# SECTION 12: FACULTY OF ENERGY SYSTEMS AND NUCLEAR SCIENCE

**Dean:** George Bereznai, BE (Hons), MEng, PhD, PEng

**Professor:**

**Dean:** George Bereznai, BE (Hons), MEng, PhD, PEng

Anthony Waker, BSc (Hons), PhD

**Associate Professors:**

Glenn Harvel, BEng, MEng, PhD, PEng

Brian Ikeda, BSc (Hons), MSc, PhD

Igor Pioro, MSc (Hons), PhD, Dr Tech Sc

Edward Waller, BSc, MScE, PhD, PEng

**Assistant Professors:**

Matthew Kaye, BASc, MSc, PhD

Eleodor Nichita, BSc, MSc, PhD

Lixuan Lu, MSc, PhD
(Cross-appointment with the Faculty of Engineering and Applied Science)

**Adjunct Professor:**

Roger Blais, BASc, MSc, PhD, FASRSC, FCAE, COC, OOQ

Daniel Meneley, BE, DIC, PhD, PEng

**Adjunct Associate Professors:**

Daniel Goodman, M.D., FRCPC

Daniel Hoornweg, BSc, MSc, PEng

Benjamin Rouben, BSc, PhD

**Academic Advisor:**

Kerry Armstrong, BA (Hons)

**Website: www.nuclear.uoit.ca**

## 12.1 Degrees offered

Bachelor of Applied Science (Honours) in Nuclear Power – BASc (Hons) (Students are not currently being admitted to this program)

Bachelor of Engineering (Honours) in Energy Systems Engineering – BEng (Hons)
(Students are not currently being admitted to this program)

Bachelor of Engineering (Honours) in Nuclear Engineering – BEng (Hons)

Bachelor of Engineering and Management (Honours) in Nuclear Engineering and

Management – BEng and Mgt (Hons)

Bachelor of Science (Honours) in Health Physics and Radiation Science – BSc (Hons)

The programs offered in the Faculty of Energy Systems and Nuclear Science have been created in consultation with key industry representatives in the fields of energy and radiation, to meet the many challenges and growing employment demand in these fields. Many of the programs in this faculty are unique in Canada.

Applications that involve energy systems in general and nuclear power plants in particular, benefit many aspects of our lives. Society depends on qualified people to design and develop new techniques, operate and maintain existing equipment, and to ensure that the benefits of energy technologies are applied as widely as possible.

Students will benefit from the university's mobile learning environment (section 1.2) which provides technically enhanced learning and teaching, including computer simulation of nuclear, fossil and alternative energy plants.

The faculty's research includes nuclear reactor design and safety analysis, nuclear power plant design and simulation, safety-critical digital instrumentation and control systems, reliability engineering, human machine interface and uncertainty analysis, radiation biophysics and dosimetry, environmental effects of radiation, health and medical physics, biological effects of tritium and low-energy x-rays, radioactive waste management, electrochemical and corrosion effects.

Master of Applied Science (MASc) and Master of Engineering (MEng) programs in Nuclear Engineering are currently under development.

## 12.2 Program information – Bachelor of Applied Science (Honours) in Nuclear Power – BASc (Hons)

Students are not currently being admitted to this program.

### 12.2.1 General information

UOIT designed the Bachelor of Applied Science (Honours) in Nuclear Power to meet a significant demand in the nuclear power industry for graduates with strong practical experience, technical knowledge and management skills. The curriculum provides students with an understanding of the principles and applications of nuclear power technology, the ability to think independently to take a systematic approach to problem solving and to develop skills in teamwork and collaboration.

### 12.2.2 Admission requirements

Current Ontario secondary school students must complete the Ontario Secondary School Diploma (OSSD) with a minimum overall average of 70 per cent on six 4U or 4M credits including English (ENG4U) with a minimum 60 per cent, advanced functions (MHF4U), calculus and vectors mathematics (MCV4U), chemistry (SCH4U) and physics (SPH4U).

In addition, a combined minimum 70 per cent average in math and science courses is required, with no grade below 60 per cent. All other applicants should refer to section 4.5 of this calendar for the requirements for their specific category of admission.

### 12.2.3 Careers

Graduates will find employment and progress to positions of increasing responsibility in a range of technology-based companies and institutions, with a particular emphasis in energy systems and nuclear power related specialties.

### 12.2.4 Degree requirements

To be eligible for the BASc (Hons) degree in Nuclear Power, students must successfully complete 120 credit hours, including all courses outlined below. For course descriptions, see section 16.

Although reasonable efforts will be made to adhere to the order and timing of courses as indicated below, course requirements and term offerings may change. For the most up-to-date list of course offerings please visit the faculty website at **www.nuclear.uoit.ca**.

**YEAR 1**

**Semester 1 (15 credit hours)**
EDUC 1050U Technical Communications
ENGR 3200U Engineering Graphics and Design
MATH 1010U Calculus I

MATH 1850U Linear Algebra for Engineers
PHY 1010U Physics I

**Semester 2 (15 credit hours)**
CHEM 1800U Chemistry for Engineers
ENGR 1200U Introduction to Programming
ENVS 1000U Environmental Science
MATH 1020U Calculus II
PHY 1020U Physics II

**YEAR 2**

**Semester 1 (15 credit hours)**
EDUC 1200U History of Science and Technology
ENGR 2220U Structure and Properties of Materials
ENGR 2500U Introduction to Nuclear Physics
ENGR 2860U Fluid Mechanics
MATH 2860U Differential Equations for Engineers

**Semester 2 (15 credit hours)**
BUSI 2000U Collaborative Leadership
ENGR 2790U Electric Circuits
ENGR 2640U Thermodynamics and Heat Transfer
ENGR 2950U Radiation Protection
ENGR 3820U Nuclear Reactor Kinetics

**YEAR 3**

**Semester 1 (15 credit hours)**
BUSI 3700U Strategic Management for Professionals
ENGR 2360U Electric Power Systems
ENGR 3540U Nuclear Steam Supply Systems
ENGR 3560U Radioactive Waste Management
ENGR 4640U Nuclear Plant Operation

**Semester 2 (15 credit hours)**
ENGR 2330U Mechanical Equipment and Systems
ENGR 3360U Engineering Economics
ENGR 3550U Nuclear Plant Steam Utilization Systems
ENGR 4730U Reactor Control
Technical elective*

**YEAR 4**

**Semester 1 (15 credit hours)**
BUSI 2603U Introduction to Operations Management
ENGR 3530U Safety and Quality Management
ENGR 4360U Nuclear Plant Electric and Auxiliary Systems
ENGR 4550U Thesis Project I
Technical elective*

**Semester 2 (15 credit hours)**
BUSI 2604U Introduction to Project Management and Supply Chain Management
ENGR 4370U Nuclear Plant Safety
ENGR 4560U Thesis Project II
ENGR 4810U Nuclear Fuel Cycles
Technical elective*

## 12.3 Program information – Bachelor of Engineering (Honours) in Energy Systems Engineering – BEng (Hons)

Students are not currently being admitted to this program.

### 12.3.1 General information

Students in the Honours Bachelor of Engineering in Energy Systems Engineering will learn the skills to design and develop tomorrow's energy systems. This degree program is the first stand-alone program of its kind in Canada. The program was developed to meet the rapidly increasing demand

for graduates with the knowledge and skills required to help Canada and the rest of the world meet the terms of the Kyoto agreement, while ensuring that the growing consumption of energy can be satisfied economically and with minimum impact on the environment.

The curriculum provides students with an understanding of the principles and applications of the full range of energy systems and technologies from traditional fossil-fuelled energy systems to alternative energy technologies. This includes the production, storage, distribution and utilization of energy.

### 12.3.2 Admission requirements

See section 12.2.2.

### 12.3.3 Careers

Graduates will be well prepared to work with systems that involve the generation, transmission or utilization of energy. Career opportunities are increasing for graduates in industry, government and non-government organizations. Graduates may also choose to start their own energy enterprise or pursue graduate studies.

### 12.3.4 Professional designation

This program was developed to meet the requirements of the Canadian Engineering Accreditation Board. Graduates will be eligible to apply for licensure as a professional engineer in any Canadian province or territory.

### 12.3.5 Degree requirements

To be eligible for the BEng (Hons) degree in Energy Systems Engineering, students must successfully complete 135 credit hours, including all courses outlined below.

For course descriptions, see section 16.

Although reasonable efforts will be made to adhere to the order and timing of courses as indicated below, course requirements and term offerings may change. For the most up-to-date list of course offerings please visit the faculty website at **www.nuclear.uoit.ca**.

#### YEAR 1

**Semester 1 (18 credit hours)**
CHEM 1010U Chemistry I
EDUC 1050U Technical Communications
ENGR 3200U Engineering Graphics and Design
MATH 1010U Calculus I
MATH 1850U Linear Algebra for Engineers
PHY 1010U Physics I

**Semester 2 (18 credit hours)**
CHEM 1020U Chemistry II
ENGR 1200U Introduction to Programming
ENGR 3530U Safety and Quality Management
ENVS 1000U Environmental Science
MATH 1020U Calculus II
PHY 1020U Physics II

#### YEAR 2

**Semester 1 (18 credit hours)**
BUSI 2000U Collaborative Leadership
EDUC 1200U History of Science and Technology
ENGR 2140U Problem Solving, Modelling and Simulation
ENGR 2220U Structure and Properties of Materials
ENGR 2860U Fluid Mechanics
MATH 2860U Differential Equations for Engineers

**Semester 2 (18 credit hours)**
EDUC 1470U Impact of Science and Technology on Society

ENGR 2010U Thermodynamic Cycles
ENGR 2330U Mechanical Equipment and Systems
ENGR 2790U Electric Circuits
MATH 2810U Advanced Engineering Mathematics or
MATH 2070U Numerical Methods
STAT 2800U Statistics and Probability for Engineers

**YEAR 3**

**Semester 1 (18 credit hours)**
ENGR 2360U Electric Power Systems
ENGR 3260U Introduction to Energy Systems
ENGR 3280U Fundamentals of Computer-Aided Design Tools
ENGR 3350U Control Systems
ENGR 3930U Heat Transfer
Liberal studies elective*

**Semester 2 (15 credit hours)**
ENGR 3360U Engineering Economics
ENGR 3380U Strength of Materials
ENGR 3730U Solar Energy Technologies
ENGR 3830U Wind Energy Systems
ENGR 3840U Fuel Cell Design

**YEAR 4**

**Semester 1 (15 credit hours)**
BUSI 3700U Strategic Management for Professionals
ENGR 4410U Fossil Fuel Energy Conversion
ENGR 4470U Hydrogen Power Systems
ENGR 4660U Risk Analysis Methods
ENGR 4994U Thesis Design Project I

**Semester 2 (15 credit hours)**
ENGR 4460U Nuclear Power Systems
ENGR 4480U Emerging Energy Systems
ENGR 4530U Hydroelectric Power
ENGR 4760U Ethics, Law and Professionalism for Engineers
ENGR 4998U Thesis Design Project II

## 12.4 Program information – Bachelor of Engineering (Honours) in Nuclear Engineering – BEng (Hons)

### 12.4.1 General information

The four-year Honours Bachelor of Engineering in Nuclear Engineering program was designed to meet a worldwide need for graduates in the field of nuclear engineering.

Although the primary focus of the program is nuclear power plant engineering, the curriculum is sufficiently broad-based that graduates will be well qualified for careers in many applications of nuclear technology and energy related fields.

The first two years of study provide students with a solid foundation in the fundamentals of mathematics and sciences, with years three and four concentrating on engineering sciences and specific nuclear engineering courses.

Students who choose Nuclear Engineering and Management take two semesters of business and management courses after successfully completing third year. The regular fourth year of the engineering program is then taken in year five of the program.

Learning takes place in a variety of settings including lectures, tutorials, field visits, laboratories and via computer simulation-the most extensive computer simulation of nuclear power plants of any engineering program in Ontario.

Electives may be taken from other programs in the engineering and science faculties, health physics and radiation science, and liberal arts, with complementary studies in collaborative leadership, economics, ethics and law, and strategic management.

Students develop management, interpersonal, problem-solving, and holistic thinking skills while gaining a comprehensive knowledge of nuclear engineering science and design, as well as the latest

developments in this field.

### 12.4.2 Admission requirements

See section 12.2.2

### 12.4.3 Work placement/internship opportunities

The university's proximity to the Pickering and Darlington nuclear power plants and a large number of diverse nuclear service companies provide many opportunities for work placements. In addition, a 12 to 16 month optional internship program is available for students completing the second or third year of the program.

### 12.4.4 Careers

There is a severe shortage of graduates to replace retiring engineers in the nuclear field. This program prepares graduates who are technically skilled engineers and who can undertake research, development, design, safety, licensing, maintenance, operation and decommissioning of nuclear power plants and related facilities.

Potential employers include utilities, service companies, government agencies, and research and design institutions, both in Canada and abroad. Major Canadian utilities and engineering companies that design, operate and service nuclear power plants are looking for a reliable supply of nuclear engineers.

### 12.4.5 Professional designation

See section 12.3.4.

### 12.4.6 Degree requirements

To be eligible for the BEng (Hons) degree in Nuclear Engineering, students must successfully complete 144 credit hours, including all courses outlined below. For course descriptions, see section 16.

Although reasonable efforts will be made to adhere to the order and timing of courses as indicated below, course requirements and term offerings may change. For the most up-to-date list of course offerings please visit the faculty website at **www.nuclear.uoit.ca**.

#### YEAR 1

**Semester 1 (18 credit hours)**
EDUC 1200U History of Science and Technology
EDUC 1050U Technical Communications
ENGR 3200U Engineering Graphics and Design
MATH 1010U Calculus I
MATH 1850U Linear Algebra for Engineers
PHY 1010U Physics I

**Semester 2 (18 credit hours)**
BIOL 1840U Biology for Engineers or
ENVS 1000U Environmental Science
CHEM 1800U Chemistry for Engineers
ENGR 1200U Introduction to Programming
ENGR 3530U Safety and Quality Management
MATH 1020U Calculus II
PHY 1020U Physics II

#### YEAR 2

**Semester 1 (18 credit hours)**
BUSI 2000U Collaborative Leadership
ENGR 2140U Problem Solving, Modelling and Simulation
ENGR 2220U Structure and Properties of Materials
ENGR 2500U Introduction to Nuclear Physics
ENGR 2860U Fluid Mechanics

MATH 2860U Differential Equations for Engineers

**Semester 2 (18 credit hours)**
EDUC 1470U Impact of Science and Technology on Society
ENGR 2010U Thermodynamic Cycles
ENGR 2950U Radiation Protection
ENGR 3820U Nuclear Reactor Kinetics
MATH 2070U Numerical Methods or
MATH 2810U Advanced Engineering Mathematics
STAT 2800U Statistics and Probability for Engineers

## YEAR 3

**Semester 1 (18 credit hours)**
ENGR 2790U Electric Circuits
ENGR 3280U Fundamentals of Computer-Aided Design Tools
ENGR 3570U Environmental Effects of Radiation
ENGR 3930U Heat Transfer
ENGR 4640U Nuclear Plant Operation
Liberal studies elective*

**Semester 2 (18 credit hours)**
ENGR 3360U Engineering Economics**
ENGR 3380U Strength of Materials
ENGR 3740U Scientific Instrumentation
ENGR 4610U Corrosion for Engineers
ENGR 4730U Reactor Control
ENGR 4780U Nuclear Reactor Design

**Students in an Engineering and Management program take BUSI 1700U

Introduction to Entrepreneurship, or a similar business and management course approved by the Faculty of Energy Systems and Nuclear Science, in place of ENGR 3360 Engineering Economics.

## YEAR 4

**Semester 1 (18 credit hours)**
BUSI 3700U Strategic Management for Professionals
ENGR 4620U Radioactive Waste Management Design
ENGR 4660U Risk Analysis Methods
ENGR 4700U Nuclear Plant Design and Simulation
ENGR 4994U Thesis Design Project I
Engineering science elective*

**Semester 2 (18 credit hours)**
ENGR 4520U Nuclear Plant Safety Design
ENGR 4760U Ethics, Law and Professionalism for Engineers
ENGR 4810U Nuclear Fuel Cycles
ENGR 4998U Thesis Design Project II
Engineering design elective*
Engineering science elective*
*ELECTIVES

**Engineering design electives**

ENGR 4670U Shielding Design

**Engineering science electives**

ENGR 4510U Nuclear Plant Chemistry
ENGR 4680U Nuclear Materials
ENGR 4880U Principles of Fusion Energy
RADI 3200U Medical Imaging
RADI 4550U Radiation Detection and Measurement
RADI 4320U Therapeutic Applications of Radiation Techniques
RADI 4430U Industrial Applications of Radiation Techniques
RADI 4440U Radioisotopes and Radiation Machines

**Liberal studies electives**

The dean of the faculty or his/her designate must approve courses selected for the liberal studies electives.

## 12.5 Program information – Bachelor of Engineering and Management (Honours) in Nuclear Engineering

### 12.5.1 General information

The engineering and management combination program meets the rapidly increasing need for engineers with the leadership skills to succeed in business and management. Students study the complete engineering program, and also gain critical management skills in key areas of business including accounting, finance, operations, human resources and marketing.

Students in this program take two semesters of business and management courses for 30 credit hours after successfully completing third year. The regular fourth year of the engineering program is then taken in year five of the program. The two semesters of business and management courses may be taken in other years of the program with permission.

### 12.5.2 Admission requirements

See section 12.2.2.

### 12.5.3 Work placement/internship/co-op opportunities

See section 12.4.3

### 12.5.4 Careers

Graduates of the engineering and management programs will be in high demand among employers in Ontario and beyond. With additional expertise in business and management, graduates of these programs will have a broader understanding of the business and management aspects of companies, allowing them to readily take on managerial roles or start their own businesses.

Graduates may also choose to pursue further studies toward higher degrees. The courses in the business and management year may be creditable towards the course requirements of advanced degrees such as an MBA.

### 12.5.5 Professional designation

See section 12.3.4

### 12.5.6 Program details and degree requirements

Bachelor of Engineering and Management (Honours) in Nuclear Engineering and Management – BEng and Mgt (Hons)

The engineering and management program follows the same program map as the four-year degree program for each option with two differences. First, in Year 3, Semester 2, students substitute ENGR 3360U Engineering Economics with BUSI 1700U Introduction to Entrepreneurship, or a similar business/management course approved by the Faculty of Energy Systems and Nuclear Science. Second, the program includes the addition of the following 10 courses in fourth year.

**YEAR 4**

**Semester 1 (15 credit hours)**
BUSI 1101U Financial Accounting
BUSI 2201U Marketing I
BUSI 2311U Organizational Behaviour
BUSI 2401U Finance I
ENGR 2340U Engineering Operations and Project Management I**

**Semester 2 (15 credit hours)**
BUSI 2170U Managerial Accounting
BUSI 2202U Marketing II
BUSI 2312U Introduction to Human Resources Management
BUSI 2402U Finance II
ENGR 2350U Engineering Operations and Project Management II**

Students take the fourth year of the appropriate engineering program in year five.

**In 2008-09, the courses ENGR 2340U Engineering Operations and Project Management I and ENGR 2350U Engineering Operations and Project Management II may not run and instead may be replaced by BUSI 2603U and BUSI 2604U, respectively.

Students should consult the Faculty of Energy Systems and Nuclear Science to determine which courses are running. The two semesters of business and management courses may be taken in other years of the program with permission.

## 12.6 Program information Bachelor of Science (Honours) in Health Physics and Radiation Science

### 12.6.1 General information

The four-year Honours Bachelor of Science in Health Physics and Radiation Science program provides an advanced science curriculum with a strong emphasis on safety aspects of radiation, as well as the application of technologies in the health care field where the expanding use of imaging technologies is creating a demand for graduates.

The curriculum is designed to provide students with a comprehensive knowledge of advanced science and applications of radiation protection, as well as the application of radiation technologies to health care, industry and agriculture. The first two years establish the fundamentals in mathematics, physical and biological sciences and technology. In year three, students learn the fundamentals of imaging, and how radiation techniques are used in a wide range of applications. Fourth year allows for specialization and includes two thesis projects.

Students in the Bachelor of Science (Honours) in Health Physics and Radiation Science receive specialized education in health physics. Health physics is a well-recognized branch of radiation science with a wide range of applications in many industries, such as nuclear power, non-destructive examinations, health care, agriculture, research, education, environmental protection, and the enforcement of government regulations.

Graduates from this program will be well positioned to meet a significant workforce demand. Learning takes place in a variety of settings including lectures, tutorials, field visits, and laboratories. These programs include mandatory liberal arts electives and business courses designed to develop students' interpersonal, problem-solving, and holistic thinking skills.

### 12.6.2 Admission requirements

See section 12.2.2.

### 12.6.3 Work placement/internship opportunities

The university's proximity to the Pickering and Darlington nuclear power plants and a large number of diverse nuclear service companies provide many opportunities for work placements. Work terms will be facilitated with interested companies working in fields that are relevant to the student's career. In addition, a 12 to 16 month optional internship program is available for students completing the second or third year of the program.

### 12.6.4 Careers

There is a growing global demand for health physics and radiation science specialists.

Graduates have many career opportunities, from research to nuclear power plants, as well as in the health care field where an aging population and the use of sophisticated imaging technologies are increasing the demand for such experts. Graduates can find careers in hospitals and clinics as well as at utilities, service companies, government agencies and research institutions.

### 12.6.5 Degree requirements – BSc (Hons) in Health Physics and Radiation Science

To be eligible for the BSc (Hons) in Health Physics and Radiation Science, students must successfully complete 132 credit hours including all courses as outlined below. For course descriptions, see section 16.

Although reasonable efforts will be made to adhere to the order and timing of courses as indicated below, course requirements and term offerings may change. For the most up-to-date list of course offerings please visit the faculty website at **www.nuclear.uoit.ca**.

## YEAR 1

**Semester 1 (18 credit hours)**
CHEM 1010U Chemistry I
EDUC 1050U Technical Communications
EDUC 1200U History of Science and Technology
MATH 1010U Calculus I
MATH 1850U Linear Algebra for Engineers
PHY 1010U Physics I

**Semester 2 (18 credit hours)**
BIOL 1840U Biology for Engineers
CHEM 1020U Chemistry II
ENGR 1200U Introduction to Programming
MATH 1020U Calculus II
PHY 1020U Physics II
RADI 3530U Introduction to Radiological and Health Physics

## YEAR 2

**Semester 1 (18 credit hours)**
BIOL 2840U Cell and Molecular Biology
BUSI 2000U Collaborative Leadership
CHEM 2020U Introduction to Organic Chemistry
ENGR 2140U Problem Solving, Modelling and Simulation
ENGR 2500U Introduction to Nuclear Physics
MATH 2860U Differential Equations for Engineers

**Semester 2 (18 credit hours)**
EDUC 1470U Impact of Science and Technology on Society
ENVS 1000U Environmental Science
MATH 2810U Advanced Engineering Mathematics or
MATH 2070U Numerical Methods
RADI 2100U Radiological and Health Physics
RADI 2110U Health Physics Laboratory
STAT 2800U Statistics and Probability for Engineers

## YEAR 3

**Semester 1 (15 credit hours)**
ENGR 2790U Electric Circuits
ENGR 3860U Introduction to Nuclear Reactor Technology
HLSC 1200U Anatomy and Physiology I
RADI 3200U Medical Imaging
RADI 4550U Radiation Detection and Measurement

**Semester 2 (15 credit hours)**
ENGR 3360U Engineering Economics
ENGR 3740U Scientific Instrumentation
RADI 4220U Radiation Biophysics and Dosimetry
RADI 4440U Radioisotopes and Radiation Machines
Science or engineering elective

## YEAR 4

**Semester 1 (15 credit hours)**
ENGR 3570U Environmental Effects of Radiation
ENGR 4660U Risk Analysis Methods
RADI 4430U Industrial Applications and Radiation Techniques
RADI 4995U Thesis Project I
Liberal studies elective*

**Semester 2 (15 credit hours)**
RADI 4320U Therapeutic Applications of Radiation Techniques
RADI 4999U Thesis Project II
Senior science OR engineering elective
Senior science OR engineering elective
Liberal studies elective*

*Liberal studies electives

The dean of the Faculty of Energy Systems Engineering and Nuclear Science or his/her designate must approve courses selected for the liberal studies electives.

## 12.7 First-year Engineering Transition Program

The objective of the First-year Engineering Transition Program is to provide first-year engineering students with an opportunity, before the start of second year, to complete first-year courses for which they have not obtained credit, to upgrade their grade point average and academic standing, and to improve their preparation for studies in subsequent years.

The program involves a second offering of demanding first-year courses, according to the following schedule:

| Winter semester | Summer semester |
|---|---|
| MATH 1010U Calculus I | MATH 1020U Calculus II |
| PHY 1010U Physics | PHY 1020U Physics II |
| | MATH 1800U Linear Algebra for Engineers |
| | ENGR 1200U Introduction to Programming |
| | CHEM 1800U Chemistry for Engineers |
| | ENGR 3200U Engineering Graphics and Design |

At the end of the fall semester, engineering students who have failed or are missing Calculus I (MATH 1010U) or Physics I (PHY 1010U), are encouraged to take the course(s) during the winter semester. Students on academic warning will likely be required to take or repeat the courses which they have not already passed. The follow-up courses, Calculus II (MATH 1020U) and Physics II (PHY 1020U), along with the other above-noted first-year courses, will be offered during the summer semester.

Students who register in and successfully complete the transition program courses will have their academic standing re-evaluated. This re-evaluation will include all the grades received in transition program courses.