



MANHATTAN COLLEGE

School of Engineering

ADVISING MANUAL 2023

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OVERVIEW

This School of Engineering (SOE) Advising Manual has been prepared to assist students in understanding what is required to earn a degree in engineering at Manhattan College as well as introducing them to different policies, procedures and services. SOE students should use the Advising Manual (published in their freshman year) as a reference throughout their undergraduate academic career. Important information such as program course plans, restricted courses, academic requirements, academic support resources, advisor contacts, and more are found in the Advising Manual. The Advising Manual is updated every June and the contents are subject to change during the year. Every effort has been made to align the contents of the Advising Manual with the Manhattan College undergraduate catalog which can be found on-line at [Undergraduate Catalog](#) and the Manhattan College Community Standards & Student Code of Conduct which can be found at [Community Standards & Student Code of Conduct](#)

Please contact the School of Engineering Office at (718) 862-7281 with any questions.

General Academic Requirements

In order to graduate with an engineering degree, a student must meet the following criteria along with other program requirements:

- A grade of C (2.0) or better in Calculus I, II, III, Differential Equations, Chemistry and Physics (Organic Chemistry, Physical Chemistry, and Science Electives are not included but are considered Engineering Core Courses subject to the no more than three grades less than C rule below). **NOTE:** A grade of C- (1.67) does NOT meet the requirement of C (2.0) or better for these or any other courses.
- Students must successfully complete all 100- and 200-level science courses before they are admitted to 300-level courses in their programs.
- Students may only attempt to successfully complete gateway courses three (3) times. These gateway courses are: Chemical Engineering - CHML 205 & CHML 207; Civil and Environmental Engineering - ENGS 206 & ENGS 230; Electrical and Computer Engineering - EECE 201 & EECE 203; and Mechanical Engineering - ENGS 205 & ENGS 206.
- Some ENGS or program specific classes may require a grade of C (2.0) or better depending upon the program. See the course requirements of the individual programs for details.
- Students are responsible for successfully completing any non-acceptable grades in the types of courses discussed under the previous bullet points **before** progressing to **any** 300-level Engineering Courses.
- No more than **three** (3) grades less than C (2.0) in Engineering Core, Core Electives, and Technical Electives required courses are permitted.
- An overall GPA of **2.0** is required for all attempted courses.
- There are additional required courses in Religious Studies (three (3) Religious Studies courses (nine credits), English (ENGL 110 plus a second English course is highly recommended or required in some programs), and General Education Courses (Twelve selected from non-engineering courses such as history, literature, philosophy, social sciences, business, education and religious studies depending on the program of study). *Note that ROTC students may substitute ROTC 401 as a social science elective*
- Students are required to provide transcripts for all Advanced Placement (AP) Courses, Transfer Courses, and Off Campus Courses within three months of admission or completion of the course, and if a prerequisite, prior to the start of the next semester, **otherwise, credit will not be granted.**

The above are just some important highlights. All of these items and other issues related to your success as a student in the School of Engineering are described in greater detail on the following pages. You may also speak to the Assistant Dean and your Academic Advisor if you need further explanation.

Attendance Policy

Students are required to fulfill all course requirements as detailed in the course syllabi for their registered courses. Implicit in these requirements is completion of all course assignments and attendance in all classes.

A student who is absent from class cannot expect the course instructor to provide notes or allow makeup tests, quizzes, or laboratories. The student may incur an appropriate grading penalty for such absences if the penalty was described in the syllabus. Reasonable accommodations for absences are recommended, but are solely at the discretion of the course instructor.

If the instructor believes that a student's failure to attend class is substantially affecting the student's course grade, then the instructor is strongly encouraged to report the situation to the dean of the school in which the student is matriculated. It is recommended that the dean be contacted by the course instructor after the student incurs four hours of absences in a course. The dean will address the situation with the student. (excerpt from [Academic Policies & Procedures](#))

Additionally, it is expected that the course instructor will enter a referral into the College's **Jasper Connect** system. The referral will be acted upon by the student's school and the College.

In a situation when an extended absence occurs because of illness, death in the family, or other significant personal reasons, the student should notify the Assistant Dean (AD) or Academic Advisor (AA) at the start of, or prior to, the absence. The AD or AA will then notify all of the student's instructors of the absence. Upon return, the student must provide suitable documentation to the AD or AA. Even with such documentation, the acceptance of an excused absence is entirely up to the course instructor. For one-day absences, the student should contact the faculty member teaching the course directly.

Academic Advisors

- Students will be provided registration instructions in advance, and must have their registration form approved by the Assistant Dean or Academic advisor no later than one week in advance of their registration date to guarantee approval in advance of registration. Students are not able to register online until this approval is complete.
- Students entering their first (1st) semester of sophomore year and are undecided about the discipline of engineering they wish to pursue must see the **School of Engineering Assistant Dean or Academic Advisor**:

Ms. Erica Reubel
Assistant Dean of Engineering

Leo 201 862-7282
erica.reubel@manhattan.edu

Ms. Charmaine Whitter-White
Academic Advisor

Leo 201 862-7986
charmaine.white@manhattan.edu

- Incoming transfer students must see the School of Engineering Academic Advisor:
- Students entering their first (1st) semester of sophomore year who have decided on a program of study in the School of Engineering and all other students must see their Department Chairperson or other designated advisor. The Chairpersons for all of the departments in the School of Engineering are:

Chemical Engineering **Dr. Sasidhar Varanasi**

Leo 427 862-7296
chmldept@manhattan.edu

| | | | |
|-------------------------------------|-----------------------------|---------|--|
| Civil and Environmental Engineering | Dr. Matthew Volovski | Leo 212 | 862-7171 civldept@manhattan.edu |
| Electrical and Computer Engineering | Dr. Robert Mauro | Leo 251 | 862-7153 elecdept@manhattan.edu |
| Mechanical Engineering | Dr. Parisa Saboori | RLC 207 | 862-7145 mechdept@manhattan.edu |

Add/Drop Period

Students are permitted to make changes to their schedules through the Self-Service up to and including the first week of classes. This gives the student an opportunity to make changes in their schedule due to unforeseen circumstances. **After the completion of the first week of classes no further changes can be made with the exception of a withdrawal from a class, which will result in a W grade on the transcript. No classes may be added after the Add/Drop period ends.** It is the student's responsibility to check that their registration is accurate and correct, and to resolve any outstanding late registrations before the conclusion of the add/drop period. Registration requests after that time may not be honored.

First-year students must see the School of Engineering Assistant Dean or Academic Advisor to make any changes to their schedule in their first semester. After the student registers in November of the fall semester, they may make adjustments to their schedules as needed.

Advising Reports

Manhattan College uses an advising report tool called *DegreeWorks*. This is accessible through the "Quick Links" page on Manhattan.edu. Your DegreeWorks will reflect your credits earned. If you feel there is something incorrect on your DegreeWorks, you must contact the Dean's Office.

The Registration Process

Incoming transfer students should meet with their respective department chairs in early October to start this registration process. For first year students, The School of Engineering Dean's Office will communicate with them about the registration process and how they can receive assistance. A student must go through the following steps before on-line registration is possible:

- Check your DegreeWorks for accuracy. **This is critical.** If your DegreeWorks is inaccurate, you must report that inaccuracy to an advisor, via email, immediately.
- Check the program schedule for your major to see what courses you should be taking that semester. The current program schedules are available in the back of the Advising Manual, as well as a listing of all the prerequisites and corequisites for each course.

BE ALERT! Depending on when you entered Manhattan College, your 4-year course outline may vary within a particular engineering program. Make sure you are following the correct schedule.

- Fill in the courses and sections you wish to take on the registration form.

- Sign your completed registration form and please read what you are signing. Note that if you do not take the course that you indicate on your registration form, it is likely that:

- You will not graduate on time with your class

or

- you will end up taking that course over the summer at an additional cost, i.e., \$4080 for a three credit course and \$5440 for a four-credit course at 2023-2024 rates (tuition subject to change).

- Submit your registration form through the method communicated by their academic department, and/or the School of Engineering Dean's Office.
- Make sure that all other holds such as Financial, Registrar, Immunization, Housing, and anything else have been removed. Holds will prohibit you from registering on-line.
- Follow the steps for on-line registration through Self-Service. This process is outlined in the advising manual.

Prerequisites/Corequisites

The engineering curricula for the different programs are very sequential in nature and build upon prior information in different courses. Each course in a program of study typically has prerequisites that must be completed successfully before the course itself is attempted. In some cases, a course will have one or more corequisites that enhance the course in question. **Students are responsible for successfully completing the prerequisites for a course before starting the course.** If a student is found enrolled in a course for which the student has not successfully completed the prerequisites, the student will be dropped from the course by the instructor or the School of Engineering Dean's Office. Each program and the School of Engineering actively screen for students who have not successfully completed prerequisite courses. Students are advised to check on prerequisites and corequisites for courses in the online undergraduate and graduate catalogs found at [Undergraduate Catalog](#) and [Graduate Catalog](#), respectively.

Modify Program Process

Students must take great care to follow the program of their choice as specified at the end of this manual. Not taking the proper courses in the proper semester can cause serious consequences, including delayed graduation. When significant extenuating circumstances require a student to change their program, a student **must** file a Modify Program Form which must be signed by both the Department Chair and the Assistant Dean or Academic Advisor representing the Dean's Office. This form will only be accepted through the online approval request form. It is available on the [SOE Online Resources](#) page.

Declaring a Minor or Concentration

To add a minor or concentration to their curriculum, a student must seek advice from a faculty advisor or an academic advisor in the School of Engineering Dean's Office. This advice is necessary to understand how the minor fits into their curriculum, and if any additional courses outside of the curriculum are required, as additional courses can result in an additional cost. After that advisement takes place, a student must file a [Minor and Concentration Declaration](#) form on the SOEOR page. If the student is a senior, the Minor and Concentration Declaration form must be received prior to the start of their final semester. Late submissions with compelling

circumstances may be considered, but might not be honored after a student has submitted their graduation application with the College.

Withdrawing from a Class

Students may withdraw from an undergraduate class up until the end of the twelfth week of a semester. The Registrar sets the last date for withdrawals each semester. Students wishing to withdraw from a class must complete the required online forms through Self-Service. It is the student's responsibility to verify (through Self-Service) that the withdrawal was properly processed. No late Withdrawals will be permitted except under compelling extenuating circumstances.

Students should be aware that withdrawing from a course may result in additional tuition fees resulting from the need to make up required courses, will impact the following semester's schedule if the withdrawn course is a prerequisite, and may delay graduation.

Grade Replacement Policy

The Manhattan College grade course replacement policy applies to any student who has not met the minimum required grade in a course for their program of study. When the student repeats the same course 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. No additional credits are earned. All grades earned will appear on the student's transcript. Grade replacement is not automatic. The student must apply for grade replacement by submitting a request to the Grade Replacement Request form on the [SOE Online Resources](#) page.

Incomplete Grades

An "I" grade indicates that some requirement of a course has not been satisfied by the end of the term. 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 no 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 and if the final grade is not submitted on schedule. Extensions for the completion of the work or the submission of the final grade will be granted by the Dean of the school only in highly unusual circumstances. All incomplete grades must be resolved before the student graduates. A grade of "I" does not satisfy the grade requirement for any prerequisite course. The "I" grade must be resolved with an acceptable grade before a prerequisite course can be counted as being successfully completed and before the student is permitted to take any course requiring the prerequisite.

Closed Courses/Sections

If a student is closed out of a section during the registration process, they may request approval from the chairperson of the department in which the course is taught. Some departments use waiting lists for courses to help schedule additional sections. You must see the Engineering Assistant Dean or the Academic Advisor for ENGS 100 level courses.

Intersession and Summer Session Courses

Consult Self-Service for a list of courses offered at Manhattan College during the winter intersession and during the summer sessions. Courses are offered during two (2) summer sessions by Manhattan College.

The Winter Intersession runs over the Christmas/New Year Holiday. Typically, no Engineering or few Science courses are offered because of the compressed schedule. Calculus I is offered but is restricted to students required to retake Calculus I from the Fall semester and the student must have approval from the Chair of the Mathematics Department.

Summer Session 1 (7 weeks) – Monday after spring final exams (mid-May) to just before July 4th holiday.
Summer Session 2 (7 weeks) – After July 4th holiday to third week in August

Students must adhere to the posted withdrawal and drop dates for the summer session; and are subject to the posted refund schedule. Students who are not registered by the first course meeting will not be permitted to register late without compelling or extenuating circumstances, as approved by the School of Engineering Dean's Office.

Credit for Off-Campus Courses

Once matriculated into a degree-granting program (major) at Manhattan College (College), a student may not take off-campus courses offered by another accredited institution for transfer to the College without prior written approval from the student's academic advisor and the student's dean. A maximum of 12 credits may be taken in off-campus courses. Each school may set limitations on what types of courses may or may not be approved for its students that are consistent with the College's overall requirements (see <https://inside.manhattan.edu/academic-resources/registrar/policies.php> for more details).

A full-time engineering student at Manhattan College is allowed to take only their English, humanities, or social science electives off-campus at another institution during the winter recess or summer. **An engineering student is not permitted to take any mathematics, chemistry, physics or engineering course at another institution except under compelling circumstances as approved by the School of Engineering Dean's Office.** Only Manhattan College courses are allowed for seniors in the Winter Intersession of the graduation year, no off-campus courses are allowed.

Permission to take an off-campus course is given by the Assistant Dean or Academic Advisor for the School of Engineering and the department chair responsible for the course. Permissions must be granted **before** the off-campus course is taken by filing a request through the [Off-Campus Course Approval Form in the Online Resources](#). **There are no exceptions to this rule.**

Leaves of Absence/Withdrawals

Students must remain registered for each semester. If for any reason a student is unable to register for a semester, they must indicate in writing that they wish to be placed on Maintenance of Matriculation through the Assistant Dean or Academic Advisor. This may be done only for two consecutive semesters. During the leave of absence from Manhattan College, the student may not take courses at other institutions for the purposes of transferring credits back to the College.

If a student is unable to complete a semester, a voluntary withdrawal form must be submitted. Withdrawals for medical reasons must receive approval from the Director of the Counseling Center which will require proper

documentation of the medical reason. This medical reason is held confidentially and is not released to anyone within the College.

Return from a Voluntary Withdrawal is solely at the discretion of the student with the exception of returns from medical leaves, which must be approved by the Director of the Counseling Center. If the student does not return after one year, the Voluntary Withdrawal or lack of registration becomes a Permanent Withdrawal and the student must reapply for admission to the College to return to classes.

Please refer to Student Account Services and Financial Aid Office for any financial repercussion of withdrawals.

On-line Registration Instructions

Instructions for Online Registration through Self-Service

- Courses for the following will be able to be viewed online in addition to the printed course offering booklet.
- Go to the Manhattan College Homepage and click on “Quick Links”, Self-Service, and Enter Secure area. You will need your Student Identification Number and your pin number. If you have lost your pin number, you can get it from the Registrar’s Office by showing your ID.
- You can access Self-Service for viewing but you cannot register for courses if you have any **holds**. It is a good idea to check for any holds before your assigned registration time. Click on Registration status, then go to Student Services, under Student Records, click on Holds to see if you have any registration holds. If there is a hold on your account, contact the office that placed the hold (e.g., Admissions, Bursar, Health Services, or others) to resolve it.
- If you are idle for a while (about 25 minutes), your session will automatically logout and you will need to log in all again.
- An add/drop form must be turned into the Dean’s Office for any courses that require special permission or any closed course that requires the signature of the department chairperson.
- If you are taking a course in the fall that has a prerequisite course that you will be taking over the summer, please point that out to your Department Chair. Failure to do so may result in you not being able to register online for that course.

Steps to Register Online

Review the course offerings and fill out the registration form including the CRN (Course Reference Number). For example, Calculus I is **NOT** 185-01, but rather the **5 or 4 digit number** located directly under the course number (in this case it would be 10558)

1. Go to the MC Homepage, click on “Quick Links” and next on “Self-Service”).
2. Enter your email login and password.

3. Click on the “Student” tab at the top of the screen”.
4. Click on the Registration Menu Option.
5. To check for holds and current status, click on the “Registration Status” Menu Option. This can and should be done two weeks prior to registration to give you time to resolve any holds if present. If you have a hold present, and wish to see more details, please go back to the Student and Financial Aid page, and click the Student Records menu. From there, you can click View Holds.
6. To register for the course, click on the “Add or Drop Courses” Menu Option and add the CRN numbers for the classes you want. If any classes are closed you may delete the CRN and place a new one in its place. Use “Look Up Courses” to find out what classes are available.
7. If you register for a different section for the SAME course that is on your signed and approved schedule sheet, there is no need to get it re-approved. However, if you register for a different course from what is on your signed approved schedule, you must get that schedule re-approved. For example, you may register for section 02 of MATH 186 if you were approved to take another section of MATH 186 on your form. You may not register for MATH 285 instead.
8. Self-Service will remain open for the student to make changes to their schedule up to and including the first week of classes in the Fall.

Religious Studies Electives (Required) - 9 Credit hours

*All Religious Studies courses must be taken at Manhattan College.

- RELS 110 – *Nature and Experience of Religion.*
- A 200 level elective course from Group A: Catholic Studies.
- A 300 level elective course from Group B: Global Studies and Comparative Issues.
- You may not substitute any courses above (i.e. a 300-level course for a 200 level course). If your schedule requires such a substitution, you must complete a program modification form with the approval of the Religious Studies department chair prior to the start of the semester.

Ethics is a key component of an engineering education. The Engineering Accreditation Commission of ABET expects ethics in engineering education. Therefore, it is strongly suggested that students (particularly juniors and seniors) try to choose one of their 300 level religious studies electives from the following list of courses that have ethics as a central theme to the course:

RELS 300 – *Special Topics (if ethics related and approved by your advisor)*
RELS 337 – *The American Religious Experience*
RELS 362 – *Ethics in the Workplace*
RELS 372 – *Religion and Science*
RELS 373 – *Death as a Fact of Life*
RELS 376 – *Religion and the Media*
RELS 377 – *Religion and Environmentalism*
RELS 381 – *Religious Dimensions of Peace*

English Electives

- Every student must take ENGL 110– *College Writing*
- Every student is highly encouraged, and some programs may require a student to take an additional English elective. It is suggested to avoid 300 level literature courses unless you consult with the Assistant Dean or your Academic Advisor first because some of these courses are designed for English majors and may have a heavy workload with regard to required readings. Your advisor may be able to suggest a more suitable semester for courses of this nature.
- Students are **not** permitted to take the following English courses: ENGL 210, 211, 255, 256 to satisfy their humanities, or English Elective requirements.

General Education Electives

To enhance their liberal arts background, engineering students take courses offered by the other schools in the college. The selection of courses is not arbitrary and must be consistent with meeting the student outcomes of the program and core competencies of Manhattan College. The Engineering Accreditation Commission of ABET states that “The professional component must include: a general education component that complements the technical content of the curriculum and is consistent with the program and institution objectives.”

As a guide, the following suggested types of courses should be considered by the student and student’s advisor:

- Two (2) *Social Science* courses. For example, these courses may be chosen from Economics, Government, Psychology, Management, Critical Race & Ethnicity Studies, and Sociology. *Students in the Civil Engineering program must take at least one of their Social Science courses in Economics*
- One (1) *Humanities* course. For example, this course may be chosen from History, Philosophy, Religious Studies (in addition to the three (3) Religious Studies requirements), English (in addition to the one (1) or two (2) English elective requirements), Modern Foreign Language, Fine Arts, Music (Arts and Music courses are limited to those that study the works of established artists).
- The fourth (4th) elective may be a *Humanities* course, *Social Science* course, or a course consistent with meeting the requirements of the engineering program (e.g., an economics course for civil engineering majors).

Please refer to the undergraduate catalog or Self-Service for a current list of courses.

Academic Requirements

Academic Progress Requirements.

All students are required to maintain good academic standing as a condition of enrollment at Manhattan College. The guidelines vary, depending upon the student's grade level and depending upon which form(s) of aid they are receiving. Good academic standing is measured by reviewing a student's quantitative and qualitative progress. The quantitative measurement ensures that students are making progress toward their degree goals, while the qualitative measurement ensures that students are succeeding in their coursework.

- *All undergraduate students in the School of Engineering are required to have a minimum cumulative*

average of 2.0, end of freshman year, 2.0 end of sophomore year and then a 2.0 or higher by your junior year while earning a minimum number of credits to demonstrate good academic standing.

- All undergraduate students are required to maintain a 2.0 for any institutional aid; this does not include scholarship aid.
- 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 undergraduate and 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.

School of Engineering Academic Progress Requirements

All school of engineering students are expected to make adequate progress towards fulfilling their degree requirements every semester. Failure to do so will result in being placed on Academic Contract, regardless of GPA. Adequate progress towards a degree is defined as having no more than two (2) courses required to be repeated during the first two semesters and no more than four (4) courses required to be repeated during the first four (4) semesters. This includes all courses – mathematics, science, engineering, and general education courses and includes all causes for repeating courses including withdrawals, failure, and courses where the minimum required grade was not achieved

In addition, each of the engineering undergraduate programs has selected two different courses defined as **gateway courses**. These are essential courses in the different programs and the ability to successfully complete the courses in a timely manner is mandatory. A student will be allowed a maximum of three (3) attempts to take and pass, with a grade of C (2.0) or better, each of the gateway courses in the student's program. A "W" grade is considered one attempt. After three unsuccessful attempts to pass a gateway course with a C (2.0) or better, the student will be subject to dismissal from the program (but not Manhattan College), as determined by the department chair and the dean. Respective engineering major gateway courses are as follows:

Chemical Engineering - CHML 205 Intro. To Thermodynamics and CHML 207 Process Calculations,

Civil Engineering - ENGS 205 Statics and ENGS 230 Intro to Solid Mechanics

Electrical and Computer Engineering - EECE 201 Fundamentals of Electrical Systems Analysis I and EECE 203 Electrical Systems Analysis II

Mechanical Engineering - ENGS 205 Intro to Thermodynamics and ENGS 206 Statics

A student taking Math 100 (pre-calculus) as a result of their performance on the TRAM exam must earn a grade of C (2.0) or better in the course by the second attempt to remain in the School of Engineering.

Academic Standing. Students are considered to be in good academic standing in Engineering when their Manhattan College cumulative grade point average is at least 2.00, and their term grade point average is at least 2.00. Grade point averages are computed at the end of each semester.

Academic Warning. A letter of academic warning is typically issued to each student earning a grade of D or F in any given semester but is still in good academic standing in Engineering. Letters of academic warning in two consecutive semesters while the student is still in good academic standing in Engineering will result in a meeting with the Academic Advisor or the Dean. The letter of academic warning clearly spells out the danger to an academic program of receiving unacceptable grades.

Academic Probation. A letter of academic probation is typically issued to each student failing to remain in good academic standing in Engineering. Also, a letter of academic probation is typically issued to students receiving multiple unsatisfactory grades (especially grades of F) even though the student may be in good academic standing. Freshman failing to remain in good academic standing after their first semester may be

placed on academic probation. Students on probation are required to take a reduced course load of 12 credits for the following semester and may be restricted from participating in College activities. Students may remove themselves from academic probation by achieving a grade point average of 2.0 by the end of the following regular semester. Failing to achieve good academic standing while on probation can lead to an academic contract or, in extreme cases, dismissal.

Academic Contract. An academic contract is typically offered to students failing to achieve good academic standing in Engineering as a result of their being on academic probation. Also, an academic contract is usually offered to a student if the most recent term grade point average falls below 1.0, even if the student was not on probation the previous semester. A student may not be on academic contract for two consecutive semesters without prior agreement with the Dean of Engineering. The academic contract is a formal, written document executed in writing between the student and the Dean of Engineering. Failure of the student to satisfy the provisions of the academic contract will lead to suspension or dismissal.

Suspension. Students are subject to suspension when a student fails to achieve good academic standing while on probation or fails to satisfy the terms of the academic contract. In cases warranting suspension, although dismissal is indicated, a judgment is made by the Dean of Engineering that the student's studies should be interrupted for a designated time period, usually six months or one year, before reinstatement would be considered. Suspended students must present evidence of their ability to continue their studies successfully when applying for such reinstatement into the School of Engineering.

Dismissal. Dismissal is a permanent separation from Manhattan College (not just the School of Engineering). A letter of dismissal may be issued to a student failing to satisfy the terms of the academic contract or failing to achieve good academic standing while on probation. A student may also be dismissed from the College when the student receives failing grades in all courses attempted in any one semester.

Academic Integrity

“Academic integrity means that every member of the academic community accepts the responsibility to be honest, truthful, ethical and accountable for all intellectual efforts, for all access to and presentation of data, facts, information and opinions, and for all access to and use of data or other files (printed, oral, audio, video or digital) related in any way to students, faculty, staff or administration. In addition, every member of the Manhattan College community must understand what can constitute violations of academic integrity, the consequences in terms of penalties, and by what process penalties are imposed.” (Excerpt from the Manhattan College Academic Integrity Policy.) Found here:

<https://inside.manhattan.edu/student-life/dean-of-students/code-conduct.php#academicintegrity>

In engineering, integrity and ethical behavior are tantamount; and, as such, any form of cheating, plagiarism, fabrication, or academic misconduct will not be tolerated. The Academic Integrity policy will be vigorously applied to all violations of academic integrity by engineering students in all courses at the College. Any student violating the Academic Integrity policy is subject to disciplinary actions up to, and including, **dismissal** from Manhattan College.

Support Services

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 on the 2nd floor in Thomas Hall.

Please note that students who have special needs or disabilities must self-identify to the SRC if they wish to access its resources. Information identifying students with special needs or disabilities is not transferred from any previous institution to the college.

Center for Academic Success

The Manhattan College Center for Academic Success (CAS), [Center for Academic Success](#), is committed to providing student centered programs and initiatives designed to enhance the learning experience of all students. These programs include peer-tutoring by trained and certified tutors, academic learning professionals, and individualized academic coaching plans. Students will work in tandem with qualified and caring professionals and peers to receive personal and academic support to ensure their undergraduate success. The CAS has several locations throughout the campus including The Learning Center in Thomas Hall, the Writing Center in Thomas Hall, and the Math & Engineering Center in Leo Hall. The CAS in Leo Hall is located in Room 117.

Center for Career Development

The Center for Career Development (CCD) located in Thomas Hall offers various professional training programs and services all throughout the year. Students and alumni can schedule individual career counseling appointments to assess interests, values, skills and preferences using decision-making tools and career assessments. The career counselors teach effective job search techniques using online resources and networking; discuss opportunities in a variety of career paths; help tailor resumes and cover letters for specific opportunities; strengthen personal branding and build strong interviewing skills. The CCD has a career counselor assigned to the School of Engineering. The Center's website provides a wealth of information on various career fields and contains links, articles, and professional organizations for various industries, company names, domestic and international internship and job sites and Manhattan College specific resources.

Students and alumni can access the on-line, 24-hour job posting board for full-time, part-time, internship (current students only) and temporary positions. For those seniors seeking full-time employment upon graduation, there is an active campus recruitment program available during the fall and spring semesters. Representatives from companies/organizations come to campus to interview students for career opportunities.

Additionally, CCD offers the Mentor Program for Manhattan College students to gain insight into their intended careers by being paired with professionals, generally Manhattan College alumni, in those career areas. Meeting with mentors during a semester, visiting the work sites, talking with other employees at the company, sitting in on a meeting, or sometimes participating in a project, offers the students opportunities to think about a chosen career field early in their college career. The program is open to incoming first-year students in the School of Engineering and to sophomores and juniors in the Schools of Arts, Business, Education & Health and Science during the participating academic year.

Center for Graduate School and Fellowship Advisement

The Manhattan College Center for Graduate School and Fellowship Advisement (CGS&FA) is organized so that graduating students and alumni who desire to continue on to graduate or professional schools are provided with

the preparation and support to make that transition and to succeed at the graduate level. In addition, the CGS&FA provides support to students and alumni applying to external fellowships. The CGS&FA offers individualized advising, centralized resources and information, and programming for students interested in graduate school, research, and fellowship opportunities. The CGS&FA is located in Thomas Hall. (Excerpts from the Manhattan College Undergraduate Catalog with modifications)

Non-Academic Campus Resources

The School of Engineering supports each student's holistic well-being. As such, the Academic Advisor or Assistant Dean may refer you to resources across campus that may help you find support, encouragement and belonging on campus. There are many resources available on campus, and more can be found on the College's website:

- The CARE Team and Dean of Students: <https://inside.manhattan.edu/student-life/dean-of-students/index.php>
- The Counseling Center: <https://inside.manhattan.edu/student-life/counseling-center/index.php>
- Commuter Services, and Outreach: <https://inside.manhattan.edu/student-life/commuter.php>
- Health Services: <https://inside.manhattan.edu/student-life/health-services/index.php>
- International Student & Scholar Services: <https://inside.manhattan.edu/student-life/international-services/index.php>
- Lasallian Women, and Gender Resource Center: <https://inside.manhattan.edu/student-life/lasallian-women-gender-resource-center/index.php>
- The Multicultural Center: <https://inside.manhattan.edu/student-life/multicultural-center/index.php>
- The Office of Diversity, Equity and Title IX: <https://inside.manhattan.edu/offices/diversity-equity-title-ix/index.php>
- Residence Life: <https://inside.manhattan.edu/student-life/residence-life/index.php>
- Student Engagement: <https://inside.manhattan.edu/student-life/student-engagement/index.php>
- Veterans' Success: <https://inside.manhattan.edu/student-life/veteran-success-programs/index.php>

School of Engineering Online Resources (SOEOR) Page

The SOEOR page on the Manhattan College website is a vital resource to engineering students. This includes information about campus resources, registration, forms, Advising Manual, and more. You are advised to bookmark the following link on your desktop and mobile devices.

Please find it at this link: <https://inside.manhattan.edu/schools/engineering/online-resources.php>

Programs Of Study For Engineering Majors

Following are representative programs of study for the different engineering majors. Students often have a variation on the sequence of courses depending on numerous factors such as transfer credits applied to the program. **The First Year for all engineering majors is the same.** Starting the sophomore year, the types of courses vary among the programs.

FIRST YEAR – ALL MAJORS 32 Credits

| Fall Term - 16 Credits | | |
|--|---|---|
| ENGS 115 | Introduction to Engineering | 3 |
| MATH 185 | Calculus I | 3 |
| CHEM 101/103 or PHYS 101/191 | General Chemistry with Lab or Physics I with Lab | 4 |
| ENGL 110 or RELS 110 | College Writing or The Nature and Experience of Religion | 3 |
| GEN ED ELEC | General Education Elective | 3 |

| Spring Term - 16 Credits | | |
|--|---|---|
| ENGS 116 | Introduction to Engineering Computation | 3 |
| MATH 186 | Calculus II | 3 |
| CHEM 101/103 or PHYS 101/191 | General Chemistry with Lab or Physics I with Lab | 4 |
| ENGL 110 or RELS 110 | College Writing or The Nature and Experience of Religion | 3 |
| GEN ED ELEC | General Education Elective | 3 |

NOTE: Incoming Transfer students with more than 30 transfer credits may not be required to take ENGS 115 and ENGS 116. Those students may use an advanced math, science, or another acceptable engineering course transferred from their prior institution, or take a 400- or 500-level technical elective within their major to fulfill the required number of program credits. If no such course can be applied from a previous institution, the student must take 3 credits in Math, or Science to make up ENGS 115. ENGS 116 may not be substituted.

CHEMICAL ENGINEERING PROGRAM

133 Credits Required

Chemical Engineering Program

The curriculum for the first year is common for all the majors in engineering. In order to enable a student to gauge their interest in chemical engineering, he or she takes designated courses from the chemical engineering course offerings in the sophomore year. The junior and senior years allow for concentrated studies in technical areas. A representative program is shown below.

Sophomore Year

| FALL SEMESTER | | | SPRING SEMESTER | | |
|-----------------------|--|-----------|-----------------------|---------------------------------------|-----------|
| MATH 285 | Calculus III | 3 | MATH 286 | Differential Equations | 3 |
| CHEM 102/104 | General Chemistry /Lab | 4 | ENGS 203 | Electrical Systems | 3 |
| CHML 201 | Chemical Engineering Materials Science | 3 | ENGS 204/206 | Environmental Principles I or Statics | 3 |
| CHML 202 | Chemical Engineering Materials Science Lab | 1 | CHML 208 | ChemE Principles I (Fluids) | 3 |
| CHML 205 ^a | Introduction to Thermodynamics | 3 | CHML 209 | Chemical Engr. Thermodynamics | 3 |
| CHML 207 ^a | Process Calculations | 3 | CHML 211 | Fluids Lab | 1 |
| ENGS 301 ^c | Engineering Professional Devel. I | 0 | ENGS 302 ^c | Engineering Professional Devel. II | 0 |
| TOTAL | | 17 | TOTAL | | 16 |

Junior Year

(Note: Juniors with a cumulative GPA of 3.2 qualify for the Seamless Master's Program and should consult with the department chair for program details. Students can take up to two graduate level courses as an undergraduate and apply it to their master's program. Credits can only apply to one degree)

| FALL SEMESTER | | | SPRING SEMESTER | | |
|-----------------------|-------------------------------------|-----------|-----------------------|--|-----------|
| CHEM 310 | Physical Chemistry II | 3 | CHEM 320 | Organic Chemistry II | 3 |
| CHEM 319 | Organic Chemistry I | 3 | CHML 316 | Computer Simulation and Design | 3 |
| CHEM 323 | Organic Chemistry Lab I | 2 | CHML 321 | Chemical Reaction Engineering (Kinetics) | 3 |
| CHML 305 | ChemE Principles II (Heat Transfer) | 3 | CHML 339 | Separations II (Adv. Mass Transfer) | 3 |
| CHML 306 | Separations I (Mass Transfer) | 3 | CHML 342 | Process Safety & Quality Assurance | 3 |
| RELS 2XX/3XX | Religious Studies Elective | 3 | ENGS 302 ^c | Engineering Professional Devel. II | 0 |
| ENGS 301 ^c | Engineering Professional Devel. I | 0 | | | |
| TOTAL | | 17 | TOTAL | | 15 |

Senior Year

| FALL SEMESTER | | | SPRING SEMESTER | | |
|-----------------------------|----------------------------------|-----------|--------------------|--------------------------------|-----------|
| CHML 403 | Chemical Engr. Lab I | 3 | CHML 404 | Chemical Engr. Lab II | 3 |
| CHML 405 | Process and Plant Design I | 3 | CHML 406 | Process and Plant Design II | 3 |
| CHML 423 | Process Control | 3 | CHML 464 | Fund. of Engr. For Chem. Engr. | 0 |
| CHEM/PHYS/MATH ^b | Advanced Chem/Phys/Math Elective | 3 | Technical Elective | Adv. Engr. Elect. 400 Level | 3 |
| Technical Elective | Adv. Engr. Elect. 400 Level | 3 | Technical Elective | Adv. Engr. Elect. 400 Level | 3 |
| General Ed. Elective | Approved Elective | 3 | RELS 2XX/3XX | Religious Studies Elective | 3 |
| | | | Gen. Ed. Elective | Language or Approved Elective | 3 |
| TOTAL | | 18 | TOTAL | | 18 |

^a **Gateway Courses:** A grade of "C" or better is required in CHML 205/Intro to Thermodynamics and CHML 207/Process Calculations, before a student will be allowed to proceed with other chemical engineering courses. Students are allowed a maximum of three attempts to achieve a "C" or better in gateway courses before dismissal from the major program (not the School of Engineering). A "W" grade is considered one attempt.

^b Students must take an advanced science/math (chemistry, physics, or mathematics) or 400 level engineering elective in senior year from an approved list provided by the Chemical Engineering department chair. Certain advanced level mathematics courses will also count towards mathematics minor.

^c Students need to register for ENGS 301 and ENGS 302 once either in sophomore or junior year. These are zero credit hour pass/fail courses (FE preparation class) listed on transcripts with mandatory registration. .

Concentrations in Chemical Engineering

In addition to the foundational program in chemical engineering, a student may focus on a concentration area. The three concentration areas in chemical engineering are *Biopharmaceutical Engineering*, *Cosmetic Engineering*, and *Petroleum Engineering*. 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. The Cosmetic Engineering concentration 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. The Petroleum Engineering 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. Students interested in one of the concentrations must meet with the department chair to plan for the necessary coursework.

CIVIL & ENVIRONMENTAL ENGINEERING DEPARTMENT

132 Credits Required

Civil Engineering Program

The curriculum for the first year is common for all the majors in engineering. Students take the foundational courses in the sophomore year. The junior and senior years allow for concentrated studies in the areas of structural, environmental & water resources, geotechnical, and transportation engineering. A representative program is shown below.

SOPHOMORE YEAR

| FALL SEMESTER | | | SPRING SEMESTER | | |
|---------------------------|-------------------------------|----|---|---|----|
| MATH 285 ¹ | Calculus III | 3 | MATH 286 ¹ | Differential Equations | 3 |
| CHEM 102/103 ¹ | Chemistry II and Lab | 4 | PHYS 102/192 ¹ | Physics II and Lab | 4 |
| ENGS 206 ^{1-5,7} | Statics | 3 | ENGS 230 ^{1-5,7} | Introduction Solid Mechanics | 3 |
| CIVL 201 ¹ | Intro to Civil Engineering | 3 | CIVL 202 ^{*1b} | Transportation | 3 |
| ENGS 204 ^{*1a} | Env. Engineering Principles I | 3 | SCI 301 OR BIOL 222 and 224 ^{a2} | Earth Science for Engineers OR Biology for Engineers + Bio Lab | 3 |
| | | 16 | | | 16 |

JUNIOR YEAR

(**Note:** Juniors with a cumulative GPA of 3.2 qualify for the Seamless Master's Program and should consult with the department chair for program details. Students can take up to two graduate level courses as an undergraduate and apply it to their master's program. Credits can only apply to one degree)

| FALL SEMESTER | | | SPRING SEMESTER | | |
|-------------------------|--------------------------------|----|-------------------------|---------------------------|----|
| CEEN 303 ¹⁻⁴ | Fluid Mechanics | 3 | CEEN 307 ¹ | Hydraulic Design | 3 |
| CEEN 304 | Fluid Mechanics Lab | 1 | CEEN 308 | Reliability | 3 |
| CEEN 305 | Energy & the Environment | 3 | CIVL 309 ¹ | Steel Design | 3 |
| CIVL 302 ¹ | Elementary Structural Analysis | 3 | CIVL 310 ¹⁻⁴ | Introduction Geomechanics | 3 |
| CIVL 305 ¹ | Computer Solutions CE Problems | 3 | CIVL 311 | Soil Mechanics Lab | 1 |
| CIVL 306 | Civil Engineering Materials | 3 | CIVL 312 ¹ | Structural Analysis II | 3 |
| | | 16 | | | 16 |

SENIOR YEAR

| FALL SEMESTER | | | SPRING SEMESTER | | |
|--|---|----|----------------------------|--|----|
| CIVL 406 ⁶ or ENVL 406 ⁶ | Structural Analysis III OR Water & Wastewater Treatment | 3 | CIVL 411 or ENVL 408 | Advanced Structural Design OR Treatment Plant Design | 3 |
| CIVL 410 ⁶ or ENVG 507 | Intro. Geotech. Applications OR Groundwater | 3 | CIVL 412 | Highway Design | 3 |
| CIVL 409 ^{6,7} | Reinforced Concrete | 3 | | CIVL/ENVL Elective | 3 |
| | CIVL/ENVL Elective | 3 | | CIVL/ENVL Elective | 3 |
| | RELS Elective | 3 | | RELS Elective | 3 |
| | General Education Elective | 3 | | General Education Elective | 3 |
| | | 18 | | | 18 |

*In each semester during the sophomore year, the student will choose between:

- a. ENGS 204 Environmental Engineering Principles I or a Science Elective
- b. CIVL 201 Introduction to Civil Engineering or CIVL 202 Transportation

1 These courses must be completed with a grade of C (2.0) or better.

2 Approved science electives in the sophomore or second year of the program are: BIOL 222 (Biology for Engineers); BIOL 223 (Ecology) and SCI 301 (Earth Science for Engineers).

3 Students are not allowed to enroll in any junior level or third year courses before completing all prerequisite mathematics, science and engineering science.

4 Every civil engineering student is required to take one approved economics course in the Manhattan College School of Business. This course will

substitute for one social science course.

5 A student must pass these courses with a grade of C (2.0) or better to enroll in CIVL 411 and/or ENVL 408.

6 The C requirement is waived for students in the environmental option.

7 **Gateway Courses:** A grade of "C" or better is required in ENGS 205/Statics and ENGS 230/Intro to Solid Mechanics. Students are allowed a maximum of three attempts to achieve a C or better in gateway courses before dismissal from the major program (not the School of Engineering). A "W" grade is considered one attempt.

CIVIL & ENVIRONMENTAL ENGINEERING DEPARTMENT ENVIRONMENTAL ENGINEERING TRACK IN CIVIL ENGINEERING

An environmental engineering track is available for students within the Civil & Environmental Engineering Department. The first three years of the curriculum are identical for all students. The schedule shown below is recommended for senior year. The required classes are the capstone design sequence (ENVL 406/ENVL 408) in Water Treatment Plant Design and either Geoenvironmental Engineering or Groundwater. In addition, there are two environmental engineering electives and one science elective.

SENIOR YEAR

| FALL SEMESTER | | | SPRING SEMESTER | | | |
|--------------------------------|--|-----------|-----------------|----------|----------------------------|-----------|
| ENVL 406 | Water Treatment | 3 | | ENVL 408 | Treatment Plant Design | 3 |
| CIVG 501 - or - ENVG 507 | Geoenvironmental Eng. - or - Groundwater | 3 | | CIVL 412 | Highway Design | 3 |
| CIVL 409 ⁷ | Reinforced Concrete | 3 | | Elective | Option Elective* | 3 |
| Elective | Option Elective* | 3 | | Elective | Option Elective* | 3 |
| | RELS Elective | 3 | | | RELS Elective | 3 |
| | General Education Elective | 3 | | | General Education Elective | 3 |
| | TOTAL | 18 | | | TOTAL | 18 |

* Electives:

- ENVG 501: Hazardous Waste Design
- ENVG 505: Surface Water Quality Modeling
- CEEN 501: Water Resources
- ENVL 316: Environmental Engineering Field Applications
- BIOL 222: Biology for Engineers (to be taken with BIOL 224: Biology for Engineers Lab)
- SCI 301: Earth Science for Engineers

** Option Electives are selected in consultation with the Academic Advisor or Environmental Engineering Graduate Program Director in the Department of Civil & Environmental Engineering.*

Completion of the Environmental Engineering track, with an approved science course (BIOL 222 or SCI 301) allows students entry into the EAC of ABET Accredited Master of Engineering (M.E.) Graduate Program provided they have a cumulative G.P.A. of 3.0 or better.

In addition, there are numerous opportunities for partial or full financial support for graduate studies including:

- Graduate Internships and Fellowships
- Graduate Research Assistantships (GRAs) and Graduate Laboratory Assistants (GLAs)

Please contact the Environmental Engineering Graduate Program Director, Dr. Jessica Wilson, if you are interested in the environmental engineering option or the environmental engineering graduate programs.

Fundamentals of Engineering (FE) Examination – Department of Civil & Environmental Engineering

All seniors must take the Fundamentals of Engineering (FE) examination in their senior year as a

requirement to graduate from the program. Students are not required to pass the FE exam; they are only required to take the FE exam and then document that they have completed the requirement.

ELECTRICAL AND COMPUTER ENGINEERING DEPARTMENT

134 Credits Required

Sophomore Year

| Fall Semester | | | Spring Semester | | |
|---------------|--|-----------|-----------------|--|-----------|
| EECE 201 ***/ | Fundamental of Electrical Systems Analysis I | 3 | EECE 203 ***/ | Electrical Systems Analysis II | 3 |
| EECE 210 | Software Engineering I | 3 | EECE 232 | Computer System, Organization & Design | 3 |
| EECE 229 | Intro to Digital Systems | 3 | MATH 286 | Differential Equations | 3 |
| MATH 285 | Calculus III | 3 | PHYS 102/192 | Physics II and Lab | 4 |
| ENGL | English Elective | 3 | Gen Ed/RELS | Gen Ed or RELS Elective | 3 |
| | Gen Ed or RELS Elective | 3 | | | |
| TOTAL | | 18 | TOTAL | | 16 |

Junior Year

(**Note:** Juniors with a cumulative GPA of 3.2 qualify for the Seamless Master's Program and should consult with the department chair for program details. Students can take up to two graduate level courses as an undergraduate and apply it to their master's program. Credits can only apply to one degree)

| Fall Semester | | | Spring Semester | | |
|---------------|-------------------------|-----------|-----------------|---------------------------------|-----------|
| EECE 303 | Signals & Systems I | 3 | EECE 304 | Signals & Systems II | 4 |
| EECE 305 | Electronic Systems I | 4 | EECE 306 | Electronic Systems II | 4 |
| EECE 307 | Mathematical Methods | 4 | EECE 311 | Applied Electromagnetics | 3 |
| EECE 321 | Embedded Systems Design | 3 | EECE 315 | Probability and Statistics | 4 |
| Gen Ed | Gen Ed Elective | 3 | EECE 320 | Software Engineering II (COMPE) | 3 |
| | | | EECE 326 | Instrumentation Systems (EE) | 3 |
| TOTAL | | 17 | TOTAL | | 18 |

Senior Year for Computer Engineers

| Fall Semester | | | Spring Semester | | |
|---------------|--|-----------|-----------------|--|-----------|
| EECE 410 | Capstone Design I | 3 | EECE 411 | Capstone Design II | 3 |
| EECE 476 | Object-Oriented Programming and Data Structures for Computer Engineering | 3 | EECE 473 | Operating Systems for Computer Engineering | 3 |
| | Technical Elective | 3 | EECE 475 | Computer Network Architecture | 3 |
| | Technical Elective | 3 | | Technical Elective | 3 |
| | Technical Elective | 3 | | Technical Elective | 3 |
| | | | | Gen Ed or RELS Elective | 3 |
| TOTAL | | 15 | TOTAL | | 18 |

Senior Year for Electrical Engineers

| Fall Semester | | | Spring Semester | | |
|---------------|------------------------|-----------|-----------------|------------------------------|-----------|
| EECE 410 | Capstone Design I | 3 | EECE 411 | Capstone Design II | 3 |
| EECE 477 | Power & Energy Systems | 3 | EECE 425 | Control Systems Design | 3 |
| | Technical Elective | 3 | EECE 474 | Modern Communication Systems | 3 |
| | Technical Elective | 3 | | Technical Elective | 3 |
| | Technical Elective | 3 | | Technical Elective | 3 |
| | | | | Gen Ed or RELS Elective | 3 |
| TOTAL | | 15 | TOTAL | | 18 |

*EECE 201 Fundamentals of Electrical Systems Analysis I and EECE 203 Electrical Systems Analysis II must be completed with a grade of C (2.0) or better.

****Gateway Courses:** A grade of "C" or better is required in EECE 201 Fundamentals of Electrical Systems Analysis I and EECE 203 Electrical Systems Analysis II. Students are allowed a maximum of three attempts to achieve a C or better in gateway courses before dismissal from the major program (not the School of Engineering). A "W" grade is considered one attempt.

Concentrations in Electrical and Computer Engineering (coming soon)

In addition to its foundational undergraduate programs, the Electrical and Computer Engineering Department offers three specialized concentrations at the undergraduate level in Artificial Intelligence (AI), Cybersecurity, and Power Grids and Green Energy Engineering. Courses satisfying the options are taken in the senior year as technical electives.

Concentration in Cybersecurity

The cybersecurity undergraduate concentration equips students with the knowledge and skills to protect and defend digital systems against cyber threats, ensuring the security and integrity of critical information, designing secure engineering systems, and developing effective security strategies.

Concentration Artificial Intelligence

Artificial Intelligence concentration is designed to provide Electrical and Computer Engineering students with the fundamental concepts of the artificial intelligence from an engineering perspective, as well as the ability to develop the knowledge of the principles, methods, systems, and toolchains underlying modern artificial intelligence. A major component of this concentration is the development and implementation of AI-orchestrated systems that can function within the constraints imposed by engineering. ECE students will be allowed to branch out and draw on courses across the spectrum of AI topics including machine learning, computer vision, imaging processing, deep learning, big data, and data mining.

Concentration in Power Grids and Green Energy Engineering

The concentration in Power Grids and Green Energy Engineering provides a broad background in the principles, analysis, and design of large electric power and green energy systems, smart grids, electric energy conversion, and the application of electronic devices at high power levels.

MECHANICAL ENGINEERING PROGRAM

133-135 Credits Required

Sophomore Year

| <i>FALL SEMESTER</i> | | |
|-----------------------------|--|-----------|
| CHEM 102/104 or PHYS 102 | General Chemistry or Physics II | 4 |
| ENGS 205 ^{*/**} | Intro Thermodynamics | 3 |
| ENGS 206 ^{*/**} | Statics | 3 |
| MATH 285 | Calculus III | 3 |
| MECH 211 | Technical and Graphical Communication | 3 |
| | | |
| TOTAL | | 16 |

| <i>SPRING SEMESTER</i> | | |
|------------------------|-------------------------|-----------|
| ENGS 201/202 | Materials Science & Lab | 3 |
| ENGS 220 | Dynamics | 3 |
| MECH 230 | Intro Solid Mechanics | 3 |
| MECH 240 | Applied Thermodynamics | 2 |
| MATH 286 | Differential Equations | 3 |
| ENGL | English Elective | 3 |
| TOTAL | | 17 |

Junior Year

(**Note:** Juniors with a cumulative GPA of 3.2 qualify for the Seamless Master's Program and should consult with the department chair for program details. Students can take up to two graduate level courses as an undergraduate and apply it to their master's program. Credits can only apply to one degree)

| <i>FALL SEMESTER</i> | | |
|----------------------|--|-------------------|
| MECH 321 | Solid Mechanics Laboratory | 1 |
| MECH 318 | Fluid Mechanics I | 3 |
| MECH 323 | Machine Design | 4 |
| MECH 312 | Intro Mechatronics | 3 |
| RELS 2XX | Religious Studies – Catholic Studies Elective | 3 |
| MATH/SCIENCE | Elective | 3/4 |
| TOTAL | | 17/ 18 |

| <i>SPRING SEMESTER</i> | | |
|------------------------|--|-----------|
| MECH 314 | Engr. Analysis & Num. Methods | 3 |
| MECH 319 | Fluid Mechanics 2 | 2 |
| MECH 325 | Heat Transfer | 4 |
| MECH 332 | Finite Element Analysis and Computer Aided Design | 3 |
| MECH 330 | Thermal & Fluid Laboratory | 2 |
| Gen Ed. Elective | General Education Elective | 3 |
| TOTAL | | 17 |

Senior Year

| <i>FALL SEMESTER</i> | | |
|----------------------|--|-----------|
| MECH 401 | Mechanical Engr Design I | 2 |
| MECH 439/440 | Manufacturing Processes & Lab | 3 |
| MECH 411 | Mechanical Vibrations | 3 |
| MECH 422 | Thermal/Fluids System Design | 3 |
| MECH | Mech Engr Elective | 3 |
| RELS 3XX | Religious Studies – Ethics Elective | 3 |
| TOTAL | | 17 |

| <i>SPRING SEMESTER</i> | | |
|------------------------|---|-------------------|
| MECH 402 | Mechanical Engr Design II | 2 |
| MECH 4141 | Engineering Economy and Project Management | 3 |
| MECH | Mechanical Engineering Elective | 3 |
| MECH | Mechanical Engineering Elective | 3 |
| MATH/SCIENCE | Elective | 3/4 |
| Gen Ed. Elective | General Education Elective | 3 |
| TOTAL | | 17/ 18 |

*ENGS 205, Introduction to Thermodynamics and ENGS 206, Statics, **MUST** be passed with a grade of "C" or better before enrolling in any 300 level Mechanical Engineering courses.

****Gateway Courses:** A grade of "C" or better is required in ENGS 205/Intro to Thermodynamics and ENGS 206/Statics. Students are allowed a maximum of three attempts to achieve a C or better in gateway courses before dismissal from the major program (not the School of Engineering). A "W" grade is considered one attempt.

Concentrations in Mechanical Engineering

In addition to its foundational undergraduate program, the Mechanical Engineering Department offers a specialized concentration at the undergraduate level in the area of *Biomechanics* and *Aerospace*. Courses satisfying the option are taken in different years. Students seeking to complete a concentration should contact the Mechanical Engineering chairperson, Dr. Parisa Saboori, all requirements.

Biomechanics Concentration

Biomechanics is the study of the mechanical engineering aspects of biological systems. Areas of interest include, tissue engineering, the strength and structural behavior of biocompatible materials; and the application of solid and fluid mechanics to biological systems in health and disease.

Students accepted into the concentration must take:

- **Two** biology courses as their science electives from: BIOL 207 Anatomy and Physiology I; BIOL 208 Anatomy and Physiology II ; BIOL222 Biology for Engineers; and BIOL 441 Cardiovascular Biology*
- **Three** Mechanical Engineering elective courses from: MECH 431 Structural Biomechanics; MECH 437 Biomechanical Instrumentation; MECH450 Bio-fluids; MECH450 Tissue Engineering; MECH 451 Intro to Biofluid Mechanics; MECH 531 Biomechanics; MECG 631 Biomechanics Modeling; and MECG 741 Advanced Biomechanics (requires MECG 531) *
- **Plus**, a biomechanical project for the Mechanical Engineering Design sequence (MECH 401/402)

Aerospace Concentration

The Aerospace concentration is designed to give students an introduction to aerospace science and technology. Aerospace engineers use engineering principles to design and develop aircraft and spacecraft, both manned and unmanned. The employment prospects in aerospace is expected to be strong for the foreseeable future.

Students accepted into the concentration must take:

- **Two** math courses as their Math/Science elective from: MATH 372 Linear Algebra, MATH 386 Partial Differential Equations, and MATH 490 Complex Analysis
- **Three** Mechanical Engineering elective courses from: MECH 461-Propulsion, MECH 462- Aircraft Design, MECH 468- Astronautics,MECG 516- Turbomachinery, MECG 528- Combustion Systems, MECG 605- Flight Mechanics, MECG 606- Design of Aerospace Structures, MECG 608- Introduction to Aerodynamics, MECG 701- Viscous Flow Theory, MECG 702- Compressible Flow, MECG 704- Computational Fluid Mechanics

Programs of Study for Engineering Minors

Engineering students have the opportunity to develop depth in an area other than the major by completing a minor in a different program. Students may minor in biology, business, computer science, chemistry, economics, English, environmental studies, finance, government, history, management, marketing, mathematics, modern foreign languages, peace studies, philosophy, physics, psychology, religious studies, urban affairs, and women and gender studies. In general, a minor requires 15 credits. Courses must be completed at Manhattan College.

Engineering students may also choose to minor in another engineering discipline. Engineering Minors are not open to any other majors except engineering. The engineering minors and course plans are as follows:

Chemical Engineering --

CHML 207 Process Calculations, CHML 208 Chemical Engineering Principles I, CHML 305 Chemical Engineering Principles II, CHML 306 Separation Process Design I, and CHML 321 Chemical Reaction Engineering.

Civil Engineering --

CIVL 302 Structural Analysis I, CIVL 309 Steel Design, CIVL 310 Introduction to Geomechanics, CIVL 409 Reinforced Concrete, and CEEN 303 Fluid Mechanics.

Computer Engineering --

1. For all students except electrical engineering majors:

EECE 229 Introduction to Digital Systems, EECE 232 Computer System, Organization & Design, and EECE 310 Software Engineering I, and two additional computer engineering courses approved by the ECE department chair.

2. For electrical engineering majors:

EECE 232 Computer System, Organization and Design and EECE 310 Software Engineering I, plus three elective computer engineering courses, of which at least two must be upper division or graduate, approved by the ECE department chair. These elective courses cannot be used to simultaneously satisfy the requirements for electrical engineering.

Electrical Engineering --

1. For all students except computer engineering majors:

EECE 201 Fundamentals of Electrical System Analysis, EECE 203 Electrical System Analysis II, and EECE 229 Introduction to Digital Systems plus sequence a, b, or c as follows:

- a. EECE 303 Signals and Systems I and EECE 304 Signals and Systems II, or
- b. EECE 305 Electronic Systems I and EECE 306 Electronic Systems II, or
- c. Two upper division courses in electrical engineering approved by the ECE department chair.

2. For computer engineering majors:

EECE 232 Computer System, Organization and Design and EECE 321 Embedded Systems Design, plus three elective electrical engineering courses, of which at least two must be upper division or graduate level, approved by the department chair. These elective courses cannot be used to simultaneously satisfy the requirements for computer engineering.

Environmental Engineering --

The minor in environmental engineering is open to all engineering majors. Required coursework includes ENGS 204 Environmental Engineering Principles I, plus four (4) courses from the following: CEEN 314 Water and Wastewater Treatment Processes, ENVL 406 Water and Wastewater Treatment Processes, ENVL 408 Environmental Engineering Design, ENVL 410 Hazardous Waste Management, ENVL 439 Environmental Engineering Projects, ENVL 505 Surface Water Quality Modeling, and ENVL 507 Groundwater.

Mechanical Engineering --

ENGS 205 Introductory Thermodynamics, ENGS 206 Statics, MECH 230 Introductory Solid Mechanics, MECH 318 Fluid Mechanics I, and MECH 325 Heat Transfer. This set of courses may be modified by the mechanical engineering department chair based upon the background of the student.

Prerequisites/Corequisites for Minors

Students pursuing an engineering minor are responsible for any required prerequisites. Completion of the engineering minor may qualify students for entry to the graduate program of the minor program. Students should contact the chair or director of the minor program for further information.

Engineering students may obtain an Application for Minor form at the SOE Online Resource (SOEOR) page. After the form is approved by the program chair or director offering the minor, the form should be returned to the Office of the Dean of Engineering by the student. When all courses have been completed, the dean will notify the Office of the Registrar.