Chemical Engineering Department

2017-2018
Undergraduate Handbook
Table of Contents

Important Phone Numbers
What Do Chemical Engineers Do?
Did You Know?
Industry Profile
Job Descriptions

SECTION I: The Chemical Engineering Program
The Chemical Engineering Department
Faculty
Department Catalog Description
Chemical Engineering Course Descriptions
Co-op Plan A Flowsheet
Co-op Plan B Flowsheet
Recommended HUM/SS/MC Electives
College of Engineering HUM/SS/MC Requirements
Co-op Work Experience
Co-op Company List
Minors
Minor in General Business
Minor in Computer Science Engineering

SECTION II: University Resources and Policies
UT Counseling Center
Safety & Health Contacts for UT Students
Campus Resources
Tutoring Services
Quick Links
Campus Activities
College of Engineering Student Activities
Academic Policies/Procedures
The University of Toledo Policy on Academic Dishonesty
The College of Engineering Policy on Academic Dishonesty

SECTION III: Steps to Achieving Academic Success
Pitfalls to Academic Success
Goals
Time Management
Studying
Test Anxiety
Healthy Living
Tips to Remember Before You Register
Campus Map
Welcome to the Chemical Engineering (CHEE) Department at The University of Toledo. As your academic advisor, I am very pleased and excited that you have chosen to pursue your education with us and I look forward to working with you throughout your academic journey.

The transition from high school to college can often be difficult; the CHEE Department offers many resources to make your transition as easy as possible. It is very beneficial to take part in student organizations and activities while attending the University. Communicating with your professors and networking on-campus also will allow you to have a successful college career.

This handbook contains important and useful information for you. Please read it carefully and use it as a reference guide. You will find helpful tips, program and course information, important phone numbers and valuable planning tools to assist you along the way.

Please feel free to call, email, or stop by my office should you have any questions. Office hours are Monday-Friday 9:00am-5:00pm or by appointment.

Best wishes for a successful college career at The University of Toledo! Go Rockets!

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* Information listed in this handbook is current at the time of printing. The Chemical Engineering Department reserves the right to make changes to this handbook at any time.
IMPORTANT PHONE NUMBERS

Chemical Engineering Department Office
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Renee Norrils, MLS
Dept. Secretary
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Career Development Center (Co-op Office)
Office: NI 1040
Phone: (419) 530-8050

Admissions (419) 530-8888
Bookstore (419) 530-2516
Campus Police (419) 530-2600 (emergency); 419-530-2601 (non-emergency)
Learning Enhancement Center (419) 530-2176
Library (419) 530-2324
Parking Services (419) 530-4100
Residence Life (419) 530-2941
Rocket Card Services (419) 530-5842

Rocket Solution Central (419) 530-8700 (Treasurer’s Office, Financial Aid, & Registrar)
Student Disability Services (419) 530-4981
Student Medical Center (419) 530-3451
Testing Center (419) 530-2011
Writing Center (419) 530-2176
WHAT DO CHEMICAL ENGINEERS DO?

It would take too long to list all the products that are impacted by chemical engineers, but knowing what industries employ them may help you comprehend the scope of their work.

Chemical engineers work in manufacturing, pharmaceuticals, healthcare, design and construction, pulp and paper, petrochemicals, food processing, specialty chemicals, microelectronics, electronic and advanced materials, polymers, business services, biotechnology, and environmental health and safety industries, among others.

Within these industries, chemical engineers rely on their knowledge of mathematics and science—particularly chemistry—to overcome technical problems safely and economically. And, of course, they draw upon and apply their engineering knowledge to solve any technical challenges they encounter. Don't make the mistake of thinking that chemical engineers only “make things,” though. Their expertise is also applied in the areas of law, education, publishing, finance, and medicine, as well as in many other fields that require technical training.

Specifically, chemical engineers improve food processing techniques, and methods of producing fertilizers, to increase the quantity and quality of available food.

They also construct the synthetic fibers that make our clothes more comfortable and water resistant; they develop methods to mass-produce drugs, making them more affordable; and they create safer, more efficient methods of refining petroleum products, making energy and chemical sources more productive and cost effective.

Chemical engineers also develop solutions to environmental problems, such as pollution control and remediation.

And yes, they process chemicals, which are used to make or improve just about everything you see around you.

Chemical engineers face many of the same challenges that other professionals face, and they meet these challenges by applying their technical knowledge, communication and teamwork skills; the most up-to-date practices available; and hard work. Benefits include financial reward, recognition within industry and society, and the gratification that comes from working with the processes of nature to meet the needs of society.

*This information and other information regarding the field of Chemical Engineering can be found at: [http://www.aiche.org](http://www.aiche.org)*
DID YOU KNOW?
(Famous Chemical Engineers!)

Dolph Lundgren (*Rocky IV*) and Frank Capra (Director: *It's a Wonderful Life*)

Both earned chemical engineering degrees from the University of Sydney and Stanford University, respectively.

Kevin Brown

Major league pitcher. He received his B.S. in Chemical Engineering from Georgia Tech. He won the World Series with the Marlins in 1997, then became one of the highest paid pitchers with the Dodgers (via the Padres).

Cindy Crawford

Supermodel, not an engineer. She was valedictorian in her high school and had a Chemical Engineering scholarship at Northwestern University. She spent a semester there before leaving for New York and a modeling career.

Roberto C. Goizueta

Former chairman and chief executive of Coca-Cola. He received his chemical engineering degree from Yale.

Bob Gore

The inventor of Gore-Tex -- the lightweight, waterproof, breathable polytetrafluoroethylene (PTFE) fabric. He was a Chemical Engineering major at the University of Delaware when he came up with the idea of using Teflon to insulate electrical wires back in 1957. His dad started a business based on this idea. Bob then discovered Gore-Tex in 1969 when he was trying to make better cable insulation. The lore was that he was trying to heat rods of the stuff to see if they would stretch, and after days of gently tugging on the heated rods only to have them break, a frustrated Gore violently yanked one. To his surprise, the PTFE suddenly stretched. Soon Gore blended PTFE into fabric, and Ma and Pa Gore field tested a Gore-Tex tent in Wyoming’s Wind River Range. Hail ripped the tent to shreds, soaking the couple. "But the fabric," insisted Mom, "was a success." Gore-Tex finally debuted as a product in 1976.

Andrew Grove

One of the founders of Intel. He received his B.S. in Chemical Engineering from City College of New York (1960), and his PhD in Chemical Engineering from Berkeley (1963).
Bill Koch

Industrialist. B.S., M.S., and Ph.D. Chemical Engineering from MIT and part of the Koch industries family. He bankrolled and won the 1992 America's Cup in the boat America, and sponsored a women's team in 1995. It started out as an all-female team. He then put in a male tactician when they started losing, and people dubbed his boat Mighty Mary as Mostly Mary.

Arthur D. Little

Consultant and co-founder, with William Walker, of "Arthur D. Little, Inc.," a major consulting firm. He coined the term "unit operations" in 1915.

Alex Lowe

One of the world's best climbers. He had a Chemical Engineering scholarship at Montana State University in Bozeman. He spent two years there. He later received a degree in Applied Math. Lowe was killed in an avalanche on Tibet's Shishipagma on October 5, 1999.

Kevin Olmstead

World-record game show payoff winner -- $2,180,000 from "Who Wants to be a Millionaire?" in 2001. After acquiring B.S. and M.S. chemical engineering degrees from Case Western Reserve University and MIT, he earned a Ph.D. in environmental engineering from the University of Michigan.

Linus Pauling

Chemist who won two Nobel prizes -- one in Chemistry and one in Peace. He was a Chemical Engineering undergraduate at Oregon State University when it was still the Oregon Agricultural College. Then he got his Ph.D. in Chemistry at Caltech.

Cynthia Trudell

The President of Brunswick Corporation’s Sea Ray Group, the nation's biggest maker of recreational boats. She was formerly (1999-2001) the Chairwoman and President of Saturn Corporation. She was the first woman to head a major U.S. automaker. She began her career as a chemical process engineer for Ford Motor Corporation.

John (Jack) F. Welch, Jr.

Former Chairman & CEO, General Electric Co. (The eighth Chairman and CEO in the Company's history.) He received his B.S. in Chemical Engineering from the University of Massachusetts (1957) and M.S. and Ph.D. in Chemical Engineering from the University of Illinois.

*This information and other information regarding the field of Chemical Engineering can be found at http://www.aiche.org.*
INDUSTRY PROFILE

Chemical engineers are employed in many industries, representing a diverse range of products, employers, and services.

Chemical Process Industries (CPI) - The CPI's focus is on the development, extraction, isolation, combination, and use of chemicals and chemical by-products. Specialty areas include:

- Agricultural Chemicals
- Catalysts
- Specialty Chemicals
- Industrial Gases
- Paints, Varnishes, Lacquers, Pigments, and Inks
- Petrochemicals
- Petroleum Products
- Plastics, Synthetic Resins, and Composites
- Polymers
- Pulp and Paper
- Rubber and Rubber Products
- Soaps, Detergents, Perfumes, Fats, Oils, and Cosmetics
- Synthetic Fibers, Textiles, and Films

Chemical engineers in the CPI design and operate the processes and systems to combine, transport, separate, handle, recycle, and store chemicals and their by-products.

Biotechnology - The biotechnology industry uses living cells and materials produced by cells, and biological techniques developed through research, to create products for use in other industries. Work in the field of biotechnology has produced antibiotics, insulin, interferon, artificial organs, recombinant DNA, techniques for waste reduction and recycling, and hybrid plants that are insect resistant. Chemical engineers in the biotechnology industry develop and design the processes to grow, handle, and harvest living organisms and their by-products.

Design & Construction - The design and construction industry works with all other industry sectors to design and build the facilities, specify the machinery, and design and troubleshoot processes that will allow companies to operate safe and efficient plants. Chemical engineers in the design & construction industry are involved with process design and project management, and work closely with other engineering disciplines.

Electronics - Chemical engineers in the electronics industry are involved with material development and production, and process control equipment design. Knowing how process equipment in a chemical plant, for example, is supposed to function gives the chemical engineer an advantage in designing control equipment to monitor each process. Chemical engineers are also involved in the manufacturing of microchips and intricate circuitry, using their training to develop the materials and processes that allow such circuits to be properly assembled. Chemical engineers’ contributions to the field include producing components that better dissipate heat, and operate faster.

Environmental, Safety & Health - In almost every industry, chemical engineers are involved in areas that concern the environment, waste minimization, and personal health and safety. With every process that involves the use and manipulation of raw materials, some by-products are produced. The chemical engineer is employed to minimize the production of by-products, if they are of no use, or find an appropriate use for them. Chemical engineers help minimize waste through process monitoring and control, and by designing new processes that are more efficient. This category also includes those...
chemical engineers who are involved in waste treatment and disposal, and process safety and loss prevention. Process safety involves how people safely work with and handle certain materials.

**Food & Beverages** - The food and beverage industry includes the handling, processing, preparation, packaging, and preservation of food and beverages. Chemical engineers in the food and beverages industry formulate new products to meet consumer demand, change ingredients for better flavor, change handling processes for more consistent texture, and freeze dry products or design aseptic packaging to ensure a longer shelf life.

**Fuels** - Those industries that fall under the category of fuels include petroleum and petroleum products production, and refining, as well as nuclear and synthetic fuels. Typically known for their work in refineries, chemical engineers are also involved in developing alternative energy sources. Chemical engineers in the fuels industries work on production processes, environmental monitoring, research and development, and process safety.

**Advanced Materials** - Industries in the category of advanced materials use chemical engineers to help develop materials with different properties such as weight, strength, heat transfer, reflectivity, and purity. Industries that employ chemical engineers for these purposes include:

- Aerospace
- Automotive
- Glass
- Ceramics
- Electronics
- Refractories
- Metals
- Metallurgical Products
- Minerals Processing
- Photographic Products

**Other** - Chemical engineers are not limited to those industries that produce products made by combining, refining, or processing chemicals. The technical training that chemical engineers receive also makes them well suited for work in the following areas:

- Business
- Finance
- Insurance
- Law
- Publications
- Education
- Government

This information and other information regarding the field of Chemical Engineering can be found at: [http://www.aiche.org](http://www.aiche.org)
The specific responsibilities of chemical engineers, though varying among industries and even within the same company, can be categorized in general terms. Titles such as "process design engineer" and "project engineer" will describe positions in most industries, whatever the type of work, process, equipment, and product that is involved.

**Process Design Engineer**: Designs manufacturing facilities and the equipment and material used inside. Process design engineers work with teams of engineers to develop new or improved processes to meet a company's production needs.

**Environmental Engineer**: Develops techniques to reduce and recover usable materials from waste created during manufacture of a product. Designs waste storage and treatment facilities, as well as pollution control strategies for plant operations. Environmental engineers may be responsible for monitoring all systems in a facility for compliance with government environmental regulations.

**Plant Process Engineer**: Provides technical support to staff and troubleshoots processes in a production facility to keep a plant running efficiently. Plant process engineers work closely with equipment operators to get feedback on the operations of each process and determine how to avoid shut-downs. They may also be involved with some design work for improvement projects.

**Process Safety Engineer**: Designs and maintains plants and processes that are safer for workers and communities. Process safety engineers may conduct safety analyses of new and existing equipment, and train employees on how to safely operate a new piece of equipment.

**Project Engineer**: Oversees the design and construction of specific processes in a facility. After construction, they may assist in equipment testing, operator training, and plant start-up. Project engineers may be responsible for the design, and start-up, of a specific process in a facility.

**Consultant**: Works for many different customers and brings specialized knowledge to individual projects. Consultants in a construction company may work with teams of engineers to design and construct an expansion project for a pharmaceutical company.

**Product Engineer**: Follows the production cycle of a particular product to ensure that it is being produced according to specification. Product engineers may work with marketing and R&D to ensure that a product will meet the needs of customers, then see the product through production. They may work on new products or special variations of existing products.

**Manufacturing Production Engineer**: Responsible for the day-to-day operation of a specific manufacturing process. Manufacturing production engineers work directly with operators to ensure that a particular product is made according to specifications.

**Research & Development Engineer**: Seeks out new and more efficient ways of using and producing existing products. Explores and develops new processes and products and determines their usefulness and applicability. Chemical engineers working in research and development may work with
chemists and other engineers to develop a new process or new product that will better meet customer needs.

**Project Manager:** Oversees the overall design and construction of a facility, and then manages ongoing operations. Project managers may manage a group of project engineers during the design and construction of a new facility.

**Biomedical Specialist:** Works alongside physicians to develop systems that track critical chemical processes in the body. Biomedical specialists may be involved in the design of artificial organs, such as hearts and lungs.

**Technical Manager:** Responsible for the engineering staff and programs at a facility. Manages people, research programs, and daily operations of the engineering functions. Technical managers may oversee the R&D program and work with plant managers to plan and implement the funding programs and expansion necessary to develop a new product.

**Business Coordinator:** Develops budgets and capital projections for a facility or process. Business coordinators work closely with production and design team members to ascertain the exact needs of a new process, then plans the capital needs necessary to implement the program.

**Quality Control Engineer:** Monitors the manufacture of a product to ensure that it meets specifications. Also, tests materials to determine how they perform over time. Quality control engineers may bring samples of a product in from a field test, or from a normal application, and test them to determine how specific properties, such as strength, color, and weatherability, change over time.

**Regulatory Affairs Engineer:** Researches, develops, and monitors policies and procedures that companies must follow to ensure the proper handling of chemicals and chemical components. Chemical engineers in regulatory affairs may be government employees, who study the environmental impact of a new chemical, then recommend appropriate guidelines for the chemical’s use.

**Technical Services Engineer:** Works with customers, usually on-site, to solve production problems caused by a specific process or machine. Chemical engineers working in technical services may represent the manufacturer of a specific machine to determine why it is not performing as designed. They often must understand the other steps in the production process to determine if there is a breakdown in another area.

**Sales and Marketing Engineer:** Assists customers in solving production and process problems by providing products and services to meet their specific needs. Chemical engineers in sales use their technical knowledge to sell chemicals, equipment, and other products, and provide follow-up services and training where needed.

* This information and additional information pertaining to careers in Chemical Engineering can be found at [http://www.aiche.org/spins/careers/](http://www.aiche.org/spins/careers/).
SECTION I:
The Chemical Engineering Program
THE CHEMICAL & ENVIRONMENTAL ENGINEERING DEPARTMENT

Chemical Engineering Office Locations:

NITSCHKE HALL (3rd floor)
Room 3048  CHEE Department Office
Room 3046  Dr. Glenn Lipscomb, Chair
Room 3051  Dr. Dong-Shik Kim, Undergraduate Director
Room 3050  Chanda Raine, Associate Director of Department Student Services
Room 3048  Renee Norrils, CHEE Department Secretary

All Chemical Engineering Department doors (faculty/staff) are teal colored & located at the south end of the building next to the staircase.

Student Lounge

The Chemical Engineering student lounge is located in Nitschke Hall, Room 1069 (first floor, next to the computer labs). The lounge is a great place to do homework, meet fellow chemical engineering students or just relax between classes. There are tables and chairs, a dry-erase board, bulletin board, refrigerator, microwave, and lockers. Entry into the lounge is accessed via a passcode. The passcode will be given during CHEE 1000 class.

Bulletin Boards & Social Media

There are two Chemical Engineering bulletin boards outside of the Chemical Engineering office (NI 3048). These boards feature faculty research publications/articles, photos, student information, and articles featuring students in the program.

The department has a Facebook page that was created to update faculty, staff, current students, prospective students, alumni, and friends of the program about the current events taking place in the department. Be sure to “like” The University of Toledo Chemical & Environmental Engineering Department’s page to receive departmental updates.

Chemical Engineering Student Organizations

Student organizations are a wonderful way to become more involved in your profession. Active participation is a great way to make friends, network and make contacts with engineers in the industry and learn more about your profession as a whole. As an added bonus, your involvement looks terrific on your resume!
American Institute of Chemical Engineers (AIChE)

The American Institute of Chemical Engineers is the national professional society in Chemical Engineering. UT has a very active student chapter open to all engineering students. Activities include one hour biweekly meetings, guest speakers from the industry, plant tours, and other various campus events that allow students and department faculty to interact outside of the classroom.

The chapter also sends as many students as possible to the National Conference, where they can meet and talk with students from other chapters and chemical engineers from all over the country. It’s highly recommended that students become involved in AIChE. Participation and membership can last throughout one’s lifetime and career.

Omega Chi Epsilon (OXE)

Omega Chi Epsilon, is the Chemical Engineering Honor Society. Those juniors that have a cumulative grade point average of at least 3.25 or are in the upper ¼ of their class with a minimum of 3.0 GPA; as well as seniors with at least a 3.0 GPA are eligible for election. Eligible candidates will receive a notice in the mail.

College of Engineering student organizations

The College of Engineering also has several student societies open to all engineering students regardless of major. These include: The National Society of Black Engineers (NSBE), The Society of Women Engineers (SWE), Engineers Without Borders and The University of Toledo’s Engineering Council (UTEC).

Three social engineering societies exist also within the College of Engineering: Phi Sigma Rho, an engineering sorority (female), Triangle is an engineering fraternity (male), and Theta Tau is the co-ed professional engineering fraternity. Further information can be obtained from organizational bulletin boards, or during Rush periods in the beginning of the year.

Juniors in the top 1/5 of their class and the top 1/8 of the senior class are invited to join Tau Beta Pi, the College of Engineering Honorary Society. The society’s motto is honor and integrity in engineering. Initiations are held once in fall semester, and once in spring semester. Eligible candidates will receive notices in the mail.

More information about College of Engineering student organizations can be found in the ‘University Resources and Policies’ section of this handbook.
Dr. G. Glenn Lipscomb
Professor & Chairman of the Department
Phone: 419-530-8088
E-mail: glenn.lipscomb@utoledo.edu

Research Interests:

1. **Hydrogen purification with membrane processes**
   Environmental, economic, and political pressures have spurred renewed interest in alternative energy sources, and the hydrogen economy is considered to be one of the leading candidates. In collaboration with other faculty in the Department, we are developing processes that can produce hydrogen at the required purity from renewable resources. Our specific contribution is the use of membrane gas separation processes to purify the hydrogen stream.

2. **Improved fermentation processes for ethanol production**
   Ethanol is used widely as replacement for gasoline. Fermentation of corn and other biomass offers a renewable source of this fuel. We are developing improved fermentation processes that integrate membrane separation technology with the bioreactor to improve reactor efficiency and reduce the cost of subsequent ethanol purification.

3. **Membrane processes for water treatment and re-use**
   Water is a scarce commodity in many parts of the world due to population growth and pollution. This scarcity has placed increased demands on water purification technology and led to the rapid growth of membrane processes from electrodialysis to reverse osmosis. We are developing novel membrane materials and processes to reduce water treatment costs and provide water in remote, undeveloped areas.

4. **Internet-delivered laboratories**
   Historically, students have had to perform laboratory experiments in-person, in a central laboratory location. The emergence of the Internet has dramatically changed this. Students can now perform live experiments anywhere, anytime with only an Internet connection and a web browser. We have developed such an Internet-delivered laboratory illustrating hemodialysis and are evaluating the educational effectiveness of this experiment in Internet-delivered and hands-on modes. We will develop additional experiments and continue our evaluation of their educational value.
DR. ANA ALBA-RUBIO

Assistant Professor
Phone: 419-530-8103
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Research Interests:
My research focuses on preparation and characterization of active and selective catalysts to provide fuel and materials sustainably. Specific projects include:

- bimetallic and bifunctional catalysis
- control of the deactivation and substitution of noble metals with base metals
- bringing the activity of heterogeneous catalysts to the level of their homogeneous counterparts

My teaching interests lie in the area of catalysis and surface science.

DR. MARIA COLEMAN

Professor
Phone: 419-530-8091
E-mail: maria.coleman6@utoledo.edu

Research Interests:
My research interests lie in the following three broad interrelated areas:

Polymeric materials for membrane based separations with emphasis on ionic liquid based polymers for targeted solubility based selectivity, multifunctional network polymers, and surface modification of polymeric membranes. Membranes and systems of interest include gas separations at harsh conditions, pervaporation, membrane distillation, and water purification. Funding from National Science Foundation and Ohio Coal Development Office.

Multifunctional polymer nanocomposites with focus on application driven approach to component selection, composite design and synthesis. Efforts in our group have focused primarily on design of interfacial region between nanofillers and polymer matrix including modification of nanofiller surface with covalently bound monomers, polymers and block copolymers. In addition, the impact on the thermal-mechanical and conducting properties of nanofiller type, loading and processing method are being investigated. Funding from Department of Army.

Sustainable materials synthesis and processing with focus on alternative feedstock for monomers or nanofillers, energy reduction and solvent reduction. Key aspects include consideration of desired properties, processibility using traditional methods, economics and environmental sustainability. Specific interest of our group is in the following areas: (i) separation requirements for material
synthesis and processing, (ii) alternatives nanofillers from renewable feedstocks and (iii) detailed structure-property analysis for biobased polymer nanocomposites.

DR. DONG-SHIK KIM  
Undergraduate Director & Associate Professor  
Phone: 419-530-8084  
E-mail: dong.kim@utoledo.edu

Research Interests:

- In situ bioremediation: Use of microbial metabolism and metabolic byproducts for degradation of toxic chemicals, metals and radionuclides, and mitigation of propagation of these contaminants.
- Biological filtration: Improving the efficacy of biological water treatment systems for reducing humic acids and toxic heavy metals.
- Recombinant DNA technique for biofilm formation mechanisms: The recombinant DNA fused with the reporter gene is used to investigate the biofilm formation mechanism at a molecular level. The mechanism study has been performed as a part of the new project to develop a novel material that prevents biofilm formation.
- Metabolic pathway control: Nano-scale investigation of metabolic pathways in fermentation reactions in order to selectively increase the reaction yield of a target byproduct.
- Biopolymer property control: Studying biopolymer gelation mechanisms and kinetics to determine more efficient methods for establishing a stable biologically active zone in in situ bioremediation and biological filtration, and to control biofilms in industrial and medical systems.

DR. YAKOV LAPITSKY  
Assistant Professor  
Phone: 419-530-8254  
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Personal Website: http://www.eng.utoledo.edu/~ylapitsk/

Research Interests:
Current research interests focus on the design, characterization and application of biopolymer-based soft materials. These include the self-assembly of bioderived surfactant/polyelectrolyte mixtures, stimulus-responsive micro- and nanoparticles and gels, and drug delivery.

Recent advances in chemical product design, medicine and nanotechnology have ushered in a new age of “smart” materials that respond to external stimuli such as changes in pH, ionic strength or
temperature, and mechanical or electromagnetic perturbations. Bioderived polyelectrolytes (e.g., cellulose derivatives, chitosan and alginate) are commonly used as sustainable building blocks for these materials and find countless applications in foods, cosmetic product formulations, controlled release, biomaterials, medical imaging, sensors, fuel cells and water treatment. Despite their broad use, however, many applications of these materials are limited by the lack in understanding of their physicochemical properties and the design variables that control them.

To this end, the goals of our research are to:

1. advance the mechanistic understanding of the molecular, colloidal and macroscopic properties of biopolyelectrolyte-based materials and
2. to apply this understanding towards furthering their use in areas such as pharmaceutics, MEMS and consumer product formulations.

Specifically, we are currently investigating: sustainable materials from bioderived surfactant-polyelectrolyte mixtures, biopolyelectrolyte-based pharmaceutical colloids, and directed assembly of “smart” polyelectrolyte complex microstructures and microdevices.

DR. STEVEN LEBLANC  
Professor & Executive Associate Dean of Academic Affairs  
Phone: 419-530-8264  
E-mail: steven.leblanc@utoledo.edu

Research Interests:

Investigations of environmental applications of chemical engineering. Systems currently being investigated include flue gas cleanup using membrane absorbers, solid phase buffers for acid gas cleanup, and photocatalytic membrane reactors for air and water treatment. Additional interests lie in the area of the use of multimedia applications for improving chemical engineering education. The focus here is on the development of an interactive web site for engineering education.

DR. MATTHEW LIBERATORE  
Associate Professor  
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Research Interests:

Engineering new materials by understanding their changes under flow serves as the central research theme of the rheology research laboratory. Specifically, the group performs complicated rheology measurements in parallel with other techniques (high pressure, light scattering, high shear, controlled humidity) on a range of polymer, colloid, and surfactant systems.
My classroom and educational research employs active and self-directed learning tools, including the unique, reverse engineering of YouTube videos.

THEHAZHNAN (THIHAL) PONNAIYAN
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DR. CONSTANCE SCHALL
Professor & Graduate Director
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Research Interests:
Current research is focused in the area of separations, particularly crystallization and precipitation processes and biofuels production.

In the area of bioseparations, we are focusing on protein crystallization with application to single crystal growth for structure determination and industrial crystallization for protein purification. Projects include impurity partitioning and defect formation, fundamental studies of nucleation kinetics, and optimization of cryogenic cooling of protein crystals.

In the biofuels area, we are developing a pretreatment method for lignocellulose using the unique solvation properties of ionic liquids. This is a collaborative project with Sasidhar Varanasi (Chemical Engineering Dept., UT) and Jared Anderson (Chemistry Dept, UT). Cellulose, a polymer of glucose, is the most abundant renewable resource in the world. However, its potential as a source of raw materials is limited by the strong hydrogen bonding network in its highly crystalline natural form. Disruption of this structure allows effective chemical modification or hydrolysis of cellulose into its glucose subunits. Ionic liquids (ILs) are non-derivitizing solvents of cellulose that efficiently disrupt its structure without production of fermentation inhibitors. In our process, cellulose is pretreated with an IL forming an easily modified amorphous structure. The amorphous cellulose substrate treated with IL can be enzymatically hydrolyzed into its glucose subunits at rates almost two orders of magnitude greater than untreated cellulose.
DR. YOUNG Woo SEO (Primary appointment in Civil Engineering)
Assistant Professor
Phone: 419-530-8131
E-mail: youngwoo.seo@utoledo.edu

Research Interests:

- Molecular scale analysis of bioadhesion and biofilm formation.
- Biofouling and its control in water and wastewater systems.
- Biodegradation and bioremediation of recalcitrant and toxic contaminants.
- Development and application of environmental sensors (microsensors / nanosensors) to monitor physical / chemical activities in microenvironment.
- Sorption process for physical removal of heavy metals and organic compounds
- Membrane Processes for Water and Wastewater Treatment

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DR. SRIDHAR VIAMAJALA
Assistant Professor
Phone: 419-530-8094
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Research Interests:

My research interests fall in two broad areas:

(1) Algal biofuels and issues related to:
   - Quantifying phototrophic growth and lipid-accumulation kinetics as they are influenced by simultaneous interactions between light (quality and irradiance), carbon dioxide concentrations, pH, temperature and nutrients;
   - strategies for economical downstream conversion of algal lipids to biodiesel (fatty acid alkyl esters); and,
   - influence of nutrient (C, N and P) speciation on algal growth and lipid content.

(2) Lignocellulose-derived biofuels and issues related to:
   - enzymatic digestion at high solid concentrations; and,
   - carbonic acid pretreatment.

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Department of Chemical Engineering
G. Glenn Lipscomb, chair

Degrees Offered
The department of chemical and environmental engineering offers an ABET-accredited program leading to the bachelor of science degree in chemical engineering (B.S.Ch.E.). Chemical engineers apply the principles of chemistry, physics and mathematics to create high-value products from lower value raw materials. The curriculum provides a thorough grounding in basic and advanced chemistry, mathematics through differential equations, and engineering physics. These courses are a firm foundation for engineering courses that include thermodynamics, fluid mechanics, heat and mass transfer, separations, reactor design, process control and design. Additional courses in economics, communication skills, humanities, social sciences and various engineering electives broaden the curriculum and are capped by comprehensive chemical engineering design experiences.

The educational objectives of the chemical engineering program are that graduates will:

- Be employed as a chemical engineer or in another related technical field or successfully complete graduate or professional studies;
- Demonstrate effective problem-solving skills that will enable them to be successful professionals;
- Be able to function effectively in a professional environment.

Chemical engineering graduates are in demand in many new and challenging fields. Chemical engineers are well suited to solve problems in many areas, including environmental engineering, polymers and materials engineering, renewable energy production, nuclear power, petrochemicals, fertilizers, new food sources, pharmaceuticals, improved refining and chemical processes, computer simulation, mathematical modeling, and bioengineering. Many students go on to graduate work in engineering, law, business and medicine. More information is available on the department website at www.che.utoledo.edu.

Degree Requirements
Students should follow and complete the degree requirements as displayed in the Chemical and Environmental Engineering Program Plan A or B charts.

Free Electives
Three hours of free electives are required. Free electives are any courses at the University that broaden students’ backgrounds in an area of interest. Courses that are considered remedial for engineering students may not be used to satisfy this requirement. For questions about this requirement, contact Chanda Raine.
Engineering Electives
Twelve hours of engineering electives are required. Students must take CIVE 1150 Engineering Mechanics: Statics or EECS 2340 Electric Circuits for Non-Majors, and one elective (three hours) from the chemical and environmental engineering department. An additional six hours may be chosen from engineering courses offered in the College of Engineering. Recommended courses include CIVE 3610 Water Supply and Treatment, CIVE 3620 Air Pollution Engineering I, MIME 2600 Engineering Economics, MIME 4000 Engineering Statistics I, or any 4000-level chemical engineering elective course.

Advanced Chemistry and Science Electives
A minimum of five or six hours of advanced chemistry electives and a minimum of three hours of advanced science electives are required. Students may choose 3000/4000-level courses from the following departments: chemistry, physics, biology, and earth, ecological and environmental sciences. Students should select courses from recommended science sequences such as:

Biochemistry: (CHEM 3510/3520 Biochemistry I and II; BIOL 2170/2180 Fundamentals of Life Science II/Lab)

Environmental: (CHEM 3510/3610 Biochemistry I and Inorganic Chemistry I; EEES 4450 Hazardous Waste Management)

Physical: (CHEM 3740/3860 Physical Chemistry II and Advanced Lab I; CHEM 4810/4820 Material Science I/II)

Analytical: (CHEM 3310/3360/3860/4300 Analytical Chemistry, Analytical Chemistry Lab I, and Instrumental Analysis)

Additional courses that may be used to fulfill the advanced science requirement include:

EEES 3050/3060 Ecology & Ecology Lab, PHYS 3070 Quantum Physics, CHEE 4800 Polymer Science and Engineering

Environmental Engineering Electives
Industrial needs require that all chemical engineers be aware of environmental issues when designing new chemical facilities or modifying existing ones. The environmental option allows chemical engineering students to apply engineering principles in the development of environmentally conscious chemical processes. Greater background in the sciences is provided in this program to allow the environmental specialist increased flexibility in understanding the environmental impact of current or proposed new practices. Specific examples of existing concepts are provided to demonstrate current practice. The trend toward pollution prevention is emphasized.

Upon completion of these electives, the environmental chemical engineer will be able to analyze chemical processes for their environmental impact, suggest modifications to
processes to minimize the production of wastes, and develop treatment alternatives.
The environmental chemical engineer provides an important bridge between the
process engineer and the waste treatment specialist.

The goals of this sequence are achieved through careful choice of the electives, without
additional hours beyond those normally required for graduation. The sequence of
recommended electives is:

**Advanced Chemistry Electives:**
CHEM 3510 Biochemistry I, CHEM 3610 Inorganic Chemistry I

**Advanced Science Electives:**
EEES 3050 Ecology, EEES 3060 Ecology Laboratory, EEES 4450 Hazardous Waste
Management, EEES 4410 Hydrogeology, EEES 4240 Soil Science

**Engineering Electives:**
CIVE 3610 Water Supply and Treatment, CIVE 3620 Air Pollution
Engineering, CHEE 4980 Physical-Chemical Processes for Water
Quality Control

**Polymer Engineering Electives**
Polymers and plastics are extremely important materials. The volume of plastics used
annually exceeds that of steel and aluminum. Chemical engineers with expertise in
polymers and plastics are in demand. Concepts with which chemical engineers
specializing in this area need to be familiar include polymer synthesis and chemistry,
polymer processing (mixing, extrusion, blow molding and injection molding), and
polymer blends and composites.

Recommended polymer engineering electives include: CHEE 4800 Polymer
Science & Engineering
Chemical Engineering (CHEE) Course Descriptions

**CHEE1000  Orientation and Computing for CHEE (3hrs)**
Introduction to the UT campus, campus resources, the College of Engineering and the Department of Chemical and Environmental Engineering. Includes an introduction to engineering computing and programming and basic chemical engineering calculations. Prerequisite: Chemical Engineering major

**CHEE1010  Professional Development (1hr)**
Social protocol and ethics in industry. Resume writing and interview skills are presented in preparation for the Co-op experience. Review of resource materials for technical and non-technical individual learning. Oral and written presentation techniques are emphasized. Prerequisite: CHEE 1000 & Chemical Engineering major

**CHEE2010  Mass and Energy Balances (3hrs)**
Introduction to the principles and techniques used in chemical engineering. Basic concepts of mathematics, physics, and chemistry are applied to solving problems involving stoichiometry, material balances, and energy balances. Prerequisite: CHEE 1000. Co-requisite: MATH1850, CHEM1230

**CHEE2110  Process Fluid Mechanics (3hrs)**
A comprehensive introduction to process fluid mechanics. Topics include: hydrostatics, characteristics of laminar and turbulent flow, mechanical energy balance, flow through packed beds and fluidization of solids, design of pumping systems and piping networks, and metering of fluids. Prerequisite: CHEE2010

**CHEE2230  Chemical Engineering Thermodynamics I (3hrs)**
The principles of thermodynamics and their application to chemical engineering. Topics include states and properties of matter, the first and second law of thermodynamics, solution to energy balance problems, and thermo-chemical effects. Prerequisite: CHEE2010

**CHEE2330  Chemical Engineering Thermodynamics II (3hrs)**
Topics include properties of fluid mixtures, phase equilibria, chemical equilibria, power generation, and refrigeration processes. Prerequisite: CHEE2230

**CHEE3030  Separation Processes (3hrs)**
An introduction to equilibrium-based separation processes. Topics include distillation, extraction, leaching, drying and membrane separations. Preliminary equipment design calculations. Prerequisite: CHEE 2330

**CHEE3110  Process Heat Transfer (2 hrs)**

**CHEE3120  Mass Transfer (3hrs)**
Mass transfer and its application in chemical engineering separations. Diffusivity, mass transfer coefficients and Fick’s Law. Applications in continuous and stagewise processes, including absorption, extraction, and distillation. Prerequisites: CHEE2110, Pre or co-requisite: CHEE3030

**CHEE3300  Reactor Engineering and Design (3hrs)**
Fundamentals of chemical reaction engineering. Rate laws, kinetics, and mechanisms of homogeneous and heterogeneous reactions. Analysis of reaction rate data. Design of industrial reactors. Prerequisites: CHEE 2230
**CHEE 3400 Process Dynamics and Control (3hrs)**
An introduction to the design of control systems for chemical engineering problems. Process stability and controller design and selection. Application of LaPlace transforms, frequency response techniques, and simulation software for open-loop and closed-loop analysis. Prerequisites: CHEE 2110, CHEE 3300, MATH 2860

**CHEE 3940 Co-Op Work Experience (1hr)**
Approved co-op work experience. Course may be repeated.

**CHEE 4110 Pollution Prevention (3 hrs)**

**CHEE 4120 Biofuels (3 hrs)**
The technical, economic, social, and political issues associated with energy consumption are discussed. The potential for biofuels to replace current energy sources is examined based on the historical evolution of the industry and current research activity. Prerequisite: CHEM 1230 & Junior standing

**CHEE 4410 New Separations (3hrs)**
Introduction to and analysis of separation techniques relevant to down-stream processing of bioreactor products. Topics include new extraction and adsorption methods, chromatography techniques, ultrafiltration, and electrokinetic methods such as electrophoresis and isoelectric focusing. Prerequisites: CHEE 3030, CHEE 3110, CHEE 3120

**CHEE 4500 Chemical and Environmental Engineering Laboratory I (2 hrs)**
An experimental study of the design and performance of selected chemical engineering process equipment. Analysis of data and presentation techniques are emphasized. Prerequisites: CHEE 2110, CHEE 3030, CHEE 3110

**CHEE 4520 Chemical Process Economics and Design (3hrs)**
Chemical equipment and process design. Introduction to simulation and flow-sheeting techniques and software. Topics include plant safety and pollution prevention, market analysis, cost estimating, decision-making and cash flow analysis. Prerequisites: CHEE 2110, CHEE 2330, CHEE 3030, CHEE 3110

**CHEE 4540 Chemical Process Simulation and Design (3hrs)**
Application of chemical engineering fundamentals and the use of process simulators in the synthesis of chemical processes. Use of cost factors and environmental considerations in process decisions. The solution of a comprehensive case study and the preparation and presentation of a formal report are required. Prerequisites: CHEE 3120, CHEE 3300, CHEE 4520

**CHEE 4550 Chemical and Environmental Engineering Laboratory II (2 hrs)**
An experimental study of the design and performance of chemical engineering process equipment, focusing on heat and mass transfer and process control. Design of experiments, analysis of data, and presentation techniques are emphasized. Prerequisites: CHEE 3120, CHEE 3300, CHEE 4500 Co-requisite: CHEE 3400

**CHEE 4800 Polymer Science and Engineering (3hrs)**
Polymerization processes, characterization, structure and properties of polymers, processing and engineering applications of the major polymer types. Prerequisite: Junior or Senior standing
CHEE4820 Colloid and Surface Phenomena (3hrs)
Introduction to the physico-chemical principles and engineering of dispersions, emulsions and colloids relevant to chemical/biochemical, pharmaceutical, and environmental areas. Topics include surface tension, adsorption, charge effects at interfaces, colloid stability and emulsions. Prerequisite: MATH2860

CHEE4960 Senior Honors Thesis (3hrs)
Independent research under the guidance of a faculty member, requiring an oral report and a written thesis upon completion of work.

CHEE4980 Special Topics in Chemical Engineering (1hr-4hrs)
Special topics of interest to chemical engineers - upper division

CHEE4990 Independent Studies in Chemical Engineering (1hr-4hrs)
Independent studies in chemical engineering - upper division
# Chemical Engineering Flowsheet  
## Co-op Plan A

### FRESHMAN

**Fall**
- Gen'l Chem I CHEM1230 4hrs
- Calc I MATH1850 4hrs
- CHEE Orientation CHEE1000 3hrs
- English Comp ENGL1110 3hrs
- HUM/SS/MC Elective 3hrs
- 15 hours

**Spring**
- Gen'l Chem II CHEM1240 4hrs
- Calc II MATH1860 4hrs
- Prof. Develop CHEE1010 1hrs
- Mass & Energy CHEE2010 3hrs
- HUM/SS/MC Elective 3hrs
- 16 hours

### SOPHOMORE

**Fall**
- Org Chem I CHEM2410 3hrs
- Org Chem Lab I CHEM2460 1hrs
- Physics I PHYS2130 5hrs
- Thermo I CHEE2230 3hrs
- HUM/SS/MC Elective 3hrs
- 16 hours

**Spring**
- Org Chem II CHEM2420 3hrs
- Calc III MATH2850 4hrs
- Thermo II CHEE2330 3hrs
- Thermo Lab II CHEE2340 3hrs
- HUM/SS/MC Elective 3hrs
- 16 hours

**Summer**
- Co-op Experience CHEE 3940 0 hr
- 16 hours

### PRE-JUNIOR

**Fall**
- Co-op Experience CHEE 3940 0 hr
- Separations CHEE3030 1hrs
- Free Elective 3hrs
- 16 hours

**Spring**
- Org Chem Lab II CHEM2470 1hrs
- Diff Equations MATH2860 3hrs
- Fluid Mechanics CHEE2110 3hrs
- Phys II PHYS2140 3hrs
- HUM/SS/MC Elective 3hrs
- 16 hours

**Summer**
- Adv Chem Elective 3hrs
- 16 hours

### JUNIOR

**Fall**
- Co-op Experience CHEE 3940 0 hr
- Tech Writing ENGL2950 3hrs
- Mass Transfer CHEE3120 3hrs
- Lab I CHEE4500 3hrs
- HUM/SS/MC Elective 3hrs
- 17 hours

**Spring**
- CIVE 1150 or EECS 2340 3hrs
- Design I CHEE4520 3hrs
- Engineering Elective 3hrs
- Lab II CHEE4550 2 hrs
- HUM/SS/MC Elective 3hrs
- 15 hours

**Summer**
- Adv Sci Elective 3hrs
- CHEE Engineering Elective 3hrs
- Control CHEE3400 3hrs
- 17 hours

### SENIOR

**Fall**
- Adv Chem Elective 3hrs
- HUM/SS/MC Elective 3hrs
- Reactor Design CHEE3300 3hrs
- Lab II CHEE4550 2 hrs
- HUM/SS/MC Elective 3hrs
- 17 hours

**Spring**
- Deficiencies Minor Grad School
- HUM/SS/MC Elective 3hrs
- 17 hours

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### Credits

<table>
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<tbody>
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</tbody>
</table>

### Credits Breakdown

- **Math & Basic Science**: 15 hours
- **Advanced Chemistry & Science**: 24 hours
- **Humanities, Social Science & Multicultural**: 15 hours
- **Engineering**: 30 hours
- **Other**: 15 hours

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*6/8/2017*
# Chemical Engineering Flowsheet
## Co-op Plan B

### FRESHMAN
- **Fall**: Gen'l Chem I (CHEM1230 4hrs), Org Chem I (CHEM2410 3hrs), Adv Chem Elective (CHEE 3940 3hrs)
- **Spring**: Gen'l Chem II (CHEM1240 4hrs), Org Chem II (CHEM2420 3hrs), Co-op Experience (CHEE 3940 0 hr)

### SOPHOMORE
- **Fall**: Calc I (MATH1850 4hrs), Calc II (MATH1860 4hrs), Phys I (PHYS2130 5hrs), Thermo I (CHEE2230 3hrs)
- **Spring**: Calc III (MATH2850 4hrs), Heat Transfer (CHEE3110 2hrs), Thermo II (CHEE2330 3hrs), Fluid Mechanics (CHEE2110 3hrs)

### PRE-JUNIOR
- **Fall**: Lab I (CHEE4500 2 hrs), Reactor Design (CHEE3300 3hrs), HUM/SS/MC Elective (3 hrs)
- **Spring**: Math & Basic Science Elective (3 hrs), Diff Equations (MATH2860 3hrs), Design II (CHEE4500 2 hrs)

### JUNIOR
- **Fall**: Mass Transfer (CHEE3120 3hrs), Mass & Energy (CHEE2230 3hrs), CIVE 1150 or EECS 2340 3hrs
- **Spring**: HUM/SS/MC Elective (3 hrs), Design I (CHEE4520 3 hrs), Lab II (CHEE4550 2 hrs)

### SENIOR
- **Fall**: Adv Sci Elective (3 hrs), Prof. Develop (CHEE1010 1 hrs), Deficiencies Minor Grad School
- **Spring**: CHEE Engineering Elective (3 hrs), Control (CHEE3400 3hrs), Other
## RECOMMENDED HUM/SS/MC ELECTIVES

### Humanities/Fine Arts (2 courses/6 hours)

<table>
<thead>
<tr>
<th>Department</th>
<th>Course</th>
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<tbody>
<tr>
<td>Communications</td>
<td>Communications Principles &amp; Practices (COMM 1010)</td>
</tr>
<tr>
<td>English</td>
<td>Reading in Fiction (ENGL 2710)</td>
</tr>
<tr>
<td>History</td>
<td>World History to 1500 (HIST 1060)</td>
</tr>
<tr>
<td>Music</td>
<td>Music Theory for Non-Major (MUS 2200)</td>
</tr>
<tr>
<td></td>
<td>*History of Jazz (MUS 2220) – Double dips with a US</td>
</tr>
<tr>
<td></td>
<td>*Cultures of Music of Non-Western Styles (MUS 2420) – Double dips with a Non-Western</td>
</tr>
<tr>
<td>Philosophy</td>
<td>Critical Thinking (PHIL 1020)</td>
</tr>
<tr>
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<td>Introduction to Philosophy (PHIL 2200)</td>
</tr>
<tr>
<td>Religious Studies</td>
<td>*World Religions (REL 1220) – Double dips with a Non-Western</td>
</tr>
</tbody>
</table>

### Social Science (2 courses/6 hours)

<table>
<thead>
<tr>
<th>Department</th>
<th>Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthropology</td>
<td>Introduction to Anthropology (ANTH 1020)</td>
</tr>
<tr>
<td></td>
<td>*Cultural Anthropology (ANTH 2800) – Double dips with a Non-Western</td>
</tr>
<tr>
<td>Economics</td>
<td>Introduction to Macroeconomics (ECON 1150)</td>
</tr>
<tr>
<td></td>
<td>Introduction to Microeconomics (ECON 1200)</td>
</tr>
<tr>
<td>Geography</td>
<td>Human Geography (GEPL 1010)</td>
</tr>
<tr>
<td></td>
<td>Environmental Geography (GEPL 1100)</td>
</tr>
<tr>
<td>Political Science</td>
<td>American National Government (PSC 1200)</td>
</tr>
<tr>
<td>Psychology</td>
<td>Principles of Psychology (PSY 1010)</td>
</tr>
<tr>
<td>Social Work</td>
<td>*Introduction to Social Welfare (SOCW 1030) – Double dips with a US</td>
</tr>
<tr>
<td>Sociology</td>
<td>Introduction to Sociology (SOC 1010)</td>
</tr>
<tr>
<td></td>
<td>*Race, Class, and Gender (SOC 2640) – Double dips with a US</td>
</tr>
</tbody>
</table>

### Multicultural Non-Western (1 course/3 hours)

<table>
<thead>
<tr>
<th>Department</th>
<th>Course</th>
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<tbody>
<tr>
<td>Africana Studies</td>
<td>Introduction to the African Experience (AFST 1200)</td>
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<tr>
<td>Anthropology</td>
<td>*Cultural Anthropology (ANTH 2800) – Double dips with a SS</td>
</tr>
<tr>
<td>Honors</td>
<td>*Multicultural Lit: The Non-European World (HON 2030) – Double dips with a HUM</td>
</tr>
<tr>
<td>Music</td>
<td>*Cultures and Music of Non-Western Styles (MUS 2420) – Double dips with a HUM</td>
</tr>
<tr>
<td>Political Science</td>
<td>Current International Problems (PSC 1710)</td>
</tr>
<tr>
<td>Religious Studies</td>
<td>*World Religions (REL 1220) – Double dips with a Humanities</td>
</tr>
</tbody>
</table>
**Multicultural US-Diversity (1 course/3 hours)**

<table>
<thead>
<tr>
<th>Department</th>
<th>Course</th>
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</thead>
<tbody>
<tr>
<td>African Studies</td>
<td>Introduction to Africana Studies (AFST 1100)</td>
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<tr>
<td>Business</td>
<td>Managing Diversity in the Workplace (BMGT 2700)</td>
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<tr>
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<td>Cultural Communications in the Workplace (BMGT 2750)</td>
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<tr>
<td>Honors</td>
<td>Multicultural Lit: The N. American Experience (HON 2020) – <em>Double dips w/HUM</em></td>
</tr>
<tr>
<td>Music</td>
<td>*History of Jazz (MUS 2220) – <em>Double dips with a HUM</em></td>
</tr>
<tr>
<td>Sociology</td>
<td>*Race, Class, and Gender (SOC 2640) – <em>Double dips with a SS</em></td>
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<tr>
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<td>Diversity in Contemporary Society (TSOC 2000)</td>
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<tr>
<td>Social Welfare</td>
<td>*Introduction to Social Welfare (SOCW 1030) – <em>Double dips with a SS</em></td>
</tr>
<tr>
<td>Women’s Studies</td>
<td>Introduction to Gender Studies: Gender, Sex, &amp; Differences (WGST 2010)</td>
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</table>

The Humanities/Fine Arts, Social Science, Multi-Cultural requirement at the University of Toledo may be satisfied by taking six [6], or if chosen properly, five [5] courses. The requirement is: two courses in Humanities/Fine Arts [in different departments], two courses in Social Sciences [in different departments], one multicultural course in the Diversity of U. S. Culture, and one multicultural course in Non-Western Tradition. This requirement may be satisfied by completing only five courses instead of six if one course is a "double-dip" course denoted by an asterisk [*] before the course. This double-dip course may serve: 1. Both as a Humanities/Fine Arts and as a multicultural course [ex: REL 1220], or 2. Both as a Social Science and as a multicultural course [ex: SOC 2640]. If this option is chosen, engineering students must complete a minimum of 15 credit hours. **The above courses are all 3 credit hours.**
### Humanities / Fine Arts

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<td>Arabic</td>
<td>Elementary Arabic II (ARBC2120) [4]</td>
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<td>Intermediate Arabic II (ARBC2150)</td>
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<td>Crafts in Art (AED 3300)</td>
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<td>Foundations 2D/Color Theory (ART 2050)</td>
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<td>Visual Construction of Gender (ART 3820/WGST 3120)</td>
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<td>Aspects of Ancient Art (ARTH 2000)</td>
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<td>History of Modern Art (ARTH 2080)</td>
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<tr>
<td>Chinese</td>
<td>Elementary Chinese II (CHIN1120) [4]</td>
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<td>Intermediate Chinese II (CHIN2150)</td>
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<td>Interpersonal Commun's (COMM 3840) [4]</td>
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<td>Introduction to the Dance (DANC1250)</td>
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<td>Issues in Disability Studies (DST 3050)</td>
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<td>Introduction to Film (FILM 1310)</td>
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<td>Culture and Commerce (FREN 1080)</td>
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<td>Intermediate French I (FREN 2140)</td>
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<tr>
<td>German</td>
<td>Culture and Commerce (GERM 1080)</td>
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<tr>
<td></td>
<td>Elementary German II (GERM 1120) [4]</td>
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<td>Intern. German I (GERM 2140)</td>
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<td>History</td>
<td>Europe to 1600 (HIST 1010)</td>
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<td>Contemporary World (HIST 1070)</td>
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<td>Latin American Civ. (HIST 1100)</td>
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<td>Middle East Civ. (HIST 1120)</td>
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<td>Main Themes in American History (HIST1200)</td>
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<td>Ancient Greece (HIST 2050 / CLC 2050)</td>
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<td>Cultural History (HON2010)</td>
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<td>Honors Readings Conf. I (HON1010)</td>
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<td>Classical Humanities (HUM 1010 / CLC1010)</td>
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<td>World Humanities Traditions I (HUM 2010)</td>
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<td>Japanese</td>
<td>*Culture and Commerce (JAPN 1080)</td>
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<td>Intern. Japanese II (JAPN 2150)</td>
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<td>Reading Fiction (ENGL 2710)</td>
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<td>Reading Poetry (ENGL 2730)</td>
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<td>Writing About Literature (ENGL 2800)</td>
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<td>Music</td>
<td>Music Theory for Non-Majors (MUS 2200)</td>
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<td>*History of Jazz (MUS 2220 / AFST 2220)</td>
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<td>*History of Rock and Roll (MUS 2240)</td>
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<td>Philosophy</td>
<td>Intro to Logic (PHIL 1010)</td>
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<td>Intro to Philosophy (PHIL 2200)</td>
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<td>*Zen: Philosophy of Existential Transformation (PHIL 3510)</td>
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<td>*World Religions (REL 1220 / HUMA 1220)</td>
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<td>*Understanding Monotheistic Religion (REL 2300)</td>
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<td>New Testament History &amp; Ideas (REL 2330)</td>
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<td></td>
<td>Intermediate Spanish I (SPAN 2140)</td>
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<tr>
<td></td>
<td>*World History since 1492 (SPAN 2170)</td>
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<td>Intro to Theater (THR 1100)</td>
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### Social Sciences

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>Anthropology</td>
<td>Intro to Anthropology (ANTH 1020)</td>
</tr>
<tr>
<td></td>
<td>*Human Society Through Film (ANTH 2100)</td>
</tr>
<tr>
<td></td>
<td>*Cultural Anthropology (ANTH 2800 / LST 2800)</td>
</tr>
<tr>
<td>Economics</td>
<td>Intro. to Economic Issues (ECON 1010)</td>
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<tr>
<td></td>
<td>Principles of Microeconomics (ECON 1200)</td>
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<td></td>
<td>Human Geography (GEPL 1100)</td>
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<td></td>
<td>Fundamentals of Geography (GEPL2100)</td>
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<td>Geography Education Strategies (GEPL4040)</td>
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<tr>
<td>Political Science</td>
<td>Amer. National Government (PSC 1200)</td>
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<td>Psychology (PSY 1010)</td>
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<td>Intro. to Social Welfare (SOCW 1030)</td>
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<td></td>
<td>Social Problems (SOC 1700)</td>
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<tr>
<td></td>
<td>Sociology (SOC 2410)</td>
</tr>
<tr>
<td></td>
<td>*Women’s Roles: A Global Perspective (SOC 2400)</td>
</tr>
</tbody>
</table>

**Summary of Requirements:**

1. **Two courses in Humanities / Fine Arts in different departments** [6 credits minimum].
2. **Two courses in Social Sciences in different departments** [6 credits minimum].
3. **One course in Multicultural Studies [Diversity of U. S. Culture]** [3 credits minimum].
4. **One course in Multicultural Studies [Non-Western Tradition]** [3 credits minimum].

**NOTE:** The above requirements may be satisfied by taking five [5] courses if one is a "double-dip" course denoted by *. See text at the top of page.

**NOTE:** Students who have taken courses in the quarter system must have completed the equivalent of 15 semester credit hours for this requirement. Quarter system credit hours multiplied by 2/3 gives equivalent semester credit hours.
- Multicultural Studies

(Select one course from the following)

Africana Studies
Introduction to the African Experience (AFST 1200)
Foundations of Culture in the African Diaspora (AFST 2200)

Anthropology
*Human Society Through Film (ANTH 2100)
*Cultural Anthropology
(ANTH 2800 / LST 2800)
Food, Health, and Society (ANTH3300)
Peoples of the Americas Before European Contact
(ANTH 3850)
Peoples of Sub-Saharan Africa (ANTH 3940)
Bicultural Ecology (ANTH 4730)
Medical Anthropology (ANTH 4760)
Anthropology of Religion
(ANTH 4820 / LST 4820)
Peasant Society (ANTH 4890)

Art
Asian Art (ARTH 2100)
Ethnographic Art (ARTH 2200)
Topics in Ethnographic Art (ARTH 3270)
African Art (ARTH 3300/AFST 3300)
Ancient Art of the Americas (ARTH 3350)

Comparative Econo. Systems

Economies

Comparative Econo. Systems (ENGL 3500)

English

World Literatures & Culture (ECON 3770)
World Cinema & Culture (ECON 4730)

Film
Third Cinema (FILM 3420)

French

Cross-Cultural Understanding (FREN 3400)

Geography
Cultural Geography (GEPL 2030)
Geography of Asia (GEPL 3120)
Geography of Africa (GEPL 3220 / AFST 3220)
Geography of Latin America (GEPL 3300)
Principles of Global Studies (GLST2000)

History
*The Contemporary World (HIST 1070)
*East Asia to 1800 (HIST 1080)
*East Asia from 1800 (HIST 1090)
*Latin Amer. Civilizations (HIST 1100)
*African Civilizations (HIST 1110 / AFST 1110)
*Middle East Civilizations (HIST 1120)
*Ancient Near East (HIST 2040 / CLC 2040)
Medieval Russia (HIST 2640)
Modern Russia (HIST 2650)
Japan and WWII (HIST 2700)
Postwar Japan (HIST 2710)
History of Tokyo (HIST 2720)
The Chinese Revolution (HIST 2730)
Colonial Latin America (HIST 3200)
Latin American Republics (HIST 3210)
History of the Middle East from 600 to 1500 (HIST 3540)
History of the Middle East Since 1500 (HIST 3550)

African History
Africa to 1800 (HIST 3630 / AFST 4570)
Africa Since 1800 (HIST 3640 / AFST 4580)
People and Politics in Mexico (HIST4470)

Comparative History

Cultural History of the People of Eastern Africa
(HIST 4590 / AFST 4590)
Imperial Russia 1700-1917 (HIST 4660)
20th Century Russia (HIST 4680)
Modern Chinese History (HIST 4720)
Modern Japanese History (HIST 4740)
Europe & Asia: Expl. & Exchange, 1415-1800 (HIST 4750)
Colonialism & Imperialism in the 19-20th Century
(HIST 4760)

Honors
*Multicultural Literatures: The Non-European World (HON 2030)
*Japanese
*Japanese Culture and Commerce (JAPN 1080)
*Intro to Japanese Culture (JAPN 1090)

Marketing
Understanding Cultural Differences for Business (IBUS 3150)

Music
* Cultures and Music of Non-Western Styles (MUS 2420)

Philosophy
Eastern Thought (PHIL 3500)
*Zen: Philosophy of Existential Transformation (PHIL 3510)
Philosophy of Culture (PHIL 3550)
Buddhist Philosophy (PHIL 4500)

Political Science
Current International Problems (PSC 1710)
Politics in Africa (PSC 2660 / AFST 2660)
Governments of Asia (PSC 2680)
Government & Political Institutions of Africa
(PSC 4660 / AFST 4680)
Government of China (PSC 4690)

Religion
World Religions (REL 1220 / HUMA 1220)
*Understanding the Monotheistic Religions (REL 2300)
Islam (REL 3100)
Comparative Religion: Living Non-Western Religions (REL 3510)

Russian
*Russian Culture & Commerce (RUS 1080)
*Introduction to Russian Culture (RUS 1090)

Sociology
Development in Third World Nations (SOC 4800 / AFST 4800)
Gender in Cross-Cultural Perspective (SOC 4810 / WGST 4190)
*Women’s Roles: A Global Perspective (SOC 2500)
*Educ. And the Construction of Societies for Women
(TSOC 3540)

Spanish
*Culture of Latin America (SPAN 1090)

Women’s Studies
Issues in Women’s Studies (WGST 3010)
Women of South Asia: Cultures, Politics, and Migration (WGST3470)

*Students may satisfy one of the two multicultural requirements with at most one course that simultaneously fulfills a second area of the core.

- Multicultural Studies -

Diversity of U.S. Culture

(Select one course from the following)

Art
Multi-Cultural Approaches for Art Appreciation (AED 3130)
*Visual Construction of Gender
(ART 3820 / WGST 3020)

Africana Studies
Intro to Africana Studies (AFST 1100)
Foundations of Black Intellectual History (AFST 2100)

Anthropology
Indians of North America (ANTH 3920)
The Irish-American Experience (ANTH 4860)

Business
Managing Diversity in the Workplace (BMGT 2700)
Cultural Communications in the Workplace (BMGT2750)

Curriculum and Instruction
Multicultural Literature (CI 4360)

Disability Studies
Disability in the United States (DST 2020)

Economics
Economics of Gender (ECON 3650 / WGST 3650 / LST 3050)
Economic History of the African Amer. Comm. (ECON 3490 / AFST 3490)

English
*Folklore (ENGL 3730 / AMST 3730)
Women and Literature (ENGL 3750 / WGST 3750)

European and Asian Studies
Language in the African Amer. Community
(ENGL 4140 / LING 4140 / AFST 4140)

African-American Studies
African-American Writers Before the 20th Century
(ENGL 4650 / AFST 4650)

African-American Literature in the 20th Century
(ENGL 4660 / AFST 4660)

Native American Literature and Culture (ENGL 4690)

Geography
Geography of U.S. and Canada (GEPL 3050)

History

African-American History (HIST 2340)
African-American History to 1865 (HIST 3290 / AFST 3290)
African-American History from 1865 (HIST 3260 / AFST 3260)
Ethnic America (HIST 3310)
Indians in Eastern North America (HIST3320)
Western American Indians (HIST3330)
The Early Frontier (HIST 3350)

American Labor and Working-Class History
(1HIST3480/LST 4440)

Women in American History
(HIST3600/WGST4510)

Women in Early America (HIST 4210)

History of Native American Religious Movements
(HIST 4310)

African-American Frontier (HIST 4340)

Slavery in America (HIST 4430 / AFST 4430)

Honors

Humanities

*African American Culture (HUMA 2100)
*Music
*History of Jazz (MUS 2220 / AFST 2220)
*Musical Diversity in the United States (MUS 2250)

Philosophy

Feminism & Philosophy (PHIL 3540 / WGST 3550)

Political Science

Women in American Politics (PSC 2210 / WGST 2610)

Sociology
*Race, Class & Gender (SOC 2640 / LST 2640)

Racial and Ethnic Minorities in the U.S. (SOC 4660)

African Americans in the U.S. (SOC 4670 / AFST 4670)

Gender Roles (SOC 4820 / WGST 4140)
*Introduction to Social Welfare (SOCW 1030)

Diversity in Contemporary Society (TSOC 2000)

Women’s Studies

Introduction to Gender Studies: Gender, Sex & Differences (WGST 2010)

- Multicultural Studies -

Other Than U.S.
(Non-Western)

*Select one course from the following:
CO-OP WORK EXPERIENCE

All undergraduate students in an Engineering Science program are required to complete a minimum of three semesters (with the option of additional semesters) of co-operative education experience in order to earn their degree. Co-op is the integration of classroom and practical experience in an organized program.

Co-op experience has been shown to further enhance a student’s full-time employment outlook. Many students continue to work with the company they co-oped with upon graduation. The hands-on experience integrates classroom theory with practical experience; it also provides the student with financial assistance to help offset the cost of their education.

Frequently Asked Questions

Does the Career Development Center (Co-op Office) guarantee placement?

No, we do not guarantee placement. Our staff will assist students in fine-tuning their resumes and developing strong interviewing skills and job search resources. We will refer their resumes to employers that are a match for their skills. However, the employers determine who they will interview and hire. Students are ultimately responsible for obtaining their own co-op position.

Which co-op plan am I on?

There are two co-op plans, Plan A and Plan B. Plan A begins the spring semester of the sophomore year and Plan B begins in the summer semester of the sophomore year. After your first co-op, you will alternate between a semester of coursework and a semester of co-op. You will be assigned to a co-op plan in March during Professional Development class. Students are randomly assigned to Plan A or B; there is no preferred plan. Students are also evenly dispersed between the two plans.

Important note: If you begin the math sequence in MATH 1330 or 1340, you will automatically be assigned to Plan B.

**Student athletes and students in ROTC will follow a summers only plan; all co-ops will take place during the summer semesters with fall and spring semesters scheduled for coursework.
Do I retain my full-time student status when on co-op?

Yes. This is accomplished when students register for co-op (CHEE3940). In addition, UT e-mail accounts stay activated while students are co-oping.

What companies may I co-op with?

Please refer to the list of co-op companies on the next page. The companies listed have worked with UT in the past or are currently working with us. The Career Development Center is continually working to find new companies to partner with. It is possible to co-op with a company that the University does not currently work with. Additional information will be required from the Co-op Office prior to receiving approval to work with a new company.

Please try to keep your options open. It is very difficult to find co-op placement in the local area (as Toledo is not a chemical engineering hub). There are terrific opportunities all over the state, across the country, and even internationally. Co-op is the time to try new areas of interest and expand your horizons!

If I accept a job, can I then change my mind and accept a more attractive job?

No, this is considered unprofessional behavior. If a student first accepts, then declines an offer in order to accept a second offer, the second job will not count towards co-op and the student will not be eligible to register for CHEE3940.

What is the co-op fee?

Students will be charged a $475 co-op fee which will be applied to the semester bill the student will co-op in. (For example: if a student registers for a summer co-op, the $475 fee will be applied to the summer bill). Payment is required at the time tuition is due. Upon completion of each co-op rotation, students and employers complete an online evaluation form. Once the Career Development Center receives the evaluations and deems the work experience as acceptable, students then receive a grade of “PS” (passing) on their transcript.

Do I have to pay the co-op fee when I complete a fourth or fifth co-op?

No, but students do need to register for CHEE3950:004 or CHEE3950:005. Students will need to see Chanda Raine to register for a 4th or 5th co-op as special permission is needed for these co-op rotations.
**How is my financial aid allocated?**

Students who receive UT recruitment/merit scholarships must notify the Scholarship Services Office of their co-op so that their scholarship can be shifted to a future term. Full details about co-op and financial aid, can be viewed at: [http://www.utoledo.edu/financialaid/scholarships/pdfs/scholar_2013_2014/Engineering%20Coop.pdf](http://www.utoledo.edu/financialaid/scholarships/pdfs/scholar_2013_2014/Engineering%20Coop.pdf).

**If I get a co-op job in spring semester, will I be released from my residence hall contract?**

Yes. If a student gets a job at the last minute, he or she will still be released from their contract.

**If I have prior work experience, will the co-op requirement be waived?**

No, however, if a student has or had an engineering-type job a mechanism exists to determine if that work experience will satisfy the co-op requirement. The job must still be pre-approved and the co-op fee must still be paid.

**Can I change co-op companies after my first co-op rotation?**

Yes. Students may change co-op employers after their first co-op assignment but not after the second and subsequent assignments. **Students must complete at least two consecutive co-op assignments with the same employer.** To change employers after their first co-op assignment, students must submit a written request during the first two weeks of the semester when they return for classes.

**Will I get paid for my work experience?**

Yes. Wages for co-op positions are set by the company. Remember, however, the primary reason for obtaining a cooperative education position is to gain valuable experience, training and skills directly related to your field of engineering study.

**What happens if I have exhausted all my options (working with the Co-op Office, interviewing, searching for a position on my own, etc.) and I still cannot find a co-op for my first rotation?**

It is very unusual for students not to secure a co-op if they are doing their part in the co-op search process. However, if a situation such as the one described above does occur, students may defer their first co-op rotation. This means if a student is assigned to Co-op Plan A and defers his/her first Spring semester rotation, the student’s next opportunity to co-op will be in the Fall semester. Likewise, if a student is assigned to Co-
op Plan B and defers his/her first Summer co-op, the next time he/she will be eligible to co-op will be in the following Spring semester.

*Please note that if a student defers his/her co-op a second time, he/she will not be permitted to take any CHEE classes until he/she has completed at least one co-op rotation. Students in this situation have put themselves in a position of being off-track from their co-op plan assignment and will consequently be delaying their graduation.*

**Below are the requirements for a co-op experience:**

Summer Co-op: Minimum 480 work hours required (12 weeks at 40 hours per week)

Spring & Fall Co-ops: Minimum 600 work hours required (15 weeks at 40 hours per week)

Co-op evaluations:
Student completes a required on-line student evaluation at:  
[http://www.eng.utoledo.edu/coop/](http://www.eng.utoledo.edu/coop/)
Employer completes an on-line employer evaluation at:  
[http://www.eng.utoledo.edu/coop/](http://www.eng.utoledo.edu/coop/)

Submit evaluations no later than one week before grades are due (check academic calendar for date)

**For more frequently asked questions**, please see the Career Development Center website at:  
[http://www.eng.utoledo.edu/coop/current_students/faq.html](http://www.eng.utoledo.edu/coop/current_students/faq.html)
CO-OP COMPANY LIST

This list contains just some of the companies The University of Toledo has worked with for Chemical Engineering Co-Op placement.

ABB Inc. Libbey, Inc.
A-GAS Americas Lincoln Electric Co.
Anderson Development Company Lubrizol Corporation
Arclin Magna Norplas
B.P. Marathon Petroleum Company
Betco Corporation Materion Brush
Bridgestone/Firestone, Inc. Matrix Technologies, Inc.
Bunge Middough Consulting
Campbell Soup Company Ohio EPA
Chemours (DuPont) OmniFusion LLC
Chemtrade Logistics OMNOVA Solutions, Inc.
City of Toledo Owens Corning
Cooper Tire & Rubber Company Rockwell Automation
Cristal Global Owens-Illinois
Domtar Perstorp Polyols
Dow Chemical Plastic Technologies, Inc. (PTI)
DTE Energy Plastipak
Duke Energy Pilkington
Emerson Climate Technologies PolymerPlus LLC
First Energy Corp. PolyOne
First Solar Sherwin-Williams Company
Fluor Silfex, Inc.
General Electric SSOE
General Mills Sun Chemical
Glatfelter Tata Chemicals
Goodyear Tenneco
Hershey Therma-Tru Corporation
Honda Toledo Refining Company
Humanetics TRW
Husky Energy Wacker Chemical Corporation
INEOS Nitriles Whirlpool Corp.
JM Smucker Company Whitaker Surface Systems
Johns Manville Worthington Industries
Lafarge
MINORS

There are many minors available in conjunction with the Bachelor of Science in Chemical Engineering degree. A **minimum 2.0 GPA is required in the minor area**. Students must complete a minimum of 21 hours for most minors; at least 9 of those hours must be completed at The University of Toledo. **Further information regarding ALL minors and specific requirements can be found in the University catalog or at www.utoledo.edu.** Below is a list of the more popular minors students choose in addition to their Chemical Engineering degrees:

**Minor in Chemistry**
All students automatically complete the Minor in Chemistry within the Chemical Engineering curriculum. No additional coursework is required. Students must declare the Minor in Chemistry by completing an application in the Student Services Office in University Hall, Room 3000. The Minor in Chemistry will appear on the transcript, but not on the diploma.

**Minor in General Business**
Engineering students may earn a Minor in Business by earning a C or better in a total of six business courses (18 credit hours) and by satisfying an economics requirement (3 credit hours). The economics requirement for the minor can be fulfilled with the completion of MIME 2600 - Engineering Economics, which also counts as an engineering elective for the Chemical Engineering curriculum. Interested students should visit the College of Business website for more details.

**Minor in Foreign Language**
A minimum of 21 - 22 hours is required for the minor in French, German, Japanese or Spanish. In the modern languages, all course work must be in the same language and at the 3000-level or higher. Some courses may also be used as Humanities electives. Interested students should contact the Foreign Languages Department for more details.

**Minor in Green Chemistry & Engineering**
Students must complete 21 hours of course work. The 21 hours must include: CHEM 2410, 2420 4200 and CHEE 4010. In lieu of CHEE 4010, Chemical Engineering students must take CHEE 4110, along with two additional elective courses.

*New for Fall 2017

**Minor in Mathematics**
A minimum of 22 hours of mathematics (MATH) courses is required for a minor in Mathematics. The 22 hours must include: MATH 1860, 1890, 2850, and one of 2860, 3610 OR 4680. The remaining hours must be courses that are acceptable toward a major in Mathematics, and must be approved by an advisor in the Department of Mathematics. Interested students should contact the Mathematics Department for more details.

**Minor in Music**
A minimum of 22 hours is required for the minor in music; 25 hours is required for a minor in the Recording Arts. Students electing to pursue a minor in music must choose one of the following areas of concentration: Jazz, Instrumental, Vocal, Keyboard, Music Theory, Music History or Recording Arts. Interested students should contact the Music Department for more details.

**Minor in Renewable Energy**
A minimum of 21 hours is required for the renewable energy minor. The 21 hours must include: PHYS 3400, GEPL/EEES 2200, CHEM 3810, ECON 3240 or PSC 4340, a minimum of 3 hours of approved coops or internship in a renewable energy related area and 6 hours of other approved courses. Interested students should visit the Physics Department website for more details.

**Minor in Sustainability**
This is an interdisciplinary minor combining courses from the College of Business as well as the College of Natural Sciences and Mathematics, the College of Engineering, and the College of Arts and Letters. Of the 15 credits hours (5 courses) required in the Sustainability minor, 12 credit hours (4 courses) must be unique to other courses in a student’s degree program. This means that only one course may “double dip” as another requirement somewhere else in their degree program – be that a major, minor or other degree requirement. If more than one course naturally occurs as a requirement in their degree program, the student would need to select additional course(s) from the list of approved electives for the minor so that they achieve the 12 unique hours.
General Minor for Non-Business Students

Requirements for the General Minor in Business for Non-Business Students

1. A minimum cumulative GPA of 2.25 is required in the following prerequisite courses or their equivalents. A student who does not meet the minimum standards but has at least a cumulative 2.0 in the prerequisites will be reviewed by the College of Business and Innovation on an individual basis.

Economics: Select from ECON 1150 and 1200, MIME 2600 or equivalent
Mathematics: Select from any UT Core Math course (e.g. MATH 1180, 1200, 1320, 1330, 1340, 1730, 1750, 1850, etc.) except statistics
Computing: Select from BUAD 1020, CMPT 1100 or approved equivalent
Business Statistics: Select from BUAD 2060, MATH 2630, 2600, or equivalent

2. Eighteen hours are required beyond the prerequisite courses above. A grade of C (2.0) or higher is required in each of the following courses, at least one of the courses from section "A" below must be at the 3000 level to avoid additional course work:

Required Foundation Course: BUAD 2040 Financial Accounting Information OR ACTG 1040 Principles of Financial Accounting

Additional Requirements:

A. Select 3 courses from the following with at least one course at 3000 level to avoid additional coursework. Approved associate degree equivalents courses are shown in ( ). (Prerequisites for selected courses must be fulfilled.):

- BUAD 1010 Introduction to Business (or BMGT 1010)
- BUAD 2050** Accounting for Business (or ACTG 1050)
- BUAD 2070** Business Statistics and Data Analytics
- BUAD 2080 Global Environment of Business (or BMGT 2110)
- BUAD 3010** Principles of Marketing (or MARS 1010)
- BUAD 3020** Principles of Manufacturing and Service System
- BUAD 3030 Managerial and Behavioral Processes in Organizations
- BUAD 3040** Principles of Financial Management
- BUAD 3050 Information Technology Management
- BUAD 3470 Legal & Ethical Environment of Business (or BMGT 2310)

B. Select two additional 3000 or 4000 level courses from the 6 listed above or select two courses at the 3000 or 4000 level from ACCT, FINA, INFS, MGMT, EFSB, IBUS, EBUS, OSCM, HURM, PSLS, BANS, BLAW or MKTG to complete the additional requirements. (Prerequisites for selected courses must be fulfilled.)

C. At least three of the five courses selected to fulfill the additional minor in business requirements must be at the 3000 or 4000 level.

**Prerequisites for an MBA can also be fulfilled by completing the indicated (**) courses with a minimum grade of C (2.0). [http://www.utoledo.edu/business/StuServ/Minors-NonBusMajors.html]
Sample schedule for Chemical Engineering students:

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<tr>
<td>BUAD2040</td>
<td>FINANCIAL ACCOUNTING INFORMATION</td>
</tr>
<tr>
<td>BUAD2070*</td>
<td>BUSINESS STATISTICS &amp; DATA ANALYTICS</td>
</tr>
<tr>
<td>BUAD3010</td>
<td>PRINCIPLES OF MARKETING</td>
</tr>
<tr>
<td>BUAD3020</td>
<td>PRINCIPLES OF MANUFACTURING AND SERVICE SYSTEMS</td>
</tr>
<tr>
<td>BUAD3030</td>
<td>MANAGERIAL AND BEHAVIOR PROCESSES IN ORGANIZATIONS</td>
</tr>
<tr>
<td>BUAD3040</td>
<td>PRINCIPLES OF FINANCIAL MANAGEMENT</td>
</tr>
</tbody>
</table>

**ECONOMICS REQUIREMENT:**

The economics requirement may be satisfied with MIME2600 or ECON1150 & 1200

The economics requirement for the minor & BS/MBA program can be fulfilled with the completion of MIME2600. This course can also be used in fulfillment of an engineering elective requirement for the Bachelor of Science in Chemical Engineering degree. If you are considering pursuing an MBA at another institution (besides UT), it is recommended that you also complete ECON1150 & ECON1200.

**SUBSTITUTIONS:**

Students not interested in a MBA may wish to make substitutions according to the rules listed in the College of Business. For example: IBUS3150 (a Multicultural elective) may be taken in place of any of the above courses except BUAD2040 if only completing the minor. In addition, IBUS3150 will simultaneously satisfy part of the University core requirement (Hum/SS/MC electives). If continuing on for an MBA, no substitutions should be made.

**PREREQUISITES:**

Students must be sophomores to take the 2000-level business courses and juniors to take the 3000-level courses. Additionally, BUAD2040 must be taken before BUAD3040, and BUAD2070 prior to BUAD3020. The economics requirement must also be fulfilled prior to taking BUAD3010. The other prerequisites are waived for Engineering students.

*If you are considering obtaining an MBA degree, you will need to take BUAD2050 AND BUAD2070. BUAD3030 is not an MBA prerequisite (see page 1).
Minor in Computer Science Engineering

The College of Engineering Department of Electrical Engineering and Computer Science (EECS) offers students the opportunity to obtain a Minor in Computer Science and Engineering (CSE). Students who successfully complete this minor will have a good working knowledge of software development and computer architecture. Elective courses can be selected to provide knowledge of database systems, computer graphics, artificial intelligence, operating systems and computer design.

The pre-requisites to pursue the CSE minor are the successful completion of MATH1850 (Calculus I) and MATH1860 (Calculus II). To obtain the CSE minor, the student must complete 26 credit hours of courses in the EECS department (6 required courses, 2 electives) with a GPA of 2.0 or better in theses courses.

To register for the CSE minor, students must contact the EECS Department in Nitschke Hall (Room 2008) or call 419-530-3853 prior to enrolling in any CSE minor courses.

**Required Courses:**

1. EECS1100 – Digital Logic Design – 4 hrs.
2. EECS1560 – Introduction to Object-Oriented Programming – 3 hrs.
3. EECS1570 – Linear Data Structures – 3 hrs.
4. EECS1580 – Nonlinear Data Structures – 3 hrs.
6. EECS2100 – Computer Organization & Assembly Language – 4 hrs

**Select six credit hours from the following courses:**

EECS3100 - Microsystems Design – 4 hrs. (prereq EECS3400)
EECS3500 - Automata & Language Translation Systems – 3 hrs.
EECS3550 - Software Engineering – 3 hrs.
EECS4130 - Digital Design – 3 hrs.
EECS4500 - Programming Language Paradigms – 3 hrs.
EECS4510 - Translation Systems – 4 hrs. (prereq EECS3500)
EECS4560 - Data Base I – 3 hrs
EECS4580 - Survey of Artificial Intelligence – 4 hrs.
SECTION II: University Resources and Policies
ABOUT US

To the students:

The University Counseling Center is the primary university-based mental health service for University of Toledo students.

The Counseling Center staff provides counseling (individual and group), mental health and wellness programming, and crisis intervention services to help students cope with the demands of college and to facilitate the development of life adjustment strategies. We hope to empower you with the skills to assist you in attaining your educational goals at the University of Toledo. In addition the Counseling Center staff provides training to graduate students in several disciplines including Clinical Psychology, Counselor Education and Supervision, and Social Work. All trainees are supervised by licensed professionals within, according to the rules and regulations of their discipline.

We provide services in accordance with the codes of ethics of the helping professions and standards of the American Psychological Association, American Counseling Association and the International Association of Counseling Services, Inc. as well as to the rules and regulations of the State of Ohio.

Phone
419.530.2426

Hours
Monday through Friday 8:15am – 5:00pm

Location
Rocket Hall, Room 1810

Mailing Address
2801 W. Bancroft Street
MS #341 RH 1810
Toledo, OH 43606

Directions
The Counseling Center is located at the southwest corner of the Main Campus in Rocket Hall near Dorr and Secor Roads.

Group counseling sessions include:

- Anger management
- Eating disorders
- LGBT support
- Grief and loss support
- Stress management

The UT Counseling Center also offers support and services for students who are looking for assistance for Alcohol, Tobacco and Other Drug issues.

Services are FREE and CONFIDENTIAL for all registered UT students!!
# Safety and Health Contacts for University of Toledo Students

**Need a Counselor?**
U.T. Counseling Center 419-530-2426

**Campus Emergencies**
- On Campus 419-530-2600
- Off Campus 911

**UTPD Non-Emergency**
419-530-2601

**Sexual Assault Education & Prevention 24-hr Help**
419-530-3431

**Title IX Information**
*If you believe you have been subjected to 1) sexual harassment by University faculty or staff, or 2) any other form of gender discrimination under title IX, you may report or file a formal complaint with the Title IX Coordinator. You may also report to the coordinator if you feel you are the victim of sexual harassment, including sexual assault, sexual violence or other sexual misconduct by another university student. The Title Coordinator can be reached at: 419-530-4747

*These incidents may also be reported at:

**National Suicide Prevention Lifeline**
800-273-TALK(8255), go to nearest ER or call 9-1-1.

**After Hours Mental Health**
419-255-5911

**Student Medical Center**
419-530-3451

**Report Bullying**
http://www.utoledo.edu/tlc/bully/bullyIncidentReport.asp

**Anonymously Report a Crime**
www.utoledo.edu/depts/police

**Safe Places for LGBT Students**
**Contact:**
Matthew Perry, M.S.E.  |  Area Coordinator
The University of Toledo
Office of Residence Life
2801 W. Bancroft St.  MS 519  |  Toledo, Ohio  |  43606
Phone: 419.530.4972  |  E-Mail: matthew.perry@utoledo.edu

**National LGBT Student Assistance/Crisis Line**
1-866-488-7386
**Campus Resources**

**Campus Police**

Transportation Center, Room 1302  
419-530-2600 (Police/Medical/Fire)  
419-530-2601 (Non-Emergency)  
http://www.utoledo.edu/depts/police/  
http://www.utoledo.edu/depts/police/response

**Carlson Library**  
(Located between the Student Union & the Ottawa River)  
419-530-2324  
http://www.utoledo.edu/library/

Hours: Vary by semester; please see the below link for updated hours or contact the library at 419-530-2298 for current hours.  
http://www.utoledo.edu/library/info/hours.html

**Center for International Studies (CISP)**  
http://www.utoledo.edu/cisp/index.html  
Snyder Memorial, Room 1000  
419-530-5268 or CISP@utoledo.edu

Services: CISP links students with programs, activities and opportunities for international travel, networking and learning, supporting both our international and traditional students. Become an active part of your global community with study abroad, as well as experiential learning and service projects that develop your world outlook and enhance your professional experience.

**Commuter Student Services**  
http://www.utoledo.edu/studentaffairs/osi/commuter/index.html  
Student Union, Room 3504  
419-530-8521 or commuter@utoledo.edu

Services: Commuter Student Services (CSS) seeks to help UT commuter students become active in campus life leading to a truly enriching and rewarding college experience. We work to inspire, support, and equip our students with every possible resource for success.
Eberly Center for Women
http://www.utoledo.edu/centers/eberly/

Tucker Hall, Room 0168 419-530-8570

Services: Its purpose is to serve the women of the University and the larger Toledo communities by advocating for women's equity in education, work, and health.

International Student & Scholar Services
http://www.utoledo.edu/cisp/international/About_OISS.html

Snyder Memorial, Room 1000 419-530-5268
Hours: Monday-Friday 8:15-5:00pm

Services: Provides assistance and services to international students at The University of Toledo. Serves as a resource to students regarding orientation, visa requirements, on-campus and off-campus housing, banking, and international student health insurance.

Multicultural Student Center
http://www.utoledo.edu/studentaffairs/omss/

Student Union, Room 2500 419-530-2261

Services: The mission of the Office of Excellence and Multicultural Student Success is to create a campus environment for students of various cultures and diverse backgrounds that is conducive to learning by providing programs and services that meet their needs. Through its programs and services, the Office of Multicultural Student Success strives to enhance the recruitment and retention efforts of the Division of Student Affairs and explore the indigenous roots of African American, Asian American, Latino American, Native American, and LGBTQ, students. While it is the mission of the Office of Multicultural Student Success to specifically address the needs of these students, programs and services are intended for the benefit of all the University community in an effort to foster understanding, acceptance, and cross cultural communication.

Office of Student Involvement & Leadership
http://www.utoledo.edu/studentaffairs/osi/

Student Union, Room 3504 419-530-4944

Service: The Office of Student Involvement seeks to build community and is committed to providing students with opportunities for involvement that will enhance and complement their UT experience.
Parking Services
http://parkingservices.utoledo.edu/

Transportation Center, Room 1400
419-530-4100
Hours: Monday-Friday 8:15-5:00pm

Service: Obtain parking permits, appeal a parking ticket or replace lost or stolen permits

Residence Life
http://www.utoledo.edu/studentaffairs/reslife/index/

Ottawa West, Room 1014
419-530-2941 or reslife@utoledo.edu
Hours: Monday-Friday 8:15-5:00pm

Services: The mission of the Office of Residence Life is to foster academic and social success for our students by providing a safe and healthy community, excellent housing facilities, education, a culture of respect and the formation of lifelong relationships.

Rocket Card (ID)
http://www.utoledo.edu/rocketcard/

Student Union, Room 1550
419-530-5842 or rocketcard@utoledo.edu
Hours: Monday-Friday 8:15-5:00pm

Services: The Rocket Card is the official University of Toledo Identification Card. The Rocket Card is multifaceted in its uses; it provides students and employees safe, quick access to campus services as well as having a debit card feature. The debit card features allows the university to apply your financial aid to your Rocket Card and for you or your family to add additional funds on-line.

Rocket Jobs
http://www.utoledo.edu/success/celcs/rocketjobs/index.html

Services: Rocket Jobs is an online interactive database where you can find jobs on and off campus.
Rocket Solution Central
www.utoledo.edu/rsc

Rocket Hall, Room 1200  419-530-8700 or rocketsolutioncentral@utoledo.edu

Hours of Operation:
Monday, Thursday, Friday:  8:15am-5:00pm
Tuesday, Wednesday:  8:15am-6:00pm

Services: RSC is an integrated service area incorporating the business functions of the Treasurer’s Office, Financial Aid, and Registrar facilitating service to UT students.

Student Disability Services
http://www.utoledo.edu/offices/student-disability-services/index.html

Rocket Hall, Room 1820  419-530-4981

Hours:  Monday-Friday  8:15-5:00pm

Services: The Office of Accessibility is an office at The University of Toledo that provides support services and accommodations for individuals with disabilities. We coordinate services for individuals with all kinds of disabilities, including students with learning disabilities.

Student Health Services/Medical Center
http://www.utoledo.edu/healthservices/student/

Student Medical Center  419-530-3451 (Appts & General Information)
419-530-3471 (myUT Pharmacy)
419-530-3474 (Student Health Insurance)

Location: Southwest side of Main campus, between the Law School & Rocket Hall directly across from Academic House & International House.

Student Clinic Hours:
  Monday - Thursday 12:00pm – 6:00pm; Friday 1:00pm – 5:00pm
(**Clinic will close during breaks and summer semester. Students will have access to medical services in the Student Wellness Center on the Health Science campus; UT transit loop provides a free shuttle between campuses.)

Services available: primary care, urgent care services; gynecology, counseling and psychiatric services; laboratory testing/pharmacy services; health education programs; sexual assault education and prevention services; binge drinking programs and services; free/anonymous HIV/AIDS testing; allergy injections and other immunizations; student health services.
Student Legal Services
http://www.utoledo.edu/studentaffairs/studentlegalservices/

Rocket Hall, Room 1610 419-530-7230 or studentlegal@utoledo.edu

Services: Student Legal Services is a general practice law firm. We provide licensed attorneys to UT students to advise and/or represent them in their personal legal matters.

Student Recreation Center
http://www.utoledo.edu/studentaffairs/rec/ 419-530-3700 or UTRecCenter@utoledo.edu

Services: Provides engaging, student-centered recreational and health promotion programs and services to enhance the well-being of the University of Toledo community.

Fees: Full use if enrolled for 12 GFB (general fee bearing) credit hours or more; 1-11 GFB hours have limited use of 15 visits per semester. If more visits are desired, the student must "buy up" at $7.81 per credit hour away from 12. Individuals completing thesis, dissertation, co-op, non-UT internships, or students who took a semester off are eligible to purchase a membership as a student with written UT documentation of status.

University Counseling Center Services
http://www.utoledo.edu/studentaffairs/counseling/index.html

Rocket Hall, Room 1810 419-530-2426

Services Available: The Counseling Center staff provides counseling (individual and group), mental health and wellness programming, and crisis intervention services to help students cope with the demands of college and to facilitate the development of life adjustment strategies. We provide services in accordance with the codes of ethics of the helping professions and standards of the American Psychological Association, American Counseling Association and the International Association of Counseling Services, Inc. as well as to the rules and regulations of the State of Ohio. Group counseling sessions include: anger management, eating disorders, LGBT support, grief and loss support group, and stress management. Services are FREE and CONFIDENTIAL for all UT students.
UT Testing Services
http://www.utoledo.edu/success/testing/services/MCtestcenter.html

Main Campus Testing Center:
Memorial Field House, Room 1080 419-530-2011

Make-up Testing Hours: Placement Testing Hours:
Monday, Tuesday and Friday  8:30 am – 4:45 pm  9:00am – 4:00pm
Wednesday and Thursday  8:30 am – 7:45pm  9:00am – 7:00pm
(Tests must be completed by closing time)

Services: Make-up testing, placement testing, GRE, CLEP testing, distance learning exams, skills assessment testing.

UT Transit Services
http://www.utoledo.edu/facilities/transit/ 419-530-1026
Transit Services provides shuttles around campus, to UT's satellite campuses, Kenwood Apartments, and Franklin Park Mall.
Tutoring Services

Learning Enhancement Center
http://www.utoledo.edu/success/lec/

Carlson Library 419-530-2176
(Lower Level, Rathbun Cove – BO200)

**Services:** FREE tutoring in math, chemistry, physics, economics, foreign languages, etc. – no appointment is necessary.

The Writing Center
http://www.utoledo.edu/success/writingcenter/

Carlson Library, Room 1005 419-530-2176

Appointments are preferred, but some walk-in hours are available. Writing services provided to UT students are **FREE** of charge.

**Services:** Provides one-to-one assistance to all members of the UT academic community who want to discuss and improve their writing.
Quick Links

Chemical Engineering Home Page
www.che.utoledo.edu

Services: Curriculum, flowcharts, degree requirements, course descriptions

College of Engineering Home Page
www.eng.utoledo.edu/main.shtml

Services: Academic policies and procedures, information about student organizations, graduation and honors convocation.

Engineering Career Development Center (Co-op Office)
http://www.eng.utoledo.edu/coop/

Services: Co-op evaluations for student & employer, Career Expo information, sample resumes.

Transferology
http://www.transferology.com

Services: Online tool that assists students with program requirements, course equivalencies, and allows students to see how completed or future courses transfer to another college or university.
Campus Activities

Reasons to Get Involved:

- Assists in the transition to college/minimizes homesickness
- Have fun!
- Meet new people/make friends
- Increases your interaction with faculty/staff
- Develops your leadership skills
- Helps you learn to manage your time
- Develops your “people skills”
- Helps you learn to work as part of a team
- Strengthens your resume

Types of Activities:

- Intramural sports - softball, football, etc. (through Rec Center)
- College organizations (FYRE)
- Student government
- Special interest clubs – Wilderness Expeditions Club, Men’s Soccer Club, etc.
- Academic oriented clubs/Honor Societies - AIChE, Golden Key
- Leadership organizations – UTEC, Blue Key
- Newspaper or radio station – WXUT, The Independent Collegian
- Tutoring (through Learning Enhancement Center, Writing Center, etc.)
- Greek fraternity/sorority – Pi Kappa Phi, Phi Sigma Ro
- Religious organizations – Campus Crusade for Christ (CUR)

How to Get Involved:

- Understand what you are looking for and why
- Be open-minded and participate – try something new
- Try to get appointed to a leadership position
- If there are no activities that meet your needs – start your own!

How to Locate Campus Activities:

- Student activities fairs (usually beginning of each year/term)
- UT website http://www.utoledo.edu/studentaffairs/osi/orglisting/
- Office of Student Involvement & Leadership, Student Union, Room 3504 ~
  Phone: 419-530-4944
  Hours: Monday – Friday, 8:15am -5:00pm

Concerns:

- Don’t overextend yourself at the expense of your education
- Never sign-up with the intention of only building your resume
College of Engineering Student Activities

First Year Rocket Engineers (FYRE): A College of Engineering organization open to freshmen of all engineering majors. Their purpose is to provide an opportunity for students to meet other incoming freshman and first year Rockets, to get involved in the College of Engineering, to encourage professional development, to promote school spirit, and to have fun. Contact Jon Pawlecki at jon.pawlecki@utoledo.edu for more information!

National Society of Black Engineers (NSBE): National organization designed to increase the number of culturally responsible Black Engineers, who excel academically, succeed professionally and positively impact the community.
- Informational and Motivational speakers
- Community service activities
- Leadership Conferences
- Http://www.eng.utoledo.edu/~sbe/

Phi Sigma Rho: A National sorority for women in engineering and engineering technology.
- Community service activities such as helping with the Cherry Street Mission
- UT Homecoming Parade Floats
- Http://www.eng.utoledo.edu/~phirho/

Society of Women Engineers (SWE):
Dedicated to making known the need for women engineers and encouraging young women to consider an engineering education.
- Co-ed organization
- Tailgates at the football games
- Speakers and food at meetings
- Involved in the community and University, such as helping in the annual Halloween Walk.
- Http://www.eng.utoledo.edu/~swe/

Tau Beta Pi: Oldest national honors engineering society in the country.
- Undergraduate students must be in the top 1/8th of the junior class or top 1/5th of the senior class to be scholastically eligible for membership
- Involved in community activities
- Football Tailgates
- Http://www.eng.utoledo.edu/~taubpi/

Theta Tau: Co-ed Engineering fraternity mixing the studies of school with social needs.
- Ski trip & other social events
- Volunteer work
- Sponsor the Rube Goldberg Contest
- Gain great contacts for help in studying and school
- Http://www.thetatauxb.com/

Triangle Fraternity: To develop balanced men in the fields of Engineering, Architecture, and Science by providing an environment that fosters personal growth and professional success.
- Social events
- Off campus fraternity house
- Meet people to help with your homework
- Http://www.triangleteledo.org/

University of Toledo Engineer’s Council (UTEC): Student organization involved in organization many events and activities that happen at the Engineering campus.
- Night in the Box & Spring R.E.C.E.S.S.
- Football Tailgating
- Publisher of the Blueprint
- Http://www.utoledoec.org/

*See Chemical Engineering Department information sheet for information on CHEE student organizations AlChE and Omega Chi Epsilon
Academic Policies/Procedures

You're in Control!

You, the student, are in charge of your own registration and scheduling of courses.

You are responsible for:

- registering early to get the courses you want
- attending all courses for which you have registered
- arranging payment plans
- dropping or withdrawing in a timely way to avoid being billed for classes you do not intend to take

Can I Add a Class or Register Late?

A student may add a course or register late within the first five calendar days of a new semester, excluding summer (which is prorated), without permission from the instructor as long as a seat is available. Students wishing to add a course between the 6th and 15th calendar days (inclusive) of a new term may do so with the instructor's permission as well as the Dean or designee from the student's College Office. This request can be made via the Course Request and Seminar Request Form. Note: Forms submitted after the 15th day are considered void and will not be accepted. The process below will be required.

After the 15th day, students wishing to add a course may petition to do so with the Request for Non-Funded Late Registration form. This will require signatures from the instructor of the course, the Dean or designee from the student's College Office, as well as approval from the appropriate Provost.

A late registration fee is assessed for initial registrations on or after the first day of the semester. For more information regarding late fee assessment please review the Treasurer's Office Finance Brochure.

Can I Drop a Course or Withdraw from a Course After the Term Starts?

Students who decide not to attend or stop attending any or all classes for which they have registered must drop or withdrawal from the course(s). Drops and withdrawals can be processed online through the myUT portal (provided there are no holds), and can also be processed at Rocket Solution Central (RSC) located in Rocket Hall, Room 1200. Failure to drop or withdrawal from a course for which a student has stopped attending may result in a grade of "F". Specific drop and withdrawal dates for a term are listed on the University's academic calendar and here, or by contacting Rocket Solution Central (RSC) 419.530.8700.

In the event that a student becomes critically ill or injured during the course of the semester, the student should contact the Registrar’s Office for information on the Medical Drop/Withdrawal process.
WARNING: Withdrawing from a course(s) will result in a grade of "W", which will appear on your official transcripts; a grade of "W" does not affect the grade point average. Once a withdrawal is processed, it cannot be rescinded. Based on the date of withdrawal, fees may or may not be adjusted. Since withdrawn courses reduce your enrolled hours, withdrawing from courses may have an adverse effect on financial aid benefits, scholarships, loan deferments, athletic eligibility, health insurance, veterans benefits, degree requirements, or other areas.

Waitlisting
Waitlisting is an option for students who encounter classes that are ‘closed’ but who still want to try to register if a seat opens again.

Students who attempt to register for a class that is full or ‘closed’ may put themselves on a waiting list. When an open seat becomes available, an email will be sent to the next student in the Waitlist queue via their student rocket email address. The student will have 24 hours from the delivery of the email to add the class. Waitlisting will be available to students until 10 p.m. on the evening prior to the start of the semester. All Holds and Registration Restrictions will still apply to be eligible to waitlist a class. (Note: Not all classes have a Waitlist option).

The Grade of Incomplete (IN)
The grade of IN is assigned only in extraordinary cases when unexpected conditions prevent the student from completing the requirements of the course within the term of enrollment. The student must complete the required work before the end of the following semester in which the grade is received; otherwise the Office of the Registrar will convert the grade to a grade of F.

Grade Deletion Policy
Students may petition to have any grade deleted. The repeated course must be completed prior to the granting of the first bachelor’s degree, and the grade deletion petition must be submitted no later than one semester after graduation. Before petitioning for a GPA recalculation, a student must have retaken the same course (or the renumbered substitute for that course) in the same department at The University of Toledo and earned a higher grade in the retaken course. No more than a total of 12 semester hours may be deleted from the student’s transcript and a college may adopt a more stringent requirement. This policy applies only to the first recorded grade in a course that a student has repeated. If the original grade was given for academic dishonesty, it cannot be deleted from the GPA calculation. Credit for any repeated course will apply only once toward degree requirements. Grades for all attempts at the course will appear on the student’s official transcript regardless of whether or not the grade has been deleted. All grades, including those for repeated courses, will be included in the determination of eligibility for honors, fellowships, or other distinctions accruing on the basis of GPA (Higher Ed GPA). Grade deletion forms are available in Chanda’s office.
Probation
A student whose cumulative GPA is less than 2.0 will be placed on probation. A student may remain in school as long as they continue to earn a GPA greater than 2.0 in each term. The student will remain on probation as long as the cumulative GPA is below 2.0. A student is removed from probation when the cumulative GPA is above 2.0. A student earning a 1.5 GPA or less in any semester, regardless of overall GPA, will be placed on probation. Students on probation should only enroll in 12-13 hours in their next semester of school.

Suspension
A student on probation whose cumulative and current semester GPA falls below 2.0 will be subject to suspension from the college. Consideration of a student’s petition for reinstatement will be given only after one semester from the date of suspension. Any course taken during the period of suspension will not be credited toward degree requirements.

Readmission
Readmission will only be by written petition to the Associate Dean of Undergraduate Studies. The Associate Dean along with the department will make readmission decisions. The petition must be typewritten and must be received at least one month prior to the start of the semester the student desires to return.

Dismissal
If readmission from a suspension is granted, a semester average greater than 2.0 must be earned each term until the cumulative GPA is above 2.0 or the student will be subject to dismissal from the college. Further consideration of a student’s petition for reinstatement will be given only after one year from the date of dismissal. Any courses taken during the period of dismissal will not be credit toward degree requirements.

Class Rank
- Freshman: 0-29.9 hours
- Sophomore: 30-59.9 hours
- Junior: 60-89.9 hours
- Senior: 90+ hours

Dean’s List
Each semester, full-time undergraduate students (12 or more hours graded A through F) earning a 3.5 or above GPA are selected for recognition by being named to the Dean’s List. This designation appears on the transcript. Due to mandatory co-op, students in engineering are eligible during the summer term.

President’s List
Full-time undergraduate students (12 or more hours, graded A through F) earning a 4.0 GPA are selected for recognition by being named to the President’s List. This designation appears on the transcript. Due to the co-op program, students in the College of Engineering will be eligible for the President’s List during the summer term.
**Graduating with Honors**

Students graduate with scholastic distinction on the basis of the higher education (overall) grade point averages. The *higher education GPA includes all coursework taken at all institutions of higher education*, including grades that are deleted through the grade deletion process at UT and transfer credit from other institutions. These averages and the citation they merit on the student’s degree are as follows:

- **Cum Laude** 3.3 cumulative GPA and above
- **Magna Cum Laude** 3.6 cumulative GPA and above
- **Summa Cum Laude** 3.9 cumulative GPA and above

Students must have taken 80% of their course work on the regular grading system, minus any credits earned in courses where the student has no choice in receiving a P/NC grade, to qualify for honors. UT requires a minimum of 30 semester hours of standard letter-graded courses from UT in order to qualify for graduation with honors.
The University of Toledo Policy on Academic Dishonesty

Academic dishonesty will not be tolerated. Among the aims of education is the acquisition of knowledge and development of the skills necessary for success as an educator or in another profession. Activities inconsistent with these aims will not be permitted. Students are responsible for knowing what constitutes academic dishonesty. If students are uncertain, for example, about what constitutes plagiarism or cheating they should seek the instructor's advice.

Examples of academic dishonesty include, but are not limited to:

1. Plagiarizing or representing the words, ideas or information of another person as one's own and not offering proper documentation.

2. Giving or receiving, prior to an examination, any unauthorized information concerning the content of that examination.

3. Referring to or displaying any unauthorized materials inside or outside of the examination room during the course of an examination.

4. Communicating during an examination in any manner with any unauthorized person concerning the examination or any part of it.

5. Giving or receiving substantive aid during the course of an examination.

6. Commencing an examination before the stipulated time or continuing to work on an examination after the announced conclusion of the examination period.

7. Taking, converting, concealing, defacing, damaging or destroying any property related to the preparation or completion of assignments, research or examination.

8. Submitting the same written work to fulfill the requirements for more than one course.

While academic integrity is particularly the responsibility of the student, the faculty members also have a responsibility. Assignments and tests should be constructed and proctored so as to discourage academic dishonesty. Faculty members are expected to inform their students explicitly as to what materials and procedures are authorized for use in the preparation of assignments or in examinations (e.g., the use of calculator, computer, 'ponies', text materials, etc.). Should cases of academic dishonesty be found among students, the instructor may chose to counsel the student, or the following sanctions may be imposed:

1. The student may be assigned an F for the work in question.
2. The student may be assigned an F for the course. In this case the instructor should inform the dean and the student of this action. The dean will make certain that the student receives the F grade and is not permitted to withdraw from the course.

3. The student may be placed on probation or suspended for some definite period of time, dismissed, or expelled by the dean if either the seriousness of the offense or a record of repeated offenses warrants it. A notation that such a sanction has been imposed will be made part of the student’s permanent record. It is expected that the dean will consult with the instructor and the student making such a judgment, and that the dean will notify the student of the sanction imposed and of the appeals procedure.

A student found to be academically dishonest by a faculty member may appeal according to procedures approved by the respective colleges. The procedures for making a final appeal to the Student Grievance Committee may be found in The University of Toledo catalog.
The College of Engineering Policy on Academic Dishonesty
[Adopted December 1979]

Academic dishonesty is unacceptable conduct for engineering students, both as students of The University of Toledo and as candidates for careers in the engineering profession. Penalties commensurate with the offense shall be imposed on students found guilty of academic dishonesty.

Academic dishonesty includes improper access to evaluation material or records, submission of material which is not the student's work, and conduct which interferes with the work or evaluation of other students. Instances of academic dishonesty range from inappropriate collaboration on homework (which may have relatively little effect on the course grade) to copying on examinations or similar dishonesty (which may have a direct and significant effect on the course grade). All such instances, however, are infractions of the standards of academic integrity expected of engineering students. Faculty members are to discourage academic dishonesty by: 1) emphasizing the University's and his/her own rules and expectations for student work, 2) reducing the possibility of academic dishonesty by methods of student work evaluation, and 3) initiating penalties for violation of these standards.

The basis for this policy is found in both University documents and standards of the engineering profession. Instead of providing a detailed listing of possible offenses and their penalties, indications of the ranges of action considered appropriate for three violations of varying seriousness are given. This approach leaves latitude to the University persons involved to act on the basis of the specific conditions of each case while still providing a framework for reasonable consistency of action.

1. Violations relating to homework, laboratory reports or similar work generally done outside of class may be treated with warnings and/or F's (or zeros) on the work. Because of varying practices in this area, the instructor should inform the class in advance of his/her requirements on such work. Such instances may be handled by the instructor.

2. Copying on test and examinations may receive penalties ranging from an F (or zero) on that paper to an F in the course. In such cases, the instructor should discuss the instance with the student's department chairman, to gain an independent review of the proof of dishonesty and to determine if there have been other violations by that student. After consultation, if this is the first offense, the instructor takes appropriate grade action.

3. Repeated violations or more flagrant acts (such as stealing information from the instructor's office or destroying another's paper) may receive an F in the course or suspension or dismissal (the latter options requiring action by the Dean's Office). In these cases, the instructor should refer to his/her department chair who will consult with the Dean's Office.

The following principles should be observed. The student should be informed of the charge and be given an opportunity to respond before the penalty is imposed. Penalties, consistent with the offense, are intended to be used to discourage dishonest behavior among engineering students and to encourage honest behavior in the future by the offender. The formality of the procedure increases with the severity of the penalty. The student's right of privacy of information should not be violated by the handling of the cases of academic dishonesty.
SECTION III:
Steps to Achieving Academic Success
10 Pitfalls to Academic Success

- Lack of goals
- Lack of priorities
  - Not going to class
  - Not completing assignments
  - Not being prepared for class, quizzes, and exams
- Lack of good time management skills
  - Procrastination
  - Laziness
  - Too busy – involved in too many activities
  - Distractions – video games, social media
- Poor study skills
- Test anxiety
- Lack of proper diet
- Lack of rest/sleep
- Lack of exercise
- Not seeking help/giving up
- Waiting until it is too late!!
Goals

**What is a goal?**
*An aim or objective that you wish to accomplish.*

**Developing/Accomplishing Goals**
- Prioritize your activities – how best to utilize your time
- Avoid negative goals – set goals you wish to accomplish
- Be specific
- Be realistic – do not establish impossible goals
- Develop measurable goals – will be better able to judge your success
- Challenge yourself – to motivate yourself to do better
- Establish a time frame
- Create reminders – will keep you focused
- Positive Reinforcement – will keep you on track

**Academic Goal**
**Correct:** Earning a 3.6 GPA this semester
**Incorrect:** Achieve good grades – this is neither measurable nor specific

**Evaluating Goals**
- Monitor the progress towards obtaining your goals.
- Goals can be adjusted - Rather than giving up on your goal, adjust your goal so that you can still accomplish it.
- Evaluate goals that you have accomplished – benchmarking – were your goals too easy to accomplish? Keep this in mind when establishing new goals.

**Five Key Steps to Establishing Goals**
1. Establish a goal – be specific and realistic; challenge yourself
2. Create an action plan – multiple ways to accomplish a goal
3. Break goal into easier, bite-sized goals
4. Set a target date – develop a timeline; prioritize your goals
5. Identify your motivators – why do you want to achieve the goal?; Focus on the results

Reward yourself when goal is accomplished!

Goals provide direction and structure to your life!
TIME MANAGEMENT

“The majority of college success is due to motivation and time management.”

• Carry a planner to keep track of when assignments are due & exams will occur
• Do not take on more than you can handle
• Make use of daylight hours & hours in between classes which increases efficiency
• Study before a class that requires discussion or pop quizzes – will keep material fresh in your mind
• Study after lecture classes – retention is enhanced; fill in gaps in your notes & review info just learned
• Study at the same time every day – set aside certain study hours each day which will form study habits
• Use your planner to plan out study schedules
• Study in the same place which will aid with concentration
• Plan enough time to study – adjust according to the need of each class
• Space study periods – take a break between subjects being studied; DO NOT CRAM!!
• Prioritize activities – study time, extracurricular activities, social time, etc.
• Study during your prime time – study hardest subject when you will be most alert
• Allow for flexibility in your schedule
• Analyze your use of time – keeping a log will let you see when time is being wasted
• Make a “to do” list – write it on mirror or message board daily as a constant visual reminder
Studying

When you study and where you study are as important as what you study!

1. **Read the syllabus** - understand how the professor grades and how the exams, quizzes, and homework are structured.
2. **Go to every class**
3. **Get to know your instructor** – attend office hours, ask questions, seek feedback from quizzes/tests
4. Attend review sessions (usually receive hints/suggestions)
5. Know where the resource centers are on campus – FREE tutoring
6. **Rule of thumb** – study two hours for every hour of class lecture
7. Study difficult and boring courses first (takes more energy & focus)
8. **Studying for long periods of time can actually be counterproductive.**
   a. Schedule shorter study sessions throughout the day to avoid becoming bored.
   b. Incorporate breaks if you study in long blocks of time.
9. Review quizzes, homework, and old exams
10. Create sample problems/test questions – rehearsal of information
11. Set goals for what you want to accomplish during that study session
12. Understand your body – study when you are most alert
13. Go to bed at a set time every night – establish regular sleep patterns
14. Study in a location with good lighting and temperature control
15. Create a comfortable study area, but not TOO comfortable
16. Keep your study area free of distractions such as the TV, phone, or stereo.
17. Keep your study materials clear and organized – review/rewrite right after lecture
18. Study in groups
   a. Lets you gauge your understanding of the material
   b. Helps clarify areas you do not understand
   c. Encourages the sharing of views and perspectives
   d. Share study strategies, quiz one another, share notes/quizzes

**Common Study Problems**

1. Delaying studying because you believe there will be a sufficient amount of time to study later in the week, month or class term
2. Believing there is way too much material to study and that there is not enough time to study all of it
3. Wasting time by studying improperly
4. Not spending enough time studying
5. Studying in a poor location
6. Falling asleep while studying
7. Believing that because the class is boring or unimportant, studying the materials is a waste of time
8. Believing that by studying for an exam right before you take the exam the information will be recalled easily
Test Anxiety

Test anxiety is an uneasiness or apprehension experienced before, during, or after an exam because of concern, worry, or fear. Most students experience some level of anxiety during an exam. However, when anxiety begins to affect exam performance it has become a problem.

What causes test anxiety?
- Lack of preparation
  - Cramming the night before
  - Poor time management
  - Failure to organize text information
  - Poor study habits
- Worrying about:
  - Past performance on exams
  - How friends and other peers are doing
  - The negative consequences of failure

Physical signs of anxiety
- Perspiration
- Sweaty palms
- Headache
- Upset stomach
- Rapid heart beat
- Tense muscles

Effects of Test Anxiety
- Nervousness
  - Difficulty reading and understanding the questions
  - Difficulty organizing your thoughts
  - Difficulty retrieving key works/concepts
  - Doing poorly on an exam even though you know the material
- Mental blocking
  - Going blank on questions
  - Remembering the correct answers after the exam is over

How to Reduce Test Anxiety
- Study and know the material well enough so that you can recall it
- Learn and practice good time management and avoid procrastination/laziness
- Build confidence by studying throughout the semester and avoid cramming
- Concentrate on the material you are studying by generating questions from your textbooks and notes; focusing on key words, concepts, and examples; making charts and outlines
Use relaxation techniques – you're in control!
- Don't think about fear; stay relevant

BEFORE the test:

- **Attend all of your classes**, find out what you’re expected to know and when the exams are scheduled
- Keep up with your work & homework to avoid cramming
- Become more efficient in your study habits
- Have a study schedule that makes use of wasted time
- Study in a location where you can concentrate and give it your full attention
- Make flashcards & review them
- Learn how to take good notes & review them periodically
- Make outlines and summary sheets
- Ask yourself “**What is the important information?”**
- Study in groups with motivated peers
- Take advantage of tutoring facilities
- Be prepared! Review your summary sheets, homework, old tests, etc.
- Exercise program
- Get a good night’s sleep the night before an exam
- Approach the exam with confidence – STOP critical/negative statements
  - **How to be self confident:**
    - Self talk! Encourage yourself – try writing your negative thoughts and then disputing each one with a positive statement.
    - Visualize yourself doing well and reaching your goals.
    - Don’t overplay the importance of the grade – it is NOT a reflection of your self-worth nor does it predict your future success! Remind yourself that a test is only a test
    - **Aim for an A level of understanding.**
    - Try not to compare yourself with others.
    - Become an expert in learning what is going well and what you can do to improve.
    - Reward yourself after studying.
    - Practice relaxing so that it becomes a learned response.
    - Aim for a state of relaxed concentration.
- Don’t go to the exam with an empty stomach – avoid caffeine & sugar!
- Arrive early – bring all the materials you need
- Be comfortable but alert – pick a good spot and make sure you have enough room to work
- Allow yourself plenty of time
- Relax before the exam
- Don’t try to do a last minute review
- Don’t talk about the test to other students just before it – anxiety is contagious!
  Avoid anxious classmates who are talking about the exam
DURING the test:

- Read the directions carefully to avoid careless mistakes
- Budget your test time
- Start with the easiest questions first
- Focus your attention on the test. Don’t waste time worrying about the consequences of not doing well, or wondering what others are doing
- Change positions to help you relax
- If you go blank, skip the question and go on
- Don’t panic – practice your relaxation techniques – close your eyes, take three deep breaths and then get back to the task
- If allowed, get a drink or go to the bathroom
- Essay tests:
  o Organize your thoughts in a brief outline. Start with a short summary or topical sentence and make your points – don’t ramble. Look for key words such as compare, contrast, describe, identify.
- Objective tests (T/F, MC, Fill-in):
  o Think of your own answer before looking at the choices provided. Eliminate clearly wrong answers and make an educated guess. After you have answered those you know, return to those you checked. If your time is running out, concentrate on those questions you know well and/or have the most weight. Use all the time allowed for reviewing your answers, completing ideas.
- Review your test to make sure that you have answered all questions, not mis-marked or made some other mistake
- Proofread your writing for spelling/grammar/decimal point errors
- Do NOT second-guess yourself – your first hunch is more likely to be correct!

AFTER the test:

- Reward yourself! Take in a movie, go out to eat, or visit friends
- Don’t go over the test questions with others. No matter how the test went, you can learn from the returned exam.
- When your test is returned to you – review it for future tests/finals

*If you are aware that you have a problem with test anxiety, be sure your teacher or instructor knows before any testing begins (and not the hour before!) Talk to your advisor and/or the Counseling Center as soon as possible – don’t wait until the end of a semester to seek help! The Learning Enhancement Center also offers study strategy appointments specifically for test taking and overcoming test anxiety. Students can call 419-530-2449 to make an appointment.
Healthy Living

Sleep, exercise, and diet are all interrelated and affect each other!

**Diet**

“Freshmen 15” – average amount of weight (15 lbs) a student will gain during their first year of college.

**Causes:** no regular exercise, lack of sleep, eating to cope with stress, eating at irregular intervals, eating whenever/whatever, consuming large quantities of food

**Preventative tips:** do not live on Mountain Dew and pizza!!!!!
- Try to eat at regular, set times – breakfast before class, lunch in the afternoon, dinner in -the 5-8pm range (do not eat too close to bedtime!)
- Try relaxation techniques or exercise or counseling to cope with stress
- Eat smaller, proportioned quantities
- Eat healthier foods – fruits/vegetables – less starch
- Exercise regularly or take walks on UT path several times per week (stay active!)

**Exercise**

It shouldn’t feel like a chore that must be done, but rather something fun!

**Suggestions for implementing exercise into your daily life as a college student:**
- Get together with your FIG Group and play basketball, volleyball, or run at the Rec Center!
- Take advantage of the Student Rec Center (it’s FREE as a student)
  - Intramurals
  - Aerobics, yoga, and other free classes
  - Club sports
- Walking, rollerblading, or biking to class rather than driving or taking the bus
  - UT Bike trail that runs through campus
- Find an exercise partner – motivate/encourage each other

**Sleep**

Normal amount of sleep a college student (18-24) requires is 7-8 hours per night.

**Achieving the proper amount of sleep:**
- Develop a regular sleep schedule – fluctuating your sleep time can cause problems in obtaining the proper amount of sleep needed
- Avoid “all-nighters” – staying up studying or cramming to prepare for an exam is not an effective study method. Depriving your body of sleep can cause you more problems.
- Relax before you go to sleep – reading, watching TV, listening to music
- Maintain a proper diet and exercise
- Avoid taking a shower before going to sleep as it tends to stimulate your body
- Avoid consuming caffeine or alcohol before going to sleep
- If you smoke, avoid smoking before going to bed as nicotine acts as a stimulant
- Avoid using sleeping medication which can cause dependency
- Create a relaxing atmosphere in your room (not too cold/hot – minimize noise/light)
TIPS TO REMEMBER BEFORE YOU REGISTER

1. You can register online through the myUT Portal or in person at Rocket Solution Central located in Rocket Hall.

2. Memorize your Rocket number

3. When adding a class, make sure you have obtained signatures if required. Once the semester begins, professor signatures are required if a course is closed; professor and college dean signatures are required after the online add date has closed.

4. Be mindful of PAYMENT DUE DATES!!

5. “R” in the day column of the course schedule represents Thursday.

6. If you need a parking permit, you will need to register through myUT. The charge for the parking pass will be applied to your tuition bill.

7. You can opt to take off the Student Legal fee charge if you wish.

8. Refer to department flowcharts & schedule of classes for prerequisites, credit hours, etc., prior to registering. Degree audit is also a useful tool as it helps students keep track of completed and outstanding degree requirements.

9. Full-time status is a minimum of 12 credit hours. Flat rate tuition covers 12 -18 credit hours.

10. Do not register for more courses than you can handle! (20 hours is not a good idea)

11. Make sure your schedule does not overlap anywhere when planning it.

12. Know where your classes have been scheduled (ex: which building, day, and time).

13. Plan enough time between classes to get from one side of campus to the other, as well as time for lunch, studying, etc.

14. If you have any questions at any time, please contact Chanda Raine at 419-530-8096 or chanda.raine@utoledo.edu. You can also stop by NI 3050 in person with your questions.