master of Science in Environmental Engineering degree. Generally, students must complete all prerequisite

courses before they may register for the designated graduate courses. Exceptions to either the 3.0 minimum undergraduate GPA requirement or the need to complete prerequisites prior to registering for graduate courses may be approved on a case-by-case basis upon the recommendation of the Environmental Engineering Graduate Program Director and the approval of the Dean of Engineering.

Degree Requirements

Master of Environmental Engineering Degree

ABET Accredited Master's of Environmental Engineering Degree requires ME designated students to complete a minimum of thirty credit hours of graduate coursework with a cumulative GPA of 3.0 or better. Below are the course requirements for completion of the ME Degree:

Six (6) Required Courses		**18**
ENVG 505	Surface Water Quality Modeling	3
ENVG 506	Water and Wastewater Treatment Processes	3
ENVG 508	Environmental Chemistry	3
ENVG 739	Experimental Analysis in Environmental Engineering (ENVG 508 Environmental Chemistry)	3
ENVG 718	Biological Treatment Wastewaters	3
ENVG 736	Environmental Advanced Unit Operations	3
Minimum of two additional upper-level engineering design courses from the following:		**6**
ENVG 703	Environmental Fate and Effects of Toxic Contaminants	3
ENVG 704	Advanced Water Modeling Quality	3
ENVG 712	Advanced Geohydrology	3
ENVG 721	Environmental Sustainability: Water Reuse & Resource Recovery	3
ENVG 746	Coastal Engineering	3
Two technical electives may be taken from the courses listed above that were not taken to fulfill other requirements and from those listed below. Other non-ENVG courses may be taken with approval of the Program Director		**6**
ENVG 507	Groundwater	3
ENVG 509	Environmental GeoChemistry	3
ENVG 510	Hazardous Waste Management	3
ENVG 702	Air Quality Analysis	3
ENVG 706	Water Chemistry	3
ENVG 708	Environmental Biotechnology	3
ENVG 710	Environmental Organic Chemistry	3
ENVG 722	Subsurface Bioremediation	3
ENVG 731	Special Topics	3
ENVG 732	Thesis	6
Total Credits		**30**

Master of Science in Environmental Engineering Degree

Students must complete a minimum of thirty credit hours of graduate coursework with a cumulative GPA of 3.0 or better.

Four (4) Required Courses		**12**
ENVG 505	Surface Water Quality Modeling	3
ENVG 506	Water and Wastewater Treatment Processes	3
ENVG 508	Environmental Chemistry	3
ENVG 739	Experimental Analysis in Environmental Engineering	3
Minimum of three upper-level engineering design courses from the following:		**9**
ENVG 703	Environmental Fate and Effects of Toxic Contaminants	3
ENVG 704	Advanced Water Modeling Quality	3
ENVG 712	Advanced Geohydrology	3
ENVG 718	Biological Treatment Wastewaters	3
ENVG 721	Environmental Sustainability: Water Reuse & Resource Recovery	3
ENVG 736	Environmental Advanced Unit Operations	3
ENVG 746	Coastal Engineering	3
Three technical electives may be selected from the courses listed above that were not taken to fulfill other requirements and from those listed below. Up to 2 courses outside the ENVG offerings (ie. CEEN or COMG) may be taken with the approval of the Program Director.		**12**
ENVG 507	Groundwater	3
ENVG 509	Environmental GeoChemistry	3
ENVG 510	Hazardous Waste Management	3
ENVG 702	Air Quality Analysis	3
ENVG 706	Water Chemistry	3
ENVG 708	Environmental Biotechnology	3
ENVG 710	Environmental Organic Chemistry	3
ENVG 722	Subsurface Bioremediation	3
ENVG 731	Special Topics	3
ENVG 732	Thesis	6
Total Credits		**30**

Focus Areas

Focus areas consisting of prescribed, specific courses are available through the environmental engineering graduate program. Unless otherwise noted, courses in these programs may be applied to a Master's of Engineering or a Master's of Science Degree in Environmental Engineering. For a list of focus areas, please go to the Manhattan College website (https://manhattan.edu/academics/graduate-programs/environmental-engineering.php).

Courses

ENVG 500. Modeling of Civil & Environmental Engineering Problems. 3 Credits.
Construction of analytical models that produce the classical formulas of structural, hydraulic, water supply and water and wastewater treatment engineering. Ordinary and partial differential equations, vectors, tensors and matrices, systems of linear equations and boundary value problems. Prerequisites: Differential Equations, Fluid Mechanics, Introductory Solid Mechanics. For seniors and/or graduate students. One three-hour lecture each week.

ENVG 505. Surface Water Quality Modeling. 3 Credits.
Principles governing the transport and fate of contaminants in rivers, streams, lakes and reservoirs. Water quality standards, transport processes, water quality modeling for water-borne disease, dissolved oxygen, and nutrient enrichment. Engineering controls to meet water quality objectives and case studies are presented. Computer solutions to some problems are required.

ENVG 506. Water and Wastewater Treatment Processes. 3 Credits.
Study of the fundamental principles used to treat both drinking water and wastewater. Drinking water treatment principles include Strokes law for particle settling, theory of coagulation and flocculation, porous media filtration, and disinfection. Principles for wastewater treatment include reactor analyses, growth and degradation kinetics for biological oxidation processes anaerobic digestion of complex organics, and hindered and compression settling. Prerequisite: ENGS 204.

ENVG 507. Groundwater. 3 Credits.
Basic principles of groundwater hydrology and subsurface contaminant transport. Construction and use of flow nets; pumping well and aquifer response under confirmed and unconfirmed conditions. Contaminant sources, transport, and retardation; the behavior of nonaqueous phase liquids (NAPLS) in the subsurface. Design of groundwater extraction systems, subsurface cutoff walls, caps, and emerging technologies for soil treatment. Prerequisite: ENGS 204.

ENVG 508. Environmental Chemistry. 3 Credits.
An introduction to the chemistry of natural waters and the atmosphere. The application of the principles of physical and analytical chemistry to the solution of problems related to environmental engineering and science. Includes a unit on relevant properties of organic compounds that are relevant to the environment and public health.

ENVG 509. Environmental GeoChemistry. 3 Credits.
Review of fundamental geologic processes. Solution-mineral equilibria of carbonates and silicates. Surface chemistry at the solution-mineral interface. Relevant phase equilibria, weathering and soils, inorganic and organic sedimentation and diagenesis, isotope geochemistry, and metamorphism.

ENVG 510. Hazardous Waste Management. 3 Credits.
Fundamentals of hazardous waste management and treatment design. Includes review of current hazardous waste regulations, groundwater and air contaminant fate and transport concepts, and risk assessment. Primary focus on the design of treatment processes including air stripping of volatile compounds, soil vapor extraction, adsorption, bioremediation of contained aquifers and soils, and incineration. Emerging treatment technologies will also be presented.

ENVG 702. Air Quality Analysis. 3 Credits.
Basic air pollution concepts; the Clean Air Act; basic meteorology; basic analytical methods and concepts for air quality analysis; the Gaussian Plume Model;Plume Rise; Traffic Impact Analysis; Environmental Impact Analysis and air quality; Airshed Models; Smog and Ozone Models; Indoor Air Quality analysis.

ENVG 703. Environmental Fate and Effects of Toxic Contaminants. 3 Credits.
Principles governing the transport, fate and effect of toxic organic contaminants in surface water systems. Topics include: physical-chemical characterization of toxic organic contaminants; phase behavior and chemical transformation kinetics; sediment contamination and transport; bioaccumulation in aquatic food webs; human and ecological risk assessment; sediment remediation technologies and environmental site remediation. Mathematical solutions and computer models are used throughout the course.

ENVG 704. Advanced Water Modeling Quality. 3 Credits.
Advanced water quality modeling for metals in surface waters and sediments. Topics include: metal speciation; metal binding to natural organic matter; metal binding in sediment; aquatic toxicity; human health effects; chemical speciation-transport modeling; critical loads; metal-sulfide oxidation kinetics; cycling of redox sensitive metals (e.g., As, Cr, Se); Hg cycling and bioaccumulation; acidification of surface waters. Computer modeling based on the Biotic Ligand Model (BLM) and the Tableau Input Coupled Kinetic Equilibrium Transport (TICKET) model will be used throughout the course.

ENVG 706. Water Chemistry. 3 Credits.
Principles of chemical equilibrium are applied to quantitatively describe the chemical composition of natural waters and engineered aquatic systems. These tolls are applied to solve environmental engineering problems related to surface and groundwater quality and water and wastewater treatment. Topics include chemical thermodynamics, acid/base equilibrium, the carbonate system, metal complexation, precipitation/dissolution of minerals and oxidation/reduction reactions.

ENVG 708. Environmental Biotechnology. 3 Credits.
Fundamentals of biotechnology and its applications to environmental engineering. Principles of microbial genetics, microbial ecology and biochemistry and how they relate to biological treatment of water, air, wastewater and hazardous wastes. Biofilm process fundamentals and applications. Molecular methods and their use in the study and analysis of ideal and non-ideal biological systems. Specific applications to public health, bioremediation, biosolids reuse and industrial treatment. Review and evaluation of Advanced water, wastewater and remediation processes that utilize biotechnology. Prerequisite: ENVL 506.

ENVG 710. Environmental Organic Chemistry. 3 Credits.
The structure and nomenclature of relevant organic compounds. Kinetics, fate and transport of xenophobic chemicals in the environment. Important hydrolytic, photolytic, oxidative and reductive reactions. Use of quantitative structure activity relationships (QSARs) in predicting toxicity and related properties of various classes of environmentally active organic compounds.

ENVG 712. Advanced Geohydrology. 3 Credits.
Review of basic principles. Introduction to numerical groundwater modeling; application of Visual MODFLOW to flow and transport modeling. Pumping well and aquifer response under confined, unconfined, and semi-confined conditions. Hydraulic conductivity testing; borehole and surface geophysical methods for site characterization. Prerequisite: ENVL 507.

ENVG 718. Biological Treatment Wastewaters. 3 Credits.
Application of biological processes to all types of water and waste streams including: municipal and industrial wastewater, drinking water, and hazardous waste streams. Treatment processes and models, aerobic, facultative and anaerobic processes, cell synthesis and respiration, oxygen and nutrient requirements. Biological nitrogen removal, enhanced biological phosphorus removal, attached growth systems, bioremediation and process designs. Anaerobic treatment with biogas recovery. Course will also cover process trouble-shooting, and operation and maintenance issues associated with many treatment technologies.

ENVG 721. Environmental Sustainability: Water Reuse & Resource Recovery. 3 Credits.
Fundamentals of wastewater reuse including: State and Federal water reclamation and reuse regulation; municipal, industrial and storm water reuse; public health aspects of reuse; and economics of reuse. Design and operation of specific reuse technologies including membrane systems, advanced oxidation systems, etc. Regulations and technologies addressing beneficial reuse of biosolids and drinking water residuals, including land application and soil conditioning, will also be covered. Finally, the role of water and residuals reuse in industrial, local and global sustainability will be addressed. Prerequisite: ENVL 506.

ENVG 722. Subsurface Bioremediation. 3 Credits.
Fundamentals of sub-surface processes, abiotic and biotic, which contribute to the bioremediation of common subsurface contaminants including petroleum hydrocarbons, chlorinated solvents, nitroaromatics, heavy metals and redionuclides. Areas of study will include multi-phase flow, convective transport, sortion/desorption, phase partitioning, as well as microbal ecology, biodegradation kinetics, biomass growth and degradative metabolisms. Specific examples of intrinsic and engineered bioremediation of aromatics and chlorinated solvents will be included. The course will utilize a text book, web-based tutorial material and three interactive bioremediation spread-sheet based models. The course will meet only three times during the semester; all other correspondence will be carried out via email. Prerequisite: ENVG 506, ENVG 507.

ENVG 730. Seminar. 1 Credit.

ENVG 731. Special Topics. 3 Credits.
Guided study of approved advanced topics related to environmental engineering or science.

ENVG 732. Thesis. 1-6 Credit.
A technical paper under faculty supervision based upon original study or research, an original design, or a thorough analysis of an existing or proposed system of either a scientific or engineering nature.

ENVG 736. Environmental Advanced Unit Operations. 3 Credits.
Advanced study of the processes used for water treatment and purification with an emphasis on design principles and process modeling. Processes covered include carbon adsorption, ion exchange, chemical oxidation of inorganic and organic chemicals, disinfection using chlorine, ozone and ultraviolet light, strategies for control of disinfection byproducts, and chemical precipitation. Spring: Prerequisite ENVG 506.

ENVG 739. Experimental Analysis in Environmental Engineering. 3 Credits.
This course is an advanced laboratory covering principles of modern experimental and analytical techniques and their applications to problems in environmental engineering. Topics include the measurement of water quality parameters, determination of contaminant partition coefficients and kinetics of transformation reactions in the environment. Prerequisite: ENVG 705.

ENVG 740. Advanced Hydraulic Design. 3 Credits.
Introduction to advanced concepts in hydraulic design. Use of computer software to analyze and design stormwater, sanitary sewer and water distribution systems. Hydraulic analysis of a river using HECRAS. A project-oriented design course. This course utilizes EPA SWIMM and EPANET software, and Corps of Engineers HECRAS software.

ENVG 741. Special Topics. 3 Credits.

ENVG 746. Coastal Engineering. 3 Credits.
This is an introductory course in coastal engineering. It blends environmental and civil engineering topics and has a strong focus on design. Topics covered include: Tides, Waves, Storm Surge, Shore Protection, Breakwaters, Harbors, Beach Protection, Sediment Transport, Beach Restoration, Floodwalls, Levees.

Mechanical Engineering

Dr. John C. Leylegian
Chair, Department of Mechanical Engineering

Dr. Bahman Litkouhi, P.E.
Director, Graduate Program

Mission

The Master of Science in Mechanical Engineering degree program is designed to provide a contemporary, educational experience beyond that of undergraduate education characterized by high academic standards, reflection on values and principles, and preparation for a lifelong career. It is intended to prepare individuals for advanced technical positions or for admission to doctoral programs.

Objectives

The objectives of the program are:

- To provide graduate students with in-depth knowledge and practices in mechanical engineering related to a chosen area of specialization.
- To develop an appreciation of how mechanical engineering is practiced in the modern engineering environment with an emphasis on communication skills and professional behavior and procedures.
- To inspire the students to become life-long learners by providing them with the tools to explore and research a topic independently and systematically.

Admission Requirements

Applicants must possess one of the following:

1. A baccalaureate degree in mechanical engineering from a program accredited by the Engineering Accreditation Commission of ABET, Inc., or from a recognized foreign institution.
2. A baccalaureate degree in another area of engineering, physics, or mathematics.

Applicants who have a baccalaureate degree in another area of engineering, physics, or mathematics may be admitted into the program provided they complete undergraduate prerequisites specified by the Department Graduate Program Director. These courses must be completed with a minimum grade point average of 3.00 with no grade lower than C. These courses will not satisfy any requirements for the Master of Science in Mechanical Engineering degree.

Generally, students must complete prerequisite courses before they are permitted to register for graduate courses. Exceptions require the recommendation of the Graduate Program Director and the approval of the Dean of Engineering.

Degree Requirements

A student must complete a minimum thirty credit hours of graduate coursework, including ENGG 614 Engineering Mathematics. Except for students enrolled in the Seamless

Master's program, a maximum of four 500-level courses may be credited to the MS degree. Students enrolled in the Seamless Master's program may receive credit for a maximum of five 500-level courses. Either MECG 742 Advanced Study: Mechanical Engineering or MECG 748 Thesis in Mechanical Engineering may be undertaken by a student who has successfully completed nine credits as a matriculated graduate student. A proposal approved by the Graduate Program Director is required before a student may register for either of these courses. Electives may also be selected from Graduate Core courses with the advice and approval of the Graduate Program Director.

Concentration Programs

Concentration programs, which consist of prescribed courses in a specific concentration area, are available through the Mechanical engineering graduate program as follows: **Biomechanics**, **Engineering Management**, **Energy Systems**, **Nuclear Power**, **Green Building Engineering, Aerospace/Propulsion, Systems/Control,** and **Solid Mechanics/Design**. Unless otherwise noted, courses in these programs may be applied to a Master's of Science Degree in Mechanical Engineering. While approval of the Graduate Program Director is required to enroll in a graduate course, admission to the Graduate Program is not required to participate in a Concentration Program. It is expected, however, that individuals desiring to take graduate-level courses in a Concentration Program will have a baccalaureate degree in either an engineering field, a science or applied science field, or mathematics, and will meet the pre-requisite requirements of the courses they wish to take in a Concentration Program. Specific information regarding Graduate Mechanical Engineering Concentrations is available on the Mechanical Engineering website. (https://manhattan.edu/academics/graduate-programs/mechanical-engineering.php)

Courses

MECG 512. Energy Conversion. 3 Credits.
Overview of thermodynamic concepts, application of first and second laws of thermodynamics to improve efficiency of gas turbines and power generation systems, combustion of hydrocarbon fuels, reacting systems, conventional and innovative energy conversion applications such as solar, wind, wave, tidal, ocean thermal, and geothermal energy. Three credits.

MECG 513. Introduction to Nuclear Power Plant systems. 3 Credits.
Study of current in-service nuclear plant design, including nuclear plant reactor, reactor auxiliaries, secondary steam plant, and electrical systems; review of the design bases for major systems and components in current operating nuclear plants; evaluation of how the systems function in an integrated fashion. Case studies are used to explore historical engineering and operational issues. New vendor nuclear plant designs are explored and compared to current designs. Three credits.

MECG 515. Energy Dynamics of Green Building I. 3 Credits.
The course emphasizes understanding the impact that various environmental systems have on the building design and operation process. Site and climate analysis will be the starting point for defining performance criteria of the built environment. Students will be introduced to analysis tools for interpreting weather data and the fundamentals of occupant comfort. Criteria used to define internal environmental conditions will be discussed as design goal to which all building elements must strive to achieve through systems integration. Three credits.

MECG 516. Turbomachinery. 3 Credits.
Review of fundamentals of fluid mechanics, dimensional analysis in fluid machinery; classification and characteristics of fluid machinery (positive displacement, radial, mixed flow and axial); efficiencies; incompressible flow machines (pumps and hydraulic turbines); cavitation; compressible flow machines (compressors and gas turbines); choking and surge.

MECG 525. Analysis and Design Hvac Systems. 3 Credits.
Indoor air quality and human comfort, economy and environmental protection requirements. Heating and cooling loads. Introduction to equipment selection and system analysis.

MECG 528. Combustion Systems. 3 Credits.
Basic Cycles for spark ignition and compression ignition engines. Combustion chemistry, flame temperataures, fuels and heating values. Actual versus ideal cycles, equilibrium charts, knock and engine variables. Mechanics of spark ignition and compression ignition engines.

MECG 531. Introduction to Biomechanics. 3 Credits.
Fundamental concepts and analysis of the engineering associated with human biology. Basic ideas of molecular biology, cell structure and function will be presented along with the mechanics of biological materials: ligament, muscle, and bone. Organ operation will then be examined from an engineering perspective, and will specifically address heart and lung operation. Body dynamics will also be addressed via the examination of walking gait and muscle dynamics. Finally, the engineering involved with the design and operation of artificial joints will be studied along with the instrumentation employed in bioengineering such as bio-imaging. Three credits.

MECG 536. Applied Biofluid Mechanics. 3 Credits.
The efficient flow of water-based liquids and a number of gases in the human body is essential to life. In this course, the principles of fluid mechanics are applied to the solution of a variety of biological flows; such as, blood flow in large arteries and in the capillary bed, and air flow in the lung. Diseases caused by the interruption of normal flow patterns are also considered. Both analytical and numerical solution methods are discussed. Three credits.

MECG 541. Special Topics. 3 Credits.

MECG 542. Data Driven Problem Solving in Mechanical Engineering. 3 Credits.
This course focuses on the implementation of data analysis to provide optimum solutions to engineering problems. The course will discuss how to; 1) visualize and classify information, 2) identify problems using data analysis and machine learning tools, 3) provide possible solutions and predict outcomes for engineering problems using data mining, and 4) design products and structures informed by data. A broad range of applications within mechanical engineering will be discussed. Three credits.

MECG 546. Manufacturing Engineering. 3 Credits.
Group projects emphasizing design for manufacturing, manufacturing system simulation, and prototype fabrication. Concurrent with projects are lectures on modern manufacturing technologies. Includes a two-hour laboratory.

MECG 548. Introduction to Robotics. 3 Credits.
The geometry and mathematical representation of rigid body motion, forward and inverse robot kinematics, robot dynamics, trajectory generation, position sensing and actuation, and the control of manipulators. Three credits.

MECG 551. Vehicle Dynamics. 3 Credits.
The focus of this course in Vehicle Dynamics are: Vehicle Subsystems, Ride, and Handling. A fundamental understanding of these areas is provided through the development, analysis and critical interpretation of vehicle models. Passenger comfort and vibrations are analyzed for vehicle ride. Suspension systems and their optimization are discussed for a quarter car model. Dynamic behavior of a vehicle on the road is analyzed for vehicle handling, with emphasis on numerical simulations using planar and rolling models. The course has a term project which involves multi-body dynamic simulations via the use of modern software. Three Credits.

MECG 605. Flight Mechanics. 3 Credits.
The operation of an aircraft as a function not only the wing but also the engine operating characteristics and overall aircraft parameters. This course develops the analysis needed to calculate flight envelop characteristics, take-off and landing parameters, engine/wing matching requirements, and basic conceptual aircraft design protocols. Three credits.

MECG 606. Design of Aerospace Structures. 3 Credits.
This course covers solid mechanics and material issues associated with the design of an aerospace structure. Students will learn how the structure of aircraft and spacecraft are designed and manufactured and how safety is incorporated at every stage. Students will also receive what are the particular structural material choices that should be made in design. Specifically, fracture mechanics and fatigue failure issues due to cyclical stresses will be reviewed. The safety philosophies used in aerospace structural design, and how they affect design choices will also be discussed. Three Credits.

MECG 608. Introduction to Aerodynamics. 3 Credits.
Pressure distribution and forces on aerodynamic shapes are predicted by using potential flow theory. Incompressible, potential flow governing equations are derived. Equations representing uniform flow, vortices, and potential flow sources are developed, and used to study velocity and pressure fields in some common external flows including airfoils. The study of boundary layers and how they affect the performance of lifting surfaces will be covered. Additionally, a panel method computer code is developed to predict pressure distribution and lift and drag forces on an arbitrary airfoil. Three Credits.

MECG 612. Alternative Energy Systems. 3 Credits.
Second Law of Thermodynamics; discussion of systems which are not limited by heat engine efficiencies. Stirling Engines. Thermoelectric systems; electrochemistry, batteries and fuel cells. Solar energy; solar thermal and photovoltaic energy systems. Lenz's Law, magneto-hydrodynamics. Wind power, horizontal and vertical wind turbine designs. Geothermal energy systems. Three credits.

MECG 613. Nuclear Reactor Theory and Design. 3 Credits.
An in-depth study of reactor operation and design principles; fundamentals of radiation; radiation decay; binding energy; types of interactions; shielding; radioisotopes; fission cross section; fission in a reactor as a method of generating heat; controlling fission chains; basic reactor model design principles; reactor theory; heat transfer with regards to reactor coolant and reactor fuel; reactor design safety; and nuclear reactor control including important parameter measurements on sub-critical and critical reactors. Three credits.

MECG 614. Energy Management. 3 Credits.
Energy Management examines the fundamental theories behind energy, energy conversion, fuels, power production, district energy systems, cogeneration, trigeneration, delivery systems, regulations, economics, and markets. Energy management assesses the engineering, economic, social, political, and environmental considerations of the processes, regulation, planning, and development for the energy and utility industry. Students will gain reinforcement in energy transfer and power production as well as be exposed to a first-hand experience of the economic, environmental, and regulatory considerations involved with fuel, power, and emerging technology via class projects.

MECG 615. Energy Dynamics Green Buildings II. 3 Credits.
In this course students will be engaged in the design of the building systems through a process that views systems as complete assemblies with design relationships to other systems (man made and natural/internal and external). The content of the course will emphasis the tectonic aspects of architecture; however, other aspects such as the technology and methods for maintaining comfort conditions and ecological balance within the buildings will be reviewed with an emphasis on high performance sustainable design, human comfort, social responsibility, ecology, and sustainability. Issues associated with LEED certification will be addressed; energy system analysis programs will be used to optimize a building performance. Three credits.

MECG 617. Solar Energy Sys Theor&Desgn. 3 Credits.
Study of solar energy systems with emphasis in solar heating and cooling of buildings; design of various types of solar collectors using different materials, working fluids, and geometries; energy storage systems for solar assisted heat pumps; use of solar energy in power generation. Three credits.

MECG 621. Advanced Mechatronics. 3 Credits.
This course is designed to provide students with the knowledge and experience to design and build mechatronic systems. The course covers basic transducer operation, controller design and programming, a-to-d and d-to-a issues, and motor selection and use. The course also introduces the students to basic programmable logic controller (PLC) systems and ladder logic.Pre-Req:MECH312.

MECG 627. Applied Solid Mechanics. 3 Credits.
Techniques are developed that allow the analysis of general continuous materials. In particular, these methods will be used to study issues associated with biological materials, metallic creep, and the visco-elastic behavior of polymers. A simplified version of the analysis is then used to study the stresses and strain in linearly elastic materials to allow the study of MEMS. Finite element techniques are also developed to allow general nonlinear problems to be solved. All of this material is used to study a specific engineering scenario via a class project. Three credits.

MECG 630. Control Sys Theor&Applictions. 3 Credits.
System model formulation; transfer functions and block diagrams; linear control and feedback systems; root-locus method will be covered along with control hardware and schematic diagrams. Case studies and applications to various engineering systems will be used to introduce students to the principles of control system design. Three credits.

MECG 631. Biomechanics Modeling and Applications. 3 Credits.
A rigorous examination of the various components of the human body is covered. These include structural elements such as bones, ligaments, muscles, and the brain. The mechanical properties and behavior of these materials are studied with emphasis being placed on the response of these materials to different loading scenarios. Also, fluid mechanic elements such as the cardio-vascular system and the respiratory system are examined to characterize the interaction between the fluid and organ operation. Particular attention will be paid to the modelling of different parts of the human body via FEA/CFD analysis using nonlinear behavior and material properties. Three credits.

MECG 642. Artificial Intelligence Applications in Mechanical Engineering. 3 Credits.
This course will familiarize students with a broad cross-section of models and algorithms in this field. The course will discuss classification algorithms and regression and clustering techniques. The course will include several examples of engineering problems such as Design of Machine Elements, Biomechanics, Additive Manufacturing and 3D printing and Autonomous Vehicles. Three credits.

MECG 676. Sustainable Materials Selectn. 3 Credits.
The first half of the class covers basic material selection issues such as material characteristics, and behavior for all types of engineering materials (metals, polymers, ceramics/glasses, and composites), along with how they fail and respond to environmental conditions (e.g. corrosion). In the second half of the class attention will be paid to material selection with particular emphasis being placed on ecological considerations such as recycling, reusability, carbon footprints, and pollution issues. Three credits.

MECG 701. Viscous Flow Theory. 3 Credits.
Development of the Navier-Stokes equation; solutions for special cases. Dimensionless forms; low and high Reynolds number forms. Boundary layer theory (similarity solution); Application to flow over a flat plate, and flow in ducts. Introduction to potential theory.

MECG 702. Compressible Flow. 3 Credits.
Linearized sub- and supersonic flow past slender bodies. One- and two-dimensional and axisymmetric flows, including normal and oblique shocks. Similarity laws. Method of characteristics.

MECG 704. Computational Fluid Mechanics. 3 Credits.
Study of numerical methods in fluid mechanics including: finite differencing, numerical errors and stability, nonlinear convection terms, boundary conditions, and turbulence.

MECG 706. Advanced Engineering Thermodynamics. 3 Credits.
First and second law analysis of engineering systems; exergy and irreversibility; equations of state and properties of working fluids, including real gases; thermodynamics of chemically-reacting systems; multi-phase and multi-component systems in thermodynamic equilibrium. Three credits.

MECG 707. Conduction Heat Transfer. 3 Credits.
Development of basic equations of heat conduction; analytical and numerical solutions of transient and steady state temperature distributions in solids; applications involving heat generation and varying physical properties. Computer projects.

MECG 708. Convection Heat Transfer. 3 Credits.
Continuity, momentum, and energy equations for engineering fluids; exact and approximate solutions for laminar and turbulent flows; free and forced convection, boiling and condensation; selected applications.

MECG 709. Radiation Heat Transfer. 3 Credits.
Black body and non-black surface radiation; radiative properties of real materials; configuration factors; multi-face radiation exchange in enclosures; radiative transfer in participating and radiative properties of gases; application to problems involving convection and radiation.

MECG 714. Computer Aided Engineering. 3 Credits.
Advanced applications of computer aided engineering software. Topics covered will include FE analysis (with applications in solid, thermal, and fluid mechanics), buckling, endurance, vibration analysis, dynamic modeling, and manufacturing simulation. Computer optimization techniques and practical applications will also be covered. Several class projects will be given using software packages such as NX, Abaqus, and Comsol. Three credits.

MECG 720. Robotics and Automation. 3 Credits.
Introduction to robotics and automation; flow-line production; numerical control and CAD/CAM; group technology and flexible manufacturing systems; robotic industrial application; robot decision making; programmable robotic automation.

MECG 734. Operation Research. 3 Credits.
Presentation of the analysis associated with managing manufacturing operations. Topics covered will be decision-making, forecasting, materials requirement planning, queuing, project management, and aggregate planning.

MECG 735. Theory of Vibration. 3 Credits.
Concepts underlying the dynamics of vibrations for single-degree of freedom and multi-degree of freedom mechanical systems, the use of Newtonian, virtual-work, and Lagrangian variation methods for analyzing vibrating systems for transient, steady state, and forced single and multi-degree of freedom linear system, an introduction to non-linear systems, and the use of numerical and simulation techniques. Three credits.

MECG 736. Design Machine Elements. 3 Credits.
Strain energy method for analyzing statistically indeterminate machine members; theories of failure; fatigue; optimum design of machine elements; stress waves and impact loading, critical speed. Finite element modeling of various machine members.

MECG 738. Advanced Dynamics. 3 Credits.
Kinematics, formulation of equations of motion for a particle, system of particles and rigid bodies, holonomic conservative and non-conservative systems, work-energy principles, three dimensional motion of rigid bodies, Lagrangian methods, and the Hamilton methods. Three credits.

MECG 741. Special Topics: in Mechanical Engineering. 3 Credits.
Special topics in mechanical engineering of current interest to graduate students; subject matter will be announced in advance of particular semester offering.

MECG 742. Advanced Study: Mechanical Engineering. 3 Credits.
Individual study of a selected topic in mechanical engineering under the supervision of a faculty member. Prerequisite: Advisor's approval of topic.

MECG 744. Seminar. 1 Credit.

MECG 746. Research Project in Mechanical Engineering. 3-6 Credit.
Research project under the supervision of a faculty member. A project proposal, approved by the faculty advisor and the graduate program director, must be submitted. A final written report and oral presentation are required. May be extended to thesis with faculty advisor’s recommendation and the approval of the Graduate Program Director. Variable credits(3-6).

MECG 748. Thesis in Mechanical Engineering. 6 Credits.
Original investigation or design in field of mechanical engineering; topic is to be chosen by student with approval of faculty advisor and the graduate program director; written report and oral presentation required. Prerequisite: Advisor’s approval of topic. Six credits.

Graduate Engineering Core Courses

Dr. Tim J. Ward, P.E.
Dean of Engineering

The Graduate Engineering Core Courses (ENGG) are general engineering courses at the graduate level. These allow students in all engineering graduate programs to enroll in courses designed to span a variety of engineering disciplines which emphasize interdisciplinary approaches to the engineering course material.

Engineering -Graduate Courses

ENGG 602. Internship for Engineering Graduate Students. 1-3 Credit.

ENGG 610. Numerical Methods in Engineering. 3 Credits.
Formulation of numerical techniques for solution of engineering problems; typical subject material includes linear and nonlinear equations, systems of equations, boundary value and initial value problems in ordinary and partial differential equations, matrix algebra, etc. Applications from various engineering disciplines are emphasized and computer solutions stressed. Prerequisite: Permission of the Instructor.

ENGG 611. Solar Energy Systems. 3 Credits.
Study of solar energy systems with emphasis on solar heating and cooling of buildings, design of various types fo solar collectors using different materials, working fluids and geometries'energy storage systems for solar assisted heat pumps, use of solar energy in electricity generation.

ENGG 612. Finite Element Methods. 3 Credits.
Derivation of element equations using direct, variational, and residual methods; multidimensional problems in the steady state and transient domains; use of general purpose finite element computer programs; applications from a variety of engineering disciplines. Prerequisite:Permission of the Instructor.

ENGG 614. Engineering Mathematics. 3 Credits.
Mathematical formulation of problems of importance to engineering; solutions of ordinary and partial differential equations; mathematical series and orthogonal functions and their applications; matrix algebra; applications from a variety of engineering disciplines are emphasized. Prerequisite: Permission of the Instructor.

ENGG 620. Applications of Instrumentation and Data Acquisition. 3 Credits.
Operation, application, and selection of engineering instruments for measuring common engineering variables, e.g. position, velocity, temperatures, pH, force, pressure, strain, flow rate, light intensity, concentration, etc; sensors, data acquisition and processing. Output devices, including logic and actuator operation and selection. Computer-based data acquisition and automated analysis are considered.

ENGG 630. System Control. 3 Credits.
Formulation of process models; transfer functions; multivariable systems; linear control and feedback systems; stability; steady state optional control; adaptive control; applications from a variety of engineering disciplines. Prerequisite: Permission of the Instructor.

ENGG 632. Modern Engineering Computations. 3 Credits.
Applications of contemporary computer software to increase speed, improve comprehension, and enhance presentation; of results when analyzing, modeling and solving a wide variety of engineering problems in various branches of engineering and computer science. Prerequisite: Permission of the Instructor.

ENGG 640. Information Processing and Technology. 3 Credits.
Examination of the technological issues, including design of integrated engineering information systems and environments. Topics to be taken from: the computer as an organizational information system; computer-based information system; manufacturing information systems; the virtual office; databases and database systems; knowledge-based systems; technology and role of the internet in integrated engineering information systems; organizational system theory and methodologies.

ENGG 650. Engineering Economics. 3 Credits.
Techniques for estimating investment and operating expenses; profitability analysis including depreciation and taxes in cash flow; methods for comparing alternate investments; market estimation and location efforts; application from a variety of engineering disciplines.

ENGG 651. Principles in Public Health. 3 Credits.
This course will cover basic principles in public health with emphasis on topics for engineering professionals. Fundamental concepts in the core public health sciences of epidemiology and biostatistics, as well as publice health biology and toxicology, will be presented. Applications of these principles to issues of human exposure to environmental agents and the role of the engineering disciplines will be examined. Human health risk assessment and the implications on regulatory policy will be discussed. Three credits.

ENGG 652. Project Management. 3 Credits.
Study of the content, planning, and control of an industrial project; comparison of functional management and project management, the role of the Engineering Manager, project organization structures, project planning, use of critical path methods and project control; emphasis on the project management concept and its applicability to a wide range of industrial projects; the case study method is used to examine a variety of specific management issues, e.g. staffing, controlling and directing the project, identifying and resolving critical issues, anticipating and solving team personnel problems, etc.; various managerial decision tools and project control methods, such as CPM and PERT are discussed.

ENGG 653. Statistical Decision Making. 3 Credits.
Methods dealing with the collection, tabulation, summarization, and presentation of data. Inferential statistics; reaching conclusions and making estimates about populations based upon sample information. Hypothesis testing is explored as a basis for decision-making. Design experiments to learn more about the natural world and how to model physical relationships. Engineering quality into a product.

ENGG 654. Quality Management for Engineers. 3 Credits.
Methods for improving the quality of engineered products and processes. Total Quality Management (TQM), Quality Function Deployment (QFD), Concurrent Engineering, Basic Statistics, Acceptance Sampling, Statistic Process Control (SPC), Reliability, Taguchi Techniques, introduction to Quality Assurance.

ENGG 656. Engineering Optimization. 3 Credits.
Introduction to optimization problems; mathematical preliminaries; unconstrained nonlinear optimization; one-dimensional search methods; equality and inequality constrained nonlinear optimization; linear programming; engineering applications to cost minimization, optimum system design and operation.

ENGG 658. Legal Aspects of Engineering. 3 Credits.
Basic legal doctrines, professional-client relationship, design and practice problems. Fundamental concepts of contract law. Topics include American judicial system, contracts, quasicontracts, agency, licensing, client obligations, construction process, licensing, client obligations, construction process, liability of engineers, copyrights, patents and trade secrets.

ENGG 660. Engineering Ethics. 3 Credits.
Ethical issues in engineering are examined such as whistle blowing, computer ethics, employer/employee relationship and responsibilities, use of technology and the environment, public safety, codes of ethics. Case studies are emphasized.

ENGG 670. Pollution Prevention. 3 Credits.
Regulations, advantages and disadvantages of pollution prevention: EPA'S pollution prevention hierarchy, including source reduction, recycling, control and ultimate disposal; Multimedia approaches and total systems analysis of pollution prevention options; applications to specific processes and industries from various engineering disciplines.

ENGG 672. Accident and Emergency Management. 3 Credits.
Engineering process safety, including emergency planning and response; fires, explosions and other accidents; dispersion fundamentals, applications and analysis; hazard and risk assessment; legal considerations; examples from various engineering disciplines. Three credits.

ENGG 674. Green Engineering Design. 3 Credits.
Multi-disciplinary considerations and techniques for greener engineering design; historical perspective of the industrial revolution and the impacts of industrialization; industrial revolution and the impacts of industrialization; industrial activity and the environment, including energy usage and resource depletion; improved industrial and municipal (POTW) operations, including process design and development; green engineering economics, including life cycle cost assessment; design for the environment, including waste prevention, water and energy conservation and packaging; wastewater treatment, air pollution and fugitive emissions control, and solid water disposal methods; and, sustainable development and the role of engineers.

ENGG 676. Sustainable Material Selection. 3 Credits.
The first half of the class covers basic material selection issues such as material characteristics, and behavior for all types of engineering materials (metals, polymers, ceramics/glasses, and composites), along with how they fail and respond to environmental conditions (e.g. corrosion). In the second half of the class attention will be paid to material selection with particular emphasis being placed on ecological considerations such as recycling, reusability, carbon footprints, and pollution issues.

ENGG 678. Sustainable Energy. 3 Credits.
Options for sustainable energy utilization are discussed with regard to the current state of the technology, the opportunities for future development and the potential environmental and economic impact. This course will focus on specific renewable energies and sustainable energy solutions, such as, solar energy, utilization of wind power, geothermal and oceanic thermal processes, hydroelectric tidal and wave technologies, biofuels, and a systems approach to sustainable energy solutions. Pre-requisite: Consent of Instructor.

ENGG 679. Modeling Sustainable Energy Systems. 3 Credits.
This course covers modeling of sustainable energy utilization and will complement the content of Sustainable Energy (ENGG 678). Modeling tools such as ASPEN-HYSYS, STELLA-Silver or Gold, and EXCEL are used to assess the current state of the technology, opportunities for future development and potential environmental and economic impact. Case studies will be developed and evaluated in the course, thus. The technologies modeled will be fermentation, reforming, partial oxidation, Fischer-Tropsch synthesis, methanation via Sabatier and combustion. This course will also focus on computer modelling of specific renewable energies and sustainable energy solutions, such as, solar energy, utilization of wind power, geothermal and oceanic thermal processes, hydroelectric tidal and wave technologies, biofuels, using a systems approach to sustainable energy solutions. Prerequisite: Consent of Instructor. Recommended Prerequisites CHML 209, CHML 305, CHML 306, ENGS 116., ENGG 678.

ENGG 680. Advanced Strength of Materials. 3 Credits.
Stresses in multidimensions; symmetrical and unsymmetrical bending; shear center; curved beams; beams on elastic foundation; beam columns; thin plates; torsion of noncircular sections; thin walled cylinders; general and symmetric bending of straight bars, curved beam and plates; applications from several engineering disciplines. Prerequisites: Undergraduate solid mechanics course.

ENGG 682. Applied Heat Transfer. 3 Credits.
Topics in process heat transfer including: steady state and transient conduction, free and forced convection, radiation and combined models, heat transfer with phase change; applications come from a variety of engineering disciplines and can include: design and rating of various heat exchangers, condensers and evaporators; heat pipes; solar collectors; electronic cooling, etc. Prerequisite: Undergraduate heat transfer course.

ENGG 695. Advanced Topics: in Engineering. 3 Credits.

ENGG 696. Spl Tpc:. 3 Credits.
Topics of current interest to graduate engineering students. Subject matter will be announced in advance of semester offering.

ENGG 700. Creativity & Innovation. 3 Credits.
This course invites each student to learn some of the early work in innovation and creativity while exploring their own creativity skills. Being mindful of a diversity of possible majors within the student body, each is asked to consider innovation and creativity within their own major as well as in general.Through this course, students will enhance their skills in creativity and innovative problem solving and thinking with an aim to increasing the originality of their ideas and thereby help generate and sustain high levels of innovation both in a start-up and corporate environments. In addition, the course will lay the foundation of the basic principles of innovation management, open innovation and design thinking, a key cornerstone of evolving corporate innovation strategies.Students in this course will be expected to submit a special topic assignment. Pre-requisite: Permission from Instructor.

ENGG 741. Special Topic: in Mechanical Engineering. 3 Credits.

Engineering Calendar*

2020 Fall Semester

Month	Date	Day	Event
August	31	Monday	Classes Begin
September	07	Monday	Late Registration & Add/Drop Ends
September	07	Monday	Labor Day Holiday – No Classes
September	15	Tuesday	Senate Meeting
October	12	Monday	Fall Break – No Classes
October	13	Tuesday	Monday Schedule
October	20	Tuesday	Mid-Term Grades Due
October	20	Tuesday	Senate Meeting
November	02	Monday	Web Registration Begins -Spring 2021
November	17	Tuesday	Senate Meeting
November	20	Friday	Last day to withdraw from courses
November	25-27	Wed-Fri	Thanksgiving Holiday – No Classes
December	11	Friday	Last Day of Classes
December	14-19	Mon-Sat	Finals Week– Winter Recess Begins after Last Examination
December	21	Monday	Fall 2020 Online Grading closes

2020-2021 Winter Intersession

Month	Date	Day	Event
December	21	Monday	Classes Begin
December	24 - 31	Thu-Thu	Christmas Break-College Closed
January	01	Friday	New Year's Holiday-College Closed
January	15	Friday	Last Day of Winter Intersession

2021 Spring Semester

Month	Date	Day	Event
January	20	Wednesday	Classes Begin
January	26	Tuesday	Late Registration & Add/Drop Ends
February	02	Tuesday	Deadline for Faculty to submit grades for Fall 2020 incompletes
February	08	Monday	Deadline for Faculty to submit grades for Fall 2020 incompletes
February	16	Tuesday	Senate Meeting
March	11	Thursday	Mid - Term Grades Due
March	15-19	Mon-Fri	Spring Break
March	16	Tuesday	Senate Meeting
April	01-05	Thurs-Mon	Easter Holiday - No Classes

April	06	Tuesday	Web Registration begins for Fall 2021
April	07	Wednesday	Monday Schedule
April	07	Wednesday	St. De La Salle Day: The Feast of St. John Baptist de la Salle, Patron of Teachers
April	20	Tuesday	Senate Meeting
April	21	Wednesday	Last day to withdraw from courses
May	07	Friday	Last Day of Classes
May	08-09	Sat-Sun	Reading Days
May	10-15	Mon-Sat	Finals Week
May	16-20	Sun-Thurs	Senior Days
May	17	Monday	Summer Session I Begins
May	18	Tuesday	Spring 2021 Online Grading Closes at 12 noon
May	19	Wednesday	Spring Commencement (GM & SCPS Division)
May	21	Friday	The 179th Undergraduate Commencement
June	29	Tuesday	Deadline to submit incomplete work to Faculty for Spring 2021
July	05	Monday	Deadline for Faculty to submit grades for Spring 2021 incompletes

2020 Summer Sessions

Month	Date	Day	Event
May	17	Monday	Summer Session I begins
July	02	Friday	Summer Session I ends
July	06	Tuesday	Summer Session II begins
August	23	Friday	Summer Session II ends

**Manhattan College reserves the right to make changes as circumstances require.*

School of Science

Dr. Janet McShane
Interim Dean, School of Science

Mission

The mission of the School of Science is to help our students to see, to know and so, to act.

To see the invisible world through the lens of a microscope or telescope; to see in the extended laboratory of New York City and the problems, opportunities and rich culture of urban life; to see — with a global perspective — the world grown both smaller through communications and more complex through cultural differences; and to see their place and responsibilities in a world of conflicting moral and ethical claims: this is our mission.

To know by developing the faculty of critical thinking and clear writing and speaking; to know by acquiring the research techniques to find information rapidly and efficiently; to know in cooperation with teachers who pay individual attention to students; to know not only the network of the core curriculum with courses in humanities, natural science, behavioral and social science; and to know not only the how but also the why: this is our mission.

And finally, to act, to do, to follow in a long line of Manhattan graduates who have made a difference in a wide variety of careers in the public as well as the private sector, and to bring into the world of the future a sense of integrity, honesty and values supported and strengthened at Manhattan College: this is our mission.

Degree Programs

The School of Science currently offers one MS degree through the Department of Computer Science and two different MS degrees through the Department of Mathematics - an MS in Applied Mathematics - Data Analytics and an MS in Mathematics.

The School of Science also offers an Advanced Certificate in Applied Mathematics - Data Analytics.

The MS in **Computer Science** program is designed for students interested in pursuing computer science theoretically as well as practically at an advanced level.

Overall, there is a large and continuously growing demand for master's level computer science professionals in the State of New York and across the country. The program will extend well beyond knowledge acquired at the undergraduate level. The program will prepare students to enter the computer-related industry directly after graduation or to continue their educational path to a Ph.D. The curriculum is designed to allow students to develop their skills needed to achieve leadership positions in industry, business, and government or related fields, where computer science has become an important tool.

The coursework in the program represents a realistic balance between fundamental computer science theory and cutting edge modern computing techniques and technologies. Students will master methods of algorithm design and their analysis, networking, databases, and operating systems. Students will have also an excellent

opportunity to explore cutting edge areas, which are currently in high demand, such as cryptography and security, cloud computing, neural networks, and machine learning, artificial intelligence, embedded systems, Linux kernel programming, image analysis, and data mining.

Students entering the program should have at least 18 credits of undergraduate computing courses, including at least 6 credits of computer programming, data structures, operating systems, software engineering, and at least one senior-level elective course in a modern computing area. They should also have at least 12 credits of mathematics, which must include at least 6 credits of calculus and may include discrete mathematics, probability/statistics, linear algebra, and numerical methods.

This program is also available as a seamless 5-year BS-MS.

The MS in **Applied Mathematics-Data Analytics** program is designed for students with a strong background in mathematics and a major in a quantitative field who wish to prepare for careers in industry, business, government, or for further study at the doctoral level. It is a particularly good fit for students who want to transition into data analytics and data science careers. The curriculum emphasizes the application of mathematics and programming with open-ended course projects. The courses combine theory and application striving to give students practical tools with the understanding to make them useful.

Applicants should possess a degree in a STEM or quantitative discipline, some exposure to computer programming, and have the desire to learn mathematical and computational methods to apply them to real-world problems. The prerequisites for the program are multi-variable calculus, probability or calculus-based statistics, linear algebra, and a programming class.

Students will typically complete the program in 3 semesters plus 1 internship or research project during summer. Students may pursue the program part-time and courses are scheduled to accommodate students who work full time.

This program is also available as a seamless 5-year BA or BS-MS.

The MS in **Mathematics** program is for individuals who hope to pursue a Ph.D. in Mathematics or a related discipline, or who wish to teach mathematics in a community college. Students in the program will complete course work in foundational areas of pure mathematics: linear and abstract algebra, real and complex analysis, topology, and probability-statistics. Electives may be chosen to deepen the applicant's knowledge in preparation for study at the Ph.D. level, for breath including applications, and may include research. A thesis option is available for those who wish to do research.

Entering students should have seen, at a minimum, Calculus I-II-III, a Proof-theoretic Linear Algebra, a Probability or Statistics class, Algebra, and Analysis. A major in mathematics is desirable. A course in programming is recommended.

This program may be completed on either a full-time or a part-time basis. Qualified undergraduates may begin graduate classes as upperclassmen, thereby enabling the completion of the MS degree in a single postgraduate year plus two summers.

Additional information on any of these programs can be found at the department links above.

Department of Computer Science

Dr. Igor Aizenberg

Chair, Department of Computer Science
Director, Graduate Program

The graduate program in Computer Science is designed for students interested in pursuing computer science at an advanced level. This program is a great opportunity to get perfectly prepared for an advanced level position in industry or for pursuing a Ph.D. degree.

This **30-credit** program is open to all **external applicants** *meeting the admission criteria*.

At the same time, our graduate program is designed in a way when **for Manhattan College students** majoring or minoring in Computer Science it should be a **one-year M.S. extension** to the existing B.S. Program in Computer Science.

Overall, there is a large and continuously growing demand for master's level computer science professionals in the State of New York and across the country. The program will extend well beyond knowledge acquired at the undergraduate level. The program will prepare students to enter computer-related industry directly after graduation, or to continue their educational path to a Ph.D. The curriculum is designed to allow students to develop their skills needed to achieve leadership positions in industry, business, and government or related fields, where computer science has become an important tool.

The coursework in the program represents a realistic balance between fundamental computer science theory and cutting edge modern computing techniques and technologies. Students will master methods of algorithm design and their analysis, networking, databases, and operating systems.

Students will have also an excellent opportunity to explore cutting edge areas, which are currently in high demand, such as cryptography and security, cloud computing, neural networks and machine learning, artificial intelligence, embedded systems, Linux kernel programming, image analysis, and data mining. These areas will be covered by electives, which students will be able to choose in accordance with their personal interests.

A capstone experience involving either a Master Thesis research or a major software system design (Master Project) will help students to strengthen their knowledge and skills, put ideas and concepts to work in solving actual problems and finally become successful professionals able to gain employment in industry and/or to be accepted into a Computer Science Ph.D. program.

Admission Criteria and Application

Admission of students pursuing a degree in Computer Science at Manhattan College

Undergraduate students pursuing degree in Computer Science at Manhattan College shall notify the Computer Science Department completing a corresponding form that they are

planning to apply for an M.S. degree after the sophomore year. They should submit their application during their senior year.

- A minimum GPA of 3.0 in the undergraduate CMPT courses taken to date is required.
- Two letters of recommendation from faculty who can comment on the applicant's ability to succeed in the M.S. coursework is required.
- The applicant will provide a statement of purpose describing applicant's objectives in undertaking graduate study

Admission of students who got a B.S. degree in Computer Science or related discipline outside of Manhattan College

Admission Requirements:

- A minimum GPA of 3.0 and a strong record in the undergraduate computing courses is required.
- Students entering the program should have at least 18 credits of undergraduate computing courses, including at least 6 credits of computer programming, data structures, operating systems, databases, and at least one senior level elective course in a modern computing area. They should also have at least 12 credits of mathematics, which must include at least 6 credits of calculus and may include discrete mathematics, probability/statistics, linear algebra, numerical methods and differential equations.

External applicants have to submit:

- **Written statement** of interest describing applicant's objectives in undertaking graduate study.
- **Academic transcript**
- **All *international applicants*** who were ***educated outside of the United States*** for their undergraduate and/or graduate degree ***must provide a course-by-course evaluation report*** (which should be inclusive of your official transcripts) through provided by one of the agencies listed on the NACES website (https://www.naces.org/members/).
- **Two letters of recommendation** from appropriate academic or professional references. At least one letter must be from an academic reference who can comment on the applicant's ability to succeed in the M.S. coursework is required
- (**Optional**) GRE Test results (optional subject GRE for international students)
- (**Optional**) Curriculum Vitae (CV) - only for those who have professional working experience

English language requirement for international applicants

- International applicants whose native language is not English and who have taken all or part of their undergraduate education in a country where English is not the native language are required to prove their ability to study in English. This can be done in either of the following two ways:

1. To submit scores on the Test of English as a Foreign Language (TOEFL). The following minimum scores must be obtained:

- Paper Based Test: 550
- Computer Administered Test: 213
- Internet Based Test: min. 80 points (or IELTS - min. 6.5 points)

2. To join Manhattan College's Intensive English Language Program (IELP), which can be completed during the summer. The program offers six levels of English beginner, intermediate and advanced levels of academic English where students benefit from individualized attention and support from professors and peers. Qualified students who successfully complete the IELP will have satisfied the English language proficiency requirement for graduate programs.
3. Criteria for exempt applicants:

- If the applicant attended one academic year of study at a university or college in a country where English is the first official language (does not include IELP programs)
- If the applicant is currently enrolled at a U.S. institution and has completed a 100-level (or equivalent) English Composition course and at least 12 credit hours of 100-level (or equivalent) courses
- If the applicant was educated in one of these countries (https://manhattan.edu/admissions/graduate/english-proficiency-countries.php)

Financial requirement for international applicants

- ***In order to complete the application and have your file evaluated, as an international applicant, you will need to submit a copy of your passport, certificate of financial responsibility (see attached), and bank statement showing sufficient funds to cover the first year of study (around $39,000).***

Degree Requirements

The M.S. program in computer science is available in the School of Science.

Common degree requirement: **30 graduate credits in total.**

General Requirements: The order in which courses are taken is flexible. The department offers two required core courses every fall and other two required core courses every spring. The department also offers at least two elective courses every fall and every spring. A minimum grade of B in each of graduate courses is required. Before taking any course, the student must obtain a grade of B or better in the prerequisite courses (if any).

Degree requirements for students graduated from Manhattan College with a BS or BA degree in Computer Science

6 credits counted towards a MS degree from the undergraduate curriculum in Computer Science (a grade B or higher is required)*

CMPT 456	Software Engineering	3
One of the following Electives (Only one of these courses can be counted even if more were taken)		
CMPT 363	Data Mining	3

CMPT 364	Cloud Computing and Virtualization	3
CMPT 420	Artificial Intelligence	3
CMPT 465	Neural Networks and Learning Systems	3

*Students minored in Computer Science and taken CMPT 456 and (or) one of CMPT 363, CMPT 364, CMPT 420, CMPT 465 as well as any other Manhattan College graduates taken these classes may also claim 3 or 6 undergraduate credits counted towards their graduate degree, respectively. Otherwise these students shall follow degree requirements for students graduated from other institutions.

12 credits of required graduate core:

CMPG 612	Operating Systems	3
CMPG 638	Design&Analy of Algorithms	3
CMPG 658	Database Systems	3
CMPG 667	Computer Networking	3

A course-based option (without MS Thesis/Project)

12 credits of graduate electives (any 4 courses from the following list**):

CMPG 720	Artificial Intelligence	3
CMPG 763	Data Mining	3
CMPG 764	Cloud Computing&Virtualization	3
CMPG 765	Neural Networks&Learn Sys	3
CMPG 767	Image Processing and Analysis	3
CMPG 768	Cryptography and Security	3
CMPG 769	Cyber Security Lab	3
CMPG 780	Linux Kernel Programming	3
CMPG 788	Topics in Advanced Computer Science	3
CMPG 797	Graduate Independent Research	3
ECEG 721	Embedded Systems	3

** Only 1 course from CMPG 720/CMPT 420, CMPG 763/CMPT 363, CMPG 764/CMPT 364, CMPG 765/CMPT 465 taken during the undergraduate study can be counted towards a graduate degree. If a student did not get a grade B or higher in the undergraduate class (classes), which can be counted towards a graduate degree, he/she needs to take respectively 5 or 6 elective classes from this list.

A MS Thesis/Project option

6 credits of MS Thesis/Project (research or a major software project design under supervision of a faculty)

CMPG 798	Master Thesis/Project Seminar	3
CMPG 799	Master Thesis/Project	3

6 credits of graduate electives (any 2 courses from the following list***):

CMPG 720	Artificial Intelligence	3
CMPG 763	Data Mining	3
CMPG 764	Cloud Computing&Virtualization	3
CMPG 765	Neural Networks&Learn Sys	3
CMPG 767	Image Processing and Analysis	3
CMPG 768	Cryptography and Security	3
CMPG 769	Cyber Security Lab	3
CMPG 780	Linux Kernel Programming	3
CMPG 788	Topics in Advanced Computer Science	3
ECEG 721	Embedded Systems	3

*** Only 1 course from CMPG 720 / CMPT 420, CMPG 763 / CMPT 363, CMPG 764 / CMPT 364, CMPG 765 / CMPT 465 taken during the undergraduate study can be counted towards a graduate degree. If a student did not get a grade B or higher in the undergraduate class (classes), which can be counted towards a graduate degree, he/she needs to take respectively 3 or 4 elective classes from this list.

Degree requirements for students graduated from other institutions of higher education with a BS or BA degree (major or minor) in Computer Science or related disciplines

Students entering the program should have at least **18 credits of undergraduate computing courses**, ***including*** at least **6 credits of** computer programming, data structures, operating systems, software engineering and at least one senior level elective course in a modern computing area. They should also have at least **12 credits of mathematics**, which must include at least 6 credits of calculus and may include discrete mathematics, probability/statistics, linear algebra, and numerical methods.

12 credits of required graduate core:

CMPG 612	Operating Systems	3
CMPG 638	Design&Analy of Algorithms	3
CMPG 658	Database Systems	3
CMPG 667	Computer Networking	3

A course-based option (without MS Thesis/Project)

18 credits of graduate electives (any 6 courses from the following list):

CMPG 756	Software Engineering	3
CMPG 720	Artificial Intelligence	3
CMPG 763	Data Mining	3
CMPG 764	Cloud Computing&Virtualization	3

CMPG 765	Neural Networks&Learn Sys	3
CMPG 767	Image Processing and Analysis	3
CMPG 768	Cryptography and Security	3
CMPG 769	Cyber Security Lab	3
CMPG 780	Linux Kernel Programming	3
CMPG 788	Topics in Advanced Computer Science	3
CMPG 797	Graduate Independent Research	3
ECEG 721	Embedded Systems	3

A MS Thesis/Project option

6 credits of MS Thesis/Project (research or a major software project design under supervision of a faculty)

CMPG 798	Master Thesis/Project Seminar	3
CMPG 799	Master Thesis/Project	3

12 credits of graduate electives (any 4 courses from the following list):

CMPG 756	Software Engineering	3
CMPG 720	Artificial Intelligence	3
CMPG 763	Data Mining	3
CMPG 764	Cloud Computing&Virtualization	3
CMPG 765	Neural Networks&Learn Sys	3
CMPG 767	Image Processing and Analysis	3
CMPG 768	Cryptography and Security	3
CMPG 769	Cyber Security Lab	3
CMPG 780	Linux Kernel Programming	3
CMPG 788	Topics in Advanced Computer Science	3
CMPG 797	Graduate Independent Research	3
ECEG 721	Embedded Systems	3

Department of Mathematics

Dr. Helene Tyler

Chair, Department of Mathematics

Dr. Angel Pineda
Director, Graduate Program

The Department of Mathematics offers two graduate degree programs and one advanced certificate program. The graduate programs lead to an MS in Applied Mathematics-Data Analytics, a 5 year BA-MS or BS-MS in Applied Mathematics-Data Analytics and an MS in Mathematics. There is also an Advanced Certificate in Applied Mathematics-Data Analytics. The degree requirements, as well as the admission requirements, for each degree, are listed below.

MS in Applied Mathematics-Data Analytics

Program Overview

The program is designed for students with a strong background in mathematics and a major in a quantitative field who wish to prepare for careers in industry, business, government, or for further study at the doctoral level. It is a particularly good fit for students who want to transition into data analytics and data science careers. The curriculum emphasizes the application of mathematics and programming with open ended course projects. The courses combine theory and application striving to give students practical tools with the understanding to make them useful.

Students will typically complete the program in 3 semesters plus 1 internship or research project during a summer. Students may pursue the program part-time and courses are scheduled to accommodate students who work full time.

Admission Requirements

Applicants should possess a degree in a STEM or quantitative discipline, some exposure to computer programming, and have the desire to learn mathematical and computational methods to apply them to real world problems. The prerequisites for the program are multi-variable calculus, probability or calculus-based statistics, linear algebra and a programming class.

Degree Requirements

The 30 credit hour program consists of a core of study in computational methods, statistics, machine learning, linear algebra, and operations research, complemented by electives. Manhattan College undergraduate students from any major can count up to six graduate credits toward both their undergraduate and graduate degrees in mathematics which may allow them to complete the master's program in one additional year.

There are four master's comprehensive exams. These are the final exams (or term projects) in MATG 511, 571, 630, and 635. Three of these must be passed with a B or better in order to complete the program.

Students may choose 2 electives in accordance with their personal interests, either in mathematics, computer science, engineering or business administration, or they may elect to pursue an internship or research project.

Required Courses for the MS in Applied Mathematics-Data Analytics:

MATG 511	Computational Methods for Analytics	3
MATG 555	Operations Research	3
MATG 557	Machine Learning	3
MATG 571	Advanced Linear Algebra with Applications	3
MATG 630	Probability and Statistics for Analytics	3
MATG 633	Advanced Statistical Inference	3
MATG 635	Probabilistic Methods	3
MATG 659	Data Base Methods for Analytics	3
Plus two graduate electives (e.g. in Mathematics, Business, Computer Science or Engineering)		6
Total Credits		30

BA or BS Mathematics, MS Applied Mathematics-Data Analytics

The program is a seamless 5 year BS-MS or BA-MS program with a major in Mathematics and an MS in Applied Mathematics-Data Analytics.

This program is designed for strong students of mathematics who wish to prepare for careers in business, industry, or government, or for further study at the doctoral level. In addition to the core undergraduate courses in the discipline, at the graduate level students will master probabilistic and statistical methods, machine learning, and optimization. Students also have the opportunity to complete minors in cognate disciplines.

Students will typically complete all requirements for the BA or BS in 4 years. They will apply to the MS program during their junior or senior year. If accepted, they take graduate classes during the 3rd and 4th years of study and will complete the requirements for the MS degree in a fifth year. Manhattan College mathematics students can count up to six graduate credits toward both their undergraduate and graduate degrees.

Advanced Certificate in Applied Mathematics-Data Analytics

To complete the Advanced Certificate in Applied Mathematics-Data Analytics, a student must complete 18 credits, to be chosen in consultation with the graduate director from the MATG courses eligible for credit towards the MS in Applied Mathematics-Data Analytics.

MS in Mathematics

Program Overview

This program is for individuals who hope to pursue the PhD in Mathematics or a related discipline, or who wish to teach mathematics in a community college. Students in the program will complete course work in foundational areas of pure mathematics: linear and abstract algebra, real and complex analysis, topology and probability-statistics. Electives may be chosen to deepen the applicant's knowledge in preparation for study at the PhD level, for breath including applications, and may include research. A thesis option is available for those who wish to do research. This program may be completed on either a full-time or a part-time basis. Qualified undergraduates may begin graduate classes as upperclassmen, thereby enabling completion of the MS degree in a single postgraduate year plus two summers.

Admission Requirements

Entering students should have seen, at a minimum, Calculus I-II-III, a Proof-theoretic Linear Algebra, a Probability or Statistics class, Algebra and Analysis. A major in mathematics is desirable. A course in programming is recommended.

Degree Requirements

The program requires 30 credits of graduate mathematics including a 3 credit statistics/ data analysis elective, a 3 credit algebra elective, a 3 credit analysis elective, 3 credits of number theory, and a 3 credit research seminar. Fifteen additional elective credits round out the program. Manhattan College students can count up to six graduate credits toward both their undergraduate and graduate degrees.

The student must pass master's comprehensive exams with a B or better in 3 of the 4 content areas of statistics, algebra, analysis, and number theory. Final exams in these courses will comprise the comprehensive exam. A research project is required.

Required Courses for the MS in Mathematics:

Algebra Elective (MATG 571 Advanced Linear Algebra with Applications or MATG 678 Algebra II)		3
Analysis Elective (MATG 688 Graduate Analysis or MATG 690 Graduate Complex Analysis)		3
Statistics / Data Analysis Elective (MATG 630 Probability and Statistics for Analytics or MATG 633 Advanced Statistical Inference)		3
MATG 542	Number Theory	3
MATG 699	Research in Mathematics	3
15 Additional Elective Credits of Graduate Mathematics (MATG 500-799)		15
Total Credits		30

Courses

MATG 511. Computational Methods for Analytics. 3 Credits.
This course is a survey of programming tools used in solving problems in applied mathematics and data analytics. The course material comprises the following broad areas: programming techniques in scientific languages such as MATLAB, Python, and R; and an overview of selected topics in data handling, data visualization, and introductory predictive analytics. Additional topics may include analytics-related topics in linear algebra and numerical analysis. A final project is required for this course. Prerequisites: CMPT 101 and MATH 285 or MATH 287 and MATH 272 or MATH 351.

MATG 532. Statistical Inference. 3 Credits.
Topics covered in this course include sampling distributions, point estimation, interval estimation, testing statistical hypotheses, regression and correlation. Requires a project. Prerequisite: MATH 331. Not available to students with credit for MATH 432 or MATG 630.

MATG 542. Number Theory. 3 Credits.
An introduction to number theory with connections to the middle and high school curriculum. Divisibility, prime numbers and their distribution, congruences, quadratic residues and nonresidues, Diophantine equations, elliptic curves, primality testing, applications to cryptology. Recent progress. The course requires a written project connecting the course content to the 6-12 curriculum. Prerequisite: MATH 272 or MATH 351.

MATG 548. Combinatorics and Graph Theory. 3 Credits.
Fundamental concepts in combinatorics include binomial coefficients, inclusion-exclusion, and generating functions. Topics in graph theory include connectivity, planarity, colorings and chromatic polynomials, and max-flow-min-cut in networks. This course will require a written project and an oral presentation on some particular application of graph theory or combinatorics. The project will consist of a case study that will require researching a particular area of application, and then formulating, solving, and analyzing an appropriate mathematical model. Findings will be presented at the end of the term. Not open to students with credit for MATH 448 or CMPT 335. Prerequisites: MATH 243, MATH 272 or MATH 351.

MATG 550. Financial Models. 3 Credits.
The course covers the following topics: the growth of money, equations of value and yield rates, annuities certain, annuities with different payment and conversion periods, loan repayment, bonds, stocks and financial markets, arbitrage, term structure of interest rates, derivatives, and interest rate sensitivity. Prerequisite: Graduate status or permission of the graduate director.

MATG 551. Financial Engineering. 3 Credits.
Basic mathematical foundations and numerical techniques required to understand quantitative finance. Interest rates, hedging, Black Scholes formula, bootstrapping, finite differences and PDE's, Bond and portfolio optimization. Prerequisite: MATG 550.

MATG 555. Operations Research. 3 Credits.
Optimization, linear programming, simplex method, duality theory, transportation problems, scheduling problems, queuing theory. Students will be required to complete an independent project. The project will consist of a case study that will require researching a particular area of application, and then formulating, solving, and analyzing an appropriate mathematical model. Findings will be presented at the end of the term. Not open to students with credit for MATH 455. Prerequisite: MATH 272 or MATH 351.

MATG 556. Non-Linear Optimization. 3 Credits.
Methods for solving non-linear optimization problems. Topics include unconstrained optimization, convex sets, approximation methods, method of least squares, convex programming, penalty methods and mixed constraints. Prerequisite: Graduate status or permission of the graduate director.

MATG 557. Machine Learning. 3 Credits.
An introduction to the field of machine learning and its real-world applications, emphasizing the coding of machine learning algorithms to iteratively learn from data and to automate analytical model building. Topics include supervised & unsupervised learning, Bayesian decision theory, non-parametric methods, linear discriminant functions, multi-layer neural networks, stochastic methods and cluster analysis. Programming experience, preferably in MATLAB, will be useful. A project is required. Prerequisites: (Math 272 or MATH 351) and MATH 285 and (MATH 331 or MATH 336).

MATG 558. Data Mining. 3 Credits.
Basic concepts of data mining. Fundamental aspects and techniques of analyzing large, complex data-sets. Topics include data objects and attributes, measuring data similarity, data visualization, data processing, apriori algorithm, classification methods, cluster analysis, outlier identification. Prerequisite: MATG 511.

MATG 564. Topology. 3 Credits.
A survey of the fundamental concepts in point set topology: open and closed sets, topological spaces, homeomorphisms, metric spaces, connectedness and compactness, illustrated by examples from applications in other disciplines. After a survey of the basics, the course will cover selected topics such as homotopy theory, chaos, fixed point theory, knots, manifolds and cosmology. Prerequisites: MATH 243 and 387, with a grade of B or better, or equivalent.

MATG 571. Advanced Linear Algebra with Applications. 3 Credits.
A continuation of topics introduced in Linear Algebra (MATH 272), covering factorization of matrices. eigenvalues and eigenvectors, orthogonality, optimization problems, ill-conditioned matrices, applications to topics such as least-squares approximation, difference and differential equations, linear programming, networks, game theory. Prerequisite: MATH 272 or equivalent.

MATG 577. Foundations of Abstract Algebra. 3 Credits.
An introduction to algebraic structures with an emphasis on the theory of groups, subgroups, isomorphism, normal subgroups, cosets. Lagrange's theorem and the fundamental homomorphism theorems. This is a prerequisite course for graduate study in mathematics for students who lack the undergraduate background.

MATG 587. Foundations of Mathematical Analysis. 3 Credits.
A rigorous treatment of differential calculus of one variable: sequences, limits, continuity, the derivative, the Riemann Integral. This is a prerequisite course for graduate study in mathematics for students who lack the undergraduate background.

MATG 588. Principles of Mathematical Analysis. 3 Credits.
Review of Riemann integral and the major theorems of integration in calculus. Review of infinite Series. Sequences and series of functions and their convergence properties, focusing on uniform convergence as the central notion for developing the properties of function spaces of real valued maps, such as equicontinuity and the Stone-Weierstrass theorem. Power series, Fourier series and the Gamma function. A rigorous definition of multivariable calculus using linear maps and differential forms over R n . Implicit and Inverse Function theorems and the general Stokes theorem. Introduction to Measure Theory. Prerequisites: MATH 387 or MATG 587.

MATG 630. Probability and Statistics for Analytics. 3 Credits.
Basic theorems in probability, random variables, distribution functions, expected values; binomial, Poisson and normal distributions. Sampling distributions, point estimation, interval estimation, testing statistical hypotheses. Prerequisite: MATH 331.

MATG 633. Advanced Statistical Inference. 3 Credits.
This is a data intensive course on statistical inference. Topics covered in this course include regression analysis, hypothesis testing, analysis of variance and nonparametric modeling. Students will utilize appropriate software for data analytics. Prerequisite: MATH 432 or MATG 630.

MATG 635. Probabilistic Methods. 3 Credits.
An introduction to probability models including random variables, conditional probability and expectation, Markov chains and time series. Additional topics may include Poisson processes, continuous time Markov processes, queueing theory, spatial, text and network models. Prerequisite: MATH 331 or MATG 630 or equivalent.

MATG 639. Statistical Learning. 3 Credits.
u A course on the statistical foundations of machine learning, this course develops the fundamental ideas of statistical learning for drawing conclusions from multivariate data sets using statistical theory and applied linear algebra. The course combines a theoretical presentation with computation of the resulting machine-learning algorithms on real data sets to develop intuition of both how the methods work and how they perform in practice. It will cover the major techniques and concepts for both supervised and unsupervised learning. Topics will include regression, classification, resampling methods, model selection, regularization, principal components and clustering. Optional selected topics include tree-based methods, support vector machines and neural networks. Prerequisite: MATG 630.

MATG 659. Data Base Methods for Analytics. 3 Credits.
Provides students with an in-depth understanding of the design, implementation and management of SQL, transactional database design, normalizing tables, functional dependencies, entity-relationship and relational database models; use of object-oriented design and event programming. Additional topics may include data warehouse modeling, analytics database systems, administration, security and other topics as time and interest permit. Prerequisite: CMPT 101 or equivalent.

MATG 678. Abstract Algebra. 3 Credits.
Study of algebraic structures, such as rings, fields and integral domains, further study in group theory, applications of abstract theory. The course requires a written project. Prerequisite: MATH 377 or MATG 577.

MATG 690. Graduate Complex Analysis. 3 Credits.
This course focuses on the complex plane, complex functions, limits and continuity, as well as analytic functions, the Cauchy-Riemann equations, the Cauchy integral theorem, and consequences. Additional topics may include: power series, Taylor and Laurent series, classification of singularities, the residue theorem and its applications, conformal mapping, and selected applications. This course will require a written project and an oral presentation on some particular application of, or historical development in complex analysis. Not open to students with credit for Math 490. Prerequisite: MATH 387.

MATG 691. Topics in Applied Mathematics. 3 Credits.
Topics in Applied Mathematics. Offered in response to interests and needs of faculty and students. Can be repeated for credit. Prerequisite: Permission of the graduate director.

MATG 692. Topics in Mathematics. 3 Credits.
Topics in Mathematics. Offered in response to interests and needs of faculty and students. Can be repeated for credit. Prerequisite: Permission of the graduate director.

MATG 698. Internship. 3 Credits.
Students will receive guidance in securing an appropriate internship and must obtain faculty sponsorship. Faculty supervisors will define appropriate academic activities in parallel to the work requirement in order to provide a complete internship experience. Prerequisite: Permission of the graduate director.

MATG 699. Research in Mathematics. 3 Credits.
Investigation of a research topic in mathematics culminating in a written paper and oral presentation. Prerequisite: Permission of the graduate director.

MATG 700. Thesis. 3 Credits.
A sequel to MATG 699, research in Mathematics. Continuation of research culminating in a Master’s Thesis.

MATG 762. Modern Methods in Plane Euclidean Geometry. 4 Credits.
This is a the second part of a two-semester introduction to classical and modern plane Euclidean geometry. The course continues with the introduction of modern methods. Topics include trigonometry, coordinate methods and the algebra associated with the conic sections, complex numbers, vector methods, transformations, and inversion with respect to a circle. Many of the results of the first semester are revisited from new perspectives (for example Heron's formula is found by complex number methods), and a host of more modern results are obtained. The course will use GeoGebra, Geometer's Sketchpad or an equivalent software product. Prerequisite: MATG 761.

Graduate Calendars

School of Engineering

School of Education & Health

School of Business

School of Science

School of Continuing & Professional Studies

Science Calendar*

2020 Fall Semester

Month	Date	Day	Event
August	31	Monday	Classes Begin
September	07	Monday	Late Registration & Add/Drop Ends
September	07	Monday	Labor Day – No Classes
September	15	Tuesday	Senate Meeting
October	12	Monday	Fall Break – No Classes
October	13	Tuesday	Monday Schedule
October	20	Tuesday	Mid-Term Grades Due
October	20	Tuesday	Senate Meeting
November	02	Monday	Web Registration Begins for Spring 2021
November	17	Tuesday	Senate Meeting
November	20	Friday	Last day to withdraw from courses
November	25-27	Wed-Fri	Thanksgiving Holiday – No Classes
December	11	Friday	Last Day of Classes
December	14-19	Mon-Sat	Finals Week– Winter Recess Begins after last examination
December	21	Monday	Fall 2020 Online Grading closes

2020-2021 Winter Intersession

Month	Date	Day	Event
December	21	Monday	Classes Begin
December	24-31	Thu-Thu	Christmas Break-College Closed
January	01	Friday	New Year's Holiday-College Closed
January	15	Friday	Last day of Winter Intersession

2021 Spring Semester

Month	Date	Day	Event
January	20	Wednesday	Classes Begin
January	26	Tuesday	Late Registration & Add/Drop ends
February	02	Tuesday	Deadline to submit incomplete work to faculty for Fall 2020
February	08	Monday	Deadline for Faculty to submit grades for Fall 2020 incompletes
February	16	Tuesday	Senate Meeting
March	11	Thursday	Mid - Term Grades Due
March	15-19	Mon-Fri	Spring Break
March	16	Tuesday	Senate Meeting
April	01-05	Thu-Mon	Easter Holiday - No Classes

April	06	Tuesday	Web Registration Begins for Fall 2021
April	07	Wednesday	St. De La Salle Day: The Feast of St. John Baptist de la Salle, Patron of Teachers
April	07	Wednesday	Monday Schedule
April	20	Tuesday	Senate Meeting
April	21	Wednesday	Last day to withdraw from courses
May	07	Friday	Last day of classes
May	08-09	Sat-Sun	Reading Days
May	10-15	Mon-Sat	Finals Week
May	16-20	Sun-Thu	Senior Days
May	17	Monday	Summer Session I begins
May	18	Tuesday	Spring 2021 Online Grading closes at 12 noon
May	19	Wednesday	Spring Commencement (GM & SCPS Division)
May	21	Friday	The 179th Undergraduate Commencement
June	29	Tuesday	Deadline to submit incomplete work to Faculty for Spring 2021
July	05	Monday	Deadline for Faculty to submit grades for Spring 2021 incompletes

2021 Summer Sessions

Month	Date	Day	Event
May	17	Monday	Summer Session I begins
July	02	Friday	Summer Session I ends
July	06	Tuesday	Summer Session II begins
August	23	Friday	Summer Session II ends

** Manhattan College reserves the right to make changes as circumstances require.*

School of Continuing & Professional Studies

Steven Goss, Ed.D., Dean

Mission Statement

The mission of the School of Continuing and Professional Studies is to prepare nontraditional students for success in emerging global, corporate, or industrial environments. The School is committed to creating and offering programs designed to serve the nontraditional student population with a particular focus on advancing their professional careers and/or fulfilling academic goals. The School is dedicated to offering programs in convenient and flexible formats.

Admission Requirements

The admissions committee process includes ongoing review of student application materials to ensure prompt admissions decisions. Applicants will be assessed primarily based on the following criteria:

- An undergraduate cumulative grade point average (GPA) of 2.75 on a 4.00 scale is normally required for admission to SCPS graduate programs, although other factors can be considered in the decision for admission.
- Official college transcripts. Sealed or official electronic copies of college transcripts should be sent directly to Manhattan College
- Personal qualities (evident by applicant's resume, which should include examples of academic, professional, and extracurricular achievement)
- Recommendations
  - Applicants must submit two letters of recommendation attesting to the applicant’s intellectual ability, leadership potential, and ability to complete the program.
- Personal Statement
  - Applicants are required to submit an essay that reflects program interest as well as personal and professional goals.

Transfer Credits

Students may transfer a maximum of six graduate credits to the program. An official transcript from a regionally accredited institution of higher learning is required.

Courses

MSOL 600. Special Topic. 3 Credits.
An introduction to a topic, theme, or issue related to leadership. The subject will vary from semester to semester. (Cr. 3).

MSOL 601. Fundamentals of Organizational Leadership. 3 Credits.
This survey course will provide an overview of the topic. Problem solving, ethics, conflict resolution, delegation, empowerment as well as general principles of leadership will be explored in this course. This will be overlaid by the practice of reflection.

MSOL 605. Leadership Communication and Coaching Essentials. 3 Credits.
This course focuses on the persuasive communication techniques and strategies that can be used when one must or chooses to rely on influence as opposed to formal authority. Situations include: how to gain commitment; how to overcome resistance; and how to effectively manage conflict. Students will use their organizations as cases, employing communications technologies as appropriate. The role of ethics is considered throughout. Prerequisite: MSOL 601 or permission from Instructor.

MSOL 607. Management and Sustainable Development for Organizational Leaders. 3 Credits.
The focus of this course is on coordinating and sustaining cooperative activities across various types of international and cultural boundaries. This course is offered and delivered in an international setting, exploring development and management concepts and the appropriate leadership skills needed in a worldwide context. The course covers the practical realities of leading across cultural differences and national boundaries.

MSOL 610. Leading Across Cultural and Global Boundaries. 3 Credits.
The focus of this course is on coordinating and sustaining cooperative activities across various types of international and cultural boundaries(including generational, gender, and regional). The course covers the practical realities of leading across cultural differences and national boundaries. Students will explore differences domestically and globally. Prerequisites: MSOL 601 and MSOL 605 or permission from Instructor.

MSOL 615. Metrics for Today's Leader. 3 Credits.
The foundation of this course is the application of metrics to performance improvement and process reengineering. The balanced scorecard as well as other metrics approaches are the key elements of this course. Students will learn the essential tools and technologies required for this effective leadership technique. Prerequisite: MSOL 601, MSOL 605, and MSOL 610 or permission from Instructor.

MSOL 620. Shaping the Learning Organization. 3 Credits.
Students will learn how to create stimulating environments that are efficient, flexible and encourage personal growth. This course will cover techniques for challenging the organization and increasing its capacity. Prerequisites: MSOL 601, MSOL 605, MSOL 610, and MSOL 615 or permission from Instructor.

MSOL 625. Ethics and Spirituality in the Workplace. 3 Credits.
This course approaches the study of organizations from a holistic viewpoint. It focuses on how leaders may utilize the canons of ethics and spirituality to enhance performance at the individual, group and organizational levels. Prerequisite: MSOL 601.

MSOL 630. Organizational Planning, Administration and Governance. 3 Credits.
The essence of effective organizational leadership is planning. This course prepares current as well as future leaders in the areas of operational and strategic planning. The course also equips students with tools and techniques for maintaining governance in an organization. Prerequisites: MSOL 601, MSOL 605, and MSOL 615 or permission from instructor.

MSOL 641. Talent and Performance Management. 3 Credits.
A comprehensive talent management system is key for organization. This course covers best practices as well as evaluation tools that contribute to organizational effectiveness. Prerequisite: MSOL 601 or permission from Instructor.

MSOL 642. Collaborative Project Management. 3 Credits.
This course goes beyond basic project management. Students will learn advanced PM technology tools and techniques for managing complex projects and programs. Cases and simulations will allow students to learn how these advanced skills are applied to produce business/organizational results that require collaborative relationships. This course builds toward the capstone course. Prerequisite: MSOL 601 or permission from Instructor.

MSOL 651. HR Issues in the Workplace. 3 Credits.
In this course, students are introduced to the principles of human resource management (HRM). The course balances the theoretical and practical approaches to HRM. Emphasis is placed on the four primary HR functions: recruitment, selection, performance management, and governance. Other topical areas that are covered include compensation and benefits as well as the challenge of international HRM. Prerequisite: MSOL 601 or permission of Instructor.

MSOL 652. Employment Law for Organizational Leader. 3 Credits.
This course introduces the non-legal professional to laws that govern workplace personnel. Students are provided with an overview of legal issues affecting human resource management. The primary concentration is on the practical application of employment law on individuals in organizations and its impact on HR decisions. Prerequisite: MSOL 601 or permission from Instructor.

MSOL 661. Non-Profit and Government Leadership. 3 Credits.
This introductory course provides in-depth discourse on the unique challenges and issues of nonprofit and government agency leadership. The course provides insights and skills for leadership in these non-corporate sectors. Prerequisite; MSOL 601 or permission from Instructor.

MSOL 662. Issues in Civic Engagement. 3 Credits.
This course balances the study of contemporary theory and empirical research on civic engagement. It examines contemporary research from the perspectives of individual identities and backgrounds, personal motivations as well as political and social institutions. Prerequisite: MSOL 601 or permission of Instructor.

MSOL 671. Special Topics:Foundations of Professional Leadership:Developing the Leader Within. 3 Credits.
The demands of business today require a range of knowledge, skills, and attitudes that lead to success. An individual's success in business often hinges on his or her self-awareness and self-management. Here the ability to build trust, communicate, manage relationships, and build effective teams, as well as ones political savvy and ethical use of power, requires management skills for everyday life. This course will dive deeply into these topics as learners reflect upon how they ’show up’ as people. (3 cr.).

MSOL 672. Global Dilemmas of Leadership: Race & Religion. 3 Credits.
The significance of issues of diversity, inclusivity, and cultural sensitivity are of pressing urgency in today's globalized and transnational world. As leaders, it is even more important to understand theoretical global dynamics of race, religion, and conflict in reflection to today's workplace. This course provides a vibrant intellectual journey of global discovery in closely thinking through historical and contemporary issues of race and religion that enables one to think differently about these issues in regard to one's workplace environment in fostering civic engagement and social responsibility.

MSOL 674. Social Media Marketing for Sports & Entertainment Leadership. 3 Credits.
Basic and advanced principles and understanding of social media and various social media marketing channels. Understanding how organizations use, implement and execute social media strategies to drive business goals and objectives including: revenue generation, increase sales and exposure, brand awareness, promote products and solutions, measure consumer behavior, etc. Students will learn current social media practices for thriving organizations in the sports and entertainment industry. Exposure to social media channels to include but not limited to: Facebook, LinkedIn, Twitter, Snapchat, Pinterest, Instagram, Tumblr and emerging networks.

MSOL 680. Train & Devl:E-Learning Design. 3 Credits.
This course provides participants with background about key principles in designing training through e-learning. It provides opportunities to design instruction that is effective, efficient, and engaging. Course content will focus on determining learner needs, define goals of the instruction, and creating a process that may take place in an asynchronous e-learning environment. E-tools and e-learning will be integrated into learning strategies and organizational planning. Participants will produce deliverables that can be used for online training and development.

MSOL 682. Instructional Systems Design for the Organizational Leader. 3 Credits.
This course is designed to provide training for Organizational Leaders who require knowledge of the instructional systems design process. Instructional design is a systematic approach to developing teaching and learning activities within the organizational environment. There are several design models that are used when developing instruction. Using elements from design models and theory, students will establish skills to apply learning outcomes, activites, and assessments in their marketplace setting.

MSOL 683. Collaboration Technologies. 3 Credits.
The ways in which we communicate today have a tremendous impact on our society and are changing everything we do. How groups of people come together has transformed over the past ten years. Technologies afford individuals the tools to cluster and connect with others around ideas, interests, and beliefs. This course looks to study and enhance organizational and teamwork synergies through the use of digital collaboration tools. It introduces theories and methods related to collaborative technologies that are increasingly critical to the management of modern organizational settings and participation in interactive teams. In today's complex global economy, group projects and teamwork take on increased significance. Technologies for collaboration can enhance team and workplace cooperation and effectiveness. When used formally they offer the ability to communicate and edit complex information within groups and to customers, organize thoughts and ideas, coordinate learning, and manage information for meetings, presentations, projects, and proposals. This course strives to apply the principles of organizational communications to the topics of collaboration and teamwork. Students will have various opportunities to utilize collaboration technologies throughout the course in virtual teams. Credits : 3 Graduate Elective Course.

MSOL 690. Capstone-Consulting Project. 3 Credits.
This two-term capstone course is a faculty led consulting project for an external client. This engagement draws on the knowledge and skills gained throughout the program and requires student teams to perform a comprehensive analysis of an actual organizational issue and develop appropriate methods to address said issue. The result is a deliverable for the client organization. Pre-requisite: All required courses in the program must be completed.

MSOL 691. Capstone Consulting Project. 3 Credits.
This course is a continuation of MSOL 690. During this segment, students will finalize their reports and presentations for the client organization.

Organizational Leadership

Steven Goss, Ed.D., Dean

Vision Statement

The M.S. in Organizational Leadership (MSOL) offers working professionals a rich foundation and deep understanding of leadership theory and skills to further define themselves as burgeoning leaders within their personal and professional organizational environments. The MSOL degree program allows students to complete their graduate work through either a hybrid and/or online format, with a schedule that is flexible and conducive for working professionals. The program seeks to cultivate leaders who are professionally skilled and civically minded.

Program Learning Goals

By the completion of the program, students will:

- Demonstrate appropriate competency in oral, written, and presentation skills, as well as interpersonal relations
- Lead and participate effectively in small and large group settings
- Determine ways to achieve maximum effectiveness in an organization including planning, problem-solving, and decision making
- Devise tools and techniques to address the culturally diverse organization
- Develop an appropriate foundation to lead ethical organizational behavior

Program Summary

The Master of Science degree in Organizational Leadership is a 33 credit program. The program consists of nine three-credit core courses and two three-credit elective courses. Currently, the elective courses offered are in four areas: *General Organizational Leadership*, *Human Resources*, *Public/Non-Profit,* and *eLearning and Training*.

All graduate students in the organizational leadership master's program must sustain a minimum of a 3.0 (B) for each core course. Failure to do so will result in retaking the core course over.

Organizational Courses (M.S.)

MSOL 601	Fundamentals of Organizational Leadership	3
MSOL 605	Leadership Communication and Coaching Essentials	3
MSOL 610	Leading Across Cultural and Global Boundaries	3
MSOL 615	Metrics for Today's Leader	3
MSOL 620	Shaping the Learning Organization	3
MSOL 625	Ethics and Spirituality in the Workplace	3
MSOL 642	Collaborative Project Management	3
MSOL 690 & MSOL 691	Capstone-Consulting Project and Capstone Consulting Project	6

Students may select any 2 courses from the following list of electives to fulfill the degree requirements.		6
General Organizational Leadership Electives		
MSOL 630	Organizational Planning, Administration and Governance	
MSOL 641	Talent and Performance Management	
MSOL 671	Special Topics:Foundations of Professional Leadership:Developing the Leader Within	
Human Resource Electives		
MSOL 651	HR Issues in the Workplace	
MSOL 652	Employment Law for Organizational Leader	
Public Service Electives		
MSOL 661	Non-Profit and Government Leadership	
MSOL 662	Issues in Civic Engagement	
eLearning & Training		
MSOL 680	Train & Devl:E-Learning Design	
MSOL 682	Instructional Systems Design for the Organizational Leader	
Total Credits		33

MSOL Academic Plan At a Glance

First Year: Semester One	**Credits**
MSOL 601	3
Open Elective	3
MSOL 605	3
First Year: Semester Two	**Credits**
MSOL 610	3
Open Elective	3
MSOL 615	3
First Year: Semester Three	**Credits**
MSOL 620	3
MSOL 642	3
MSOL 625	3
Second Year: Semester One	**Credits**
MSOL 690	3
MSOL 691	3
Total Credits: 33	

SCPS Graduate Calendar*

2020 Summer Semester

Month	Date	Day	Event
May	04	Monday	Summer 2020 Begins - Term I
May	10	Sunday	Drop Period Closes - Term I
May	11	Monday	Course Withdrawal Open - Term I
June	14	Sunday	Course Withdrawal Closes - Term I
June	22-28	Mon-Sun	Finals Week - Term I
June	29	Monday	Summer 2020-Term II Begins
July	05	Sunday	Drop Period Closes - Term II
July	06	Mon	Fall 2020 Registration begins
July	06	Monday	Course Withdrawal Open - Term II
August	09	Sunday	Course Withdrawal Closes - Term II
August	17-23	Mon-Sun	Finals Week - Term II

2020 Fall Semester

Month	Date	Day	Event
August	31	Monday	Fall 2020 Semester Term I Begins
September	06	Sunday	Drop Period Ends- Term I
September	07	Monday	Course Withdrawal Open - Term I
October	11	Sunday	Course Withdrawal Closes - Term I
October	18	Sunday	Last Day of Classes - Term 1
October	19-25	Mon-Sun	Finals Week - Term I
October	26	Monday	Fall 2020 Term II Begins
November	01	Sunday	Drop Period Ends - Term II
November	02	Monday	Course Withdrawal Opens- Term II
November	02	Monday	Web Registration Begins for Spring 2021
December	06	Sunday	Withdrawal Period Ends - Term II
December	13	Sunday	Last Day of Classes - Term II
December	14-20	Mon-Sun	Finals Week - Term II

2020-2021 Winter Session

Month	Date	Day	Event
December	21	Monday	Winter Session Begins
January	15	Friday	Winter Session Ends

2021 Spring Semester

Month	Date	Day	Event
January	18	Monday	Spring 2021 Term I Begins
January	24	Sunday	Drop Period Closes-Term I
January	25	Monday	Course Withdrawal Begins - Term I
February	28	Sunday	Course Withdrawal Ends - Term I
March	07	Sunday	Last Day of Classes - Term I
March	08-14	Mon-Sun	Finals Week - Term I
March	15	Monday	Spring 2021 Term II Begins
March	21	Sunday	Drop Period Ends - Term II
March	22	Monday	Course Withdrawal Opens - Term II
April	06	Tuesday	Summer 2021 Registration Begins
April	25	Sunday	Course Withdrawal Closes - Term II
May	02	Sunday	Last Day of Classes - Term II
May	03-09	Mon-Sun	Finals Week - Term II

2021 Summer Semester

Month	Date	Day	Event
May	10	Monday	Summer 2021 begins - Term I
May	16	Sunday	Add/Drop Ends -Term I
May	17	Monday	Withdrawal begins - Term I
June	20	Sunday	Last day to withdraw from courses - Term I
June	27	Sunday	End of Term I
June-July	28-04	Mon-Sun	Finals Week - Term I
July	05	Monday	Summer 2021- Term II begins
July	06	Tuesday	Web Registration begins for Fall 2021
July	11	Sunday	Add/Drop ends - Term II
July	12	Monday	Withdrawal begins - Term II
August	15	Sunday	Last day to withdraw from courses - Term II
August	22	Sunday	Last Day of Classes - Term II
August	23-29	Mon-Sun	Finals Week - Term II

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REFUND OF TUITION

During the 1st Week of online/class - 100% refunded (Drop)
During the 2nd Week of online/class - 70% refunded (Withdrawal)
During the 3rd Week of online/class - 30% refunded (Withdrawal)
Thereafter withdrawal - 100% liable

Admission & Academic Standards

Application and Admission

Specific application procedures and admission requirements are described for each school in their respective sections of the Catalog. For all programs, ***official*** transcripts (not student copies) of all institutions the applicant has attended must be submitted. Applicants who file an application before the baccalaureate degree has been conferred may be conditionally accepted pending the successful completion of their undergraduate coursework. A final transcript must be received before registering for graduate courses (for Manhattan College undergraduate applicants, the Office of Graduate Admissions will access their final grades). International applicants who were educated outside of the United States for their undergraduate and/or graduate degree must provide a course-by-course evaluation report (which should be inclusive of official transcripts) provided by one of the agencies listed on the NACES website (https://www.naces.org/members/).

Applicants should be aware that the courses listed under each program are not offered every year but are offered in a cycle over a five-year period, which is the time allotted for the completion of all degree requirements.

Because the majority of students matriculating for the degree are attending on a part-time basis, it is not always possible to indicate the academic session when each course is expected to be offered. However, a schedule is posted approximately two months in advance of every session (fall, spring, summer) detailing which courses are to be offered, the days, times, rooms and professors.

The College reserves the right to withdraw or modify any of the courses, costs or programs listed in this catalog, to cancel any course or program for which it deems registration insufficient, usually less than ten registrants, to make any other changes which it considers necessary or desirable.

All documents submitted in support of ones application cannot be returned to the applicant nor can they be duplicated for any purpose. All documents received are part of the records of the College.

Health Services

Health Services provides on campus evaluation and treatment for common health problems, including: episodic illnesses, injuries, blood pressure checks, vision screenings, suture removal, and a variety of other health-related services. Health Services providers facilitate referrals to off-campus health care when necessary. No cost services by our nurse practitioners and physician are available to all undergraduate students. Students that require outside services, such as laboratory, x-rays, Urgent care, Emergency Care, etc., will be responsible for payment to that provider of services.

Health Services is located in Horan Hall, Room 218. The office is open during the academic year Mondays through Fridays from 9:00 am to 4:30 pm. Students are advised to call or email for an appointment. (718-862-7217) health.services@manhattan.edu

When the office is closed a list of urgent care and off campus providers is available on the Health Service's website for students in need of healthcare.

Medical Emergencies: Public Safety (718-862-7333) should be contacted immediately for on campus medical emergencies. Public Safety responds to all emergency calls 24 hours a day, notifying Health Services or New York City Emergency Medical Services (911) as appropriate.

Immunizations: New York State Law mandates that all students born after January 1, 1957 submit proof of immunity against measles, mumps and rubella to the College as well as a completed Meningitis Response Form. All students are also required to complete a Tuberculosis Risk Screen. Manhattan College Health Forms are available on the website. Immunization records may generally be obtained from the student's private physician or previous educational institution. Any student who is having difficulty obtaining the necessary medical records should contact the Health Services staff for assistance (718-862-7217). Immunization compliance matters can generally be resolved quickly once a student requests assistance.

Insurance: Manhattan College requires all full-time undergraduate students, degree-seeking international students, resident students, and Division 1 athletic participants to have health insurance. Students should check that their health insurance provides coverage in the New York area while they are attending college. Manhattan College students are automatically enrolled in a Student Health Plan until the student provides proof of insurance to waive the sponsored plan. This waiver process is available on the Health Services website.

Transfer Credit

A maximum of six credits for graduate courses completed at another institution prior to matriculation at Manhattan College may be granted if the courses are equivalent to those required at Manhattan College. The courses must have been taken within the five year period prior to acceptance as a matriculated student and have been awarded the grade of B or better. Request for such transfer credit must be made at the time of filing the application for admission. In general, credits that have been used to earn one degree may not be applied to the degree requirements of another degree. The request for transfer credit must be submitted to the Office of Admissions. Courses accepted for transfer credit will be noted on the Manhattan College academic record. However, the grades will not be counted in the Manhattan College grade point average.

Off-Campus Credit

It is understood that all courses for the degree must be taken at Manhattan College. For compelling reasons and in rare instances, however, a student may secure permission to earn a maximum of six transfer graduate credits at another institution transferable to the Manhattan College record. Written permission to take such work must be obtained by the student in advance from the chair or director and the dean of the school. When such a course is completed, the student must arrange for an official transcript to be mailed directly by the institution where the course was taken to the office of the program director or the dean of the school in which the student is enrolled and must pay the 'Off-Campus Courses' fee per course before the course is entered on the student's academic record by the Office of the Registrar. Only courses which have earned a B grade or better are

transferable. A student who was granted six transfer credits on admission is not eligible for any further transfer of credits during their matriculation.

Registration

Students are required to officially register for each session in which they will be in attendance. Before the actual registration, students must submit a registration form approved by their program director. Payment must be provided in advance of the time of registration.

Online registration is available through the *Self-Service* system by logging onto the self-service.manhattan.edu (http://self-service.manhattan.edu) site. Students may also register in person or by mail. Dates and instructions for registration will be included with the graduate schedule of courses published online and available in advance by the Office of the Registrar or by the program director.

Late registration will not be accepted. Enrollment in a course is considered final after the first scheduled class in the fall or spring term and after the first two class meetings in the summer session.

Maintenance of Matriculations

Students not in attendance during a semester must register for 'Maintenance of Matriculation' in the spring and the fall semesters.

Course Changes

Adding or dropping a course must be approved by the graduate program director and processed in the Registrar's Office before the second scheduled class. Refunds are subject to the policy stated in the catalog.

Grades

The grades used to indicate the quality of the student's performance in every course are as follows: *A* means excellent, *B* means good, *C* means satisfactory, *D* means poor but passing, *F* means failing. For the purpose of computing grade point averages, the corresponding numerical equivalents for letter grades will be used:

Grade	Quality Points
A	4.0
A-	3.67
B+	3.33
B	3.0
B-	2.67
C+	2.33
C	2.0
C-	1.67
D+	1.33
D	1.0
F	0.0

I Incomplete. Indicates that some requirement of a course has not been satisfied by the end of the term. A student's request for an Incomplete must be submitted to the instructor before the end of the term or session. The instructor determines whether to grant the request. In all cases, the incomplete work must be completed and submitted to the instructor no later than 45 days from the last day of the term's final examination period. The faculty member must submit the final grade not later than 50 days from the last day of the term's final examination period. An incomplete will be converted to a grade of F if the work is not completed on schedule. Extensions for the completion of the work or the submission of the final grade will be granted by the dean only in highly unusual circumstances.

W Withdrawal. Indicates withdrawal from a course in which the student is regularly enrolled. The student is required to have the withdrawal notification form signed by the instructor of the course and the director of the student's school. The deadline for withdrawal from a course will be the end of the twelfth week of the semester. In “W” courses, neither quality hours nor quality points are assigned.

AW Academic Withdrawal - Indicates a student who has never attended a course that they were officially registered for.
An AW grade will function the same as a Drop.

UW Unofficial Withdrawal - Indicates a student has stopped attending a course that they were officially registered for.
A UW grade will function the same as an F grade.

P Passing. No quality points assigned.

NC No Credit.

P/F Pass/Fail. In Pass/Fail courses, neither grade influences the grade point average. Credit is awarded for a P grade; no credit for F.

Quality points and quality hours are assigned for every credit attempted at Manhattan except those taken on a Pass/Fail basis, and those for which designations of a W or an I have been assigned. The scholarship index is determined by dividing the total number of quality points earned by the total number of quality hours.

For all students, the cumulative scholarship index is computed at the end of each semester; for those who attend the summer or winter sessions, it is also computed at the end of each session.

T Thesis. Indicates a Master's Project or Thesis or Internship/Practicum/Field Experience that is not completed by the end of the semester in which the student has registered for.

GPA Calculation

Computing the Grade Point Index (GPA)

The following is the method by which a student’s GPA is calculated:

1. Multiply the quality points equal to the grade by the number of credits for which the grade was earned

A=4.00 quality points x 3 credits = 12.00 points

2. Add the total quality points earned in a semester

3. Divide by the total number of credits for a semester

The total quality points, divided by the total credits equals the GPA for the semester. To compute a cumulative grade point average, include all MC courses taken to date and divide by the total number of credits for which grades other than W, P, NC, AUD, have been earned or given.

Withdrawal from the College

Regular Withdrawal

Students currently enrolled in Manhattan College who wish to withdraw from the College, effectively ending their status as matriculated students, must complete the required Manhattan College Withdrawal Form. An appointment should be made with the appropriate Academic Advisor to have an exit interview and to complete the required form. This form must be completely filled out or students will not be eligible for tuition adjustments and may be responsible for paying back any financial aid received from the College. Students will be considered withdrawn on the date that they officially notify the College. Students who withdraw from the College after the last day for course withdrawal will receive a grade of “F” for all courses during the session unless a waiver is granted by the Provost for medical, psychological or emergency reasons. In this case, the student will receive a grade of “W” for all courses during that session.

Administrative Withdrawal

A student may be administratively withdrawn from the College:

1. If he or she fails to register for classes by the end of the add/drop period.
2. If he or she fails to attend classes by the end of the add/drop period.
3. If he or she has not returned to the College or fails to qualify to return to the College when the approved period of leave of absence has expired.
4. If he or she has not returned after academic or disciplinary suspension at the time specified and the period of suspension has not been extended.
5. If in extraordinary circumstances a student is unable or unwilling to request a voluntary leave of absence or a voluntary medical leave of absence and there is a clear need to protect the safety of the student and/or others or to protect the integrity of the College’s learning environment.

Reinstatement Following Withdrawal

A student who withdraws or is withdrawn from the College may apply for reinstatement. In order to return to the College from a withdrawn status, a student must make a request in writing to his or her Dean at least eight weeks before the beginning of the semester to which the student seeks to return. The College reserves the right to require, review and approve documentation that the student is qualified and ready to return to academic work.

In the case of a voluntary withdrawal for medical/psychological reasons or any administrative withdrawal under this policy related to a physical or mental health condition, the student must submit a written progress assessment from a treating health professional as part of the request for reinstatement. The Director of Counseling and Health Services

may require a release from the student to discuss current treatment and follow-up needs with the treating health professional, in order to assess whether the student is qualified and ready to return to the College and whether the College can provide the follow-up care needed to maintain the student's enrollment. The Director of Counseling and Health Services approves the return of all students who have withdrawn or been withdrawn for medical or psychological reasons.

Students who are reinstated following a withdrawal from College will comply with the degree requirements of the catalog in effect when they are reinstated.

Graduate Course Repeat Policy (effective starting the 2014-2015 academic year)

If a matriculated graduate student fails a course or receives a grade below the minimum requirement of the program, the student may choose to apply for grade replacement. Permission for a replacement course must be approved by the dean or executive director of the student's school. When a student repeats the same course (which can only be repeated at Manhattan College), the higher of the two grades is used in calculating the student's GPA. The lower grade will remain on the student's record but will not be used in the calculation of the cumulative GPA. If the course is repeated three or more times, the second and subsequent grades are factored into the cumulative GPA. No additional credits are earned.

Explanation

- Graduate grade replacement is not automatic and must be approved by the graduate program director and the dean/executive director of the student's school.
- It is expected that this policy will apply primarily to failing grades, although this policy may be used for programs that have higher grade requirements to progress.
- The lower grade will stay on the transcript with an annotation that the course was repeated.
- For a repeated course with a first grade other than F: the credits for the course will count only once; the higher (as opposed to the most recent) grade will count in the GPA.

Conditions
The policy applies to:

1. all graduate-level courses.
2. only the first time a course is repeated.
3. no more than 6 credits of the student's academic record.
4. only those courses where the grade was not lowered because of violations of the Academic Integrity policy.
5. every currently enrolled degree-seeking graduate student at Manhattan College.

Contested Grades

If a student believes that their final grade in a course is not consistent with the grading criteria designated by the course instructor, the student should first discuss the matter with the course instructor. If the student and the instructor cannot resolve the matter in this

discussion, the student may discuss the matter with the program director. Copies of all graded tests, quizzes, and other assignments will be needed.

In the event that the student is not satisfied with the outcome of the discussions with the course instructor and the chair, the student may make a written request to the program director for a formal consideration of the problem. This request must be submitted within three weeks after the beginning of the semester immediately following the regular fall or spring semester. Included in the request will be an outline of the student's specific complaints. The program director shall make a detailed investigation and shall notify the student and course instructor of their findings.

The student may appeal the findings of the chair to the dean of the school in which the course was offered. The dean will respond to the student in writing and will preserve the documentation of the process. When the department chair is the course instructor, the student may appeal to the dean of the school in which the course was taught who will investigate the matter and notify the student and the department chair and/or program director of their findings.

Students should be aware that only the course instructor may change a grade.

Grade Changes

All course grades (except 'I' grades) are intended to be final and permanent. It is expected that course instructors will determine and report final grades as accurately and precisely as the nature of the evaluation of student achievement and the grading system will permit. It is considered the instructor's direct and personal responsibility to ensure that grades are fair and reported correctly.

Notwithstanding all precautions, faculty members can make errors. When this occurs, the errors should be corrected so that students are not unfairly penalized. If a course instructor decides to request a grade correction, the appropriate forms must be completed and sent to the dean of the school in which the course was taught. Except in the case of contested grades, all requests for correcting grades must be submitted by the last day of the fourth week of the semester of the following fall or spring semester. Only the course instructor can submit a grade change request. The dean of the school may disapprove of the request, indicating in writing the reasons why.

Academic Standing

Graduate students are expected to remain in good standing and to make continued progress towards their degree requirements. Graduate students will be considered in good standing if they maintain a cumulative grade point average (GPA) of 3.0 (B) in their course work; graduate students are expected to have a minimum GPA of 3.0 before they are allowed to graduate. If a graduate student receives a grade less than B in more than one course, the student will be required to meet with the director of the program to discuss continued enrollment in the program. Similarly, a student who has completed nine (9) or more credit hours towards the degree requirements and has a cumulative GPA less than 3.0 will be required to meet with the program director. Failure to meet with the program director may result in the student being subject to dismissal from the program. Any graduate student who receives a failing grade in a graduate course will be placed on academic warning until the course is repeated or an approval substitute course is taken with a grade of B or better. If a graduate student receives a failing grade in the repeated or

substituted course, or a second, separate course, the student will be subject to dismissal from the program.

- All graduate students are required to have a cumulative average of 3.0 or higher while earning a minimum number of credits to demonstrate good academic standing.
- All graduate students will only have federal aid paid one time for courses they are repeating to improve a course grade.
- Each School at Manhattan College may implement additional guidelines for satisfactory academic progress in their programs.

Dean of Students

The Dean of Students is the principal student advocate and provides guidance and direction to all students at Manhattan College. The dean coordinates student life assessments, provides leadership and supervision of student activities, facilitates interdepartmental interaction, and serves as a central student crisis intervention resource by supporting and coordinating student referrals both within and outside of the division. The dean upholds the Manhattan College Community Standards and Student Code of Conduct by coordinating all judicial affairs for the college community. The Dean of Students also directly supervises Residence Life, Student Activities, the Counseling Center, Health Services, and the One Card Office. The Dean also works closely with Student Government to further incorporate student wishes and needs into College life.

The dean’s office is located in Thomas Hall, room 514; telephone (718) 862-7438.

Student Conduct

At Manhattan College, community is based on the mutual respect of many persons engaged in different aspects of the academic venture. In this cooperative educational experience, the Manhattan community has found that certain kinds of behavior defeat the respect we bear for one another. These behaviors are outlined in the Manhattan College Community Standards and Student Code of Conduct. The implementation of the Community Standards and Student Code of Conduct is directly influenced by the thought and writings of St. John Baptist de La Salle. All enrolled students at Manhattan College are subject to the policies outlined in the Community Standards and Student Code of Conduct.

Inappropriate behavior observed by campus officials, as well as information provided by the police and other local authorities, will be addressed. The College will sanction such behavior in accordance with the policies and procedures as outlined in the Manhattan College Community Standards and Student Code of Conduct. For further information on judicial procedures, including College jurisdiction, residence hall guidelines, and procedures for hearings, please refer to the *Manhattan College Community Standards and Student Code of Conduct*.

Disciplinary authority is vested in the Dean of Students. This authority may also be exercised by referral to one of the following hearing boards: the Student Court, the College Judiciary Council, or the Dean of Students' Board. For detailed information on each board, refer to the Manhattan College Community Standards and Student Code of Conduct or contact the office of the Dean of Students, Thomas Hall, room 514; telephone (718) 862-7438.

Pursuant to Article 129-B §6444.6 of the New York State Education Law, if a student is found responsible through the College's judicial process for crime(s) of violence, including, but not limited to sexual violence, as set forth at 20 U.S.C. § 1092(f)(1)(F)(i)(I)-(VIII) ("Clery Act crimes of violence"), the Dean of Students will direct that a notation be placed on the student's transcript.

Where the sanction is a suspension, the following notation will be listed: -"SUSPENDED AFTER A FINDING OF RESPONSIBILITY FOR A CODE OF CONDUCT VIOLATION."

Where the sanction is expulsion, the following notation will be listed:
- "EXPELLED AFTER A FINDING OF RESPONSIBILITY FOR A CODE OF CONDUCT VIOLATION."

Should a student withdraw from the College, while such conduct charges are pending for allegation(s) related to Clery Act crimes of violence and the student declines to complete the student judicial process, the Dean of Students will direct that the following notation be placed on the student's transcript: "WITHDREW WITH CONDUCT CHARGES PENDING."

If a student is found responsible for a Code of Conduct violation that is not classified as a Clery Act crime of violence, and the sanction is expulsion It is recorded in the student's file in the Office of the Dean of Students, on the academic record and the College transcript. A letter is sent to the Dean of the student's school and to the parent or guardian. An expelled student may not enroll in the College at any future date. Expelled students must also seek authorization from the Office of Public Safety to fulfill any appointments on campus.

Students who engage in behavior which is so detrimental to the campus community that they must lose their right to housing, be suspended from the College, or be expelled from the College, are not subject to reimbursement for money paid for the semester in accordance with Title IV federal guidelines.

Drug and Alcohol Violation Disclosure

Section 444 of the General Education Provisions Act (20 U.S.C. 1232 g) is amended by adding at the end the following: (i) Drug and Alcohol Violation Disclosures.

1. In General – Nothing in this Act or the Higher Education Act of 1965 shall be construed to prohibit an institution of higher education from disclosing, to a parent or legal guardian of a student, information regarding any violation of any Federal, State, or local law, of any rule or policy of the institution, governing the use or possession of alcohol or a controlled substance, regardless of whether that information is contained in the student's education records, if -

1. the student is under the age of 21

2. the institution determines that the student has committed a disciplinary violation with respect to such use or possession.

2. State Law Regarding Disclosure – Nothing in paragraph (1) shall be construed to supersede any provision of State law that prohibits an institution of higher education from making the disclosure described in subsection (a).

Disciplinary Hearings Committee

Disciplinary authority is vested in the Dean of Students. This authority may be exercised by referral to the College Judiciary Council, or the Dean of Students' Board.

Any member of the College community may report in writing to the Dean of Students an alleged incident of academic dishonesty as defined in the policy on Academic Integrity. The student(s) involved then becomes subject to an investigation and possible subsequent disciplinary action. The Dean of Students Office is located in Thomas Hall 514.

Student Privacy Rights

Background Information
The primary purpose of The Family Educational Rights and Privacy Act of 1974 is to grant college students “the right to inspect and review any and all official records, files and data directly related to them,” and generally to deny access by others without written consent of the student except in limited and specified circumstances.

Definitions and Procedures
Included in the coverage of the Act is any person who is or was enrolled in Manhattan as a student (including full time and part time undergraduate and graduate students, day and evening).

In compliance with and subject to the provisions of this legislation and the College’s Statement on the Confidentiality of Student Records, the College will make available to each student the College’s official records, files and data falling within the scope of the Act to each student for his or her personal review and inspection. Specifically excluded from the definition are: personal notes of teachers, supervisors and administrators which are retained in their possession and are not accessible to others except substitutes; medical and psychiatric records except that these records may be reviewed by a physician or other professional of the student’s choice; the Parent’s Confidential Statement; letters of recommendation placed in the file before January 1, 1975; and campus security records.

Students wishing to inspect and review any of their official records and material contained therein should file a request in writing with the Registrar. Forms for such requests-in-writing will be made available. All proper requests will be complied with as soon as reasonably possible, but no later than forty-five days of the date of the request.

A hearing may be requested by a student to ensure that his or her records are not inaccurate, misleading, or otherwise in violation of his or her privacy or other rights, to provide an opportunity for the correction or deletion of any such inaccurate, misleading, or otherwise inappropriate data contained therein or to challenge the content thereof. An appropriate hearing procedure has been established by the College and is included in the Statement of Confidentiality of Student Records.

The Law prohibits the release of material in a student’s file without written consent of the student, except to officials and teachers of the same school, another school where the student intends to enroll, and certain state and federal officials.

A copy of the Law and a copy of the Statement is available in the Office of the Registrar and the Office of the Vice President for Student Life.

Withdrawal from Course

Students who find it necessary to withdraw from courses must file the official withdrawal form with the director of the program. The W grade will not be given if the student withdraws after the published date for withdrawal. The withdrawal is dated when the office of the Registrar has been informed. No refund is given if a student withdraws from a course after the third scheduled class.

Incomplete Course Work

In extraordinary instances, when some requirement of a course has not been completed before the final examination, a student may be assigned the temporary grade of I (Incomplete Course Work), if, in the judgment of the teacher, a passing grade may be attained with the completion of the requirement. The *I* grade will be removed and a permanent grade assigned if the requirement is completed satisfactorily. If the requirement is not completed by the date specified in the academic calendar, (see discussion regarding Incomplete grades above) the *I* grade will be automatically changed to *F*. Students are responsible for making arrangements with the teacher to complete the requirement within the time permitted. For certain projects, Independent Study prerequisites, internships and other non-course work (which carry academic credit), students may have an additional session to complete the required work with the permission of the dean of the school.

Students who fail to complete their Master's Thesis/Project by the end of the semester in which they are registered will be issued the temporary grade of T.

The “T” grade indicates a Master's Project, Thesis or Internship/Practicum/Field Experience that is not completed by the end of the semester in which the student has registered. “T” grades are intended to be temporary and must be resolved before the graduate student’s term of matriculation expires. For domestic graduate students, the term of matriculation is five years. For international students on visas, the term of matriculation is 24 months based on visa requirements.

If the course is required for the student’s degree, the “T” grade will convert to an “F” grade if a grade change is not submitted by the end of the matriculation period. If the course is not required for the student’s degree, the “T” grade will convert to an “NG” (No Grade) grade if a grade change is not submitted by the end of the matriculation period. Once a grade is changed to either an “F” or “NG”, the conversion cannot be changed.

The required work must be completed and forwarded to the instructor as soon as it is complete, but no later than 30 days before the end of the matriculation period. The faculty member must submit the final grade within 7 days of receipt of the completed work received from the student.

If the completed work is not submitted according to the timeline or by the time a student applies for graduation, “T” will be converted to “F” or “NG” grades by the Registrar’ Office after consultation with the faculty member. Extensions for the completion of the work or the submission of the final grade may be granted by the Dean of the student’s school only in compelling circumstances. “T” grades must be resolved before the student graduates.

The T grade is not assigned any quality points and is not computed in the student's grade point average.

Semester Hour of Credit

Many three-credit graduate courses meet for two hours of a lecture once a week. To comply with the regulation of the Commissioner of Higher Education that there be fifteen hours of instruction for each semester hour or the equivalent, a third credit is granted for the successful completion of a course paper, an independent reading list, or some suitable project assigned by the professor. In addition to the two hours of lecture, the professor will be available during a third hour to assist and direct the student. The student's final grade for the three credits will reflect the response of the student to this third-hour requirement.

Records

A report of the semester course grades can be viewed on *Self-Service*. Official and unofficial transcripts can be requested from the Office of the Registrar in person, by mail or online at http://www.getmytranscript.com. The Office of the Registrar cannot comply with telephone requests. All obligations to the College must be fulfilled before transcripts will be issued.

Requirements for the Degree

The requirements for a master degree for each of the programs are listed in the departmental sections. All requirements must be completed within the degree time limit.

Students who began graduate studies after January 1, 1989, must present a minimum grade point average of 3.00 within the specified departmental course requirements needed for their degree. If students do not achieve the required grade point average within those specified course requirements, they may take additional courses with the permission of the department chairperson or director of the program to achieve the 3.00 index.

Courses

To be awarded a master degree, a student must successfully complete a minimum of 30 to 60 credit hours of graduate course work, depending upon the requirements of the specific program. Because most graduate programs are part-time, many courses are offered in a cycle over two or more years. It is the responsibility of the student to register for courses in the sequence in which they are offered and to make the necessary progress to complete all the requirements within the five-year time period.

Degree Time Limits

All requirements (courses, paper, projects, thesis) must be completed within the maximum of five years from the beginning of the semester of matriculation. The beginning semester of matriculation is the semester within which the candidate is awarded the first credits towards the degree whether they were earned as a non-matriculated or matriculated student. Candidates should plan their five-year program to assure the completion of all requirements within the five-year period. Foreign students must be full-time students. They must complete the requirements for the degree within two years.

Termination of Matriculation

The dean of the school, on the recommendation of the graduate program director, may terminate the matriculation of any student who fails to make sufficient progress towards the degree or to cancel a student's registration if the student is registered for courses for which the student does not have the prerequisites.

Candidates for the degree not in attendance for two calendar years will have their matriculation terminated. To reactivate their matriculation, these candidates must receive permission from the dean of the school. Such candidates, will need to reapply under the current admissions process and would be required to meet all current degree requirements within the five-year period from the beginning of the semester of matriculation. If this is not possible, the candidate may have to complete additional courses and current degree requirements.

Conferring of Degrees

Degrees are conferred four times a year - September 1, end of December, February 1 and at the annual Commencement Exercises in May. Students who complete their programs in May will receive their degrees at the Spring Commencement in May.

International Student Services

The office of International Student and Scholar Services provides programs and services for Manhattan College students and scholars who are in the United States on non-immigrant F and J visas. These programs and services are designed to aid their adjustment to living and studying in New York City. Services include issuing required federal visa documents; assisting with immigration regulations governing enrollment, employment and travel; and publishing a monthly electronic newsletter, which provides important and timely information on a variety of topics. The office conducts an orientation session for all new international students and scholars in August and in January, coordinates a variety of cross-cultural programs and acts as liaison between students and scholars and other college offices, student groups and U.S. and foreign government agencies.

International students and scholars on non-immigrant visas are required to visit the office of International Student and Scholar Services when they arrive on campus, and are encouraged to maintain close contact with the office throughout the year. The office is located in Room 3.02A within the Multicultural Center on the third floor of the Student Commons. For further information, contact the Director of International Student and Scholar Services at (718) 862-7213.

Administrative Officers

(Date in parentheses following the listing of each person indicates the academic year of appointment to Manhattan College.)

Brennan R. O'Donnell
President
B.A. 1981, Penn State University; M.A. 1983, Ph.D. 1987, University of North Carolina at Chapel Hill. (2009)

Steven Schreiner
Provost and Vice President of Academic Affairs
B.S., Western New England University; M.S., Ph.D.,Vanderbilt University. (2020)

William H. Walters
Executive Director of the Libraries
B.A. 1988, SUNY Geneseo; MLS 1989, University at Buffalo; MA 1992, University of Vermont; Ph.D. 2002, Brown University. (2014)

Colette Geary
Interim Vice President for Enrollment Management
B.S., Manhattan College; M.A., University of Notre Dame; Ph.D.,Stony Brook University. (2020)

Academic Support & Resources

Center for Academic Success

The Manhattan College Center for Academic Success is committed to providing student centered programs and initiatives designed to enhance the learning experience of all students. Students will work in tandem with qualified and caring professionals and peers to receive personal and academic support to ensure their undergraduate success. The Center for Academic Success (CAS) has several locations throughout the campus including the Writing Center and The Learning Center in Thomas Hall, and the Math & Engineering Center in Leo Hall.

The Center prides itself on its holistic approach to learning and is proud to offer various programs designed to support the entire student body. We provide tutoring designed to support students with their courses by providing them with content-specific assistance accessed through individual or on-line tutoring. All tutors employed through the CAS meet the highest standards of academic achievement and are certified through the College Reading and Learning Association. We also provide workshops focused on academic enhancement designed to teach innovative strategies and techniques to assist students with their own unique challenges and experiences.

The Manhattan College Supplemental Instruction Fellowship Program is another facet of the Center which targets traditionally difficult courses and provides regularly scheduled peer facilitated study groups. Supplemental Instruction is an academic assistance program designed to improve student academic performance and increase retention.

The Writing Center offers writing instruction to all members of the Manhattan College community. Assistance is available for writing assignments from any discipline as well as for any professional writing activities. Our cornerstone practice is one-on-one conferencing with trained writing consultants: we help writers identify problems and implement solutions at any point during their writing process. We forge intellectual partnerships to work on specific assignments, to increase confidence, and to improve overall writing performance. Various writing workshops will augment this one-on-one philosophy.

Specialized Resource Center

The Specialized Resource Center (SRC) serves all students with a special need or disability. The SRC is a resource for students, faculty and the college at large. Use of services is voluntary, strictly confidential and without fee. The mission of the center is to ensure educational opportunity for all students with special needs by providing access to full participation in campus life. This is accomplished by assisting students in arranging individualized support services. A sampling of auxiliary aids and/or academic adjustments offered by the SRC for students providing appropriate documentation based on their individual needs for no fee include: priority seating; alternative testing environments; readers, note takers and scribes; access to adaptive technology and liaison with faculty and other college departments. The SRC is located in Thomas Hall, 3rd floor within the Learning Commons.

Study Abroad Opportunities

Manhattan College encourages students to enhance their education through Study Abroad programs. In order to participate in such a program, a student must generally have a minimum cumulative index of 2.75 (some programs require 3.00). Students generally take a semester or a year abroad in their junior year, and occasionally in first semester of senior year. Participation in Study Abroad in second semester of senior year may interfere with graduating on time. Several short-term, faculty lead programs are available also during January intersession and during the summer.

The College offers Study Abroad opportunities in many countries, including Manhattan's own programs at the University of Madrid, at the Istituto Europeo in Florence, and at AIE in Buenos Aires. Exchange programs are available at the Universities of Paris (through MICEFA), LaSalle University of Mexico City and LaSalle University of Barcelona, Spain. Study Abroad programs are also available through our partnership with the colleges and universities of LaSallian International Programs Consortium and the Lower Hudson Valley Catholic College and University Consortium.

All foreign study programs must be approved by the Dean of the School in which the student is enrolled and the Dean of Students, in consultation with the Director of Study Abroad Programs. Further information is available through the Study Abroad Office.

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All foreign study programs must be approved by the Dean of the School in which the student is enrolled and the Dean of Students, in consultation with the Director of Study Abroad Programs. Further information is available through the Study Abroad Office.

Faculty

Full-time:

Walaa Abdallah
Assistant Professor of Chemical Engineering
B., S., M.S., Manhattan College; Ph.D., Columbia University. (2019)

James Patrick Abulencia
Associate Professor of Chemical Engineering
B.S., Manhattan College; Ph.D., Johns Hopkins University. (2007)

Mahmoud Amin
Associate Professor of Electric and Computer Engineering
B.S., M.S., Helwan University, Cairo; Ph.D., Florida International University. (2012)

Samiul Amin
Associate Professor of Chemical Engineering
B.S., Rutgers University; M.S., The Johns Hopkins University; Ph.D., North Carolina State University. (2017)

Salwa Ammar
Professor of Management
B.S, University of Salford, U.K.; M.S, Ph.D., University of Florida. (2009)

Poonam Arora
Professor of Management and Marketing
B.B.A., John Cabot University, Rome; M.B.A., Northwestern University; Ph.D., Columbia University. (2010)

Ehsan Atefi
Assistant Professor of Mechanical Engineering
B.S., Amirkabir University of Technology, Iran; M.A.Sc., Iran University of Science and Technology; Ph.D., The University of Akron. (2017)

Lina Baroudi
Assistant Professor of Mechanical Engineering
B.S., Damascus University; M.S., M.Phil., Ph.D., The City College of New York. (2016)

Natalia Boliari
Associate Professor of Economics and Finance
B.S., Middle East Technical University, Turkey; M.A., Ph.D., Carleton University, Canada. (2009)

Richard F. Carbonaro
Professor of Chemical Engineering
B.S., M.E., Manhattan College; Ph.D., Johns Hopkins University. (2004)

Mahbuboor Choudhury
Assistant Professor of Civil & Environmental Engineering

B.S., M.S., Bangladesh University of Engineering and Technology; Ph.D., Carnegie Mellon University. (2019)

Anirban De
Professor of Civil and Environmental Engineering
B.C.E., Jadevpur University, Calcutta; M.S., Illinois Institute of Technology; Ph.D., Rennselaer Polytechnic Institute. (2003)

Mohab El-Hakim
Assistant Professor of Civil & Environmental Engineering
B.S., Alexandria University, Egypt; M.S., Ph.D., University of Waterloo, Ontario. (2016)

Wafa Elmannai
Assistant Professor of Electrical & Computer Engineering
B.S., Ben Alshor College, Libya; M.S.S., Ph.D., University of Bridgeport. (2018)

Bahareh Estejab
Assistant Professor of Mechanical Engineering
B.S., Shiraz University, Iran; M.S., University of Kentucky; Ph.D., Virginia Tech. (2018)

Kevin J. Farley
Professor of Civil and Environmental Engineering
B.E., M.E., Manhattan College; Ph.D., Massachusetts Institute of Technology. (1995)

Aileen L. Farrelly
Visiting Instructor of Accounting/Law/CIS
B.S, Manhattan College; M.S., Queens College. (2011)

Corine Fitzpatrick
Professor of Education
B.A., Arcadia University, M.S., P.D., Fordham University, Ph.D., Columbia University. (1996)

George Giakos
Professor of Electrical and Computer Engineering
Laurea in Applied Physics, University of Turin, Italy; Post-Graduate Diploma, University of Edinburgh, Scotland; M.S., Ohio University; Ph.D. Marquette University. (2014)

Ahmed T. Goma
Associate Professor of Accounting
B.Comm., M.Acc., Al Azhar University; M.B.A., Baruch College; M.Phil., Ph.D., City University of New York. (1988)

Oleg Goushcha
Assistant Professor of Mechanical Engineering
B.S., M.S., University of California; Ph.D., The City College of New York. (2016)

Hany Guirguis
Professor of Economics, Louis F. Capalbo Professor of Business
B.A., University of Helwan; M.A., University in Cairo; M.B.A., Baruch College; M.S., Ph.D., University of Oregon. (2001)

Jennifer Gullesserian
Assistant Professor of Education

B.A., Pepperdine University; M.A., New York University; Ph.D. School Psychology, New York University. (2009)

Frank Henry
Visiting Professor of Mechanical Engineering
B.S., Thames Polytechnic, U.K., Ph.D., Rutgers University. (2012)

Daniel Hochstein
Assistant Professor of Civil & Environmental Engineering
B.S., M.S., Manhattan College; Ph.D., Columbia University. (2012)

Peyman Honarmandi
Associate Professor of Mechanical Engineering
B.S., Sharif University of Technology; M.S., Amirkabir University of Technology; Ph.D., University of Toronto; Ph.D., Massachusetts Institute of Technology. (2016)

Moujalli Hourani
Associate Professor of Civil and Environmental Engineering
B.C.E., Manhattan College; M.S., RoseHulman Institute of Technology; D.Sc., Washington University. (1988)

Ahmed Refaey Hussein
Assistant Professor of Electrical and Computer Engineering
B.S., M.S., Alexandria University, Egypt; Ph.D., Laval University, Quebec City. (2016)

Evangelia (Eva) Ieronymaki
Assistant Professor of Civil and Environmental Engineering
B.Sc., M.Sc., National Technical University of Athens; Ph.D., Massachusetts Institute of Technology. (2015)

Sr. Mary Ann Jacobs, SCC
Associate Professor of Education
B.A., Felician College, M.S., Manhattan College, PD-ALS, Manhattan College; Ed.D., St. Mary's University. (1994)

Nand K. Jha
Professor of Mechanical Engineering
B.S., Birla Institute of Technology, M.Tech., Ph.D., Indian Institute of Technology. (1981)

Yongwook Kim
Assistant Professor of Civil & Environmental Engineering
B.S., Yonsei University, Seol, South Korea; M.S., Ph.D., Cornell University. (2014)

Elizabeth M. Kosky
Professor of Education
B.A., Manhattanville College; M.S. in Ed., Fordham University; M.A., Manhattan College; Ed.D., University of Miami. (1970)

Swaminathan Krishnan
Associate Professor of Civil & Environmental Engineering
B.S., Indian Institute of Technology; M.S., Rice University; Ph.D., California Institute of Technology. (2019)

Sister Remigia Kushner, C.S.J.

Professor of Education
B.A., Mt. Mercy College; M.Ed., Duquesne University; Ph.D., Fordham University. (1990)

Shawn R. Ladda
Professor of Physical Education
B.S., Pennsylvania State University; M.S., Springfield College; Ed.M., Ed.D., Teachers College, Columbia University. (1994)

Dong Hwan Lee
Associate Professor of Marketing
B.A., Kon-Kuk University; M.B.A., Oklahoma University; Ph.D., Indiana University. (1997)

Juneseok Lee
Associate Professor of Civil & Environmental Engineering
B.S., Korea University, South Korea; M.S., Ph.D., Virginia Tech. (2018)

Ian Levy
Assistant Professor of Education
B.A., Queens College, City University of New York; M.A., Ed.M., Ed.D., Columbia University. (2018)

John C. Leylegian
Associate Professor of Mechanical Engineering
B.E., The Cooper Union; M.S.E., M.A., Ph.D., Princeton University. (2008)

Bahman Litkouhi
Professor of Mechanical Engineering
B.S., Tehran Polytechnic; M.S., Ph.D., Michigan State University, Professional Engineer, New York. (1983)

Sandra Lopez-Quintero
Visiting Assistant Professor of Mechanical Engineering
B.S., Universidad de Los Andes, Columbia; M.Sc., The City College of New York; Ph.D., The Graduate Center at CUNY. (2014)

Scott A. Lowe
Professor of Civil and Environmental Engineering
B.E., Ph.D., University of Wollongong, Australia, Professional Engineer, New York. (1994)

Fiona C. Maclachlan
Professor of Economics and Finance
B.A., Queen’s University, Canada; M.A., Rutgers University; Ph.D., New York University. (1992)

Gennaro J. Maffia
Professor of Chemical Engineering
B.S., M.S., Manhattan College; M.B.A., New York University; Ph.D., Dartmouth College. (2010)

Robert Mauro
Professor of Electrical and Computer Engineering
B.S., M.S., Ph.D, Polytechnic Institute of Brooklyn. (1974)

William J. Merriman

Professor of Health and Physical Education
B.S., Manhattan College, M.S., Pennsylvania State University, Ph.D., New York University. (1987)

Mary L. Michel
Assistant Professor of Accounting, Gabriel Hauge Faculty Fellow of Business
B.S., Duquesne University; M.S., Carnegie Mellon University; M.Phil., Ph.D., Columbia University. (1998)

Mohammad H. Naraghi
Professor of Mechanical Engineering
B.S., University of Tehran; M.S., University of Wales; M.S., Ph.D., University of Akron. (1986)

Karen Nicholson
Dean of the School of Education and Health and Associate Professor of Education
B.S., West Virginia State College; M.S., West Virginia College of Graduate Studies; Ph.D., Ohio State University. (1994)

Chester J. Nisteruk
Professor of Electrical and Computer Engineering
B.E.E., M.S., Ph.D., Polytechnic Institute of Brooklyn. (1951)

Mehdi Omidvar
Assistant Professor of Civil and Environmental Engineering
B.Sc., M.Sc., Mazandaran University, Iran; Ph.D., New York University. (2015-)

Nevzat Ozturk
Associate Professor of Electrical and Computer Engineering
B.S., M.S., Middle East Technical University; Ph.D. Hacettepe University. (1986)

Romeo Pascone
Professor of Electrical and Computer Engineering
B.S., Massachusetts Institute of Technology; M.S., Columbia University; Ph.D., Polytechnic Institute of New York. (1982)

Lisa Anne M. Rizopoulos
Professor of Education
B.A., Herbert H. Lehman College; M.S., Fordham; Ph.D., Fordham University (2000)

Richard D. Ross
Visiting Instructor of Real Estate
B.A., City College of New York; M.B.A., Baruch College; Ph.D., Pace University. (2019-)

Janet L. Rovenpor
Professor of Management
B.A., Tel Aviv University; M.B.A., Baruch College; Ph.M., Ph.D., City University of New York. (1991)

Yassir Samra
Associate Professor of Management
B.E., M.S.Mgmt., M.S.Indust.Eng., New Jersey Institute of Technology; Ph.D., Stevens Institute of Technology. (2005)

Grishma Shah
Associate Professor of Management
B.A., M.A, Ph.D., Rutgers University. (2008)

Zahra Shahbazi
Associate Professor of Mechanical Engineering
B.S., University of Tehran; M.S., Amir Kabir University of Technology; Ph.D., University of Connecticut. (2012)

Robert R. Sharp
Professor of Civil and Environmental Engineering
B.S.C.E., M.S., University of New Mexico; Ph.D., Montana State University, Professional Engineer, New York. (1995)

Patricia M. Sheridan
Associate Professor of Law
B.A., Manhattan College; J.D., Fordham Law School. (1994)

Radwa Sultan
Assistant Professor of Electrical & Computer Engineering
B.S., M.S., Alexandria University; Ph.D., University of Houston. (2018)

Aravind Suresh
Assistant Professor of Chemical Engineering
B.Tech., National Institute of Technology, India; Ph.D., University of Connecticut. (2018)

Kudret Topyan
Professor of Economics and Finance
B.S., Middle East Technical University (Turkey); M.Phil., Ph.D., City University of New York. (1991)

Mehmet Ulema
Professor of Computer Information Systems
B.S., M.S., Istanbul Technical University; M.S., Ph.D., Polytechnic University. (2002)

Sasidhar Varanasi
Professor of Chemical Engineering
B.S., Andhra University, India; M.S., Indian Institute of Technology, India; Ph.D., State University of New York at Buffalo. (2017)

Matthew Volovski
Assistant Professor of Civil and Environmental Engineering
B.S., Northeastern University; M.S.C.E., Ph.D., Purdue University. (2015)

Marc E. Waldman
Associate Professor of Computer Information Systems
B.A., M.S., Ph.D., New York University. (2003)

Graham Walker
Professor of Mechanical Engineering
B.S., Strathclyde University; Ph.D., Southampton University. (1993)

Jane-Chia Wang
Associate Professor of Economics and Finance

B.A., National Tsing Hua Uni Taiwan; M.B.A., Baruch College; Ph.D., Rutgers University. (2005)

Qian Wang
Associate Professor of Civil and Environmental Engineering
B.E., Dalian University of Technology, China; M.Phil., The Hong Kong University of Science & Technology; M.S., Ph.D., The University of Iowa. (2012)

Yi Wang
Assistant Professor of Electrical and Computer Engineering
B.S., M.S., Wuhan University of Science and Technology; Ph.D., University of Alabama. (2015)

Timothy J. Ward
Dean, School of Engineering and Professor of Civil and Environmental Engineering
B.S., M.S., University of Nevada, Reno; Ph.D., Colorado State University, Professional Engineer, New Mexico. (2008)

Gloria Wolpert
Professor of Education
B.A., SUNY at Stony Brook, M.A., Ed.M., Ed.D., Columbia University Teachers College. (1996)

Kathryn C. Weld
Professor of Mathematics
B.A., State University of New York at Potsdam; Ph.D., City University of New York. (1988-)

Part-time:

Rosanna Almanzar
Graduate Counseling
B.A., MSEd, Fordham University; P.D., Manhattan College. (2015)

Ralph Amicucci
Civil Engineering
B.E., Manhattan College; M.B.A., Iona College; J.D., Touro Law School. (2010)

Michelle Anne Bell
Graduate Counseling
B.A., M.A., Psy. D. Rutgers University. (2006)

Jamie Bernstein
Education
B.S., SUNY Oneonta; M.S.E.D., Long Island University. (2007)

Christine Bleecker
Graduate Counseling
B.S., Queens College; M.S., C.W. Post; Ed.D., University of Pennsylvania. (2008)

Natasha Bowman
School of Continuing and Professional Studies
B.S., Troy University; J.D., University of Arkansas. (2012)

Neil Bussutil
Graduate Counseling
B.A., Fordham University; M.A., John Jay College of Criminal Justice; Ph.D., Yeshiva University. (2010)

Jovarya Cabrera
Education
B.A., College of New Rochelle; M.S., City College of New York. (2014)

Tony Canale
Civil and Environmental Engineering
B.S., Manhattan College; M.S., Virginia Tech. (2008)

Marco Castaldi
Chemical Engineering
B.S., Manhattan College, M.S., Ph.D., University of California, LA. (1998)

David Chapinski
School of Continuing and Professional Studies
B.A., M.P.A., Rutgers University. (2012)

Sung Choi
Civil and Environmental Engineering
B.S., M.S., Inha University (Korea); Ph.D., University of Illinois at Urbana-Champaign. (2006)

James Colasacco
School Building Leadership
B.S., New York University; M.S, City College of New York; M.S., Manhattan College. (2010)

Lynn Gorey
School Building Leadership
B.S., College of Mount St. Vincent; M.S., College of New Rochelle. (2014)

Woodrow Crouch
Civil Engineering
B.S., Merchant Marine Academy; M.S., Columbia University. (2009)

Robert Day
School of Continuing and Professional Studies
B.A., Yale University; M.A., University of California, Berkley. (2012)

Angelo DeVito
Electrical and Computer Engineering
B.E.E.E., Manhattan College; M.S.E.E., Polytechnic Institute of New York. (1978)

Robert Farrauto
Chemical Engineering
B.S., Manhattan College; Ph.D., Rensselaer Polytechnic Institute. (2006)

Paul Farrell
Graduate Counseling

B.A., Manhattan College; M.S., City College of New York; Certificate of Advanced Graduate Study, City College of New York; Ph.D., Yeshiva University. (2010)

Barbara Ferraro
Education
B.A., Hunter College; M.S., Lehman College; P.D., Fordham University; Ed.D., Fordham University. (1989)

Sarah FitzMaurice
Civil Engineering
B.S., M.S., Manhattan College. (2012)

Donna Fitzsimmons
Graduate Education
B.A. Lehman College; M.S.Ed. Spec Ed Lehman College. (2002)

Dawn Gavin
Education
B.S., New York University; M.S., Columbia University; M.S., Harvard University. (2003)

Nancy Goldman
School of Continuing and Professional Studies
B.A., New York University; M.A., Ed.D., Columbia University. (2012)

Lynn Gorey
School Building Leadership
B.S., College of Mount St. Vincent; M.S., College of New Rochelle. (2014)

Michael Hager
Civil Engineering
B.S., Worcester Polytechnic Institute; J.D., Pace University. (2009)

Margaret Harten
Education
B.A., Dominican College; M.S., College of New Rochelle; M.S.Ed., Manhattan College. (2004)

Barbara Haynes
Graduate Counseling
B.A., Brown University; M.A., New York University; Ph.D., Teachers College, Columbia. (2010)

Jaqueline Heyward
Education
B.A., Lehman College; M.A., Bank Street College; M.S.Ed., Manhattan College. (2014)

Helen C. Hollein
Chemical Engineering
B.S. University of South Carolina; M.S., D.Eng.Sc., New Jersey Institute of Technology; Professional Engineer, New Jersey. (1982)

William Horgan
Civil Engineering
B.E., Manhattan College; M.S., NYU Polytechnic University. (2011)

Sunitha Howard
Education
B.S., Lehman College; M.Ph., Columbia University. (2006)

Christine Ironside
Education
B.A. Marymount College; M.S. Ed., College of New Rochelle. (2004)

Patrick Jean-Pierre
Graduate Education
B.A., M.A., State University of New York, Stonybrook; Ph.D., Rutgers University. (2011-)

Julien M. Kern
Education
B.A., Hunter College; M.S., Manhattan College. (1996)

Vera Kishinevsky
Graduate Counseling
M.A., Odessa State University; M.A., Jersey City State College; Ph.D.,, New York University. (2001)

Rose Klimovich
Management and Marketing
B.S., M.S., Carnegie-Mellon University. (2011)

Nicole Lent
Education
B.S., M.S.Ed., Manhattan College. (2014)

Raymond Loverso
Education
B.A., M.A., Hunter College. (2007)

Robert Lucas
Chemical Engineering
B.S., M.S., M.B.A., Manhattan College; Professional Engineer, New Jersey (2004).

Alexis Marrero
School Building Leadership
B.S., M.S., Manhattan College; Ed.D., Sage. (2015)

Thomas N. McKee
Electrical and Computer Engineering
B.S., M.A., Manhattan College. (2003)

Susan P. Moor
Graduate Counseling
B.S., Fordham University; M.A., Manhattan College; M.Ed., Ed.D., Teachers College, Columbia University. (1988)

Paul Murtagh
Civil Engineering
B.S., National University of Ireland (Galway); M.S., Trinity College (Dublin). (2014)

Eileen Murtha

Education
B.A., Iona College; M.S.Ed., Manhattan College. (2010)

Robert D. Mutch
Civil and Environmental Engineering
B.S.C.E., Newark College of Engineering; M.S.C.E., New Jersey Institute of Technology. (1990)

Christin Nedumchira
Graduate Counseling
B.S., New York Institute of Technology; B.S., Stella Maris College; Psy.D., The Chicago School of Professional Psychology. (2014)

Karen Parisi
Education
B.A., SUNY Oswego; M.A., Adelphi University. (2014)

Suzanne Peda-Libfeld
Education
B.A., M.S., Lehman College; P.D., Fordham University. (1992)

Frank Perricelli
Civil Engineering
B.S., Manhattan College; M.S., Manhattan College. (2009)

Michael Powers
Electrical and Computer Engineering, Mechanical Engineering
B.S.N.E., M.S.N.E., Eng.N.E., Polytechnic University. (2001)

Kevin J. Rader
Civil and Environmental Engineering
B.S., M.S., Manhattan College; Ph.D., University of Delaware. (2010)

Genise Reid
School of Continuing and Professional Studies
B.S., Cornell University; M.A., M.Ed., Ed.D., Columbia University. (2012)

Luba Roytburd
Graduate Counseling
B.S., University of Maryland; Ph.D., University at Albany, State University of New York. (2010)

Dana Rose
Graduate Counseling
B.A., Southern New Hampshire University; M.A., P.D., Manhattan College. (2016)

Daniel Russo
Education
B.S., M.S., Manhattan College. (2012)

Paul Schmall
Civil Engineering
B.S., Bucknell University; Ph.D. in progress, University of Nottingham, U.K. (2009)

Damian F. Sciano

Electrical and Computer Engineering
B.S., Cooper Union; M.B.A., Baruch College; M.S., Manhattan College, Professional Engineer, New York. (2011)

Marie Sheehan
Education
B.A., Hunter College; M.S., Manhattan College. (2006)

Jeanne Schultz
Education
B.S., SUNY New Paltz; M.S., New York University. (2011)

Robert P. Stein
Graduate Counseling
B.A., M.A., California State University; M.A., Seton Hall University; Ph.D., Alliant International University. (2014)

Peter K. Sweeney
Civil Engineering
B.S.E.E., M.S., Manhattan College; M.S., Ph.D., New YOrk University. (1996)

Mathew Swerdloff
Education
B.A., University of WA; M.S., SUNY New Paltz; Ed.D., Western CT State University (2013)

Richard Tomko
School Building Leadership
B.A., M.S., Ph.D., Seton Hall. (2013)

Jonscott Turco
School of Continuing and Professional Studies
B.S., M.A., Manhattan College. (2012)

Ali Vadavarz
Mechanical Engineering
B.S., New York Institute of Technology; M.S., University of Bridgeport; Ph.D., Polytechnic University. (2009)

Milan Vatovec
Civil Engineering
B.S., Belgrade University; M.S., University of Illinois; Ph.D., Oregon State University. (2007)

Antonio Vincitore
Chemical Engineering
B.S., Manhattan College; M.S., University of California, LA; Ph.D., University of California, LA. (2005)

Kathleen Horner Wall
School of Continuing and Professional Studies
B.S., Westfield State University; M.S., Western New England University; M.S., University of Hartford; Ed.D., Columbia University. (2012)

Thomas Welby

Civil Engineering
B.E., Manhattan College; M.S., New York University; M.B.A., New Mexico Highlands University; M.S., Polytechnic University; J.D., Pace University School of Law. (2015)

Financial Services

Tuition and Fees

Student Accounts and Bursar Services

Financial Aid Administration

Tuition and Fees

Tuition and Fees (2020-2021)*

Regular Fees*

Fee	Amount
Application for all students (nonrefundable)	$75
Registration per term (nonrefundable)	$110
O'Malley School of Business Information Services Fee (per term) (For students enrolled for 5 or more credits)	$200
School of Education Information Services Fee (per term) (For students enrolled for 5 or more credits)	$200
School of Engineering Information Services Fee (per term) (For students enrolled for 5 or more credits)	$160
School of Science Information Services Fee (per term) (For students enrolled for 5 or more credits)	$160
SCPS Information Services Fee (per term) (For students enrolled for 5 or more credits)	$200
Information Services Fee_Resident surcharge (per term)(For students enrolled in 5 or more credits)	$170
Graduation Tuition per credit - O'Malley School of Business	$1,180
Graduate Tuition per credit-Online School of Business	$1,230
Graduation Tuition per credit - School of Education	$1,010
Graduation Tuition per credit - School of Engineering	$1,150
Graduate Tuition per credit- School of Science	$1,150
Graduate Tuition per credit-SCPS	$930
Graduate Tuition per credit-Online SCPS	$990
Tuition per credit for Undergraduate prerequisite courses	$1,070
Tuition per credit for Business Bridge Courses for Non-Majors (summer rate)	$440
Student Health Insurance ** Annual Charge	$2,550
Graduation Fee	$410

Special Fees*

Fee	Amount
Non-Matriculation Fee (per semester)	$210
Returned check charge	$25
Off-campus courses transfer credit	$170
Deferral Fee	$100
Each transcript of record from Registrar	$5
Finance charge (per month on overdue balance)	1%

* Subject to change

** *Student Health Insurance will be assessed to all international students, resident students and students participating in intercollegiate athletics. The charge can be waived if proof of existing comparable coverage is submitted and approved by the insurance provider.*

Students enrolled in any 5-year program as an undergraduate student should contact the Office of Student Accounts and Bursar Services for guidance on the correct terms and conditions of tuition and aid.

Polices and Procedures

Payment Responsibilities and Agreement Notice

Enrolled students agree to be in accordance with all policies and procedures related to their financial obligation to the College. The enrolled student assumes liability for any debt incurred during his/her attendance at Manhattan College including late payment penalties and all legal and/or collection costs related to the efforts to collect a past due balance. The terms of payment, withdrawal and adjustment set forth in this catalog are incorporated upon enrollment.

Students are required to notify in writing to the College any change in address or other contact information. All changes in billing address must be provided immediately in writing even after such time as a student completes his/her program and has loans outstanding to the school. Failure to comply with the policies on address changes that result in the loss or delay of contact are the sole responsibility of the student.

Payment to the College is always the responsibility of the student regardless of the source of funding for tuition. Inquiries regarding accounts receivable and/or cashiering can be directed to the Office of Student Accounts and Bursar Services by phone at (718) 862-7961 or e-mail studentaccounts@manhattan.edu (finaid@manhattan.edu).

Account access is available at www.manhattan.edu/myaccount (https://self-service.manhattan.edu/) with official Manhattan College login credentials. Students and designated authorized users can view the billing account detail transactions and up-to-date account balances. Other student information services available to view via self service include financial aid awards, class schedules, grades, unofficial transcripts, and personal information such as address, phone number, and e-mail address.

Safeguarding Policy

This is an official notice of Manhattan College's policy regarding the safeguarding of customers' information established by the Federal Trade Commission (FTC). Manhattan College is subject to the provisions of the Gramm-Leach Bliley Act (GLBA, 16 CFR 314) which recognizes the College and other higher education institutions as a financial institution.

Manhattan College adheres to very strict privacy and safeguarding rules, keeping sensitive information safe. Manhattan College is in compliance with specific requirements related to the administrative, technical and physical safeguarding of customer information. Manhattan College also requires its service providers to implement and maintain such safeguards.

Tuition Liability for Fall and Spring Terms

Only students who have satisfied their current account for the term will be eligible for online pre-registration for an upcoming term. Billing statements with a tuition deadline date will be emailed to students in early July for the Fall term and by mid-December for the Spring term. Follow-up billing statements for outstanding balances continue monthly thereafter, but it is the student’s responsibility to access the Student Account Suite, studentaccounts@manhattan.edu, for account updates. No student will be permitted to

enroll for an academic term until all outstanding accounts with the College have been satisfied. Liability for tuition and fees is not contingent on completing courses, course attendance, receiving grades, receiving passing grades or status of financial aid awards. Students who register after the tuition deadline for a term or make adjustments which result in increased liability after the tuition deadline for a term must make payment to the College upon those transactions.

Registration/Payment for Intersession Terms

Summer preregistration is available online. Students are encouraged to review their account balance on the Student Account Suite to view the charges. Payment reminders will be sent approximately one week before the payment deadline. In order to enroll in person for an intersession term (January/Summer), payment must accompany a request for registration or be provided in advance. There is no option to register without prepayment after preregistration concludes and for the winter session.

Payment of Tuition and Fees

Acceptable forms of payment are cash, personal check, bank check, money order, credit card, and bank wire, via Western Union. Checks must be payable to Manhattan College and routed to the Office of Student Accounts and Bursar Services. The student's identification number should be included on all payments. The College reserves the right to dictate form of future payments in cases where insufficient funds are presented and/or in cases of continued delinquent account status. Payment can be made in person at the Student Accounts and Bursar Services Office in Miguel Hall, Room 100 or mailed. The College accepts MasterCard, Visa, Discover and American Express credit cards. Secure, online credit card payments and ACH automatic check or savings withdrawals may be processed by accessing the Student Account Suite, studentaccounts@manhattan.edu with the appropriate login credentials.

Method of Financial Aid Payments

Financial aid will be credited directly to the student tuition account. Although initial tuition bills will list pending aid to assist in financing calculations, actual disbursements are subject to eligibility requirements, completion of necessary applications, and verification of applications. Institutional awards, Federal Direct Stafford Loans, Federal Direct PLUS Loans, Federal Pell, SEOG, ACG, SMART, TEACH, and New York State TAP will be disbursed to the student account in two disbursements; one-half at the scheduled start of the Fall term and the other half at the scheduled start of the Spring term. If a student earns eligibility for any federal aid (Pell, Direct Loans) for intersession terms, awards will be applied at the start of those terms. Private loans will also be applied in accordance with the authorized enrollment periods. Federal Work Study is not applied to the tuition account. FWS awards become active upon application and when a work position is secured. Paychecks are issued to students semi-monthly and are based on actual hours worked.

Non-Payment Penalties

Students can avoid late payment charges by paying their tuition and fees by the published deadline. A late penalty of 1% of the outstanding balance of any student account will be

assessed at the end of each month until the account is settled. Accounts not paid in full may be referred to a collection agency, which can result in additional collection and/or legal costs.

Indebtedness to the College may automatically terminate current enrollment and indefinitely suspend future enrollment. The College reserves the right to request prepayment before allowing registration for future terms. In addition, students with an outstanding obligation to the College will also be barred from online account access via Self Service, receiving grade reports, parking decals, transcripts, and participating in commencement until all account balances have been paid.

Policy on Returned Items

If for any reason a check, eCheck, eRefund does not clear for payment, a returned ACH and/ or check charge of $25 is charged to the student's tuition account. Payment for the amount of the returned item and the $25 return item charge must be paid immediately by cash, credit card, certified bank check or money order. Personal checks and ACH withdrawal will no longer be accepted as a payment option. Account restrictions will also bar electronic payments via eCheck after an item is returned. *The College will request that future payments be made in form of cash, credit card, certified bank check or money order. The College reserves the right to cancel or deny enrollment for a particular term due to payment with insufficient funds.*

Monthly Payment Plan

Manhattan College partners with TouchNet to offer semester based 5-month installment plans (Fall & Spring only), referred to as the Monthly Payment Plan (MMP) for matriculated students enrolling at least part time. The cost to enroll is $50.00 per term. The monthly payment plan allows for convenient adjustments and will automatically notify you via email anytime your installments increase or decrease based on changes in tuition and fees or revisions in financial aid items. For more information, you can refer to the Payment Options tab on the Student Accounts Website (manhattan.edu/studentaccounts). (https://inside.manhattan.edu/offices/bursar/payment-options.php)

Employer Deferment

Students expecting reimbursement from their employer may defer payment of tuition and applicable fees upon approval of our Application for Deferral. Upon approval, a student's account is charged the deferral fee (listed on application) and any portion of tuition/fees not covered by the employer will be payable in advance. The application will require certification of the employer's reimbursement on company letterhead. Please contact the Office of Student Accounts and Bursar Services for the current terms and fees and to seek eligibility for a **regular student deferral** if there is no employer reimbursement. The cost of an employer deferral is $100 (subject to change) which is charged to the student account and payable immediately.

Regular Student Deferment

Students who need additional time to secure tuition financing will have the opportunity to apply for a tuition deferment, with an approved source of funding. If approved, a deferment can extend your tuition payment deadline by approximately six weeks. Applications must

be filed by the tuition deadline date. The cost of a deferral is $100 (subject to change) which is charged to the student account and payable immediately. The deferment fee and extended deadline date will be listed in the signed and approved application.

Refund and Liability Policy

If a student withdraws from a term, takes a leave of absence after the start of term, or is dismissed from Manhattan College, then the school may be required to return all or some portion of federal funds awarded to the student. The student may be eligible for a refund for a portion of the tuition, fees, and room and board paid to the College depending on the refund/liability schedule and the determined official withdrawal date. Students **must** complete an official “Withdrawal from College” form.

Failure to attend class and/or failure to notify the Office of the Dean and Office of the Registrar does not constitute an official withdrawal. Also, failure to make or complete payment does not constitute official withdrawal. Students who never attend or stop attending classes and fail to file the official paperwork mandated by College policy are responsible for 100% of tuition and fees.

Official Date of Withdrawal

The date used for refund/liability purposes will be the date that the paperwork was completed, not the last date of attendance. Drops or withdrawals received by mail will be effective as of the official postmarked date.

Refund of Tuition/Liability of Tuition- Traditional 15 week term

Refund of tuition charges only will be made in accordance with the following schedule:

Duration	Refund/Liability
During the 1st week	100% refund no liability
During the 2nd week	80% refund 20% liability
During the 3rd week	60% refund 40% liability
During the 4th week	40% refund 60% liability
During the 5th week	20% refund 80% liability

After Week 5 there is no refund, and 100% liability of tuition.

Refund of Tuition/Liability of Tuition- SCPS, IELP Degree Programs & 7-week Session:

Refund of tuition charges only will be made in accordance with the following schedule:

Duration	Refund/Liability
During the 1st week	100% refund no liability
During the 2nd week	70% refund 30% liability
During the 3rd week	30% refund 70% liability

After Week 3 there is no refund, and 100% liability of tuition and fees.

Room and Board Liability

Charges will be prorated per calendar week up to 5 weeks, as authorized by the Office of Residential Life.

Official Date of Withdrawal

The date used for refund/liability purposes will be the date that the paperwork was completed, not the last date of attendance. Drops or withdrawals received by mail will be effective as of the official postmarked date.

Tuition Insurance Plan

Manhattan College has partnered with ***GradGuard*** to offer an optional insurance plan, Tuition Protection Plan by Allianz Global Assistance, which helps protect you in cases of accident or illness. Your participation in Tuition Protection Plan is completely voluntary; it represents a contract between you and the Allianz Global Assistance. Manhattan College does not benefit from your participation.

Enrollment Instructions

Should you decide to participate in the Tuition Protection Plan, you can learn more and obtain a quote by calling 877-232-0765 or go to www.gradguard.com/manhattan (http://www.gradguard.com/manhattan/). Sign-up is required prior to the first day of classes. For the 2018-19 year, August 27 is the first day of classes in the fall and January 15 is the first day of classes in the spring.

What the Plan Covers

The coverage complements our refund policy-providing reimbursement for eligible tuition payments, room and board fees and other nonrefundable expenses if you withdraw for a covered illness or injury at any time during the plan period.

Adjustment of Institutional Aid

The College's refund policy exists for calculating liability for institutional tuition charges. Therefore, if any charges are prorated as a result of voluntary or involuntary withdrawal, the College must in turn prorate any institutional grants based on the percentage charged to the student as listed in the above policy.

Return of Title IV Federal Aid

When a student withdraws during a term, the amount of federal financial aid earned by the student is determined on a pro-rata basis up to the end of 60% completion point of a term. The amount of federal Title IV aid earned is based upon the period of enrollment completed. A percentage is computed by dividing the number of days completed (as of the date the student officially withdraws) by the total number of days in the term as determined by the Office of Financial Aid Administration. Scheduled breaks of more than four consecutive days are excluded. The percentage is then applied to the aid received to determine earned and unearned aid. If and when any aid is determined to be unearned,

it must be returned to the appropriate financial aid program(s). Once a student has completed more than 60% of the term, the student is considered to have earned 100% of aid and no adjustment to aid is made.

Refunds of Credit Balances

Refunds are subject to the review of the Office of Student Accounts and Bursar Services. Institutional awards can never be refunded to the student. Credit balances resulting from private scholarships, federal and alternative loan programs are subject to specific guideline review and approval by a financial aid counselor and a student account representative. Refunds will be routed through the approval process when the credit amount actually exists on the student's account, after the census date for each term (first week of each term, or the add/drop period). In the event of an overpayment of personal funds paid to the College by check, refunds will be subject to a ten day holding period while original funding is cleared by the bank. Credit balances resulting from excess payments will be refunded to the student's name.

Processing of Refunds

Checks will be mailed to the current home address of the student, if the student does not elect to receive an eRefund.

Financial Assistance

The office of Office of Financial Aid Administration and Office of Student Accounts and Bursar Services will assist in obtaining the maximum financial aid available to those who qualify. Since the majority of students enrolled in the graduate programs at Manhattan College are attending part-time, financial assistance is limited.

To be eligible for financial assistance, a student must be matriculated and attending at least 1/2 time (3 credits per semester). To be considered for financial aid, students must comply with the timely submission of the following:

Free Application for Federal Student Assistance (FAFSA) — our FAFSA code is 002758. The FAFSA application must be completed by filing directly on the web at www.fafsa.gov (http://www.fafsa.gov). The FAFSA form should be filed as early as October 1 for the following academic year for which the student wishes to be considered for aid.

The Federal Student Aid Program performs a needs analysis service which computes the student/family contribution toward educational costs. Manhattan College then determines financial need based on the total cost of attendance at the College. The cost of attendance includes tuition and fees, a room and board allowance, books, transportation and other miscellaneous costs. The office of Student Financial Services deducts the family contribution as determined by the FAFSA from the Total Cost of Attendance to arrive at an amount of family need. An online financial aid award letter will be sent to advise students of eligible aid types. Typical financial awards might include:

Unsubsidized Federal Direct Stafford Student Loan: a matriculated graduate student may borrow up to $20,500 per year depending on need as determined by the FAFSA. Under this program, borrowers are responsible for interest that accrues while attending school.

Graduate PLUS Loans: a matriculated graduate student is eligible to borrow under this additional program to meet the costs of attendance if they have exhausted their Federal Direct Stafford annual limit or aggregate limit. Students are advised to meet with a financial aid counselor for a review of eligibility.

Note: Maximum eligibility for these federal loans is $20,500 per academic year. However, the loan amount may be limited to cover only the cost of attendance as determined by the guidelines above. First-time borrowers at Manhattan College must submit a Master Promissory Note (MPN) and complete Online Entrance Interview Counseling. Links are available at www.sfs.manhattan.edu.

Federal Teacher Education Assistance for College and Higher Education (TEACH Grant): The TEACH Grant is a federal program that strives to encourage teachers into high-need teaching areas in K-12 low-income schools. It allows for a grant (not need-based) of up to $4,000 per year for students in qualifying undergraduate and graduate programs in exchange for service as full-time highly-qualified teachers in a high-need field within a low-income school upon graduation. If the teaching service years are not fulfilled within eight years of graduating or leaving the qualifying program, the grant is converted into a Federal Direct Unsubsidized loan with interest, and must be repaid in full. Teachers are responsible for gaining employment within these parameters by

themselves. No formal assistance is provided by the College. To be eligible, students must be U.S. citizens or eligible non-citizens, have a documented score of at least the 75th percentile on any section of the SAT or ACT or have an overall GPA of at least 3.25, annually complete a FAFSA and Agreement to Serve (ATS) and entrance counseling, and enroll in a teacher certification program in one of the following areas offered at Manhattan: Foreign languages, Mathematics, Science (grades 5-9 and 7-12), Special Education, NYC teachers only for English (grades 5-9 and 7-12), and Physical Education. More information is available on the Student Financial Services website.

Graduate Assistantships: Generally awarded to a student based on his or her academic program, graduate assistantships are part-time jobs working for a faculty member, department, or the College in general. All graduate assistantships are administrative except through the School Of Engineering, which are research-based. Graduate Assistants are typically hired on a 9 month contract, work 20-30 hours/week, and cover 9 credits a semester (fall and spring only) with a maximum of 18 credits per calendar year. Graduate assistantship positions do not cover fees.

Research Assistantships: Graduate Research Assistantships (GRAs) involve a full-tuition scholarship and a monthly stipend for 18-24 months. GRAs are required to work 24 hours/week during school sessions, and 35 hours/week during winter intersession and summer.

Veterans: All recipients of veterans' educational benefits must meet the certifying officer after proceeding with an application for admission to Manhattan College. Please forward a copy of your certificate of eligibility to Manhattan College's VA Certifying Official, Addie Newman located in Thomas Hall, 3rd Floor, 718-862-7382 or email anewman01@manhattan.edu.

The Yellow Ribbon GI Education Enhancement Program (Yellow Ribbon Program) allows institutions of higher learning (degree-granting institutions) in the United States to voluntarily enter into an agreement with the Department of Veteran Affairs to fund tuition expenses that exceed the highest public in-state tuition rate. This tuition benefit program includes both undergraduate and graduate study at either a full-time or part-time enrollment. This significant commitment upholds a long history of Manhattan College support for our veterans and their academic and career endeavors.

Yellow Ribbon Benefit at Manhattan College: The Department of Veteran Affairs will match at the same amount 50%of the difference between the student's tuition benefit and the total cost of tuition and fees. The VA published cap rate for 2020/2021 is $ 25,162.14.

Code of Conduct Policy : Manhattan College enforces a code of conduct policy (http://manhattan.edu/student_life/student-financial-services/resources/code-conduct/) for all employees who are involved with the administration of federal student aid. The purpose of the policy is to prohibit conflicts of interest in situations involving student financial aid and to establish standards of conduct for employees with responsibility for student financial aid. Visit the Student Financial Services website for current information.

Academic Progress and Program Pursuit for Federal Loans:

As a graduate student you must meet a 3.0 GPA and complete credits for each term.

Federal Direct Stafford Loan

Federal Direct Graduate PLUS Loan for Graduate Students

Degree and Aid Time Limits

There is a maximum length of time set for completion of a degree program with the benefit of receipt of federal financial assistance. The standards provide that a student must complete two-thirds of all coursework attempted in each term.

Satisfactory Academic Progress (SAP)

- All graduate students are required to have a cumulative average of 3.0 or higher while earning the minimum number of credits to demonstrate good academic standing.
- All graduate students will only have federal aid paid one time for courses they are repeating to improve a course grade.
- Each School at Manhattan College may implement additional guidelines for satisfactory academic progress in their programs.

All students at Manhattan College are expected to make positive academic progress toward a degree. Students are said to be making satisfactory academic progress when they meet both the quantitative and qualitative criteria established by federal regulations.

Standards of Satisfactory Academic Progress involve both qualitative (cumulative grade point average and academic standing) and quantitative (hours earned compared to hours attempted and a maximum time limit) elements. This requirement applies to all applicants for any type of federal assistance. To be eligible for financial aid at Manhattan College students must be in compliance with all three of the following areas: cumulative GPA, hours earned, maximum time limit.

I. Cumulative Grade Point Average (GPA): Students must maintain the required 3.0 cumulative grade point average established by Manhattan College to continue enrollment and to be eligible for financial aid. Satisfactory progress will be measured for all coursework attempted and/or completed toward the student's degree.

II. Earned Hours (Compared to Attempted Hours): It is recommended that students attempt to earn at least two-thirds of the credits required per academic year in order to complete graduation requirements in the degree limit time. To remain eligible for financial aid, students must earn at least 67% of total cumulative hours attempted.

III. Maximum Time Limit: To remain eligible for financial aid, undergraduate students must complete their degree requirements within 150 percent of the published length of their academic program. At Manhattan College, for example, this means that students in programs requiring 36 credit hours for graduation are eligible for financial aid during the first 54 attempted credit hours. All attempted hours are counted, including transfer hours, whether or not financial aid was received, or the course work was successfully completed.

SAP Reviews: At the end of the each semester, a review is completed, and students who are out of compliance with one or more of the SAP standards will be notified by the Dean and the Office of Student Financial Services. The College's policies on academic warning, probation and dismissal are cited under the Academic Standards and Procedures section of the catalog. Manhattan College may fund students during their probationary period.

Regaining Eligibility for Financial Aid: To regain eligibility, the student may attend summer school and/or any other terms necessary, without aid, until all deficiencies are remedied.

Appeals: Federal regulations allow for certain cases in which the school may waive the standards. Appeals for the waiver may be considered if a student's failure to comply with one or more areas of Satisfactory Academic Progress is due to mitigating circumstances. These must be appropriately documented for the specific term(s) in which the deficiency occurred. Eligibility may be regained by appeal. Contact the Director of Student Financial Services to process a Satisfactory Academic Progress (SAP) Appeal.

Endowed and Special Category Scholarships

Eder Associates Scholarship

Founded by Eder Associates, the scholarship provides tuition assistance to a financially needy graduate student with an outstanding academic record who is seeking a master's degree in the Graduate Environmental Engineering Program.

The HydroQual, Inc., Scholarship

Founded in 1991 by HydroQual, Inc., to provide tuition assistance to students accepted for matriculation in the Graduate Environmental Engineering Program.

The Hazen and Sawyer Scholarship

In honor of C. Richard Walter '50. Founded in 1990 by Hazen and Sawyer, P.C. upon the occasion of C. Richard Walter's retirement as president and chair of Hazen and Sawyer. This scholarship will provide tuition assistance to graduate students accepted for matriculation in the Graduate Environmental Engineering Program.

Programs of Study

Organization

The Graduate Division operates as an integral unit of the College under the oversight of the Provost of the College and the Deans of the Schools of Education and Engineering. Each graduate program is managed by a chair or a director who reports to the dean of the school in which the program is housed. The Graduate Council is responsible for general policies affecting all graduate programs. The provost and the deans of the schools housing graduate programs constitute the Executive Committee of the Graduate Council. The Graduate Council includes, in addition to the members of the Executive Committee, all chairs or directors responsible for managing graduate programs.

The following degree programs have been approved and are registered with the Bureau of Evaluation, New York State Higher Education Department, under the HEGIS number listed:

EDUCATION:

Program	ID
Master of Arts in School Counseling	HEGIS 0826.1
Master of Science in Mental Health Counseling	HEGIS 2104
Advanced Certificate in Mental Health Counseling	HEGIS 2104
Advanced Certificate in School Counseling	HEGIS 0826
Advanced Certificate in Bilingual Pupil Personnel Services	HEGIS 0899.60
Advanced Certificate in Bilingual Extension: School Counseling	HEGIS 0826
Master of Science in Education in Educational Leadership	HEGIS 0828
Advanced Certificate in School Building Leadership	HEGIS 0828
Master of Science in Education in Advanced Leadership Studies	HEGIS 0827
Master of Science in Education - Adolescence/Students with Disabilities Generalist 7-12	HEGIS 0803.00
Advanced Certificate in Advanced Leadership Studies	HEGIS 0827
Master of Science in Education - Special Education	HEGIS 0808
Master of Science in Education - Childhood Education/Special Education	HEGIS 0802

Advanced Certificate in Bilingual General Education	HEGIS 0802
Advanced Certificate in Bilingual Special Education	HEGIS 0802
Master of Science in Marriage & Family Therapy	HEGIS 2104.10

ENGINEERING:

Program	ID
Master of Science in Chemical Engineering	HEGIS 0906
Master of Science in Civil Engineering	HEGIS 0908
Master of Science in Computer Engineering	HEGIS 0999
Master of Science in Construction Management	HEGIS 5099
Master of Science in Electrical Engineering	HEGIS 0909
Master of Science in Environmental Engineering	HEGIS 0922
Master of Engineering (Environmental Engineering)	HEGIS 0922
Master of Science in Mechanical Engineering	HEGIS 0910

BUSINESS:

Program	ID
B.S./MBA in Professional Accounting	HEGIS 0502
B.S./MBA in Business	HEGIS 0506
Master of Business Administration	HEGIS 0506

SCIENCE:

Program	ID
Master of Science in Adolescent Education - Mathematics	HEGIS 1701
Master of Science in Mathematics	HEGIS 1701
B.S. Mathematics/M.S. Applied Mathematics - Data Analytics	HEGIS 1701
B.A. Mathematics/M.S. Applied Mathematics - Data Analytics	HEGIS 1701
Master of Science in Applied Mathematics - Data Analytics	HEGIS 1703
Master of Science in Computer Science	HEGIS 0701
Advanced Certificate in Applied Mathematics-Data Analytics	HEGIS 1703

CONTINUING & PROFESSIONAL STUDIES:

Program	ID
Master of Science in Organizational Leadership	HEGIS 2299

Graduate Services/Telephone Numbers

The College Bookstore is located on the first floor of the Kelly Commons Building. Textbooks and auxiliary materials may be obtained there.

Health Services is located on the first floor of Alumni Hall. A full-time Nurse Practitioner and part-time college Physicians are available to address student health concerns.

An Accidents and Sickness Insurance Plan is available to students of Manhattan College. Students from foreign countries are especially urged to participate in this plan. Information is available at the office of the Vice President of Finance, 3rd floor of Memorial Hall.

Available to students is the Center for Career Development; personnel will assist students seeking employment. The office is on the third floor of Thomas Hall.

Manhattan College has a Counseling Center located on the fifth floor of Miguel Hall. Registered Manhattan College students may avail themselves of the services offered by the Center academic and psychological counseling, consultation and referral.

Parking permits may be obtained from the Director of Public Safety whose office is on the first floor of Jasper Hall.

The Campus Ministry has an office on the second floor of Miguel Hall and Kelly Commons, Room 2.03 All Manhattan College students may receive religious counseling through the Campus Ministry.

The Office of International Student and Scholar Services provides programs and services for Manhattan College students and scholars who are in the United States on non-immigrant F and J visas. Services include issuing required federal visa documents; assisting with immigration regulations governing enrollment, employment and travel; and publishing a monthly electronic newsletter, which provides important and timely information on a variety of topics. The office conducts an orientation session for all new international students and scholars in August and in January, coordinates a variety of cross-cultural programs and acts as liaison between students and scholars and other college offices, student groups and U.S. and foreign government agencies. The office is located In the rear of the Multicultural Center on the third floor of the Kelly Student Commons.

Library

The Mary Alice & Tom O'Malley Library supports the work of faculty and students through its collections, facilities, and services. Reference librarians are available to help with students' academic work, and the librarians teach information literacy and advanced research classes to students in all subject areas.

The library is open 24 hours a day during the academic year. The collection includes 450,000 books and more than 48,000 current journals, including all the journals of the most prominent scholarly publishers: Elsevier, Oxford University Press, SAGE, Springer Nature, Taylor & Francis, and Wiley. Through the Library website, students on or off

campus can access more than 220 databases that provide access to journals, books, and reference materials.

Students and faculty of Manhattan College can also use libraries throughout New York City and Westchester County through the on-site arrangements established by WALDO, our local library network. Books and articles from libraries worldwide are available through our interlibrary loan service.

O'Malley Library has four computer labs with more than 100 computer workstations as well as conference rooms and a wide range of areas for individual and group study. An Internet Cafe is located outside the main library entrance.

The Library maintains the Manhattan College Archives as well as the De La Salle Christian Brothers Archives of the New York and Long Island-New England Districts, the District of Eastern North America, the Midwest District, the Christian Brothers Conference, and the Lasallian Research Collection.

For more information about library hours and services, please see https://lib.manhattan.edu/home (https://lib.manhattan.edu/home/)

Computer Facilities

A wide variety of computing resources are available to Manhattan College students, faculty, and staff via JasperNet, the college's campus-wide network. JasperNet deploys wired and wireless computing and information services to campus laboratories, classrooms, and offices, as well as to student residence halls. Computer labs running Microsoft Windows 10 are available across the Manhattan College campus. See more information about computer labs (https://inside.manhattan.edu/offices/its/computer-labs.php).

All campus locations are connected via a multi-gigabit backbone network. JasperNet provides many network based applications and services including online courses and web based storage as well as E-mail, internet access, and laser printing in the laboratories. A wide range of software is available including math and statistical packages (Maple, MathCad, MatLab, SPSS, Excel), compilers (C++ & Visual Studio), databases (Access, SQL), word processors (MS Word), presentation graphics (PowerPoint), multimedia authoring (Adobe Design Premium), as well as department-specific applications (E.g. Abaqus & AutoCad). See list of software available in computer labs (https://manhattan.teamdynamix.com/TDClient/KB/ArticleDet/?ID=2768) for more information. JasperNet provides full ethernet connectivity to students in all of the College's residence halls. Students living in these networked buildings can connect their own networkable devices directly to JasperNet.

A dedicated website for the College – http://manhattan.edu (http://www.manhattan.edu) – is maintained by the Information Technology Services Department and supports pages of information including online catalogs, handbooks, and policies. Some faculty members maintain web pages for their courses on the server supported by a separate file server to facilitate the posting of online courseware. The Information Technology Services Department also provides online support, documentation, and other services via their web site: https://m (https://inside.manhattan.edu/offices/its/)anhattan.edu/its (http://manhattan.edu/its/).

Computing laboratories are equipped for digital projection and many are used as hands-on classrooms. Laptop computers with projection capabilities are used by instructors for demonstrations purposes in other classrooms throughout the campus which are linked to JasperNet.

Computer Laboratory Hours:

Research & Learning Center

Day	Time
Monday-Friday	8:00am - 10:30pm
Weekends	10:00am - 5:30pm

De La Salle CIS Lab

Day	Time
Monday-Friday	8:00 am - 10:00 pm

O'Malley Library Computing Labs

Day	Time
Sunday-Saturday	24/7

Public Safety

The Public Safety Department is charged with the responsibility of enforcing all College security regulations, and overseeing the College's risk management policies, including the supervision of all campus parking facilities. There are 50 officers and supervisors who conduct foot and vehicle patrols of the campus 24 hours a day. Being a component of the Student Life Division, the Public Safety Department actively supports the stated mission of the College and accepts its responsibility to employ security measures to ensure that our students enjoy their years at Manhattan in safety and well being.

Current Education Law 6450 crime reporting and statistics are as follows:

2016

Primary Crimes:

OFFENSE	On Campus	Residence Halls	Public Property	Unfounded
Murder/ Non-Negligent Manslaughter	0	0	0	0
Negligent Manslaughter	0	0	0	0
Rape	4	4	0	0
Fondling	0	0	0	0
Statutory Rape	0	0	0	0
Incest	0	0	0	0
Robbery	0	0	2	0

Aggravated Assault	0	0	0	0
Burglary	3	3	0	0
Motor Vehicle Theft	0	0	2	0
Arson	0	0	0	0

Arrests:

Offense	On Campus	Residence Halls	Public Property	Unfounded
Weapon Possession	0	0	0	0
Drug Abuse Violations	1	1	4	0
Liquor Law Violations	0	0	6	0

Disciplinary Actions/Referrals:

Offense	On Campus	Residence Halls	Public Property	Unfounded
Weapon Possession	1	1	0	0
Drug Abuse Violations	143	139	0	0
Liquor Law Violations	297	295	1	0

Offense (VAWA)**:

Offense	On Campus	Residence Halls	Public Property	Unfounded
Domestic Violence	0	0	0	0
Dating Violence	1	1	0	0
Stalking	4	4	0	0

There were no hate crimes reported for 2016.

2015

Primary Crimes:

OFFENSE	On Campus	Residence Halls	Public Property	Unfounded
Murder/ Non-Negligent Manslaughter	0	0	0	0
Negligent Manslaughter	0	0	0	0
Rape	3	3	0	0
Fondling	2	1	0	0

Statutory Rape	0	0	0	0
Incest	0	0	0	0
Robbery	1	0	1	0
Aggravated Assault	0	0	0	0
Burglary	4	4	0	0
Motor Vehicle Theft	0	0	2	0
Arson	0	0	0	0

Arrests:

Offense	On Campus	Residence Halls	Public Property	Unfounded
Weapon Possession	0	0	0	0
Drug Abuse Violations	2	1	1	0
Liquor Law Violations	0	0	0	0

Disciplinary Actions/Referrals:

Offense	On Campus	Residence Halls	Public Property	Unfounded
Weapon Possession	1	1	0	0
Drug Abuse Violations	66	62	0	0
Liquor Law Violations	163	161	0	0

Offense (VAWA)**:

Offense	On Campus	Residence Halls	Public Property	Unfounded
Domestic Violence	0	0	0	0
Dating Violence	1	1	0	0
Stalking	1	1	0	0

There were no hate crimes reported for 2015.

2014

Primary Crimes:

OFFENSE	On Campus	Residence Halls	Public Property	Unfounded
Murder/ Non-Negligent Manslaughter	0	0	0	0

Negligent Manslaughter	0	0	0	0
Rape	1	1	0	0
Fondling	4	4	0	0
Statutory Rape	0	0	0	0
Incest	0	0	0	0
Robbery	0	0	0	0
Aggravated Assault	1	0	1	0
Burglary	1	0	0	0
Motor Vehicle Theft	0	0	1	0
Arson	0	0	0	0

Arrests:

Offense	On Campus	Residence Halls	Public Property	Unfounded
Weapon Possession	0	0	0	0
Drug Abuse Violations	0	0	5	0
Liquor Law Violations	0	0	0	0

Disciplinary Actions/Referrals:

Offense	On Campus	Residence Halls	Public Property	Unfounded
Weapon Possession	0	0	0	0
Drug Abuse Violations	81	81	0	0
Liquor Law Violations	251	251	0	0

Offense (VAWA)**:

Offense	On Campus	Residence Halls	Public Property	Unfounded
Domestic Violence	0	0	0	0
Dating Violence	2	2	0	0
Stalking	1	0	0	0

There were no hate crimes reported for 2014.

**(VAWA)-VIOLENCE AGAINST WOMEN REAUTHORIZATION ACT OF 2013 **On Campus total includes Residence Hall incidents.*

Daily Crime and Fire Log Availability

The Manhattan College Daily Crime and Fire Log is available to the public.

It is available for review in the public safety office located in Jasper Hall, Monday – Friday, 9 a.m. – 4:30 p.m.

The Advisory Committee on Campus Safety will provide upon request all campus crime statistics as reported to the U.S. Department of Education. These are also available by searching for Manhattan College at http://ope.ed.gov/campussafety/#/institution/list**. The Director of Public Safety is authorized to provide these statistics and can be contacted at** 718-862-7240**.**

Telephone Numbers

Department	Phone	Contact
The Provost	(718) 862-7304	William C. Clyde, Ph.D.
Graduate Admissions and Information	(718) 862-7325	William J. Bisset, Jr.
Dean of Business	(718) 862-7440	Janet Rovenpor, Ph.D.
Dean of Education	(718) 862-7374	Karen Nicholson, Ph.D.
Dean of Engineering	(718) 862-7307	Timothy J. Ward, Ph.D., P.E.

Directors of Graduate Programs

Department	Phone	Contact
MBA	(718) 862-7872	Marc Waldman, Ph. D
Counseling Programs	(718) 862-7497	Corine Fitzpatrick, Ph.D.
Instructional Design and Delivery	(718) 862-7147	Shawna Bu Shell, Ph.D.
School Building Leadership	(718) 862-7473	Sr. Remigia Kushner, Ph.D.
Special Education	(718) 862-7969	Elizabeth M. Kosky, Ed.D
Chemical Engineering	(718) 862-7185	Chien-Pin Chen, Ph D.
Civil Engineering	(718) 862-7172	Moujalli Hourani, D.Sc
Electrical & Computer Engineering	(718) 862-7153	George Giakos, Ph.D.
Environmental Engineering	(718) 862-7169	Robert Sharp, Ph.D.
Mechanical Engineering	(718) 862-7927	Bahman Litkouhi, Ph.D.
School of Continuing & Professional Studies	(718) 862-7870	Cheryl Harrison, Ed.D.

Service Offices

Office	Phone
Admissions and Information	(718) 862-7325
Office of Student Financial Services	(718) 862-7100
Office of the Registrar	(718) 862-7914
Office of Financial Assistance	(718) 862-7381
Office of Commencement and Special Events	(718) 862-7918

International Student and Scholar Services	(718) 862-7213
Director of Residence	(718) 862-7438
Bookstore	(718) 862-7249
Information Technology Services	(718) 862-7973

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