GENERAL ENGINEERING

Introductory and General Engineering Courses

Required Introductory Courses

DSGN 106-1 Design Thinking and Communication (0.5 Unit) Integrated introduction to the user-centered design process and technical communication. Students will address challenges proposed by project partners by identifying unmet needs, conducting research, generating and evaluating potential solutions, and finally, presenting a final design concept with supporting documentation. Students also enhance their abilities in equitable teamwork, project management, fabrication skills, and producing written, oral, graphical, and interpersonal communication. One lecture, two section meetings, and lab. Co-registration with ENGLISH 106-1 required. Primarily intended for first-year engineering students.

DSGN 106-2 Design Thinking and Communication (0.5 Unit) Integrated iteration on the user-centered design process and technical communication. This course will build on the learning objectives from DTC-1 while adding more focus on ethics in design and communication, equitable distribution of teamwork, project management, documenting and communicating progress, and exploring a wider variety of project topics. One lecture, two section meetings, and lab. Co-registration with ENGLISH 106-2 required. Primarily intended for first-year engineering students.

GEN_ENG 205-1 Engineering Analysis I (1 Unit) Introduction to linear algebra from computational, mathematical, and applications viewpoints. Computational methods using a higher-level software package such as MATLAB. Prerequisite: consent of instructor.

GEN_ENG 206-1 Honor Engineering Analysis (1 Unit) Covers topics addressed in GEN_ENG 205-1 at a deeper level. Intended for students with demonstrated strength in mathematics, computer programming, and/or physics. Prerequisite: consent of instructor.

GEN_ENG 205-2 Engineering Analysis II (1 Unit) Covers topics addressed in GEN_ENG 205-1 at a deeper level. Intended for students with demonstrated strength in mathematics, computer programming, and/or physics. Prerequisite: C- or better in GEN_ENG 205-1; MATH 220-1.

GEN_ENG 205-3 Engineering Analysis III (1 Unit) Covers topics addressed in GEN_ENG 205-2. Meets weekly, starting at midquarter, in small groups along with a peer facilitator, to collaboratively review material, work through practice problems, and clarify course concepts. Enrollment optional. Graded S/U.

GEN_ENG 205-4 Engineering Analysis IV (1 Unit) Peer-guided study group for students enrolled in GEN_ENG 205-1. Meets weekly in small groups, along with a peer facilitator, to collaboratively review material, work through practice problems, and clarify course concepts. Enrollment optional. Graded S/U.

GEN_ENG 205-SG-1 Peer-Guided Study Group: Engineering Analysis I (0 Unit) Peer-guided study group for students enrolled in GEN_ENG 205-1. Meets weekly in small groups, along with a peer facilitator, to collaboratively review material, work through practice problems, and clarify course concepts. Enrollment optional. Graded S/U.

GEN_ENG 205-SG-2 Peer-Guided Study Group: Engineering Analysis II (0 Unit) Peer-guided study group for students enrolled in GEN_ENG 205-2. Meets weekly in small groups, along with a peer facilitator, to collaboratively review material, work through practice problems, and clarify course concepts. Enrollment optional. Graded S/U.

GEN_ENG 205-SG-3 Peer-Guided Study Group: Engineering Analysis III (0 Unit) Peer-guided study group for students enrolled in GEN_ENG 205-3. Meets weekly in small groups, along with a peer facilitator, to collaboratively review material, work through practice problems, and clarify course concepts. Enrollment optional. Graded S/U.

GEN_ENG 205-SG-4 Peer-Guided Study Group: Engineering Analysis IV (0 Unit) Peer-guided study group for students enrolled in GEN_ENG 205-4. Meets weekly in small groups, along with a peer facilitator, to collaboratively review material, work through practice problems, and clarify course concepts. Enrollment optional. Graded S/U.

GEN_ENG 205-1 Engineering Analysis I (1 Unit) Introduction to linear algebra from computational, mathematical, and applications viewpoints. Computational methods using a higher-level software package such as MATLAB. Prerequisite: consent of instructor.

GEN_ENG 206-1 Honor Engineering Analysis (1 Unit) Covers topics addressed in GEN_ENG 205-1 at a deeper level. Intended for students with demonstrated strength in mathematics, computer programming, and/or physics. Prerequisite: consent of instructor.

GEN_ENG 205-2 Engineering Analysis II (1 Unit) Covers topics addressed in GEN_ENG 205-1 at a deeper level. Intended for students with demonstrated strength in mathematics, computer programming, and/or physics. Prerequisite: C- or better in GEN_ENG 205-1; MATH 220-1.

GEN_ENG 205-3 Engineering Analysis III (1 Unit) Covers topics addressed in GEN_ENG 205-2. Meets weekly, starting at midquarter, in small groups along with a peer facilitator, to collaboratively review material, work through practice problems, and clarify course concepts. Enrollment optional. Graded S/U.

GEN_ENG 205-4 Engineering Analysis IV (1 Unit) Peer-guided study group for students enrolled in GEN_ENG 205-1. Meets weekly in small groups, along with a peer facilitator, to collaboratively review material, work through practice problems, and clarify course concepts. Enrollment optional. Graded S/U.

GEN_ENG 205-SG-1 Peer-Guided Study Group: Engineering Analysis I (0 Unit) Peer-guided study group for students enrolled in GEN_ENG 205-1. Meets weekly in small groups, along with a peer facilitator, to collaboratively review material, work through practice problems, and clarify course concepts. Enrollment optional. Graded S/U.

GEN_ENG 205-SG-2 Peer-Guided Study Group: Engineering Analysis II (0 Unit) Peer-guided study group for students enrolled in GEN_ENG 205-2. Meets weekly in small groups, along with a peer facilitator, to collaboratively review material, work through practice problems, and clarify course concepts. Enrollment optional. Graded S/U.

GEN_ENG 205-SG-3 Peer-Guided Study Group: Engineering Analysis III (0 Unit) Peer-guided study group for students enrolled in GEN_ENG 205-3. Meets weekly in small groups, along with a peer facilitator, to collaboratively review material, work through practice problems, and clarify course concepts. Enrollment optional. Graded S/U.

GEN_ENG 205-SG-4 Peer-Guided Study Group: Engineering Analysis IV (0 Unit) Peer-guided study group for students enrolled in GEN_ENG 205-4. Meets weekly in small groups, along with a peer facilitator, to collaboratively review material, work through practice problems, and clarify course concepts. Enrollment optional. Graded S/U.

GEN_ENG 220-1 Analy/Comp Graph (0.5 Unit) Introduction to AutoCAD, geographic information systems (GIS), and electronic surveying and measuring.

GEN_ENG 220-2 Analy/Comp Graph II (0.5 Unit) Introduction to AutoCAD, geographic information systems (GIS), and electronic surveying and measuring.

GEN_ENG 295-0 Special Topics in Engineering (1 Unit) Intermediate-level topics suggested by students or faculty members and approved by the curriculum committee.

GEN_ENG 355-0 Domestic Study Affiliated (0 Unit) Fulltime registration in an academic program in the continental United States that is affiliated with Northwestern. Upon successful completion of the program, registration is replaced with credits transferred from the affiliated institution.

GEN_ENG 395-0 Special Topics in Engineering (1 Unit) Topics suggested by faculty and approved by the curriculum committee.

GEN_ENG 397-0 Selected Topics in Engineering (0.5 Unit) Topics of limited scope as suggested by faculty and approved by the curriculum committee.

GEN_ENG 399-0 Independent Study (1 Unit) Independent study on an engineering subject supervised by a faculty member and concluding with a final report.

Murphy Institute General Engineering Courses

- Participation in the Murphy Institute and its courses is by invitation only. Additional information can be found on the Murphy Institute website: https://www.mccormick.northwestern.edu/academics/undergraduate/programs/honors-and-combined-degrees/murphy-scholars/

GEN_ENG 195-1 Engineering Dialog I (0.33-0.34 Unit) Weekly seminar addressing subjects of interest in engineering, design, engineering policy, and entrepreneurial activities. For participants in the invitation-only Murphy Institute Scholars Program. May be repeated.
Cooperative Engineering Courses

Workplace-management issues, and transition back to school. It includes
CRDV 301-0 Introduction to Career Development (0 Unit)
Introductory Coursework
development/
Engineering Career Development offers students:
• Courses and workshops designed to aid students in preparing and conducting a job search
• Personalized, one-on-one career advising
• Employer events and on campus interviewing opportunities
• Work integrated learning programs that allow students to maintain their student status while enrolling in zero-credit, zero-tuition courses for co-op, internship, research, and service learning experiences.

For more information visit: www.mccormick.northwestern.edu/career-development/ (https://www.mccormick.northwestern.edu/career-development/)

Engineering Career Development Course Offerings

Introductory Coursework
CRDV 301-0 Introduction to Career Development (0 Unit)
Course preparing students for the Walter P. Murphy Cooperative Engineering Education Program, internships, and fulltime employment. It includes units on job-search skills, self-assessment, transition to the workplace, workplace-management issues, and transition back to school.

Cooperative Engineering Courses

• All courses in the CRDV 310 sequence are 0 credit.
• Sequence of courses covering the work terms of students in the Walter P. Murphy Cooperative Engineering Education Program.

Course | Title
---|---
CRDV 310-1 | Cooperative Engineering Education
or CRDV 310-1-GM | International Cooperative Engineering Education

CRDV 310-2 | Cooperative Engineering Education
or CRDV 310-2-GM | International Cooperative Engineering Education

Engineering Internship Courses

• All courses in the CRDV 311 sequence are 0 credit.
• Series of courses designated for students seeking University recognition of their internship experience, or participating in an approved internship during the regular academic year.

Course | Title
---|---
CRDV 311-1 | Professional Engineering Internship
or CRDV 311-1-GM | International Engineering Internship

CRDV 311-2 | Professional Engineering Internship
or CRDV 311-2-GM | International Engineering Internship

CRDV 311-3 | Professional Engineering Internship
or CRDV 311-3-GM | International Engineering Internship

CRDV 311-7 | Engineering Internship: Half-Time
or CRDV 311-7-GM | International Engineering Internship: Half-Time

Engineering Projects in Service Learning Courses

• All courses in the CRDV 312 sequence are 0 credit.
• CRDV 312 courses require students to engage in an engineering-related, full-time community service project under the guidance of an appropriate faculty member, agency supervisor or mentor.

Course | Title
---|---
CRDV 312-1 | Undergraduate Engineering Projects in Service Learning
or CRDV 312-1-GM | International Engineering Service Learning

CRDV 312-2 | Undergraduate Engineering Projects in Service Learning
or CRDV 312-2-GM | International Engineering Service Learning

CRDV 312-3 | Undergraduate Engineering Projects in Service Learning
or CRDV 312-3-GM | International Engineering Service Learning

CRDV 312-7 | Engineering Projects in Service Learning: Half-Time
or CRDV 312-7-GM | International Engineering Service Learning: Half-Time

Undergraduate Engineering Research Courses

• All courses in the CRDV 313 sequence are 0 credit.
• The CRDV 313 course sequence allows students to maintain half-time enrollment at Northwestern while engaged full-time in an University-based research project under the supervision of a faculty research sponsor. Students are evaluated by ABET criteria, the same as those in the Walter P. Murphy Cooperative Engineering Education Program and the Professional Engineering Internship Program.

Course | Title
---|---
CRDV 313-1 | Undergraduate Engineering Research
or CRDV 313-1-GM | International Engineering Research Experience

CRDV 313-2 | Undergraduate Engineering Research
Northwestern Personal Development StudioLab

The Northwestern Personal Development StudioLab is a space where students create and practice their personal and powerful life approach. The StudioLab collaborates with partners across campus and beyond to develop and deliver courses, opportunities, resources, and experiences that promote the personal growth of students. The StudioLab strives to cultivate a student body who possess:

- The ability to be intentional with their attention.
- Accurate awareness of themselves, their peers, and the world around them.
- Healthy connections to the present moment, to themselves, and to those around them.

The StudioLab offers the Curious Life Certificate (CLC), a series of classes that develop these qualities as the foundation for a successful and curious life.

For more information visit [www.mccormick.northwestern.edu/personal-development-studiolab/](https://www.mccormick.northwestern.edu/personal-development-studiolab/)

Engineering Office of Personal Development Course Offerings

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
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<tbody>
<tr>
<td>PRDV 101-1</td>
<td>McCormick First-Year Experience</td>
<td>0 Unit</td>
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<tr>
<td>PRDV 101-2</td>
<td>McCormick First-Year Experience</td>
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<td>PRDV 200-0</td>
<td>PATH (Personal Development Studio Lab)</td>
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<tr>
<td>PRDV 300-0</td>
<td>Designing Your Life</td>
<td>1 Unit</td>
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<tr>
<td>PRDV 325-0</td>
<td>Emotional Intelligence 101 - Managing Yourself, Maximizing Your Potential</td>
<td>1 Unit</td>
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<tr>
<td>PRDV 335-1</td>
<td>Engineering Improv I: The Art of Allowing</td>
<td>0.5 Unit</td>
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<tr>
<td>PRDV 335-2</td>
<td>Engineering Improv II: The Art of Application</td>
<td>0.5 Unit</td>
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<tr>
<td>PRDV 345-0</td>
<td>Whole-Body Thinking: Collaborative Problem Solving through Partner Dancing</td>
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<tr>
<td>PRDV 395-0</td>
<td>Special Topics in Personal Development</td>
<td>1 Unit</td>
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<tr>
<td>PRDV 396-0</td>
<td>Topics of limited scope as suggested by faculty and approved by the McCormick Office of Personal Development</td>
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<tr>
<td>PRDV 397-0</td>
<td>Selected Topics in Personal Development</td>
<td>0.5 Unit</td>
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Northwestern Institute on Complex Systems

The Northwestern Institute on Complex Systems (NICO) was founded in 2004 with the goals of uncovering fundamental principles governing complex systems in science, technology, and human behavior and applying these principles to solve societally relevant problems through the analysis, design, and control of complex systems. Today, NICO serves as a hub and facilitator for pathbreaking research in complexity and data science transcending the boundaries of established disciplines. NICO is a collaboration between the McCormick School of Engineering and the Kellogg School of Management.

Northwestern Institute on Complex Systems Course Offerings

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Units</th>
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<tbody>
<tr>
<td>NICO 101-0</td>
<td>Introduction to Programming for Big Data</td>
<td>0.67 Unit</td>
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<tr>
<td>NICO 102-0</td>
<td>Project for Introduction to Programming for Big Data</td>
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