

TABLE OF CONTENTS

Graduate Catalog	2	Attendance	30
About the Catalog	2	Conduct Expectations	31
Academic Calendar	3	Enrollment	36
Academic Programs	5	Family Educational Rights and Privacy Act (FERPA)	39
College of Engineering	6	Grades	40
MS Engineering: Mobility Systems	6	Graduation	42
MS Engineering: Computer Engineering	7	International Students	43
MS Engineering: Electrical & Computer Engineering- Advanced Mobility	8	Student Records	44
MS Engineering: Electrical Engineering	8	Thesis	44
MS Engineering: Mechanical Engineering	9	Information Technology	45
College of Sciences and Liberal Arts	11	Library Services	46
MS in Applied Data Science and Data Analytics	11	Alumni Engagement	47
Graduate School & Research	12	Administration and Faculty	48
MS in Lean Manufacturing	12	Contact Information	52
School of Management	13	Non-Discrimination	53
Master of Business Administration	13	Graduate A-Z	53
Technical Master of Business Administration	14	Accounting (ACCT)	53
MS in Engineering Management	15	Business (BUSN)	53
MS in Operations Management	16	Computer Engineering (CE)	54
MS in Supply Chain Management	17	Communications (COMM)	56
Accelerated Masters	19	Computer Science (CS)	56
Second Master's Degree	19	Elect. & Computer Engrg (ECE)	57
Learning Outcomes	20	Electrical Engineering (EE)	57
Certificate Programs	21	Engineering (ENGR)	58
Data Analytics	21	Financial (FINC)	58
Foundation of Data Science	21	Healthcare Management	59
Global Leadership	21	Indust/Manufctrng Engrg (IME)	59
Healthcare Management	21	Information Systems (ISYS)	61
Modern Business Practices	21	Mathematics (MATH)	61
Operations Management	21	Mechanical Engineering (MECH)	61
Supply Chain and ERP	22	Lean/Manufacturing Ops (MFGO)	64
Supply Chain Management Level I	22	Management (MGMT)	65
Supply Chain Management Level II	22	Marketing (MRKT)	67
Technology Leadership	22	Supply Chain Management (SCM)	67
Course Descriptions and Numbering Schema	23	Index	69
Admissions	24		
Tuition and Fees	28		
Academic Policies and Regulations	29		
Academic Advising/Standing/Status	29		

GRADUATE CATALOG

Kettering University offers graduate programs that cater to the needs of students, young professionals and those looking for a new challenge.

- Master of Business Administration (p. 13) - On Campus and Online
- Technical Master of Business Administration (p. 14) - On Campus Only
- MS Engineering Mobility Systems (p. 6) - On Campus Only
- MS Engineering (p. 8) Electrical Engineering (p. 8) - On Campus Only
- MS Engineering (p. 7) Computer Engineering (p. 7) - On Campus Only
- MS Engineering Mechanical Engineering (p. 9) - On Campus Only
- MS (p. 15) Engineering Management (p. 15) - On Campus and Online
- MS (p. 16) Operations Management (p. 16) - On Campus and Online
- MS Applied Data Science (p. 11) and Data Analytics - On Campus and Online
- MS Engineering-ECE-Advanced Mobility (p. 8) - Online Only
- MS Lean Manufacturing (p. 12) - Online Only
- MS Supply Chain Management (p. 17) - Online Only

[Click here](#) for more information about admission requirements and deadlines.

About the Catalog

The online Kettering University catalog (Undergraduate, Graduate, Kettering University Online) reflects current academic policies, procedures, degree offerings, course descriptions, and other pertinent information. This digital version of the catalog is the official catalog of the University. The printed catalog is no longer the official catalog of the University, and in the case of any difference between the printed catalog and the online catalog, University officials will be guided by the online catalog.

The catalog should not be considered a binding contract between Kettering University and students, and the University reserves the right to make changes in curricula, degree requirements, course offerings, or academic policies at any time.

2021-2022 Academic Calendar

This calendar also exists as a downloadable .pdf file on Kettering University's Academic Calendars Webpage. **Kettering University Online does not use this calendar.**

Summer 2021

Date	Event
July 8	A-section Convocation
July 8-11	New Student Orientation
July 12	Classes Begin
July 16 (Noon)	Last Day to add or drop courses for the term
August 8	Last Day for Course Withdrawal for Partial Refund
August 23 (Noon)	Undergraduate Student Midterm Grades Due
August 29	Last Day for Undergraduate Course Withdrawal - No Refund
September 3-6	Labor Day Break (no classes)
September 19	Last Day for Graduate Course Withdrawal - No Refund
September 21	Last Day of Classes (follow Friday schedule)
September 22	Reading Day (no classes)
September 23-25	Final Exam Period
September 25	Term Ends
September 27-October 1	Grading, Assessment & Professional Development for Faculty
October 1 (Noon)	Final Grades Due From Instructors. Final grade processing for the term will be completed within 2-3 business days.

Fall 2021

Date	Event
September 30	B-section Convocation
September 30-October 3	New Student Orientation
October 4	Classes Begin
October 8 (Noon)	Last Day to Add or Drop Courses
October 31	Last Day for Course Withdrawal for Partial Refund
November 15 (Noon)	Undergraduate Student Midterm Grades Due
November 21	Last Day for Undergraduate Course Withdrawal - No Refund
November 25-26	No classes
December 12	Last Day for Graduate Course Withdrawal - No Refund
December 13-14	Last Day of Classes (follow Thursday/Friday schedule)
December 15	Reading Day (no classes)
December 16-18	Final Exam Period
December 18	Term Ends
December 20-24	Grading, Assessment & Professional Development for Faculty
January 4, 2022 (Noon)	Final Grades Due From Instructors. Final grade processing for the term will be completed within 2-3 business days.

Winter 2022

Date	Event
January 10	Classes Begin
January 14 (Noon)	Last Day to Add or Drop Courses
January 17	Dr. Martin Luther King Jr. Day - University Closed
February 6	Last Day for Course Withdrawal for Partial Refund
February 21 (Noon)	Undergraduate Student Midterm Grades Due
February 27	Last Day for Undergraduate Course Withdrawal - No Refund
March 4	No classes
March 20	Last Day for Graduate Course Withdrawal - No Refund
March 22	Last Day of Classes (follow Friday schedule)
March 23	Reading Day (no classes)
March 24-26	Final Exam Period
March 26	Term Ends

March 28-April 1	Grading, Assessment & Professional Development for Faculty
April 1 (Noon)	Final Grades Due From Instructors. Final grade processing for the term will be completed within 2-3 business days.

Spring 2022

Date	Event
April 4	Classes Begin
April 8 (Noon)	Last Day to Add or Drop Courses
May 1	Last Day for Course Withdrawal for Partial Refund
May 16 (Noon)	Undergraduate Student Midterm Grades Due
May 22	Last Day for Undergraduate Course Withdrawal - No Refund
May 30	Memorial Day - No Classes
June 12	Last Day for Graduate Course Withdrawal - No Refund
June 13	Last day of classes
June 14	Reading Day (no classes)
June 15-17	Final Exam Period
June 17	Term Ends
June 18	Commencement
June 20-24	Grading, Assessment & Professional Development for Faculty
June 24 (Noon)	Final Grades Are Due From Instructors. Final grade processing for the term will be completed within 2-3 business days.

Graduate Level Academic Programs

Kettering University's graduate programs include several Master degrees that are offered to both on and off campus students, either part-time or full-time. The Accelerated Master's option also allows Kettering University undergraduates to leverage approved courses toward a graduate degree.

Kettering University has been offering graduate programs since 1982. Each program is designed to prepare future leaders for a global workplace with 'first-class education that reflects the real world.' Many students are able to complete a program in less than two years. Our graduate programs leverage nationally-ranked faculty who are recognized for their commitment to practical education. Kettering University has long been admired by educational peers and businesses as a leader in developing top engineers and corporate managers.

Master Degree Programs and Certificates - offered both on campus and online unless otherwise noted.

Master of Business Administration (p. 13) (MBA)

Certificates:

Global Leadership (p. 21), Healthcare Management (p. 21), Operations Management (p. 21)

Supply Chain & ERP (p. 22) (Available On Campus Only)

Modern Business Practices (p. 21) (Available Online Only)

Supply Chain Management Level 1 (p. 22) (Available Online Only)

Supply Chain Management Level 2 (p. 22) (Available Online Only)

Technical Master of Business Administration (p. 14) (Available On Campus Only)

Master of Science in Applied Data Science (p. 11) and Data Analytics (MSDS)

Master of Science in Engineering (MSEN):

Computer Engineering (p. 7) (Available On Campus Only)

Electrical Engineering (p. 8) (Available On Campus Only)

Electrical & Computer Engineering-Advanced Mobility (p. 8) (Available Online Only)

Mechanical Engineering (p. 9) (Available On Campus Only)

Mobility Systems (p. 6) (Available On Campus Only)

Master of Science in Engineering Management (p. 15) (MSEM)

Certificates:

Global Leadership (p. 21), Healthcare Management (p. 21), Operations Management (p. 21)

Supply Chain & ERP (p. 22) (Available On Campus Only)

Technology Leadership (p. 21) (Available On Campus Only)

Modern Business Practices (p. 21) (Available Online Only)

Supply Chain Management Level 1 (p. 22) (Available Online Only)

Supply Chain Management Level 2 (p. 22) (Available Online Only)

Master of Science in Operations Management (MSOM)

Certificates:

Global Leadership (p. 21), Healthcare Management (p. 21), Operations Management (p. 21)

Supply Chain & ERP (p. 22) (Available On Campus Only)

Modern Business Practices (p. 21) (Available Online Only)

Supply Chain Management Level 1 (p. 22) (Available Online Only)

Supply Chain Management Level 2 (p. 22) (Available Online Only)

Master of Science in Lean Manufacturing (MSLM) - Available Online Only

Certificates:

Global Leadership (p. 21), Healthcare Management (p. 21), Modern Business Practices (p. 21), Operations Management (p. 21), Supply Chain Management Level 1 (p. 22), Supply Chain Management Level 2 (p. 22)

Master of Science in Supply Chain Management (MSSC) - Available Online Only

Certificates:

Global Leadership, Healthcare Management, Modern Business Practices (p. 21), Operations Management

College of Engineering (Graduate)

Craig J. Hoff, Ph.D., P.E.

Dean of the College of Engineering
3-105 AB, 810-762-9856
coe@kettering.edu

Graduate Programs

The Master of Science in Engineering is a set of professional masters programs that build on an undergraduate engineering program by offering additional depth and greater mastery in a number of technical areas.

- The MSE in Mobility Systems (p. 6) (formerly Automotive Systems) is intended for individuals who desire a deeper understanding and knowledge of mechanical, electrical, computer, industrial, and manufacturing systems used in mobility. Courses cover subjects such as conventional and electric propulsion systems, safety systems including connected and autonomous systems, and modern manufacturing systems. Students select courses from a structured framework in order to customize a program that best meets their individual and career needs.
- The MSE in Computer Engineering (p. 7) is a research-intensive on-campus program designed to deepen students' understanding of computer engineering and to develop their skills in independent research. Courses within the computer engineering program include digital systems design, real-time embedded systems, mobile robotics and haptic systems. This program has a thesis requirement.
- The MSE in Electrical & Computer Engineering - Advanced Mobility (p. 8) is designed for individuals who wish to acquire a deeper understanding and applied knowledge of the engineering principles of autonomous and electric mobility. In addition, the program provides an opportunity to study business, finance, and management concepts which are valuable to practicing engineers. This program is available online only.
- The MSE in Electrical Engineering (p. 8) is a research-intensive on-campus program designed for individuals who wish to deepen their understanding of electrical engineering principles and applications and to develop their skills in independent research. Students study topics such as digital systems, electric machine design, fuel cell system integration and packaging, and robot dynamics and control. This program has a thesis requirement.
- The MSE in Mechanical Engineering (p. 9) program is designed for individuals who wish to deepen their understanding of mechanical engineering principles and applications and to develop their skills in independent research. Students can study a variety of topics including fuel cells, engineering optimization, green energy conversion, and mechanics of materials. This program has a thesis option.

MS in Engineering: Mobility Systems

Home Department: Industrial and Manufacturing Engineering

Available: On Campus Only

Program Advisor/Contact:

Scott E. Grasman, Ph.D.
Room 1-700A, AB 810-762-7948
ime@kettering.edu

Program Overview

The Master of Science in Engineering is a professional master's program that builds on an undergraduate engineering program by offering additional depth and greater mastery in a number of technical areas.

Program Objectives

The **Mobility Systems** program (formerly Automotive Systems) is intended for individuals who desire a deeper understanding and knowledge of mechanical, electrical, computer, and industrial systems used in automotive vehicles and their manufacture. Courses cover subjects such as conventional and electric propulsion systems, vehicle safety systems including connected and autonomous vehicle systems, and modern automotive manufacturing systems. Students select courses from a structured framework in order to customize a program that best meets their individual and career needs.

To receive the M.S. degree a student in the graduate program must complete a minimum of 40 credit hours of graduate work. There are two options to choose from:

- Thesis Option (consists of course work, research, and a thesis)
- Non-thesis Option (consists of only course work)

Accelerated Masters (BS/MS) Program

The MSE-Mobility Systems program is eligible for the Accelerated Masters Program. Kettering University undergraduate students electing to continue their studies may apply up to 12 credits of qualifying 400-level courses completed as an undergraduate. For more information see: <http://catalog.kettering.edu/grad/programs/acceleratedmasters/> or contact the program advisor.

SAE/Kettering University Partnership

Students who have up to eight (8) Continuing Education Units (CEU) from approved SAE seminars may be eligible to transfer those CEU's into the Mobility Systems Masters program. For more information, contact the program advisor.

Program Curriculum Requirements

Completion of 40 credits as follows:

Program of Study

Code	Title	Credit Hours
Required Courses		
Mobility Principles: Students with a single undergraduate engineering major take the two "Principles" courses that are outside of their Undergraduate major. Students with dual undergraduate majors take the one "Principles" course outside of their dual major and one additional elective course.		8
ECE-601	ECE Principles for Mobility	
IME-601	IME Principles for Mobility Systems	
MECH-601	ME Principles for Mobility Systems	
ECE-610	Modeling of Dynamic Systems	4
Electives		28
Thesis Option: Select five electives from the approved lists & complete an 8 hour Thesis		

Non-Thesis Option: Select seven electives from the approved lists.

Total Credit Hours 40

Electives offered by the Department of Electrical and Computer Engineering

(Course prerequisites must be observed.)

Code	Title	Credit Hours
CE-620	Microcomputer Systems	4
CE-626	Real-Time Embedded Systems	4
CE-642	Mobile Robotics	4
CE-652	Artificial Intelligence for Autonomous Driving	4
CE-654	Computer Vision for Autonomous Driving	4
CE-672	Virtual Reality Systems: M&C	4
CE-680	Computer Networks	4
CE-684	Internet of Things (IoT)	4
EE-621	Energy Storage Sys w/ EV App	4
EE-626	Power Electronics for Vehicle Electrification	4
ECE-630	Digital Signal Processing Techniques for Automotive Engineering	4
ECE-632	Automotive Control Systems	4
ECE-642	Machine Drives for Electric Vehicles	4
ECE-648	Electromagnetic Compatibility	4

Courses Offered by the Department of Industrial and Manufacturing Engineering

(Course prerequisites must be observed.)

Code	Title	Credit Hours
IME-453	Tools for Managing the Supply Chain	4
IME-473	Design of Experiments	4
IME-603	Numerical Control Machining	4
IME-608	Industrial Robotics	4
IME-622	Simulation	4
IME-652	Designing Value in the Supply Chain	4
IME-662	Ergonomics	4
IME-663	Safety & Human Factors	4
IME-671	Quality Assurance	4
IME-672	Reliability & Maintainability	4
IME-676	Lean Six Sigma	4
IME-680	Computer Integrated Manufacturing	4

Electives Offered by the Department of Mechanical Engineering

(Course prerequisites must be observed.)

Code	Title	Credit Hours
MECH-426	Fuel Cell Science and Engineering	4
MECH-440	Introduction to Internal Combustion Engines	4
MECH-442	Chassis Systems	4
MECH-446	Vehicle Systems Dynamics	4
MECH-451	Vehicular Crash Dynamics and Accident Reconstruction	4
MECH-613	Nonlinear Finite Element Analysis	4
MECH-615	Engineering Optimization	4
MECH-641	Advanced Auto Power Systems	4
MECH-643	Noise, Vibration & Harshness	4
MECH-644	Introduction to Automotive Powertrains	4
MECH-645	Hybrid Electric Vehicle Propulsion	4
MECH-646	Advanced Vehicle Dynamics	4
MECH-647	Combustion & Emissions	4
MECH-650	Automotive Bioengineering: Occupant Protection and Safety	4

Internships

(With approval of a faculty advisor)

Code	Title	Credit Hours
ENGR-693	Internship in Engineering	4

MS in Engineering: Computer Engineering

Home Department: Electrical and Computer Engineering

Available: On Campus Only

Program Advisor/Contact:

Xuan Zhou, Ph.D. (xzhou@kettering.edu)
 xzhou@kettering.edu
 810-762-7900

Program Overview

The Master of Science in Engineering is a professional master's program that builds on an undergraduate engineering program by offering additional depth and greater mastery in a number of technical areas.

Program Objectives

All graduates of the Master of Science in Engineering program will:

- Deepen their knowledge and increase their mastery of technical areas that match their personal career goals.
- Be better prepared to advance in positions of technical and/or managerial leadership.
- Develop their ability to sustain a life-long career in engineering, through continuing self-directed learning and professional development activities.

The MSE-Computer Engineering program is a research-intensive on-campus program designed for individuals who wish to deepen their

understanding of computer engineering principles and applications and to develop their skills in independent research.

Graduate Assistantship

Financial support, in the form of a tuition waiver or stipend, is available on a competitive basis. Students who receive a stipend are required to serve as a Research Assistant (RA), Teaching Assistant (TA), or a Staff Assistant (SA) for up to 20 hours per week (depending on the level of financial support offered). For more information on graduate funding, please contact the Graduate School at gsm@kettering.edu.

Program Curriculum Requirements

Completion of 40 credits as follows:

Code	Title	Credit Hours
Select four of the following:		16
CE-612	Digital Systems Design	
CE-620	Microcomputer Systems	
CE-622	Computer Architecture and Organization	
CE-624	VLSI Design	
CE-626	Real-Time Embedded Systems	
CE-642	Mobile Robotics	
CE-652	Artificial Intelligence for Autonomous Driving	
CE-654	Computer Vision for Autonomous Driving	
CE-672	Virtual Reality Systems: M&C	
CE-680	Computer Networks	
CE-684	Internet of Things (IoT)	
CE-691	Computer Engineering Special Topics	
CE-699	Computer Engineering Independent Study	
Two 500-600 graduate level elective courses		8
CE-695	Graduate Research in Computer Engineering	8
CE-695	Graduate Research in Computer Engineering	8
Completion and successful defense of a master's thesis		
Total Credit Hours		40

Undergraduate level coursework might also be required for some students as a prerequisite for either graduate-level coursework or research, depending on the student's background and the nature of the coursework or research. If required, undergraduate-level credit cannot be used to satisfy the graduate-level credit requirements given above.

The program operates on a calendar similar to a conventional quarter system: Fall, Winter, and Spring terms are 'regular' academic terms during which students normally enroll full-time, and the Summer term is optional. The nominal pace of student calls for a total of six terms of study over 21 months.

First Year	Fall	8 credits coursework
First Year	Winter	8 credits coursework
First Year	Spring	8 credits coursework

	Summer	
Second Year	Fall	8 credits coursework
Second Year	Winter	8 credits coursework
Second Year	Spring	Thesis defense and submission

Many variations of this plan are possible. In particular, students may begin the program in any term, not just Fall, and may elect to register for coursework or research during Summer. Students may not, however, register for more than eight credits in a term.

MS in Engineering: Electrical & Computer Engineering-Advanced Mobility

This program is available through Kettering University Online.

Kettering University is shaping the future of automotive engineering and advanced mobility with a groundbreaking online program: the MS Engineering-ECE-Advanced Mobility. The first of its kind, this cutting-edge advanced engineering degree equips graduates with the technical expertise to play an integral role in the development of electric and autonomous vehicles, mobile robotics and other dynamic systems. This program is specifically designed to meet growing demands within the automotive and advanced mobility industry, and it focuses on systems essential to the future of transportation, such as:

- **Integration of electrical and computer systems** for autonomous vehicles and other advanced mobility applications
- **Development of advanced mobility applications** for electric, hybrid and autonomous vehicles, transportation systems, artificial intelligence and robotics as it applies to mobility
- **Design of dynamic systems** that work to enhance and support autonomous functionality
- **Robotics** enhanced by artificial intelligence

Code	Title	Credit Hours
CE-642	Mobile Robotics	4
CE-652	Artificial Intelligence for Autonomous Driving	4
ECE-610	Modeling of Dynamic Systems	4
ECE-630	Digital Signal Processing Techniques for Automotive Engineering	4
ECE-632	Automotive Control Systems	4
ECE-642	Machine Drives for Electric Vehicles	4
EE-626	Power Electronics for Vehicle Electrification	4
Management Elective		4
Free Electives		8
Total Credit Hours		40

MS in Engineering: Electrical Engineering

Home Department: Electrical and Computer Engineering

Available: On Campus Only

Program Advisor/Contact:

Xuan Zhou, Ph.D. (xzhou@kettering.edu)
xzhou@kettering.edu
810-762-7900

Program Overview

The Master of Science in Engineering is a professional master's program that builds on an undergraduate engineering program by offering additional depth and greater mastery in a number of technical areas.

Program Objectives

All graduates of the Master of Science in Engineering program will:

- Deepen their knowledge and increase their mastery of technical areas that match their personal career goals.
- Be better prepared to advance in positions of technical and/or managerial leadership.
- Develop their ability to sustain a life-long career in engineering, through continuing self-directed learning and professional development activities.

The MSE-Electrical Engineering program is a research-intensive on-campus program designed for individuals who wish to deepen their understanding of electrical engineering principles and applications and to develop their skills in independent research.

Graduate Assistantship

Financial support, in the form of a tuition waiver or stipend, is available on a competitive basis. Students who receive a stipend are required to serve as a Research Assistant (RA), Teaching Assistant (TA), or a Staff Assistant (SA) for up to 20 hours per week (depending on the level of financial support offered). For more information on graduate funding, please contact the Graduate School at gsr@kettering.edu.

Program Curriculum Requirements

Completion of 40 credits as follows:

Code	Title	Credit Hours
ECE-610	Modeling of Dynamic Systems	4
Select three of the following:		12
CE-612	Digital Systems Design	
CE-624	VLSI Design	
ECE-630	Digital Signal Processing Techniques for Automotive Engineering	
ECE-642	Machine Drives for Electric Vehicles	
ECE-648	Electromagnetic Compatibility	
EE-621	Energy Storage Sys w/ EV App	
EE-626	Power Electronics for Vehicle Electrification	
EE-633	Digital Control Systems	
EE-682	Robot Dynamics and Control	
EE-691	Graduate Special Topics in EE	
EE-699	Graduate Level Independent Study in Electrical Engineering	
Any TWO graduate level elective courses		8

EE-695	Graduate Research in Electrical Engineering	8
EE-695	Graduate Research in Electrical Engineering	8
Completion and successful defense of a master's thesis		
Total Credit Hours		40

Undergraduate-level coursework might also be required for some students as a prerequisite for either graduate-level coursework or research, depending on the student's background and the nature of the coursework or research. If required, undergraduate-level credit cannot be used to satisfy the graduate-level credit requirements given above.

The program operates on a calendar similar to a conventional quarter system: Fall, Winter, and Spring terms are "regular" academic terms during which students normally enroll full-time, and the Summer term is optional. The nominal plan of study calls for a total of six terms of study over 21 months:

First Year	Fall	8 credits coursework
First Year	Winter	8 credits coursework
First Year	Spring	8 credits coursework
	Summer	
Second Year	Fall	8 credits coursework
Second Year	Winter	8 credits coursework
Second Year	Spring	Thesis defense and submission

Many variations of this plan are possible. In particular, students may begin the program in any term, not just Fall, and may elect to register for coursework or research during Summer. Students may not, however, register for more than eight credits in a term.

MS in Engineering: Mechanical Engineering

Home Department: Mechanical Engineering

Available: On Campus Only

Program Advisor/Contact:

Dr. Bassem Ramadan
Room 2-103 MC, 810-762-7992
me@kettering.edu (bramadan@kettering.edu)

Program Overview

The Master of Science in Engineering is a professional master's program that builds on an undergraduate engineering program by offering additional depth and greater mastery in a number of technical areas.

Program Objectives

The MSE-Mechanical Engineering program is intended for individuals who desire a deeper understanding and knowledge of mechanical engineering as applied to various systems. Students select courses from a structured framework in order to customize a program that best meets their individual and career needs.

To receive the M.S. degree a student in the ME graduate program must complete 40 credit hours of graduate work. There are two plans to choose from:

- Plan A (consists of course work, research, and a thesis)
- Plan B (consists of only course work)

The student will receive a Master's degree upon completion of ten (10) courses within the program. This program has a thesis option.

MECH-6XX or Two 600 Level Technical Electives	8
Thesis	8

MSE-Mechanical Engineering Program Curriculum Requirements

Completion of 40 credits as follows:

Program of Study

Code	Title	Credit Hours
Required Courses		
MECH-600	Engineering Mathematics with Applications	4
Select up to four Mechanical Engineering courses from the 400 level course list **		16
Select at least five Mechanical Engineering courses from the 600 level course list (Or three courses and Thesis) **		20
** Course prerequisites must be observed.		
Total Credit Hours		40

400 Level Course Electives

(Course prerequisites must be observed.)

Code	Title	Credit Hours
MECH-416	Introduction to Finite Element Analysis with Structural Applications	4
MECH-426	Fuel Cell Science and Engineering	4
MECH-427	Energy and the Environment	4
MECH-428	Bio and Renewable Energy	4
MECH-4XX or Two 400 Level Technical Electives		8

600 Level Course Electives

(Course prerequisites must be observed.)

Code	Title	Credit Hours
MECH-610	Mechanics of Materials I: Linear Elasticity	4
MECH-611	Mechanics of Material II: Nonlinear Elastic-Plastic Behavior	4
MECH-615	Engineering Optimization	4
MECH-621	Applied Transport Phenomena	4
MECH-626	Hydrogen Generation, Storage and Safety	4
MECH-627	Green Energy Conversion	4
MECH-645	Hybrid Electric Vehicle Propulsion	4
MECH-647	Combustion & Emissions	4
MECH-682	Mechanics and Design Simulation of Fiber-Reinforced Composite Materials	4

College of Sciences and Liberal Arts

Kathryn Svinarich, Ph.D.

Dean of the College of Sciences and Liberal Arts
 cs1a@kettering.edu

Graduate Program

Master of Science in Applied Data Science and Data Analytics (p. 11)

MS in Applied Data Science and Data Analytics

Home Department: Computer Science

This program is also available through Kettering University Online.

Availability of unprecedented amounts of data and emerging scalable technologies are changing the way we make decisions. Data Science and Data Analytics are the study of collecting, maintaining, processing and communicating intelligent insights about complex data and applying these insights to various endeavors ranging from healthcare to marketing. The professional Master of Science in Applied Data Science and Data Analytics program is a multi-disciplinary program designed to create tomorrow's leading applied data scientists and analysts.

MS in Applied Data Science and Data Analytics is an interdisciplinary program which is a fusion of statistical and computing technologies with business and engineering applications. Technology courses include data mining, machine learning, cloud computing, and data visualization. Application courses include managerial sciences, supply chain management, and enterprise resource planning with future applications possible. Students will have the option to work with faculty on a research project, on an internship with one of our co-op partners, or a capstone project in applied data science and analytics.

The program also features a Special Topics course to address the ever changing current issues and techniques in Data Science and Data Analytics. Potential Special Topics courses include data science applications in Advanced Mobility, Security and Privacy in Data Science and Deep Learning.

Code	Title	Credit Hours
COMM-601	Communicating about Data	4
CS-641	Foundations of Data Science	4
CS-665	Information Retrieval and Data Mining	4
CS-682	Machine Learning	4
MATH-650	Statistical Methods for Data Science	4
MGMT-623	Data Analytics	4
Select at least one of the following:		4
CS-601	Programming Methods for Data Science	
CS-651	Cloud Computing: Architecture & Applications	
CS-661	Database Systems	
CS-691	Data Science Special Topics	
Select no more than two of the following:		8 or 4
IME-654	Enterprise Resource Planning	

MGMT-625	Digital Strategy and Competitive Advantage	
MGMT-629	Management Science	
SCM-610	Foundations Supply Chain Management	
Select one of the following (CS-695 must be elected twice, and CS-693 may be selected twice):		4 or 8
CS-690	Data Science Capstone Project	
CS-693	Internship in Data Science	
CS-695	Thesis in Data Science	
<i>Credit Hours Subtotal:</i>		40
Total Credit Hours		40

First Term	COMM-601, CS-641, MATH-650
Second Term	CS-651, CS-665, MGMT-623
Third Term (Spring Co-op/Research Term)	CS-693 or CS-695
Fourth Term (Summer Co-op/Research Term)	CS-693 or CS-695
Fifth Term	MGMT-625, CS-682
Sixth Term (Only needed for students not selecting CS-693 or CS-695)	SCM-610, CS-690

Graduate School & Research

Scott W. Reeve, Ph.D.

Dean of the Graduate School & Sponsored Research
4-945 CC, 810-762-9711, gsr@kettering.edu

Kettering University Graduate Learning Outcomes

In keeping with its mission, core values, and goals, Kettering University strives to ensure that graduates of its graduate degree programs achieve the following Graduate Learning Outcomes:

- **Communication** – demonstrate effective communication to a diverse range of professional audiences
- **Research and analytical skills** – demonstrate the ability to collect and synthesize information in ways consistent with the highest professional standards
- **Ethics** – develop a framework that recognizes and chooses ethical courses of action
- **Leadership and teamwork** – exhibit professional integrity, ethical leadership, and effective collaboration skills
- **Global perspective** – contribute to a sustainable world as informed by a global perspective
- **Entrepreneurial Mindset** – possess the skills necessary for creative and innovative problem-solving, awareness of customer needs, and opportunity recognition

MS in Lean Manufacturing

This program is available through Kettering University Online.

The Only Program of Its Kind – Developed in Partnership with G.M.

Kettering University's Online Master of Science in Lean Manufacturing emphasizes engineering and practical application of theory and is the only program of its kind. What better place to learn modern manufacturing process knowledge and Lean Six Sigma skills than the university that taught the brightest minds in automotive manufacturing? Kettering University Online's Lean Manufacturing degree was developed in collaboration with General Motors to provide the skills needed to improve quality output, streamline processes and reduce waste.

The curriculum for the Lean Management program involves 10 courses totaling 40 credit hours including:

- Seven core courses for 28 credits, plus
- Three certificate courses for 12 credits

Code	Title	Credit Hours
MFGO-601	Globally Integrated Manufacturing Company	4
MFGO-619	Six Sigma for Manufacturing	4
MFGO-633	Lean Production Systems	4
MFGO-635	Work Analysis for Lean Production Application	4
MFGO-639	Quality Assurance and Reliability	4
MFGO-649	Metrics for Lean Production Improvement	4

MFGO-659	Integrative Capstone Project	4
<i>Credit Hours Subtotal:</i>		28

Certificate options are Global Leadership, Healthcare Management, Operations Management, Supply Chain Management Level I & Level II and Modern Business Practices.

School of Management

The School of Management is home to the Department of Business. The programs offered by the School develop business leaders through management education. The School of Management offers an undergraduate degree in management and a variety of Master's programs including Master of Science in Operations Management, Master of Science in Engineering Management, Master of Science in Supply Chain Management, Master of Business Administration and Technical Master of Business Administration.

GRADUATE PROGRAMS

Master of Business Administration (p. 13)

Kettering University's Master of Business Administration (MBA) program provides students with an educational experience that enables graduates to perform as effective management professionals and leaders in modern organizations. This program is offered online and on campus.

Technical Master of Business Administration

The Technical Master of Business Administration (TECH MBA) provides graduates of STEM undergraduate degree programs with a stimulating on-campus educational experience that is at the intersection of contemporary business and cutting edge technical fields. The STEM-designated program prepares graduates who can be ambidextrous with business and technology in leading organizations, both as technology experts and digital value creators while competing in an economy characterized by disruptive innovations and digital reinvention & reconfiguration. This program is offered on campus only.

Master of Science in Engineering Management (p. 15)

The Master of Science Engineering Management (MSEM) program blends education in traditional business topics with technical coursework in engineering. This program is offered online and on campus.

Master of Science in Operations Management (p. 16)

The Master of Science in Operations Management (MSOM) program focuses on the management skills, knowledge, and attitudes required to lead organizations that create goods and services. This program is offered online and on campus.

Master of Science in Supply Chain Management

The Master of Science Supply Chain Management program positions graduates for career advancement and leadership opportunities within the import and export, manufacturing and transport, and logistics management industries. This program is offered online only.

MAKE YOUR MARK ON YOUR WORLD

Master of Business Administration (MBA)

Home Department: School of Management

Program Advisor/Contact:

School of Management
810-762-9630
som@kettering.edu

Program Overview

Kettering University's Master of Business Administration (MBA) program provides students with an educational experience that enables graduates to perform as effective management professionals and leaders in modern organizations. Students may start this program in any term. This program does not have a thesis option.

The Accelerated Masters Program (Bachelor/Master) option is available to qualified students irrespective of their intent to complete the graduate degree taking courses on-campus or Kettering University Online. Kettering University Accelerated Masters (BS/MS-BS/MBA) Program rules apply.

In addition to the seven core courses, students complete one of the approved certificates, each of which comprises three graduate level business courses. The MBA is offered both online and on campus.

Program Curriculum Requirements

The Curriculum for the MBA involves 10 courses totaling 40 credit hours including:

- Seven core course for 28 credits, plus
- Three concentration or certificate courses for 12 credits.

Prerequisites

A foundational level of knowledge in critical areas is required prior to beginning the Master of Business Administration (MBA) program. This foundation helps to ensure that students are prepared to fully engage and succeed in the coursework associated with graduate programs in management. Students must have an undergraduate course in each of the following areas, complete MGMT-510 Foundations of Business, or test out of individual prerequisite courses through self-directed study.

Areas of prerequisite knowledge:

Code	Title	Credit Hours
	Economics	
	Managerial Accounting	
	Statistics	
	Management	
	Marketing	

Required Courses

Code	Title	Credit Hours
Required Courses ¹		
ACCT-639	Managerial Accounting	4
FINC-619	Financial Management	4

MGMT-639 or BUSN-689	Managing People & Organization Organizational Behavior	4
MRKT-679	Marketing Management	4
MGMT-665	Strategic Management	4
Choose One		4
BUSN-659	International Business	
MGMT-679	Leadership	
MGMT-619	Project Management	
BUSN-779 or MGMT-693	MBA Capstone: Innovation & New Ventures Internship in Management	4
Total Credit Hours		28

Concentration & Certificates

Code	Title	Credit Hours
General Concentration		
(This is a Concentration only.)		
Select three 600-level electives from ISYS, IME, MFGO, or MGMT		12
<i>Credit Hours Subtotal:</i>		12
Global Leadership Certificate		
BUSN-689	Organizational Behavior	4
MGMT-649	Ethics and Leadership	4
MGMT-679	Leadership	4
<i>Credit Hours Subtotal:</i>		12
Supply Chain & ERP Certificate (Available on Campus Only)		
IME-652	Designing Value in the Supply Chain	4
IME-654	Enterprise Resource Planning	4
MGMT-669	Supply Chain Operations	4
<i>Credit Hours Subtotal:</i>		12
Operations Management Certificate		
MGMT-661 or IME-676	Operations Management in Service Organizations Lean Six Sigma	4
MGMT-609	Technology Management	4
MGMT-619	Project Management	4
<i>Credit Hours Subtotal:</i>		12
Healthcare Management Certificate (Available Online Only)		
IME-656	Engineering for Healthcare Systems	4
IME-676 or MGMT-669	Lean Six Sigma Supply Chain Operations	4
HMGT-609	Healthcare Management	4
<i>Credit Hours Subtotal:</i>		12
Supply Chain Management Level 1 Certificate (Available Online Only)		
SCM-610	Foundations Supply Chain Management	4
SCM-611	Collaboration Supply Chain Management	4
SCM-612	Customer Relationship Management	4
<i>Credit Hours Subtotal:</i>		12

Supply Chain Management Level 2 Certificate (Available Online Only)		
SCM-613	Supply Chain Logistics	4
SCM-614	Procurement and Risk Management	4
SCM-615	Supply Chain Planning	4
<i>Credit Hours Subtotal:</i>		12
Modern Business Practices Certificate (Available Online Only)		
MGMT-620	Business Communication and Presentation	4
MGMT-621	Diversity, Equity, and Inclusion in the Workplace	4
MGMT-622	Organized Labor and Management Relations	4
<i>Credit Hours Subtotal:</i>		12

¹ MGMT-693 is only available to on campus students.

TECH Master of Business Administration

Home Department: School of Management

Program Advisor/Contact:

School of Management
810-762-9630
som@kettering.edu

Program Overview

Kettering University's Technical Master of Business Administration (TECH MBA) provides graduates of STEM undergraduate degree programs with a stimulating on-campus educational experience that is at the intersection of contemporary business and cutting edge technical fields. The STEM-designated program prepares graduates who can be ambidextrous with business and technology in leading organizations both as technology experts and digital value creators while competing in an economy characterized by disruptive innovations and digital reinvention & reconfiguration.

The seated 40-credit TECH MBA programs contain seven (28 credits hours) core business courses with an additional three graduate elective courses (12 credits hours) in a specific **technical** emphasis area among the options listed below.

- Data Analytics and Big Data
- Advanced Mobility
- New Energy and Sustainability
- Materials Science and Engineering
- Advanced Manufacturing
- Systems Engineering
- Logistics & Supply Chain Management

Students may select a management internship course as part of the core program and may start the program in any term. Elective course selections in technical emphasis areas must be approved by the Department Head of the department where the course is offered, the

Advisor in the School of Management, and the Dean of the Graduate School.

Prerequisites

A foundational level of knowledge in critical areas is required prior to beginning the TECH Master of Business Administration program. This foundation helps to ensure that students are prepared to fully engage and succeed in the coursework associated with graduate programs in management. Students must have an undergraduate course in each of the following areas, complete MGMT-510 Foundations of Business, or test out of individual prerequisite courses through self-directed study.

Areas of prerequisite knowledge:

Economics, Managerial Accounting, Statistics, Management, Marketing

Required Courses

Code	Title	Credit Hours
ACCT-639	Managerial Accounting	4
FINC-619	Financial Management	4
MGMT-639	Managing People & Organization	4
or BUSN-689	Organizational Behavior	
MRKT-679	Marketing Management	4
MGMT-665	Strategic Management	4
Choose One		4
BUSN-659	International Business	
MGMT-679	Leadership	
MGMT-619	Project Management	
BUSN-779	MBA Capstone: Innovation & New Ventures	4
or MGMT-693	Internship in Management	
<i>Credit Hours Subtotal:</i>		28

Technical Emphasis Areas

Code	Title	Credit Hours
Data Analytics & Big Data		12
Choose Three		
COMM-601	Communicating about Data	4
CS-601	Programming Methods for Data Science	4
CS-641	Foundations of Data Science	4
CS-651	Cloud Computing: Architecture & Applications	4
CS-661	Database Systems	4
CS-665	Information Retrieval and Data Mining	4
CS-682	Machine Learning	4
MGMT-623	Data Analytics	4
MGMT-624	Data Visualization	4
MGMT-625	Digital Strategy and Competitive Advantage	4
MATH-627	Probability and Stochastic Modeling	4
Advanced Mobility		12
Choose Three		
CE-642	Mobile Robotics	4

CE-652	Artificial Intelligence for Autonomous Driving	4
CE-654	Computer Vision for Autonomous Driving	4
ECE-610	Modeling of Dynamic Systems	4
ECE-630	Digital Signal Processing Techniques for Automotive Engineering	4
ECE-632	Automotive Control Systems	4
ECE-642	Machine Drives for Electric Vehicles	4
New Energy & Sustainability		12
MECH-426	Fuel Cell Science and Engineering	4
MECH-427	Energy and the Environment	4
MECH-428	Bio and Renewable Energy	4
Material Science & Engineering		12
MECH-416	Introduction to Finite Element Analysis with Structural Applications	4
MECH-482	Mechanics and Design Simulation of Fiber-Reinforced Composite Materials	4
MECH-610	Mechanics of Materials I: Linear Elasticity	4
Advanced Manufacturing		12
Choose Three		
IME-601	IME Principles for Mobility Systems	4
IME-603	Numerical Control Machining	4
IME-608	Industrial Robotics	4
IME-622	Simulation	4
IME-662	Ergonomics	4
IME-663	Safety & Human Factors	4
IME-665	Human-Computer Interaction and Interface Design	4
Systems Engineering		12
CS-601	Programming Methods for Data Science	4
ECE-610	Modeling of Dynamic Systems	4
IME-601	IME Principles for Mobility Systems	4
Logistics/Supply Chain Management		12
Choose Three		
IME-652	Designing Value in the Supply Chain	4
IME-654	Enterprise Resource Planning	4
IME-676	Lean Six Sigma	4
MGMT-669	Supply Chain Operations	4

MS in Engineering Management

Home Department: School of Management (p. 13)

Program Academic Advisor/Contact:

School of Management
810-762-9630
som@kettering.edu

Program Overview

The Master of Science Engineering Management program combines individuals' professional engineering knowledge with education in the topics necessary to effectively manage in the modern business

environment. Enrollment is limited to graduates of ABET accredited engineering programs or Kettering University graduates with majors other than management or business. Five certificate options are embedded in the Engineering Management degree program.

Prerequisites

A foundational level of knowledge in critical areas is required prior to beginning the Master of Science in Engineering Management (MSEM) program. This foundation helps to ensure that students are prepared to fully engage and succeed in the coursework associated with graduate programs in management. Students must have an undergraduate course in each of the following areas, complete MGMT-510 Foundations of Business, or test out of individual prerequisite courses through self-directed study.

Areas of prerequisite knowledge:

Code	Title	Credit Hours
Economics		
	Managerial Accounting	
Statistics		
Management		
Marketing		

Program Curriculum Requirements

The curriculum for the Engineering Management program involves 10 courses totaling 40 credit hours including:

- Seven core courses for 28 credits, plus
- Three certificate courses for 12 credits.

Required Core Courses

Code	Title	Credit Hours
Required Core Courses ^{1,2,3}		
BUSN-659	International Business	4
FINC-619	Financial Management	4
IME-564	Ethics and Practice of Engineering	4
ISYS-669	Enterprise Information System Models	4
MGMT-639	Managing People & Organization	4
MGMT-659	Strategy (Capstone)	4
or MGMT-693	Internship in Management	
MRKT-679	Marketing Management	4
Total Credit Hours		28

Certificates

Code	Title	Credit Hours
Global Leadership ⁴		
BUSN-689	Organizational Behavior	4
MGMT-649	Ethics and Leadership	4
MGMT-679	Leadership	4
<i>Credit Hours Subtotal:</i>		12
Operations Management		
MGMT-661	Operations Management in Service Organizations	4

or IME-676	Lean Six Sigma	
MGMT-609	Technology Management	4
MGMT-619	Project Management	4
<i>Credit Hours Subtotal:</i>		12
Supply Chain & ERP		
IME-652	Designing Value in the Supply Chain	4
IME-654	Enterprise Resource Planning	4
MGMT-669	Supply Chain Operations	4
<i>Credit Hours Subtotal:</i>		12
Technology Leadership		
Students select three 600 level courses from CE, CS, ECE, EE, IME, or MECH.		12
<i>Credit Hours Subtotal:</i>		12
Healthcare Management		
IME-656	Engineering for Healthcare Systems	4
IME-676	Lean Six Sigma	4
or MGMT-669	Supply Chain Operations	
HMG-609	Healthcare Management	4
<i>Credit Hours Subtotal:</i>		12

- ¹ Study Abroad credits cannot be applied to this core courses set.
- ² Students admitted to the Accelerated Masters program can count up to three (3) 400*/500-level courses taken as an undergraduate. *400 level courses must be part of an approved 400/600 course offering.
- ³ MGMT-693 is only available to on campus students.
- ⁴ Students affiliated with the SACM program are not allowed to enroll in this certificate.

The degree also has a study-abroad option that allows students to experience German culture and receive up to 16 credits of graduate course work.

MS in Operations Management

Home Department: Sch (p. 13)ool of Management

Program Advisor/Contact:

School of Management
810-762-9630
som@kettering.edu

Program Overview

The Master of Science in Operations Management (MSOM) program focuses on the management skills, knowledge, and attitudes required to lead organizations that create goods and services. Students in this program will gain expertise in general business management areas, as well as a firm understanding of methods and practices in modern operations management. Students currently in this program possess a wide variety of backgrounds and undergraduate degrees. The School of Management designed this program for people who currently are in — or desire to enter — a management position within a manufacturing or services company. This program does not require a thesis. Four certificate options are embedded in the MS in Operations Management degree program.

Program Curriculum Requirements

The curriculum for the Operations Management program involves 10 courses totaling 40 credit hours including:

- Seven core courses for 28 credits, plus
- Three certificate courses for 12 credits.

Prerequisites

A foundational level of knowledge in critical areas is required prior to beginning the Master of Science in Operations Management (MSOM) program. This foundation helps to ensure that students are prepared to fully engage and succeed in the coursework associated with graduate programs in management. Students must have an undergraduate course in each of the following areas, complete MGMT-510 Foundations of Business, or test out of individual prerequisite courses through self-directed study.

Areas of prerequisite knowledge:

Code	Title	Credit Hours
	Economics	
	Managerial Accounting	
	Statistics	
	Management	
	Marketing	

Required Core Courses

Code	Title	Credit Hours
Required Core Courses ¹		
FINC-619	Financial Management	4
ISYS-669	Enterprise Information System Models	4
MGMT-629	Management Science	4
MGMT-639	Managing People & Organization	4
MGMT-659	Strategy	4
or MGMT-693	Internship in Management	
MGMT-661	Operations Management in Service Organizations	4
MRKT-679	Marketing Management	4
Certificate		
Select three (3) 4-credit courses in one of the certificate areas listed. ²		12
Total Credit Hours		40

Certificates

Code	Title	Credit Hours
Global Leadership ³		
BUSN-689	Organizational Behavior	4
MGMT-649	Ethics and Leadership	4
MGMT-679	Leadership	4
<i>Credit Hours Subtotal:</i>		12
Operations Management		
MGMT-661	Operations Management in Service Organizations	4

or IME-676	Lean Six Sigma	
MGMT-609	Technology Management	4
MGMT-619	Project Management	4
<i>Credit Hours Subtotal:</i>		12
Supply Chain and ERP		
IME-652	Designing Value in the Supply Chain	4
IME-654	Enterprise Resource Planning	4
MGMT-669	Supply Chain Operations	4
<i>Credit Hours Subtotal:</i>		12
Healthcare Management		
IME-656	Engineering for Healthcare Systems	4
IME-676	Lean Six Sigma	4
or MGMT-669	Supply Chain Operations	
HMG-609	Healthcare Management	4
<i>Credit Hours Subtotal:</i>		12

¹ MGMT-693 is only available to on campus students.

² Students admitted to the Accelerated Masters program can count up to three (3) 400*/500-level courses taken as an undergraduate. *400 level courses must be part of an approved 400/600 course offering.

³ Students affiliated with the SACM program are not allowed to enroll in this certificate.

MS in Supply Chain Management

Home Department: School of Management (p. 13)

Program Advisor/Contact:

This program is available through Kettering University Online.

Program Overview:

The online Master of Science in Supply Chain Management degree positions graduates for career advancement and leadership opportunities within the import and export, manufacturing and transport, and logistics management industries.

Program Curriculum Requirements

The curriculum for the Supply Chain Management program involves 10 courses totaling 40 credit hours including:

- Seven core courses for 28 credits, plus
- Three certificate courses for 12 credits

Required Courses

Code	Title	Credit Hours
FINC-619	Financial Management	4
SCM-610	Foundations Supply Chain Management	4
SCM-611	Collaboration Supply Chain Management	4
SCM-612	Customer Relationship Management	4
SCM-613	Supply Chain Logistics	4
SCM-614	Procurement and Risk Management	4

SCM-615	Supply Chain Planning	4
Total Credit Hours		28

Certificates

Code	Title	Credit Hours
Global Leadership		
BUSN-689	Organizational Behavior	4
MGMT-649	Ethics and Leadership	4
MGMT-679	Leadership	4
<i>Credit Hours Subtotal:</i>		12
Healthcare Management		
IME-656	Engineering for Healthcare Systems	4
IME-676	Lean Six Sigma	4
or MGMT-669	Supply Chain Operations	
HMGT-609	Healthcare Management	4
<i>Credit Hours Subtotal:</i>		12
Operations Management		
MGMT-661	Operations Management in Service Organizations	4
or IME-676	Lean Six Sigma	
MGMT-609	Technology Management	4
MGMT-619	Project Management	4
<i>Credit Hours Subtotal:</i>		12
Modern Business Practices		
MGMT-620	Business Communication and Presentation	4
MGMT-621	Diversity, Equity, and Inclusion in the Workplace	4
MGMT-622	Organized Labor and Management Relations	4
<i>Credit Hours Subtotal:</i>		12

Accelerated Masters

Accelerated Masters Option

This option is available to Kettering University undergraduate students entering any Kettering University graduate program, either residential or online.

Kettering University undergraduate students interested in graduate study may elect to apply to the Accelerated Masters Option which provides students an opportunity to accelerate the process and complete a baccalaureate degree while earning credit towards a graduate degree. This program is only available to Kettering University undergraduate students and leverages Kettering University's premier academic programs. Students who are admitted into the Accelerated Masters Option will complete the same total number of Co-op work terms as conventional undergraduate students.

- Students can apply before graduating (after completing 120 undergraduate credit hours) or within four (4) years of obtaining their baccalaureate degree.
- The student completes the baccalaureate degree, with the traditional undergraduate thesis (BS), and receives the degree at the conventional time.
- Up to 12 credits, of 400*or 500 level courses completed as an undergraduate, and for which a grade of B or better was earned, are also applied to the graduate degree. (Undergraduate capstone courses are not eligible.) (***400 level courses must be part of an approved 400/600 course offering.**)
- 28 credits remain to complete the graduate degree (total of 40 credits).

Grade Requirements for Admission to Accelerated Masters Option

A minimum GPA of 3.0 is required. Students with a GPA below 3.0 may be considered on an individual basis. The degree granting department will determine acceptance.

Other Requirements

- Both part-time and full-time students may qualify for this program.
- This program is only available to students who will receive (or have received) a Kettering University bachelor's degree.

For more information, please contact the Graduate School at gsr@kettering.edu.

Second Master's Degree

Pursuing a Second Master's Degree

Graduates of Kettering University's MS and MBA programs are encouraged to pursue a second master's degree subject to the following policies.

- Students pursue a single master's degree at a time. Students desiring a second master's degree must complete the application.
- To earn a second master's degree, students must complete all degree requirements for the degree. In so doing, students must complete additional credit hours equal to a minimum of 40% of the second degree's requirements:
 - For MBA (or MS) graduates pursuing a 10 course MS degree – minimum of four additional courses (16 credits).
 - For MS graduates pursuing a 10 course MBA degree – minimum of four additional courses (16 credits).
 - For students interested in pursuing an MS in Mobility Systems or Mechanical Engineering as the 2nd degree, students must:
 - Meet ALL requirements for the program. The minimum amount of additional graduate work to meet these requirements is 24 credit hours (for those students who choose the graduate thesis option - four courses plus eight hours of graduate thesis). Students who do not elect the graduate thesis option will need to complete an additional 28 credit hours.
 - MECH-600 (4 credits) is required for both engineering graduate programs. However students only need to complete it once. For example, if MECH-600 was completed during the first Masters degree program, students are not required to take it again as part of the second graduate degree program.
 - Two graduate level courses (8 credits) from the first Masters degree can be applied to the second Masters degree program assuming the courses are eligible core or elective graduate program courses. A third graduate level course from the first graduate degree program may also be applied provided that A) the student elects to pursue a Masters thesis option in the second Masters degree program and B) the third course is also an appropriate core or elective course in the second Masters degree program.
- In order to gain maximum advantage from prior course work, graduates must apply for their second master's degree within three years of graduating from their first-degree program. The admission committee will review applications beyond the three-year time limit to establish the relevancy of their course work. Students in this case may be required to complete more than 40% of the second degree's requirements.
- Students may request to transfer in a maximum of eight credits to Kettering University for use in their graduate studies. Pursuit of a second master's degree does not raise this limit. Transfer credit is only considered for courses with a grade of B or better.
- Students must successfully complete all prescribed courses within the six (6) year limit. A student who anticipates not meeting the time limit must notify the Graduate Office at least six (6) months prior to the expiration of the six (6) year limit.

Learning Outcomes

Graduate Learning Outcomes

- **Communication** – demonstrate effective communication to a diverse range of professional audiences
- **Research and analytical skills** – demonstrate the ability to collect and synthesize information in ways consistent with the highest professional standards
- **Ethics** – develop a framework that recognizes and chooses ethical courses of action
- **Leadership and teamwork** – exhibit professional integrity, ethical leadership, and effective collaboration skills
- **Global perspective** – contribute to a sustainable world as informed by a global perspective
- **Entrepreneurial Mindset** – possess the skills necessary for creative and innovative problem-solving, awareness of customer needs, and opportunity recognition

Certificate Programs

Kettering University has designed a set of graduate certificate programs for students that want to update their skill set in a new area of study. For students who do not have a graduate degree in hand, a graduate certificate can be the beginning of work toward a master's degree. For students who already hold a master's degree, a certificate program can provide graduate level education in an additional area of concentration.

Certificate Programs

- **Data Analytics**
 - Curriculum (p. 21)
- **Foundation of Data Science**
 - Curriculum (p. 21)
- **Global Leadership**
 - Curriculum (p. 21)
- **Healthcare Management**
 - Curriculum (p. 21)
- **Operations Management**
 - Curriculum (p. 21)
- **Supply Chain and ERP**
 - Curriculum (p. 22)
- **Supply Chain Management Level I**
 - Curriculum (p. 22)
- **Supply Chain Management Level II**
 - Curriculum (p. 22)
- **Modern Business Practices**
 - Curriculum (p. 21)
- **Technology Leadership**
 - Curriculum (p. 22)

Students must meet admission requirements for a graduate program to be accepted to the graduate certificate.

Prerequisite requirements must be met for the courses in a certificate program or must be waived by the offering department. If prerequisites are waived for the certificate program and the student decides to pursue a complete graduate degree, there may be prerequisites required for a complete program admission.

Graduate tuition will be paid for graduate certificate programs. Students may take classes online or on-campus as available.

Data Analytics

Code	Title	Credit Hours
CS-601	Programming Methods for Data Science	4
MGMT-623	Data Analytics	4
Select one of the following		4
MGMT-624	Data Visualization	
MGMT-625	Digital Strategy and Competitive Advantage	

Foundation of Data Science

Code	Title	Credit Hours
MATH-650	Statistical Methods for Data Science	4
Select one of the following		
COMM-601 or CS-601	Communicating about Data Programming Methods for Data Science	4
CS-641	Foundations of Data Science	4

Global Leadership

School of Management

Admissions basis: MBA/MSOM/MSEM/MSLM

Code	Title	Credit Hours
BUSN-689	Organizational Behavior	
MGMT-649	Ethics and Leadership	
MGMT-679	Leadership	

Healthcare Management

School of Management

Admissions basis: MBA/MSOM/MSEM/MSLM

This Certificate is available online only.

Total Required Credits: 12

Code	Title	Credit Hours
HMGMT-609	Healthcare Management	4
IME-656	Engineering for Healthcare Systems	4
IME-676 or MGMT-669	Lean Six Sigma Supply Chain Operations	4

Modern Business Practices

School of Management

This Certificate is available online only.

Code	Title	Credit Hours
MGMT-620	Business Communication and Presentation	4
MGMT-621	Diversity, Equity, and Inclusion in the Workplace	4
MGMT-622	Organized Labor and Management Relations	4
<i>Credit Hours Subtotal:</i>		12

Operations Management

School of Management

Admissions basis: MBA /MSOM/MSEM/MSLM

Code	Title	Credit Hours
MGMT-661	Operations Management in Service Organizations ¹	4
MGMT-609	Technology Management	4
MGMT-619	Project Management	4

¹ MS-Operations Management students take IME-676, MGMT-609 and MGMT-619 to complete the Operations Management Certificate.

Supply Chain and ERP

School of Management

Admissions basis: MBA/TECH MBA/MSOM/MSEM

This Supply Chain and ERP certificate, which is available only to on-campus graduate students, provides students with foundational knowledge in Supply Chain Management that extends the coverage of the core courses in the MBA, MSOM and MSEM programs.

Code	Title	Credit Hours
IME-652	Designing Value in the Supply Chain	4
IME-654	Enterprise Resource Planning	4
MGMT-669	Supply Chain Operations	4

Supply Chain Management Level I

School of Management

This Certificate is available online only.

Code	Title	Credit Hours
SCM-610	Foundations Supply Chain Management	4
SCM-611	Collaboration Supply Chain Management	4
SCM-612	Customer Relationship Management	4
<i>Credit Hours Subtotal:</i>		12

Supply Chain Management Level II

School of Management

This Certificate is available online only.

Code	Title	Credit Hours
SCM-613	Supply Chain Logistics	4
SCM-614	Procurement and Risk Management	4
SCM-615	Supply Chain Planning	4
<i>Credit Hours Subtotal:</i>		12

Technology Leadership

The Technology Leadership Certificate is intended to provide additional technical focus for students in the Master of Science in Engineering Management program. This program is limited to on-campus students and to graduates of Kettering University enrolled as a BS/MS. This

certificate is not available for online students. In order to complete this certificate, students select three 500 or 600 level courses from Computer Engineering (CE), Computer Science (CS), Electrical and Computer Engineering (ECE), Electrical Engineering (EE), Industrial and Manufacturing Engineering (IME), or Mechanical Engineering (MECH).

Code	Title	Credit Hours
	500 or 600 level technical elective	4
	500 or 600 level technical elective	4
	500 or 600 level technical elective	4
<i>Credit Hours Subtotal:</i>		12

Course Descriptions & Numbering

The catalog menu item **Courses A-Z** has all Kettering's courses listed with their descriptions for all university courses; the descriptions appear in alphabetical order according to their course letter designations. These descriptions include any prerequisites (requirements student must satisfy before registering for the course), corequisites (requirements students must satisfy while taking the course), the number of credit hours applied for each course, and, where relevant, the hours devoted to lecture, recitation, and laboratory (see applicable department sections for the total credits required for each major or program).

The course numbers **591 and 691** shall be used to describe special topics courses. Special topics courses are one-time offerings whose content is determined by current faculty interest. These courses may be repeated for credit when the course is run with different content.

The course numbers **597 and 697** shall be used to admit credit for transfer or guest courses that are not equivalent to existing Kettering courses within a discipline. These course numbers are not used for study abroad transfer credit.

The course numbers **598 and 698** shall be used to describe transfer courses taken as part of a Kettering University International Studies Program.

The course numbers **599 and 699** shall be used to describe an independent study course. Independent study is student-directed exploration with faculty guidance at an advanced level. This course may be repeated for credit when the course is run with different content.

Graduate Admissions

To be admitted into Kettering University as a Graduate Student, a prospective student must select a graduate degree or certificate program, fulfill all specific admission requirements as laid out for each program, complete an online application, and arrange for official transcripts from all universities/colleges previously attended, additional documentation, and/or test scores to be sent directly to Kettering University, either electronically or by mail.

Admission into a graduate program is only offered after all parts of an application have been received, and have been appropriately evaluated. Incomplete applications will not be reviewed. Once evaluated, applicants will be notified of the admission decision. If granted program admission, the student may then proceed to subsequent steps necessary to register for classes and matriculate. In addition to meeting published degree requirements of University degree programs, students with limited undergraduate backgrounds may be required to correct such deficiencies by completing courses which serve as prerequisites to graduate work. Students will be notified of these prerequisites at time of admission. Kettering does not discriminate on the basis of race, color, national origin, age, marital status, sex, sexual orientation including gender identity or expression, disability, religion, height, weight, genetic information, or veteran status.

The Kettering University Graduate School has multiple start dates each year and applications may be submitted at any time. Program start dates will be determined based on date of acceptance and program availability. Start dates may not be available every term.

Admission Requirements

Application

Complete Kettering University's application for On-Campus Graduate Students.

Grade Point Average

A Bachelor degree from a regionally accredited U.S. university/college, or its international equivalent, is required for acceptance into a graduate program. Admission generally requires an individual to possess a minimum undergraduate overall grade point averages of 3.0 on a 4.0 Grading System, or international equivalent. Applicants with a lower grade point average may be admitted based on other outstanding credentials (work history, for example).

Transcripts

All students applying for admission must have official undergraduate transcripts sent directly to Kettering University from accredited U.S. colleges/universities or international equivalents. Only transcripts received by Kettering University directly from undergraduate institutions will be considered official, either by postal mail or electronic delivery. International students may also be asked to submit English-language translations and/or a professional credential evaluation. In the case of a professional credential evaluation, the evaluating body must be a member of the National Association of Credential Evaluation Services (NACES). Costs of credential evaluations and translations are the responsibility of the applicant. Kettering University undergraduate students do not need to submit their Kettering transcripts, but are required to submit transcripts from any other university attended.

Letters of Recommendation

Two letters of recommendation are required for all on-campus degree program applications. Certificate programs do not require letters of recommendation. Letters should be submitted within the online application, or by email or mail:

graduateadmissions@kettering.edu (admissions@kettering.edu)

Admissions Office
Kettering University
1700 University Avenue
Flint, MI 48504-6214

Resume/CV

A resume/CV is a mandatory part of the application. Resumes should be submitted within the online application, or by email or mail. Certificate programs do not require a resume/CV.

Notification of Admission

Applicants will be notified by email of the Admissions Committee's decision. Once Kettering University has received your application and all supporting documents, please allow approximately four weeks for processing, evaluation, and delivery of notification.

On-Campus Graduate Programs

The following Master Degree programs are available on-campus at Kettering University:

Master of Business Administration (MBA)

Tech MBA

Master of Applied Data Science and Data Analytics

Master of Science in Engineering (MSE) – Computer Engineering

Master of Science in Engineering (MSE) - Electrical Engineering

Master of Science in Engineering (MSE) - Mechanical Engineering

Master of Science in Engineering (MSE) - Mobility Systems

Master of Science in Engineering Management (MSEM) - with Certificates

Master of Science in Operations Management (MSOM) - with Certificates

Technology Leadership Certificate

Additional application requirements by degree program

MBA, Tech MBA, MSEM and MSOM Applicants

Students entering these programs must have specific prerequisite undergraduate courses completed, with a passing grade of "C" or better. Applicants without this background may complete the required prerequisite foundational course at Kettering University. Contact the Kettering School of Management with questions about prerequisite requirements and foundational courses at som@kettering.edu.

MS in Engineering Management (MSEM) Applicants

MSEM applicants must have a Bachelor of Science degree in Engineering from an approved ABET-accredited engineering or computing program, or international equivalent. Engineering Technology degrees will not be considered for the MSEM program. All Kettering University graduates are eligible except those with degrees in management or business.

Master of Science in Engineering (MSE) Applicants (Computer Engineering, Electrical Engineering, Mechanical Engineering, Mobility Systems)

MS in Engineering (MSE) applicants must submit official transcripts of their Bachelor's degree in an engineering discipline from an ABET-accredited program, or international equivalent. Engineering Technology degrees will not be considered for the Engineering programs.

The GRE General Section is also required for applicants to the MS in Engineering programs. This GRE requirement will be waived for students with an undergraduate degree from Kettering University, or for applicants with particularly strong education and/or work histories who request consideration without a GRE. Test scores should be sent directly to the Kettering University Admissions Office using Kettering University's institution code: 1246. If asked to choose a department code, please choose the one that best fits your intended program. GRE scores more than five years old are not valid.

International Applicants

In addition to the above criteria, applicants that are not U.S. citizens or Permanent Residents of the United States may be required to provide the below documentation.

Professional Credential Evaluation and/or English-language Translations

A course-by-course professional credential evaluation of undergraduate transcripts *may* be requested from students who obtained their Bachelor's degree outside of the United States. Kettering accepts evaluations from companies recognized by the National Association of Credential Evaluating Services (NACES). Kettering University will only evaluate transcripts in English. All fees for credential evaluation and/or English-language translation are the responsibility of the applicant. Additionally, a university grading scale may be requested to facilitate grade point average conversion and application review.

Copy of First Page of Passport

All applicants should provide a copy of the prospective student's passport, sent to:

graduateadmissions@kettering.edu (admissions@kettering.edu)

Admissions Office
Kettering University
1700 University Avenue
Flint, MI 48504-6214

English Language Proficiency

Applicants from non-English language speaking countries may be *conditionally* admitted based on academic merit with the understanding that English proficiency standards must be met before full matriculation into a degree-seeking program. To demonstrate English-language proficiency, students should submit at least one of the following test results: TOEFL iBT (Test of English as a Foreign Language) or TOEFL Essentials (Kettering's code is 1246), International English Language

Testing System (IELTS), MELAB/MET, or Duolingo. International students may have testing waived if they have earned a Bachelor's degree from an accredited U.S. institution. International applicants *may* have testing waived if they have attended an accredited U.S. college or university for one calendar year or two academic semesters with a minimum 3.00 grade point average. Students may also demonstrate competency in Kettering University's ESL Program or by completing an ESL program offered by an approved ELS center.

Statement of Financial Support for On Campus Programs

International student applicants must document their ability to meet all educational expenses for the first year of study before Kettering University can issue a Certificate of Visa Eligibility (Form I-20). Evidence may include a statement from a legitimate financial institution reflecting the minimum dollar amount detailed in the Affidavit of Financial Support. Medical insurance, including repatriation and evacuation coverage, is required for all international students and must be purchased through Kettering University. Students also need to provide the completed Affidavit of Financial Support.

Mail information to:

graduateadmissions@kettering.edu (admissions@kettering.edu)

Admissions Office
Kettering University
1700 University Avenue
Flint, MI 48504-6214

Immigration Information: F-1 Student Visa Applicants

Admitted international students will receive an I-20 form with their official letter of admission. All international students are required to present the I-20 when applying for a student visa and again at their port of entry into the United States. Applicants enrolled at another U.S. institution with a student visa must complete Kettering's Transfer-In form and be released from the Student & Exchange Visitor Program (SEVIS) by their current institution before Kettering University can issue a new I-20 form.

Scholarship

Upon admission into an on-campus graduate degree program, the Office of the Dean of Graduate School and Sponsored Research *may* offer scholarship aid. In these cases, a scholarship award will be included in the offer of admission. Scholarships are awarded based on the academic merit of the application.

Graduate Assistantship for On Campus Programs

The Kettering University Graduate Assistantship (GA) program was established to meet the following goals:

- Develop strong bonds between graduate students and faculty
- Support the research enterprise and instructional mission
- Prepare graduate students for productive careers
- Provide financial support for graduate students

Graduate Assistants are assigned to work with an individual faculty member performing duties such as grading, assisting in a faculty member's teaching/research lab, or supporting a student technical team.

In addition, all GAs are required to participate in and complete training modules offered by the Graduate School as part of the appointment.

To be eligible for the GA program, students must be currently admitted and in good academic standing or have accepted admission to an on-campus graduate program. GA appointments are competitively awarded subject to the availability of program funding.

Interested students should contact the Graduate School at gsm@kettering.edu for more information.

Financial Aid

Some financial aid programs may exist for graduate students. Students who wish to apply for financial aid should contact the Financial Aid Office for more information at: 800-955-4464 ext. 7859 or finaid@kettering.edu.

Financial Aid Eligibility

- Must be at least half-time or more to be considered for aid
- Certificate courses are not eligible for aid - the cost of a non-degree certificate course is not included in the Cost of Attendance when determining a financial aid package
- Students who receive tuition assistance or reimbursement from their employer should contact their financial aid advisor or email finaid@kettering.edu
- International students do not qualify for U.S. federal financial aid

Cost of Attendance (COA)

- COA values are based on assumed enrollment for the academic year.

Federal Direct Loan (for U.S. Citizens and Permanent Residents)

Federal Direct Unsubsidized Loans This loan is available to students through the government's loan program. This loan has a fixed interest rate and can be deferred while the student is enrolled at least half-time. An origination fee is deducted from the approved loan amount before disbursement. This fee is determined each year and is subject to change. Repayment on these loans begins six months after graduation or when the student ceases to be enrolled at least half-time. These loans have a 10-year repayment plan.

Federal Direct PLUS Loans This loan is available to a graduate or professional student enrolled at least half-time in a program leading to a graduate or professional degree. A credit check will be performed during the application process. The maximum PLUS loan you can borrow is the cost of attendance (determined by the school) minus any other financial assistance you receive.

In order to qualify for the Direct Loan, students must first complete the FAFSA (Free Application for Federal Student Aid) and submit all requested documents to the Financial Aid Office.

Private Student Loan Programs Private student loans offered by various lenders are another source of financing your educational costs. These loans are based on credit approval, and interest begins accruing upon disbursement of the loan. Each loan has different terms, borrowing limits, interest rates, and other special criteria. Additional information about private loans can be found on this website.

Graduate Satisfactory Academic Progress (SAP)

In order to receive Student Financial Aid under the programs authorized by Title IV of the Higher Education Act, as amended, a student must maintain satisfactory academic progress in the course of study that he/she is pursuing.

Minimum standard requirements:

- **Qualitative Measure (Cumulative GPA):** Graduate students must maintain a minimum cumulative GPA of 3.0.
- **Maximum time frame for degree completion:** For degree completion, students who exceed 150% of the normal period to complete their academic programs are not eligible for additional Title IV assistance for the period that is in excess of 150% of the academic period normally required to complete the program of study.
- **Credits Attempted** are defined as all classes for which a student received a passing grade ("D" or better), or an "F", "FN", "W", "WN" or "I"
- **Repeated courses** count as credits attempted during each term the student is enrolled in the course; however, they will be counted only once as credits completed the first time a passing grade is received for the course.

Financial Aid Warning

Graduate students will be evaluated at the end of each academic term to determine if the student is meeting the standards described above. Graduate students who fail to meet the minimum 3.0 cumulative grade point average standard will be placed on Financial Aid Warning for the subsequent semester/period of enrollment. Financial aid can be received during the semester/term of warning. Financial aid disbursement for the next period of enrollment will be held until grades have been reviewed for the warning semester/period of enrollment of Financial Aid Warning; he/she must successfully complete the term without any failures, incompletes, or withdrawals.

Financial Aid Suspension

The Financial Aid Office will review the records of students who are on financial aid warning at the end of the term that are placed on warning. If the student is still not meeting the minimum cumulative grade point average (3.0), the student will forfeit eligibility for all federal and institutional financial aid programs.

Financial aid will be suspended until the student successfully meets the cumulative grade point average standards. The student is responsible for paying his/her own expenses, such as tuition, books, etc. and will not be reimbursed for the period(s) of financial aid suspension.

Right to Appeal

Students have the right to appeal any decision of ineligibility to continue to receive financial assistance unless they have previously been granted an appeal. Appeals must be filed within 30 days of notification that aid eligibility has been lost. An appeal should be based upon some unusual situation or condition which prevented the student from passing courses, or which necessitated withdrawal from classes. Examples of possible situations include documented serious illness, severe injury, or death of a family member.

Withdrawing from Courses

Financial Aid is based on the number of credits for which students are enrolled at the end of the refund period. Students are encouraged to meet with a financial aid advisor before making withdrawal decisions.

Withdrawing from Kettering

For financial aid purposes, there are two types of withdrawals: complete and unofficial.

- Complete: Official withdrawal from the university by the student
- Unofficial: Federal financial aid regulations consider a student to be an unofficial withdrawal if the student receives all fail (F) grades or a combination of all fail (F) and withdraw (W) grades for the term.

Student Fails to Earn a Passing Grade in any Class

Never Attended: If a student receives a grade of F due to not attending class, Federal Title IV aid will be adjusted for those classes never attended.

Why do we monitor students receiving all 'F' grades?

The University is obligated by federal regulation to review aid recipients receiving all 'F' grades. The assumption behind the law is that a student receiving all 'F' grades walked away from the semester without properly withdrawing from the University. Schools must identify students with 'F' grades within 30 days from the date final grades are posted.

Tuition and Fees

Expenses

The current tuition and business related fees are listed below. The Student Accounts Office will send an email notification to your Kettering email when your tuition bill is ready to view via KU.ePay in Banner Self Service.

KU.ePay is the university's online billing and payment service, which provides our students the ability to view and pay their student account bill online, 24 hours/day, seven days a week. Students may authorize others to access their KU.ePay account and make payments on their behalf.

With KU.ePay, students and authorized users are able to:

- Review their student account activity.
- View and print billing statements.
- Make payment on their student account, including a single payment or sign up for a payment plan.
- View and print form 1098-T.

Payments may be made via an ACH transaction from a bank account or credit card. International payments may be made through KU.ePay, and will be processed as a bank wire. Please visit KU.ePay for more information. Payment in the form of a check, money order, or cashier's check may be sent directly to the Student Accounts Office.

Any account not paid in full by the first day of class is subject to a \$40 late fee and a financial hold.

Tuition for the 2021-22 Academic Year

On Campus Graduate Tuition (per credit hour) \$959

Business Related Fees

NSF ACH/Check Processing Fee	\$25
Graduate Late Payment Fee	\$40
Graduate Credit by Proficiency Exam Fee	\$30
Graduate Transfer or Credit Posting Fee (per credit hour)	\$5
Graduate Graduation Fee	\$160
Graduate Enrollment Deposit	\$350

When registered for courses, students acknowledge enrollment in the course(s) and authorizes Kettering University to bill for any related tuition and fees. Payment is due by the first day of class. A financial hold and late fee will be assessed on the account for those students who have not paid their tuition or submitted an employee tuition assistance voucher from their employer—this 'hold' prohibits future course registrations and may cause course cancellations and will result in grades and transcripts being withheld.

Employer Assistance

Many employers provide financial assistance for graduate study. Programs differ, so interested students should contact the appropriate office at their place of employment. Depending on company policy, Kettering University may be able to bill the employer directly for tuition. Students whose tuition is to be billed to their employers must submit complete and proper authorization from the employer to Kettering University Student Accounts Office via fax 810-762-9603 or email

studentaccounts@kettering.edu. Students should apply for their employer tuition assistance as soon as possible – since costs and course offerings are known in advance. **Any portion of tuition that will not be paid by the employer must be paid by the student.** Kettering University will hold the student responsible for payments not received from the employer.

Tuition Refund Policy for On Campus Programs

Course withdrawals and associated refunds are initiated by completing a Graduate Program Course Withdrawal Form and submitting it the Office of the Registrar for processing. The date the form is received in the Office of the Registrar determines the refund amount. Students are personally responsible for submitting the forms and verifying their receipt by the University. Refunds are made to the payer of the tuition. Click here for a calendar of specific refund dates for each term.

When a student withdraws from a course, refunds are made on the following schedule:

Week 1	100%
Week 2	75%
Week 3	50%
Week 4	25%
Week 5	0%

NOTE: Kettering University Online (KUO) has a different Refund Schedule.

Refund rates are calculated through Sunday of each week.

Any questions related to the tuition and fees should be directed to the Student Accounts Office at 800-955-4464 ext. 9552 or studentaccounts@kettering.edu.

VA Education Benefits

Kettering University will permit any covered individual to attend or participate in the course of education during the period beginning on the date on which the individual provides to the educational institution a certificate of eligibility for entitlement to educational assistance under chapter 31 or 33 (a "certificate of eligibility" can also include a "Statement of Benefits" obtained from the Department of Veterans Affairs' (VA) website – eBenefits, or a VAF 28-1905 form for chapter 31 authorization purposes) and ending on the earlier of the following dates:

1. The date on which payment from VA is made to the institution.
2. 90 days after the date the institution certified tuition and fees following the receipt of the certificate of eligibility.

Kettering University will not impose any penalty, including the assessment of late fees, the denial of access to classes, libraries, or other institutional facilities, or the requirement that a student borrow additional funds because of the student's inability to meet their financial obligations to the institution due to the delayed disbursement of a payment to be provided under chapter 31 or 33.

Academic Policies and Regulations

All faculty and students are urged to review and understand the University's Academic Policies and Regulations. This section is intended as a convenient reference for faculty, staff and students. It also serves as a description of the student's academic rights and responsibilities and as a guarantee of equitable treatment for all students. Some sections may reference other sections of the catalog, when necessary. Each section also concludes with the name of the official or office to contact with questions.

Academic Advising/Standing/Status

Academic Advising

Academic advising represents a shared relationship between the student and his/her academic advisor and a process of continuous improvement, clarification and evaluation with the aim of assisting the student in achieving his/her goals. Each academic department has established its own system for facilitating advising processes as well as a representative academic program. In addition to following the representative program, students are encouraged to communicate regularly with an academic advisor to discuss academic matters, to determine progress toward degree completion, and to ensure that prerequisites have been satisfied and other departmental requirements have been met.

Questions: Contact the degree/program department

Academic Standing Conditional Continuance

Conditional continuance is a temporary status, which allows students to demonstrate their readiness for graduate work. A graduate student who has been granted conditional continuance is granted full admission, however, they will not be eligible for a Graduate Assistantship until after they have completed their first two courses with a 3.0 or better. Failure to complete the first two courses with a grade point of 3.0 or better may result in dismissal from the program.

The criteria for conditional continuance is uniquely determined by the Graduate Admission Committee, and in some cases collateral work may be required from the applicant to confirm their readiness for a specific program.

Probation

A graduate student whose cumulative grade point average falls below a 3.0 is automatically placed on academic probation. Probationary status is removed only when a graduate student's cumulative GPA equals or exceeds the minimum of 3.0 required to earn a Master's degree.

A graduate student who remains on probation after completing 12 credit hours since being placed on probation may be dismissed from the program. A probationary student whose cumulative GPA falls below 2.5 will automatically be dismissed from the graduate program. Such dismissals may be appealed to the Graduate Council. Advisement regarding the appeal process to return after academic dismissal is provided through the Graduate School.

Appeal Process to Return after Academic Dismissal

After the academic dismissal process, students may appeal to the Graduate Academic Review Committee for readmission by submitting a

letter of appeal to the Graduate Council via the Graduate School one term prior to the term in which they are seeking re-admittance.

This letter of appeal for re-admittance must state the cause(s) of the student's academic problems, changes in the student's situation that may rectify those problems and a proposed plan of action to ensure success in the Graduate School. Students are readmitted on a probationary status for one term.

Decisions of the Graduate Council are final.

Questions: Contact the Graduate School at gsr@kettering.edu

Disability Services

Kettering University provides disability services in compliance with the American with Disabilities Act (1990) and its amendments, along with state and local regulations regarding students, employees, and applicants with disabilities. Under these laws, no qualified individual with a disability shall be denied access to participation in services, programs, and/or activities at Kettering University. In carrying out Kettering's policy regarding disabled students, employees and applicants, we recognize mobility, sensory, medical, psychological, and learning disabilities. We attempt to provide reasonable accommodations for these disabilities for all students who meet the criteria described in the Americans with Disabilities Act.

Any Kettering student who has been diagnosed with a physical, medical, psychological, or learning disability, or suspects that he/she may have one, must contact the Wellness Center. The staff will evaluate the required documentation in support of the claim of disability and make an assessment of a student's needs on a case-by-case basis. The Wellness Center will then determine the appropriate services and accommodations necessary to meet the legal requirements as required by law. The Center will inform faculty and staff who may be responsible for providing the services and/or accommodations. Each term, students must meet with each professor to arrange individual accommodations.

Prospective students in the admissions process should contact the Wellness Center as soon as possible to discuss appropriate documentation needed to verify a disability and to identify the type of services, accommodations, and adaptive equipment that may be necessary.

Testing Assistance

The Academic Success Center provides an alternative testing space for students requiring ADA accommodations. These accommodations may include extended test time, individual testing space, readers/scribes, or other accommodations as needed. Any student seeking accommodations for testing must first meet with the Wellness Center to determine and approve all necessary accommodations. This must be done at the beginning of every academic term.

Active Status

Students are expected to enroll in their first class within a year of their acceptance term. Students who do not enroll within that year will have their enrollment status changed to Inactive. As a consequence, the student may need to reapply to the degree program.

Students may also have their status changed to Inactive if there is a lapse in course enrollment for more than two years. If inactivated, the student will need to contact the registrar's office to apply for readmission to the degree program.

Readmission to Kettering University

Students who were academically eligible to continue when they became inactive or withdrew may request readmission by contacting the Office of the Registrar.

Questions: Contact the Office of the Registrar

Attendance

Last Known Date of Attendance Reporting:

Kettering University does not require faculty to take attendance. The U.S. Department of Education requires the Financial Aid Office to differentiate students who fail a class because they quit attending from those who fail a class based on merit. Because a student could be a financial aid applicant at any point during the academic year, this information must be collected on all students, so that financial aid eligibility can be accurately determined.

The Last Known Date of Attendance Reporting Policy is necessary to appropriately assess the financial liability for students, ensure good stewardship of financial aid funds, and limit the financial liability for the university and academic consequences for the student. The amount of funds earned by a student is based on the amount of time spent in attendance by the student for that term. In addition, this information is often useful in arbitrating cases when students believe they completed the process to drop or withdraw from a course.

After the drop/add period each term, a 'last date of attendance' notification, or 'never attended' notification by a faculty member will result in the automatic assignment of either a WN (withdrawal for non-attendance) grade or an FN (failure for non-attendance) grade by the Registrar's Office. This initiates re-evaluation of a student's financial aid and it will be adjusted for those classes.

Student Responsibility

Students are expected to attend all the sessions of the classes in which they are enrolled. Students who stop attending classes should immediately withdraw from those course(s) prior to the course withdrawal deadline specified on the academic calendar. Students who do not officially withdraw from a course they are not attending may be reported by their instructor as having a last date of attendance. When this happens, the student will remain responsible for any financial liability, less applicable refunds they have incurred associated with the last date of attendance reported, and for any academic consequences associated with the last date of attendance reported and the assignment of the WN or FN grade.

School Responsibility

After the drop/add period each term, a last date of attendance reporting by a faculty member will result in that automatic assignment of either a grade of WN (withdrawal for non-attendance) or FN (failure for non-attendance) by the Registrar's Office as follows:

- A grade of WN (withdrawal for non-attendance) is issued if the last known date of attendance is within the course withdrawal period specified on the academic calendar. A WN grade is treated the same as a W (withdrawal) grade in that it will not affect a student's term or overall GPA.
- A grade of FN (failure for non-attendance) is issued if the last known date of attendance is after the course withdrawal period specified on the academic calendar. An FN grade is treated the same as a failing grade in that it will be included in a student's term and overall GPA.
- Once a faculty member has reported a last date of attendance, the student will no longer be able to attend or participate in the class.

Class Attendance Policy Related to Required Military Duty or Veteran Status

Questions on whether an activity is a required military service activity for purposes of this policy should be directed to the Associate Provost. If anticipated absences for a term appear to be extraordinarily numerous or difficult to accommodate, a faculty member may appeal the need for the full accommodation to the Associate Provost.

Absences due to military duty or veteran status must be excused. This includes, but is not limited to, the following:

- Mandatory monthly drill instruction, such as duty completed by national guard members and military reservists (typically this involves a one-day absence in order to extend weekend training).
- Service-related medical appointments where failure to appear might result in a loss of benefits.

Students must give written notice to the faculty member at least one week in advance of the absence unless last-minute schedule changes make this notice impossible. Students are strongly encouraged to inform each faculty member of their known and anticipated absences as far in advance as possible, preferably at the start of the term.

The faculty shall afford students the opportunity to independently make up coursework or work of equal value, for the day(s) the event was scheduled and to take a scheduled exam at an alternate time. The faculty member shall determine alternate exam times and due dates for missed course work. These assigned dates may be prior to the date of the absence.

Students are still responsible for demonstrating achievement of course learning goals, even when absences due to military duty are necessary and reasonable. In situations with many absences or extended periods of military duty (e.g. being called to active duty), it may be most appropriate for the student to withdraw and retake the course in a future term.

Conduct Expectations

Student Conduct

E-mail: Notification/Obligation to Read

All students have the privilege of having a Kettering University Google Apps e-mail account. The Kettering e-mail account is the official way Kettering University faculty and staff communicate to students. Students are responsible for required actions conveyed to them through this communication vehicle, **whether or not they read the message**.

Kettering provides each student with unlimited e-mail server storage. Therefore, we strongly recommend that students do not auto forward to another e-mail service provider which may have less storage capacity, fewer features, and may hinder you to reply directly to the original email source.

Due to the proliferation of spam and phishing emails, be advised that you may receive emails that may request personal information such as usernames and passwords. Although it may look authentic, pretending to originate from a legitimate source such as Kettering, do not respond. Immediately delete it recognizing that a legitimate source such as the Kettering IT department would never ask you to provide information such as passwords. Be cautious regarding any unsolicited email as it may contain elements that would prove to be detrimental to your computer.

Questions: Contact Information Technology

Ethics in the University

The mission of Kettering University rests on the premise of intellectual honesty; in the classroom, the laboratory, the office, and at the examination desk. The very search for knowledge is impaired without a prevailing ethic of honor and integrity in all scholarly, professional, and personal activities. The principles of honor and integrity make it possible for society to place trust in the degrees we confer, the research we produce, the scholarship we present and disseminate, and the critical assessments we make of the performance of students. In order to achieve our goals of preserving, disseminating, and advancing knowledge, Kettering University expects all members of the community to be open to new ideas, to be governed by truthfulness, and to be considerate of the rights of others. We strive to foster these values in all our endeavors and will employ all possible means to discourage dishonest behavior in any form. We hold students accountable for their choices and actions through the Code of Student Conduct, administered by the Vice President of Student Affairs & Dean of Students.

Academic Integrity

We believe fairness, openness, and intellectual honesty to be the keystones of our educational mission. We foster these qualities in all our endeavors and use all possible means to discourage dishonesty, in any form. All members of the Kettering community should report academic dishonesty to the appropriate faculty person, as well as to the Vice President of Student Affairs & Dean of Students. Academic dishonesty prohibited at Kettering includes, but is not limited to, the following forms:

- **Cheating**
Intentionally using or attempting to use unauthorized materials, information, or study aids in any academic exercise.
- **Fabrication**
Intentional and/or unauthorized falsification or invention of any information or citation in an academic exercise.
- **Facilitating Academic Dishonesty**

Intentionally or knowingly helping or attempting to help another to engage in academic dishonesty in any form.

- **Plagiarism**

Intentionally or knowingly representing the words, ideas, or images of another as one's own in any academic exercise.

Students found to have carried out any form of academic dishonesty are subject to the faculty member's scrutiny and sanctions, as well as the Student Conduct policies and procedures.

Kettering University Code of Student Conduct

The Kettering University Code of Student Conduct represents a body of behavioral standards for all students. These standards are strictly and vigorously enforced by Kettering University to ensure members of this educational community a productive, safe, and equitable environment for growth and development. Kettering University students are expected to conduct themselves as responsible, mature individuals while on campus, at home, and in their work-section communities.

Students are expected to comply with all University regulations governing student conduct and the use of University property and facilities.

Kettering University has the right to take action and investigate any offense that involves our students, either as victims reporting or students accused of violating the Code of Student Conduct and any federal, state, and/or local laws/ordinances. The Code of Student Conduct extends to students at their places of cooperative employment. We expect students to honor their co-op employer's standards for workplace demeanor and may impose our Student Conduct procedures upon any student charged by an employer with workplace misconduct.

Conduct for which students may be subject to disciplinary action falls into, but is not limited to, the following categories:

- Endangering people or their property.
- Obstructing the normal functions of Kettering University or a co-op employer.
- Theft or damage to property, including intellectual property, of Kettering University, a co-op employer, or any individual.
- Any willful damage to the reputation or psychological well-being of others.
- Threatening, intimidating, harassing, coercing, or verbally abusing another.
- Any physical violence directed at any member of the Kettering University community or a co-op employer.
- Unauthorized entry to, use of, or occupancy of Kettering University facilities or a co-op employer's facility.
- Any dishonesty, cheating, forgery, plagiarism, or alteration of, or misuse of Kettering University documents, records or identification, or a co-op employer's.
- Computer misuse, while on academic or work term, at the University or at co-op employment, including but not limited to:
 - Theft or other abuse of computer operations.
 - Unauthorized entry into a file to use, read, or change the contents, or for any other purpose.
 - Unauthorized transfer of a file or files.
 - Unauthorized use of another individual's identification and/or password[s].
- Use of computing facilities to interfere with the work of another student, faculty member, or university official.

- Use of computing facilities to send obscene or abusive messages.
- Use of computing facilities to interfere with the normal operation of the University's or a co-op employer's computer system.
- Violation of applicable public laws while on Kettering University owned property, University or student-sponsored or supervised functions, a co-op employer's owned or controlled property, or at a co-op employer-sponsored or supervised function.
- Possession or use on campus or at a place of co-op employment of firearms, explosives, explosive fuels, dangerous chemicals or other dangerous weapons, except as specifically authorized by Kettering University or a co-op employer.
- Use, possession, or distribution of narcotics or controlled substances except as expressly permitted by law.
- Possession or use of alcohol on Kettering's campus; any underage possession or use of alcohol.
- Failure to comply with directions of Kettering University or co-op employer officials acting in performance of their duties.
- Conduct which adversely affects the student's suitability as a member of the Kettering University and/or co-op employment communities.

Student Conduct at Kettering University

Student conduct serves and protects Kettering students by encouraging responsible behavior and civic competence. We expect students to develop their characters by exercising self-discipline and taking responsibility for their actions. We also expect students to make themselves aware of the regulations governing them as members of the Kettering community. Student Conduct supports the academic mission of the university by promoting student development, fostering a harmonious and stimulating environment, and protecting the well-being of all students.

Student Conduct Policies and Procedures

Members of the Kettering community should contact the Vice President of Student Affairs and Dean of Students whenever a violation or suspected violation of Kettering's Code of Student Conduct takes place. The University will take appropriate measures to investigate each incident and decide how best to proceed: to dismiss charges, to refer the charge[s] to a designated Conduct Officer(UBSC). If the charges are referred for further action, the Conduct Officer will hold a pre-hearing with the accused student[s]. The pre-hearing serves the following purposes:

- To explain Kettering University's conduct process
- To inform the accused of his/her rights accorded through the University's conduct process
- To inform the accused, in writing, of all charges
- To request that the accused write an official response to all charges
- To inform the accused of all available resolution options appropriate to the specific charges.

Student Rights and Responsibilities Provided by Kettering University's Student Conduct Procedures

Any student accused of any violation of Kettering University's Code of Student Conduct will be extended the following rights and responsibilities:

- Formal, written notification of all charges to be heard at either an Administrative Hearing or a University Board of Student Conduct.

- Right to a timely hearing. The University has the right to establish deadlines for hearing a case, as well as hear a case in a student's absence should they fail to appear at the established time and place.
- Opportunity to review the conduct file which will be presented at an Administrative Hearing or University Board of Student Conduct.
- Time to prepare a defense. Students will receive at least 48 hours notice of the time and place of an Administrative Hearing or University Board of Student Conduct.
- Right to be present at an Administrative Hearing or University Board of Student Conduct.
- Right to have an adviser present at an Administrative Hearing or University Board of Student Conduct. The adviser must be a member of the Kettering University community and may advise the accused student, but may not conduct the student's defense.
- Right to ask questions of any witnesses who appear at an Administrative Hearing or University Board of Student Conduct.
- Right to present defense witnesses whose presences has been requested, in writing, at least 48 hours prior to an Administrative Hearing or University Board of Student Conduct.
- The Vice President of Student Affairs & Dean of Students may determine that other Kettering University officials ought to be aware of the results, and will inform them.
- Crime victims will be notified of hearing results, in accordance with existing federal, state, and local laws.

Kettering University has the right to request a student return to campus during a work-term or off-term in order to expedite a case perceived as serious and pressing in nature. Students are entitled to the rights afforded by the Family Educational Rights and Privacy Act (FERPA).

Public Criminal Justice System Versus Kettering University's Student Conduct Process

Kettering's Student Conduct process differs in both purpose and function from the public criminal justice system. The University's process is designed to be educational and to afford students opportunities for personal growth and development. The criminal process is designed primarily to be punitive. Protections afforded the accused are less comprehensive in Kettering's Student Conduct process than those extended in the criminal system. The University is not required to follow federal, state, and/or local rules of evidence. Instead, charges against a student need only be proven by "preponderance of evidence," i.e., such evidence as a reasonable person might accept as adequate to support a conclusion that the offense more likely than not took place. Criminal investigations and/or charges do not hinder or delay the University's responsibility to investigate and adjudicate allegations of student misconduct in a timely fashion.

Resolution Options

Administrative Hearing

In cases where charges do not appear to merit suspension or expulsion, or in cases which the accused does not contest the charges, the Vice President of Student Affairs & Dean of Students may designate a Conduct Officer (CO). The CO will investigate the case and conduct a hearing with the accused. Administrative hearings accommodate all the rights and procedures accorded to students by the University's policies. Following the hearing, the University will provide the student with written notification of the results of the hearing, as well as information about the appeal process.

University Board of Student Conduct

The Vice President of Student Affairs & Dean of Students designates a conduct board or University Board of Student Conduct (UBSC) whenever charges may result in suspension or expulsion, including all cases involving academic misconduct. In these cases, a designated Conduct Officer of the University chairs the UBSC, comprised of a minimum of three members of the Kettering community and including representatives from faculty, staff, and students. The Conduct Officer investigates the charges and prepares the case for presentation to the UBSC. All presentations include resolution options. The UBSC makes recommendations to the Vice President of Student Affairs & Dean of Students, who may endorse, alter, or dismiss them.

Other Resolution Options

The Vice President of Student Affairs & Dean of Students may, after consultation with the involved parties, provide other avenues of resolution, including mediation and/or conciliation.

Administrative and University Board of Student Conduct Hearings Decisions

All decisions will be based only on documents, testimony, and evidence presented at administrative and University Board of Student Conduct hearings.

Sanctions

The University has the right to enforce a variety of sanctions upon students who are found to have violated the Code of Student Conduct. They include, but are not limited to, the following:

- **Creation of a Misconduct File**
The University applies this sanction whenever the Conduct Officer or other hearing officer[s] upholds charges against a student for violating the Kettering Code of Student Conduct, yet it appears that interviews and counseling associated with the pre-hearing and hearing are sufficient to deter further violation. The Conduct Officer creates an official file detailing the student's offense.
- **Misconduct Warning**
A Misconduct Warning consists of a formal, written notice that the student has violated the Code of Student Conduct and that any future violation will result in more serious consequences.
- **Restitution and/or Fines**
When a violation of the Code of Student Conduct results in costs to other students, Kettering University, or others, a student may be required to make restitution and/or pay a fine. The University applies fines to community endeavors.
- **Community Service**
This sanction requires students to contribute a fixed number of hours, without compensation, to benefit the University or the local community. The University retains the right to require that students complete community service with particular organizations it specifies.
- **Misconduct Probation**
Misconduct probation implies a medial status between good standing at Kettering, and suspension or expulsion. A student on Misconduct Probation will be permitted to remain enrolled at Kettering University under certain stated situational conditions, depending on the nature of the violation and the potential learning value that may be derived from such conditions. Usually, Misconduct Probation extends over a stated period, during which it is clearly understood that the student is subject to further disciplinary action, including suspension or expulsion, if the student violates the terms of

probation or in any way fails to conduct him/herself as a responsible member of the Kettering University community. Misconduct Probation serves as a final warning to the student to re-evaluate and modify his/her unacceptable behavior. Students on Misconduct Probation will not be allowed to represent the University in any formal manner and may not serve in a student leadership position during the period of probation. Knowledge of a student's Misconduct Probation status may be made known to others at the University on a need-to-know basis.

- **Interim Suspension and/or Altered Privileges**

Kettering imposes Interim Suspension when it appears the accused poses a threat to him/herself or others at the University. It may also be imposed following allegations of sexual or physical assault, drug use and/or distribution, threats of violence, etc.

The Vice President of Student Affairs & Dean of Students or designate may alter or suspend the privileges/rights of a student to be present on campus and/or to attend classes for an interim period prior to the resolution of a conduct proceeding. Decisions of this sort will be based upon whether the allegation of misconduct appears reliable and whether the student's continued presence reasonably poses a threat to the physical or emotional condition and/or well-being of any individual, including the accused student's. Interim Suspension may also be imposed when the accused student's continued presence appears to disrupt the University's regular or special functions, or threatens the safety or welfare of university property.

Interim Suspension and/or altered privileges remain in effect until a final decision is made on a pending incident. The Vice President of Student Affairs & Dean of Students or designate may repeal interim suspension or altered privileges at his/her discretion.

- **Suspension**

Suspension—an involuntary separation of a student from Kettering University—implies and states a time for return to the University. Suspension may extend for a school and/or work term, for a specified period, until a specified date, or until a stated condition is met. A University Board of Student Conduct may recommend suspension, but only the Vice President of Student Affairs & Dean of Students may impose it.

- **Expulsion**

Expulsion—a permanent involuntary separation of a student from Kettering University—may be recommended by a University Board of Student Conduct, but only the Vice President of Student Affairs & Dean of Students may impose it.

- **Notification of Sanction to Co-Op Employers**

The University has the right and responsibility to notify a student's co-op employer whenever the student is found to have violated the Kettering Code of Student Conduct.

- **Student Conduct Appeals**

Any student who has been sanctioned through the Kettering University Code of Student Conduct processes has the right to appeal to the Vice President of Student Affairs & Dean of Students. All appeals must be made in writing within five [5] business days of notification of the results of the hearing and must state the grounds upon which the appeal is based. Grounds for appeal might include claims of procedural errors, new information, denial of rights, or inappropriately severe punishment. Should the Vice President of Student Affairs & Dean of Students choose to grant an appeal, the case will be reviewed and a written decision will be conveyed to the student indicating whether the sanction[s] shall stand, be modified, or reversed.

Students' Use of Technology

The use of any personal computational or communication devices in the classroom, not otherwise governed by the University or course policies, is subject to the approval of the instructor. This includes, but is not limited to, the use of calculators, computers, personal digital assistants, text pagers, and cell phones. Any use of such devices without the instructor's approval is prohibited. The use of such devices without permission of the instructor may be considered disruptive behavior. Students who persist in such activity may be subject to the University's "Dismissal Due to Disruptive Behavior" policy.

The use of electronic devices to facilitate an act of academic misconduct, such as cheating or plagiarism, will be considered a violation of the Code of Student Conduct and adjudicated following standard Student Conduct policies and procedures.

Students are expected to familiarize themselves with Kettering University's Acceptable Use Policy, posted on the "Policies and Standards" section of the Information Technology website.

Dismissal from Class Due to Disruptive Behavior

Whenever an enrolled student's presence or behavior in class disrupts the learning environment and, in the faculty member's opinion, undermines the best interests of the class and/or the student, the faculty member may request in writing (with a copy to the appropriate Department Head) that the student be issued an administrative dismissal. The faculty member should discuss the student's behavior with the Vice President of Student Affairs & Dean of Students (VPSA) and/or his designate, who will meet with the faculty member to discuss the alleged incident. The VPSA will also meet with the student to determine possible judicial action after determining whether or not the student's behavior violates the Kettering Code of Student Conduct. The VPSA will either adjudicate the matter or refer it for action by a designated conduct officer and/or University Board of Student Conduct. If the dismissal occurs by Friday of seventh week, student will receive a grade of W (withdrawn). If the dismissal occurs after Friday of seventh week, student will receive a grade of F.

Productive Learning Environment

Kettering University expects all students, faculty, and staff to contribute to a productive learning environment by demonstrating behavior that neither interferes with another individual's performance nor creates an intimidating, offensive, or hostile environment. The University will not tolerate harassment or discrimination in any forms, regardless of intent and/or the victim's reaction.

Harassment

The University prohibits all sexual harassment and/or offensive conduct, on campus and in students' work section communities. Such conduct includes, but is not limited to sexual flirtation, touching, verbal or physical advances or propositions, verbal abuse of a sexual nature, graphic or suggestive comments about an individual's dress or body, sexually degrading words to describe an individual, and/or the display of sexually suggestive objects or pictures, including nude photographs. Behavior constitutes sexual harassment when it is unwelcome and it interferes with the ability of another person to carry out his/her responsibilities, creates a hostile learning or work environment, or its expression implies that acceptance of the behavior is a condition of course registration, course completion, course evaluation, or employment.

If you believe the words or actions of a University employee or student on campus constitutes unwelcome harassment, take the following steps:

- Inform him or her that his/her actions are unwelcome and the harassing behavior must cease.
- Keep a written record of the details, including time, date, what was said, or what occurred.
- Report the discrimination to the Vice President of Student Affairs & Dean of Students, the Director of Human Resources, other University officials, or via our Non-Academic Grievance Form, available in the Student Affairs Office, Academic Services, the Wellness Center, Thompson Hall, and online at the Student Affairs website.

If harassment occurs at your work site, you should report it to your supervisor or the appropriate person as directed by your employee handbook, as well as to your Cooperative Education Manager/Educator.

Enlist the counsel of a trusted adviser, if necessary, to report sexual harassment wherever and whenever it occurs. The University pledges to investigate promptly all complaints of harassment and to pursue a timely resolution, which the appropriate University officials will communicate to the parties involved. We will maintain confidentiality to the extent reasonably possible.

Discrimination

Kettering University is committed to a policy of non-discrimination and equal opportunity for all persons regardless of race/ethnicity, color, ancestry, national origin, religion, sex, sexual orientation, age, marital status, height, weight, marital, military or disability status or any other basis protected by federal or state law. Discrimination includes, but is not limited to the following:

- Preventing any person from using University facilities or services because of that person's race/ethnicity, color, ancestry, national origin, religion, sex, sexual orientation, age, height, weight, and/or marital, military, or disability status.
- Making determinations regarding a person's salary based on race/ethnicity, color, ancestry, national origin, religion, sex, sexual orientation, age, height, weight, and/or marital, military, or disability status.
- Denying a person access to an educational program based on that person's race/ethnicity, color, ancestry, national origin, religion, sex, sexual orientation, age, height, weight, and/or marital, military, or disability status.
- Instigating or allowing an environment that is unwelcoming or hostile based on a person's race/ethnicity, color, ancestry, national origin, religion, sex, sexual orientation, age, height, weight, and/or marital, military, or disability status.
- Denying raises, benefits, promotions, leadership opportunities, or performance evaluations on the basis of a person's race/ethnicity, color, ancestry, national origin, religion, sex, sexual orientation, age, height, weight, and/or marital, military, or disability status.

If discrimination takes place at your work site, you should report it to your supervisor or the appropriate person as directed by your employee handbook, as well as to your Cooperative Education Manager/Educator. Enlist the counsel of a trusted adviser, if necessary, to report discrimination wherever and whenever it occurs. The University pledges to investigate promptly all complaints of discrimination and to pursue a timely resolution, which the appropriate University officials will communicate to the parties involved. We will maintain confidentiality to the extent reasonably possible.

If you believe the words or actions of a University employee or student constitutes discrimination, take the following steps:

- Inform him or her that his/her actions are unwelcome and the discriminating behavior must cease.
- Keep a written record of the details, including time, date, what was said, or what occurred.
- Report the discrimination to the Vice President of Student Affairs & Dean of Students, the Director of Human Resources, other University officials, or via our Non-Academic Grievance Form, available in the Student Affairs Office, Academic Services, the Wellness Center, and Thompson Hall.

Student Grievance Procedures

A grievance is a written or verbal expression of dissatisfaction or formal allegation against the university, its units, its employees (including faculty and staff), and/or its students.

Other Grievances

Currently enrolled students who have a grievance or issue should first try to work out the issue informally by discussing it in an honest and constructive manner with those persons most involved. Many grievances can be resolved when a student makes an effort to honestly communicate his/her frustrations or concerns. If a student has a grievance related to a specific course he or she is enrolled in, he/she should first consult with the instructor of the course. If necessary, the student or instructor may consult with the academic department head responsible for the course for guidance on how to best resolve the student's concern.

For any grievances that the student cannot resolve informally with the parties involved, the student should contact either the Dean of Students (for non-academic-related issues) or the Associate Provost for Assessment & Academic Support (for academic-related issues).

Student Complaint Procedures

A complaint is a written or verbal expression of dissatisfaction or formal allegation against the university, its units, its employees (including faculty and staff), and/or its students.

Other Complaints

Currently enrolled students who have a complaint or issue should first try to work out the problem informally by discussing it in an honest and constructive manner with those persons most involved with the issue. Many complaints can be resolved when a student makes an effort to honestly communicate his/her frustrations or concerns. If a student has a complaint related to a specific course he or she is enrolled in, he/she should first consult with the instructor of the course. If necessary, the student or instructor may consult with the academic department head responsible for the course for guidance on how to best resolve the student's concern.

For any complaints that the student cannot resolve informally with the parties involved, the student should contact either the Dean of Students (for non-academic-related issues) or the Associate Provost for Assessment and Academic Support (for academic-related issues).

Questions: Contact the Student Affairs Office for non-academic issues or the Office of the Provost for academic-related issues.

Enrollment

Academic Terms

The Kettering University on-campus schedule operates on four 11-week terms per year.

Auditing a Course

Occasionally, a student may wish to attend a course without earning credit (for example, to refresh course knowledge). This arrangement is called 'auditing' a course. Audited courses are listed on a transcript with the grade AU (audit) and no credits earned. Audited courses incur regular tuition fees; however, audits are not considered part of a course load for academic or financial aid purposes, which means that students cannot count audited credits toward a full-time student status, or receive financial aid for an audited class.

A student needs the course instructor's permission to audit a course. Students who want to audit a course must complete a Request to Audit Course Form, have it signed by the course instructor, and submit it to the Office of the Registrar during the drop/add period specified on the academic calendar. Audits cannot be charged to a regular enrollment after the drop/add period noted on the academic calendar.

Students who choose an audit option are expected to attend the audited class and complete all course requirements (with the exclusion of the tests). If the students do not meet attendance requirements for the course, they earn the grade of WN (withdrawn for non-attendance). Once a WN grade is issued, the student may no longer attend or participate in the class. AU and WN grades do not affect the term and cumulative grade point averages.

Enrollment Status/Verifications

Enrollment Status

8 or more credits, or THS1, THS2, or Internship Course (ENGR-693 or MGMT-693) = Full Time
 4-7 credits = Half Time
 1-3 credits = Less Than Half Time

Enrollment Verifications may be obtained through the Office of the Registrar. Enrollment verifications confirm a student's enrollment status (full-time, half-time, less than half-time) and expected graduation date.

Questions: Contact the Office of the Registrar

Graduate Program Extension Policy

Overly long times-to-degree are costly to both students and the University, for a variety of reasons. Indeed, timely progress is a sign of intellectual vigor, competence and commitment. Therefore, students have up to six years to complete all requirements for the Master's degree at Kettering University. If a student cannot complete the degree within the six-year time limit, they must request an extension. To be considered eligible for a time extension, the student must 1) demonstrate satisfactory progress towards the completion of the degree and 2) receive endorsement or approval from the Graduate Program Advisor and/or the Department Head.

Items that must be addressed on the **Time Extension Request** include:

1. The reason(s) for the request.
2. An explanation of how the student's circumstances have changed to enable them to now complete the degree.
3. An agreed upon plan and timeline for completion of the degree.

If approved, the student must complete the program requirements as outlined on the approved Program Time Extension form. During the extension, the student must meet with the Program Director periodically to ensure that adequate progress towards degree completion is being maintained.

Appeal Process

If the Graduate Program Advisor and/or Department Head will not approve a request for extension, the student may appeal to the Graduate School. In such cases, the Graduate Dean will confer with the Graduate Council to examine the extension request. If the Graduate School is not able to approve the request, the student may make a final appeal to the Provost.

Questions: Contact the Graduate School at gsr@kettering.edu

Independent/Directed Study

In order to increase the scope and flexibility of course offerings, many departments offer courses under the designation of Independent or Directed Study. A student who desires a course not normally offered or not available during a given term should approach the instructor in whose discipline the course would normally fall to discuss the possibility of an Independent or Directed Study. If the instructor agrees, a written proposal may be required from the student, specifying the reading and/or research to be undertaken, reports or rests to be used for grading purposes, number of meetings per week, number of credits to be awarded, etc.

Independent Study

An independent study is a unique topic in a specific area of study not offered in an existing course. Requirements and meeting times are arranged by the instructor and student. A student must request and receive approval for an independent study through the instructional department. This is done by completing an Independent Study Form stating the independent study name and description, and obtaining all required signatures. The completed form must be submitted to the Office of the Registrar no later than the last day of the drop/add period specified on the published academic calendar.

Directed Study

A directed study is a course listed in the undergraduate catalog but not scheduled during a given term. It is done on a one-on-one basis with an instructor for that course. A student must request and receive approval for a directed study through the instructional department. If approved, the department will notify the Registrar's Office to create the course no later than the last day of the drop/add period specified on the published academic calendar.

Questions: Contact the department offering the course

Registration

Registration is the process by which a student enrolls in a specific course(s) during a specific term. Registration for courses occurs after the application/admission process is complete and the student has been granted admission. Students cannot receive credit for a course for which

they have not registered. Students must register for courses every term they wish to take classes.

Students must register online via Banner Web. Registration instructions can be found on the Office of the Registrar website.

Students registered for courses will receive an e-mail notification to their Kettering e-mail account with instructions on how to log into Banner Web to retrieve their official invoice. This invoice will confirm enrollment and denote the required tuition. Detailed payment information will be in the email and on the invoice. Payments can be made online or by mail.

Course Selection

Selection of courses is the responsibility of each student. The student is personally responsible for being aware of prerequisite coursework and choosing program courses accordingly. To assist with your planning, program curricula is available online or in this catalog for each Kettering graduate program. The responsibility for deciding how many courses to take in a term is solely the student's, however, a normal course load is one or two courses. Kettering University advises against heavier loads except for resident students who are not employed.

Curriculum Restrictions

A student may take no more than four (4) courses numbered below 600-level to count toward their Master's degree.

Questions: Contact the Program Advisor

Repeating a Course

A graduate student who receives a failing grade in a required course should retake the course as soon as possible. If the student is unable to take the next course offering, or should the course not be available when the student registers, the student may take other classes keeping in mind the Graduate School GPA requirements. Should the student fail the same course twice, they must appeal in writing to the Graduate Appeal Committee to retake the course for a third and final time. The decision of the Graduate Appeal Committee will be final.

The option to retake a failed required course can only be utilized for one course requirement in a degree program. Students who fail a course and then subsequently fail another but different course will be dismissed from the program.

Graduate students may also retake one course in which they have not met the scholastic standards of Kettering University's Graduate School (earned a grade lower than a B-) to improve their cumulative GPA.

Students electing to repeat a course will be subject to the following conditions:

- Students planning to repeat a course in which they received a grade above "F" should consult with the Graduate School as the repeated course may not be eligible for scholarship or tuition support.
- Courses taken for undergraduate credit at Kettering University may not be repeated at the graduate level. Furthermore, Kettering undergraduate courses cannot be counted as graduate credit except as approved per the Accelerated (BS/MS, BS/MBA) Masters policy guidelines.
- Courses taken after degree conferral cannot be used for a GPA adjustment.

- Once a repeated course has been passed satisfactorily the *most recent passing* grade for that course will be used to calculate the student's cumulative GPA.
- Course withdrawals (W grade), incomplete courses (I grade), and courses completed as Credit/No Credit (CR/NC grades) are not eligible for the GPA adjustment.
- A student's grade in the original course may not be a result of academic misconduct as documented through the Office of Student Life.
- All occurrences of the course along with associated grades will remain on the student's academic record as well as on the official transcript

Transfer Credit

The maximum number of graduate credits for which a person may receive transfer credit is eight (8) credit hours. Credit is only considered for courses with a grade of B or better. All requests for transfer credit should be for graduate-level courses (taken for graduate credit) significantly similar to a specific course within the student's program.

To apply for transfer credit, the student must complete the Application for Transfer Credit Form and submit an official transcript from an accredited institution, plus a course description and syllabus. There is a processing fee of \$5.00 (U.S.) per credit hour, or \$20.00, for each 4-credit course. This fee is based on the number of credits for replacing the Kettering course, not the credits of the course being transferred in (i.e. a 3-credit course from another institution, is a 4-credit KU course equivalent).

Questions: Contact the Graduate School at gsr@kettering.edu for more information.

Undergraduates Taking Graduate Courses

Students taking graduate level courses are not automatically admissible to the graduate program. They still have to meet all published admissions requirements. **Note:** Courses taken for undergraduate credit at Kettering University may not be repeated at the graduate level and count towards the graduate program. Furthermore, graduate level courses taken at Kettering University for undergraduate credit may not count as graduate credit except as approved per the Accelerated Master's policy guidelines.

Undergraduates Taking Graduate Courses for Undergraduate Credit

Students enrolled in an undergraduate degree program at Kettering University may request registration in a Kettering graduate level course for undergraduate credit. To do this, students must:

- Complete and receive instructional department and degree department approvals on the Undergraduate Request to take Graduate Course Form and submit form to Registrar's Office for proper registration.

Undergraduates Taking Graduate Courses for Graduate Credit

Students enrolled in an undergraduate program at Kettering University may request registration in a Kettering graduate level course for graduate credit. Undergraduate students may take up to three graduate courses for graduate credit while an undergraduate student (no more than two per term).

Students are eligible if they meet all of the following criteria:

- They are enrolled in an undergraduate program at Kettering University
- They are in good academic standing
- They have a minimum of 120 earned credits
- They are enrolled in no more than 20 credits, unless qualified to take 24 credits.

In order to receive graduate level credit, students must do the following:

- Complete and receive instructional department and degree department approvals on the Undergraduate Request to take Graduate Course Form and submit the form to Registrar's Office for proper registration.
- Earn a grade of B or better in the course taken.

Questions: Contact the Office of the Registrar

Withdrawals

Course Withdrawals

When circumstances occur whereby a student feels that completion of a course is not possible or in the student's best interest, the student may request a non-punitive grade of W (Withdrawn) be issued by the Registrar's Office. Such requests will be accepted and honored during the course withdrawal period specified on the published academic calendar. After the course withdrawal period, the student may not withdraw from the course and is committed to receiving a Kettering University letter grade. A student who wishes to withdraw from a course must submit a written request using the Graduate Program Course Withdrawal Form. Refunds or reduction of tuition are made according to the published schedule in the graduate catalog.

Medical/Compassionate Withdrawal (After 7th Sunday)

A medical/compassionate withdrawal request may be made in extraordinary cases. Such cases in which serious illness or injury (medical) or another significant personal situation (compassionate) prevents a student from continuing his/her classes or withdrawing during the course withdrawal period (specified on the academic calendar), and where incompletes or other arrangements with the instructors are not possible.

The usual consideration is for a complete term withdrawal. All applications for withdrawal require thorough and credible documentation; however, applications for less than a complete course term withdrawal must be specifically documented to justify the selective nature of the partial medical/compassionate withdrawal.

A student may request and be considered for a medical withdrawal when extraordinary circumstances, such as a serious illness or injury, prevent the student from continuing classes. The medical withdrawal policy covers both physical and mental health difficulties.

A student may request and be considered for a compassionate withdrawal when extraordinary personal reasons, not related to the student's personal physical or mental health (for example, a death in the student's immediate family, care of a seriously ill family member, etc.), prevent the student from continuing in classes.

All requests for medical and compassionate withdrawals must be made through the Wellness Center. Each request is reviewed, but they are not automatically approved. The Vice President for Student Affairs and Dean of Students will determine the status of a case based on the documents

provided. When requesting either of these withdrawals, students must provide:

- A written statement summarizing the circumstances and providing detailed information regarding the reason for the request. If the withdrawal began or took place during the course withdrawal period specified on the academic calendar, students must explain why they did not withdraw by the published deadline.
- Medical withdrawal requests must include supporting documentation from a licensed health care professional detailing:
 - The date of onset.
 - Dates of treatment.
 - The general nature of your condition.
 - How and why it prevented you from completing your course work, including the last date you attended class.
 - This documentation must be on official letterhead and must be specific to this request.
 - Prescriptions and similar types of documentation will not be sufficient.
- Compassionate withdrawal requests must be accompanied by documentation pertinent to the precipitating event. For example, a compassionate withdrawal request to care for a seriously ill family member may require information similar to that for a medical withdrawal. Other required documentation may include police reports, legal documents, airline ticket receipts, newspaper clippings, death certificates, etc.

Students considering a request for medical or compassionate withdrawals after the course withdrawal period specified on the academic calendar should consult with the Wellness Center as soon as possible. No refunds apply to approved medical or compassionate withdrawals, which occur after the course withdrawal deadline.

Questions: Contact the Wellness Center

University Withdrawal

Withdrawing from the University requires a written request to the Office of the Registrar at registrar@kettering.edu.

Withdrawal due to Active Duty

Students may withdraw from the University and receive a 100% tuition refund upon presenting to the Registrar, the original Armed Forces orders. Non-punitive grades of W will be issued. Should the call come during eighth week or later, in the judgment of the instructor and the student, a grade of Incomplete (I) may be given with no reimbursement of tuition. Course work then would be completed per arrangements agreed upon by the instructor and student.

Questions: Contact the Office of the Registrar

Leave of Absence

The Graduate Student Leave of Absence (LOA) Policy assists and encourages students to return and complete their degree after up to two consecutive terms of absence from Kettering University. Eligible students are encouraged to take advantage of the benefits provided by an LOA, e.g., no need to apply for readmission and ability to participate in their regularly scheduled registration/enrollment period upon return to the University. Refer to the Leave of Absence Request Form for more information and instructions.

Questions: Contact the Office of the Registrar

Family Educational Rights and Privacy Act (FERPA)

The Family Educational Rights and Privacy Act (commonly referred to as “FERPA” or the “Buckley Amendment”), helps protect the privacy of student records. The Act provides for the right to inspect and review education records, the right to seek to amend those records and to limit disclosure of information from the records. The Act applies to all institutions that are the recipients of federal funding.

In accordance with FERPA, Kettering University has policies and procedures in place to protect the privacy of education records. Students will be notified of their FERPA rights annually by publication in the Undergraduate and Graduate Catalogs and by an annual email message to students at the beginning of the academic year.

Disclosure of Education Records

Kettering University will disclose information from a student’s education record only with the written consent of the student, except:

1. To school officials who have a legitimate educational interest in the records.

A school official is:

- A person employed by the university in an administrative, supervisory, academic, research, or support staff position (including Campus Safety and Wellness Center staff);
- A person elected to the Board of Trustees;
- A student serving on an official committee, such as disciplinary or grievance committee, or assisting another school official in performing his or her task;
- A volunteer or person employed by or under contract to the university to perform a special task, such as legal counsel or an auditor;
- Agencies conducting business on behalf of Kettering University (i.e. National Student Clearinghouse, officials of the U.S. Department of Education and state and local educational authorities, accrediting organizations and banks).

Educational Need to Know:

A school official has a legitimate educational interest if the official needs to review an education record in order to fulfill his or her professional responsibilities for Kettering University.

2. To officials of another school, upon request, in which a student seeks or intends to enroll.
3. In connection with a student’s request for or receipt of financial aid, as necessary to determine the eligibility, amount, or conditions of the financial aid, or to enforce the terms and conditions of the aid.
4. To organizations conducting certain studies for or on behalf of the university.
5. To comply with a judicial order or a lawfully issued subpoena.
6. To appropriate parties in a health or safety emergency.
7. When the request is for directory information (see below).

Directory Information

Institutions may disclose information on a student without violating FERPA through what is known as “directory information.” Kettering University designates the following categories of student information as public or “Directory Information.” Such information may be disclosed by the institution at its discretion.

- Corporate affiliation
- Degrees awarded, including dates (actual and expected)
- Dates of attendance
- Degree program (major field of study, concentrations and minors)
- Degrees and honors awarded (including Dean’s List)
- Enrollment Status (including full or part-time)
- Honor Societies
- Photo
- Previous institutions attended
- Class standing (freshman, sophomore, junior, senior, graduate student)
- Name, address and phone number
- E-mail address

Solomon Amendment

Federal law requires that all institutions of higher learning provide directory information to the military upon request, including student name, address, telephone number, age or year of birth, academic major and level of education (e.g. freshman, sophomore, etc. or degree awarded). Where there is a conflict between the Family Educational Rights and Privacy Act of 1974 (FERPA), the Solomon Amendment would supersede FERPA.

Annual Notification to Students of Rights Under FERPA

FERPA affords students certain rights with respect to their education records. They include:

1. Inspect and Review of Records

The right to inspect and review the student’s education records within 45 days after the day the University receives a request for access. A student should submit to the registrar, dean, head of the academic department, or other appropriate official, a written request that identifies the record(s) the student wishes to inspect. The University official will make arrangements for access and notify the student of the time and place where the records may be inspected. If the records are not maintained by the University official to whom the request was submitted, that official shall advise the student of the correct official to whom the request should be addressed.

2. Amendment of Records

The right to request the amendment of the student’s education records that the student believes are inaccurate, misleading, or otherwise violate the student’s privacy rights under FERPA. Students should write the University official responsible for the record, clearly identify the part of the record they want changed, and specify why it should be changed. If the University decides not to amend the record as requested, the University will notify the student of the decision and advise the student of his or her right to a hearing regarding the request for amendment. Additional information regarding the hearing procedures will be provided to the student when notified of the right to a hearing.

3. Consent to Disclosure

The right to provide written consent before the university discloses personally identifiable information from the student’s education records, except to the extent that FERPA authorizes disclosure without consent.

The school discloses education records without a student’s prior written consent under the FERPA exception for disclosure to school

officials with legitimate educational interests. A school official is a person employed by Kettering University in an administrative, supervisory, academic, research, or support staff position (including Campus Safety and Wellness Center staff); a person serving on the board of trustees; a student serving on an official committee, such as a disciplinary or grievance committee, or assisting another school official in performing his or her task; a volunteer or person employed by or under contract to the university to perform a special task, such as legal counsel or an auditor; agencies conducting business on behalf of Kettering University (i.e. National Student Clearinghouse, accrediting organizations and banks).

A school official has a legitimate educational interest if the official needs to review an education record in order to fulfill his or her professional responsibilities for Kettering University.

4. FERPA Complaints

The right to file a complaint with the U.S. Department of Education concerning alleged failures by Kettering University to comply with the requirements of FERPA. The name and address of the Office that administers FERPA is:

Family Policy Compliance Office
U.S. Department of Education
400 Maryland Avenue, SW.
Washington, DC, 20202

For more information on the Family Educational Rights and Privacy Act, visit the Office of the Registrar Website, under FERPA.

Grades

Course grades are available after each term via Banner Web. Federal law prohibits communication of grades by telephone. Students may access their grade report and/or print a grade report to provide to their company by logging on to Banner Web.

Grade	Description	Points
A	Outstanding	4.0
A-	Outstanding	3.7
B+	Satisfactory	3.3
B	Satisfactory	3.0
B-	Satisfactory	2.7
C+	Less than satisfactory	2.3
C	Less than satisfactory	2.0
C-	Less than satisfactory	1.7
F	Fail	0.0
AU	Audit	0.0
CR	Credit	0.0
FN	Failure for non-attendance	0.0
I	Incomplete	0.0
W	Withdrawal	0.0
WN	Withdrawn for non-attendance	0.0

Course Hours and Points Definitions

Quality Points = Grade x Credit Hours

GPA = Quality Points ÷ GPA Hours

Attempted hours (AHRS) – are the sum of the course credit hours for which a student has registered. Attempted hours per term is the basis for determining tuition charges and a measure of the student load.

Earned hours (EHRS) – represent work equivalent to that defined for a University credit hour that the student has successfully completed at Kettering University, at another university or by examination. Not all earned hours necessarily apply to the specific degree program being pursued by the student.

Grade Point Average (GPA) – is computed for each term individually and cumulatively. In either case, the weighted GPA is computed by dividing the total quality points earned by the total quality hours accumulated.

GPA hours (GPA-HRS) – are equal to the credit hour value of the course and are awarded only for course work taken at Kettering University. Only course work resulting in GPA hours is used in computing a student's grade point average (GPA).

Quality Points (QPTS) – are a computational value used to compute a student's grade point average (GPA). The quality points earned for a given course are equal to the credit hour value of the course multiplied by the numerical equivalent of the letter grade.

Questions: Contact the Office of the Registrar

Credit Hour Policy

Kettering University defines a credit hour as one 60-minute class period per week. The University assigns four [4] credits to all courses in all undergraduate and graduate degree programs. Undergraduates and on

campus graduate students are expected to spend at least two hours outside of class preparing for each hour in class. A 4-credit course requires these students to devote 120 hours of effort per term, or approximately three [3] hours of effort per week, for 10 weeks, for each registered credit hour.

These credit hour requirements fulfill federal definitions and regulations regarding the assignment of credit hours as follows under Section 600.2 and 600.24(f) of the Higher Education Opportunity Act:

Credit hour: Except as provided in 34 CFR 668.8(k) and (l), a credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally established equivalency that reasonably approximates not less than —

1. One hour of classroom or direct faculty instruction and a minimum of two hours of out of class student work each week for approximately fifteen weeks for one semester or trimester hour of credit, or ten to twelve weeks for one quarter hour of credit, or the equivalent amount of work over a different amount of time; or
2. At least an equivalent amount of work as required in paragraph (1) of this definition for other academic activities as established by the institution including laboratory work, internships, practica, studio work, and other academic work leading to the award of credit hours.

Grade Appeal Process

The course instructor has the authority and obligation to assign appropriate grades in any course. Questions concerning an assigned final grade are to be handled through the grade appeal process. Final course grades may be appealed only if the student can demonstrate that the grading policy applied to his/her grade does not conform to the stated grading policy of the course instructor. The absence of a grading policy will be considered reasonable grounds for appeal. Appeals should be initiated as soon as possible but no later than **12 weeks** after the grade has been posted. The student's failure to access grades does not provide an exemption from the time limitation.

Grade Appeal Process

1. **Student** - The student completes a Grade Appeal Form attaching any pertinent documentation to support his/her claim.
2. **Instructor** - Within two (2) weeks of the student's request for a grade appeal, the course instructor accepts or denies the appeal in writing.
3. **Department Head** - Students who are not satisfied with the decision of the course instructor may appeal to the course instructor's department head within 30 days of the course instructor's response. Students appealing to the department head assume the burden of proof. The appeal must include: a statement of the reason the student is appealing the grade, evidence to support the appeal, the steps taken to resolve the disagreement over the assigned course grade and the resolution sought. The department head will serve as a mediator between the student and the course instructor but cannot change a grade. The department head must respond in writing to the student, course instructor, and the dean of the college within 30 days of receipt of the appeal with the result of mediated discussion between the student and course instructor.
4. **Dean** - Students who are not satisfied with the result of the discussions between the student and course instructor, mediated by the department head (step 3 above), may submit an appeal to the college dean (or graduate dean in the case of a graduate student). The student must forward all documents submitted in steps 1-3

above to the college dean (or graduate dean in the case of a graduate student). If the dean concludes that the facts alleged by the student do not constitute grounds for appeal, the dean may dismiss the review. The student will not be allowed any further appeal. If the dean determines that the facts alleged by the student are true, the dean shall refer the appeal to the Final Appeal Board.

5. **Final Appeal Board** – The Associate Provost (or designee) will convene an appeal board comprised of the following members: one tenured faculty member from the course instructor's department, chosen by the course instructor; one tenured faculty member from the course instructor's department, chosen by the Department Head; one tenured faculty member from outside the course instructor's department, chosen by the Chair of the Promotion, Tenure and Ethics (PTE) Committee; and the Associate Provost (or designee), who does not vote, but chairs the board and handles all administrative matters.
6. **Provost** - The Final Appeal Board makes a recommendation to the Provost to change the grade to a "P" for passing or keep the course instructor's original grade. The Associate Provost will provide a written overview of the Appeal Board's decision to all involved parties. The decision of the Provost represents a final University decision.

Questions: Contact the Office of the Registrar

Grade Changes

Grades (except incompletes) reported by a course instructor are considered permanent and final. However, requests for a change of grade after a course instructor reports a final grade will be honored to correct an error in calculating or assigning that grade. To facilitate this process, the course instructor will submit to the Registrar an email, with the Department Head copied, noting the rationale for the change and what retroactive correction is to be made. Grade changes must be processed within one calendar year (12 months) from the last date of the term in which the course was taken. This includes incomplete grades that have been changed to a grade or have converted to a failing grade. Grade changes are not permitted after a degree has been awarded.

Questions: Contact the Office of the Registrar

Incomplete Grades

The grade of "I" (Incomplete) is a temporary grade assigned by the instructor in cases where a student is unable to complete course requirements within the term. The grade of "I" may be issued by a course instructor for any course in which the following conditions are met:

1. On-campus Graduate students request "I" grade from the Instructor: no later than 10th week Friday
2. The student has satisfactorily completed a substantial portion (typically about 75%) of the total coursework and has convinced the instructor of his or her ability to complete the remaining work without re-registering for the course. It is not to be given if a student is failing the course.
3. The student is unable to complete the course requirements within the regular time frame due to significant, extenuating circumstances which can be documented.
4. The student and course instructor must complete an Incomplete Grade Agreement Form that clearly states the requirements to be completed and the due date for the completion of each requirement. The form must be signed by the Department Head and filed in the Office of the Registrar as official documentation of the agreement.

Deadline for completion of the coursework:

On-campus Graduate students: not to exceed 6 months from the last day of the term in which the incomplete was assigned.

If a final grade is not submitted within the specified deadline for completion, the incomplete grade converts to an “F” (Fail) on the student’s record and will be reflected in the students’ GPA. The grade of “F” will be considered a permanent grade on the student’s record.

Students should note that an incomplete grade does not yet reflect credit in the course. This means if a course with an incomplete grade is a prerequisite for another course, they may not register for that course until the incomplete grade has been changed to reflect a passing grade.

Questions: Contact the Office of the Registrar

Graduation

Graduation Requirements

Application

Students must apply to graduate to begin the graduation process. The time-frame to submit this application is when registering for your last term of courses.

In order for a graduate degree to be awarded and verified by the Office of the Registrar, the following requirements must be satisfied:

- Successfully complete all prescribed courses within the six (6) year limit. A student who anticipates not meeting the time limit must notify the Graduate Office at least six (6) months prior to the expiration of the six (6) year limit.
- Achieve a final cumulative grade-point average (GPA) of 3.0 or higher.

Commencement

Commencement is the formal ceremony which recognizes and celebrates graduates and graduation candidates. At Kettering University, commencement is held annually at the conclusion of the spring term. Refer to the published academic calendar for the date of commencement. Detailed information including eligibility requirements is available on the Office of the Registrar website.

Questions: Contact the Office of the Registrar

Degree Completion for Inactive Students with Coursework Remaining

Inactive students who wish to return to Kettering University must contact the Registrar’s Office for assistance. After ensuring there are no outstanding financial obligations to the university, the Registrar will refer such students to the appropriate Academic Department Head to develop a plan of study. The final plan will be annotated as a NOTE in the student’s Degree Works audit. These students will be subject to meeting the requirements for degrees in effect at the time of readmission.

Diplomas

Diplomas are personally presented to students by the President of Kettering University at commencement. Students who are unable to attend commencement will receive their diplomas via the USPS to their permanent US address **after the event**. Diplomas are mailed to US addresses only. For International Shipping, please refer to the Shipping Instructions for International Packages.

Diplomas are not considered official proof of graduation. For proof of graduation, students must request an official transcript.

Final Degree Verification Letter

Students may request a final letter when all requirements for graduation are met. Final letters will not be issued until all grades for the graduating term are submitted and posted to the student’s record. Final letters will not be issued once a degree has been awarded, students must request an official transcript.

Financial Obligations

Diplomas and transcripts are withheld until the student has satisfied all financial obligations with the University.

International Students

Plan of Study for International students

International students are able to utilize a term for internship, better aligning the graduate program with the University's mission. The on-campus programs operate on a calendar similar to a conventional quarter system: Fall, Winter, and Spring terms are "regular" academic terms during which students normally enroll full-time, and the Summer term is optional.

Many variations of this plan are possible, both with or without thesis. In particular, students may begin the program in any term, not just Fall. However, international students are required to complete two academic terms to be eligible for a non-study/internship term. This works perfectly for students that start in Fall or Winter. If an international student starts in Spring term, they will not be able to take an internship their first summer term. They may forego the non-study/internship term or apply to have their non-study/internship term changed to a regular academic term. For an international student, only one non-study/internship term is allowed during the plan of study.

The non-study/internship term offers the opportunity for the student to work in an internship at a related industry, work on-campus, travel, or optionally register in further coursework.

Please refer to specific program information as you develop your plan of study. Note that the CE and EE concentrations, in the MS Engineering program, require a masters thesis which is non-credit bearing. However, in the other MS Engineering concentrations the masters thesis is optional and carries eight (8) credit hours.

Note that eight (8) credit hours constitutes full time for financial support, and visa requirements. Students may elect to carry a higher course load. While some students prefer to take one class at a time, this may create issues with financial support or visa status.

Students enrolling in the on-campus MBA, MS in Engineering Management, or MS in Operations Management, may have prerequisite courses that will lengthen the plan of study.

Example Plan of Study without Thesis:

Classification	Code	Earned Hours
First Year	Fall	8 credits coursework
	Winter	8 credits coursework
	Spring	8 credits coursework
	Summer	Non-Study / Internship term
Second Year	Fall	8 credits coursework
	Winter	8 credits coursework

Example Plan of Study with Thesis:

Classification	Code	Earned Hours
First Year	Fall	8 credits coursework
	Winter	8 credits coursework
	Spring	8 credits coursework
	Summer	Non-Study / Internship term
Second Year	Fall	8 credits coursework

	Winter	8 credits coursework + thesis 1
	Spring	Thesis defense and submission

Example Plan of Study without Thesis, taking summer classes:

Classification	Code	Earned Hours
First Year	Fall	8 credits coursework
	Winter	8 credits coursework
	Spring	8 credits coursework
	Summer	8 credits coursework
Second Year	Fall	8 credits coursework

Student Records

The Office of the Registrar maintains the students' permanent academic record, including course registrations, enrollment status and the official transcript. The Registrar's Office is the point of contact for any required enrollment and degree certifications. As such, it is important that students keep the office current with their permanent mailing address so these services can be provided.

Note: The Registrar's Office will not discuss the student record with any third party without a written consent from the student.

Address, Phone, and Name Changes

Changes in addresses or phone numbers should be made by the student through Banner Self Service.

In order to process a name change, a copy of a government issued photo ID such as a driver's license and either a marriage license, a Social Security card, or a court order that reflects the new name are necessary. Name changes must be processed through the Registrar's Office.

Permanent Academic Records

All information, applications, correspondence, etc., involved in admitting and processing the active progress of an admitted student are maintained for five years after the student has last been an active degree-seeking student. After five years, only the student's attendance dates, academic performance, corporate affiliate, and degree awarded are kept as a permanent record.

Transcripts

A student's official academic record is maintained by the Registrar's Office at Kettering University and is normally reflected through a transcript. All requests for transcripts must be submitted through the National Student Clearinghouse. Transcripts are \$2.50 for domestic mailing or pickup and \$3.50 for electronic delivery. Official transcripts will not be issued to students who fail to meet their financial obligations or agreements with Kettering University. Unofficial transcripts are available on Banner Self Service.

Official transcripts from other institutions are not reissued or copied for distribution. If needed, they must be obtained directly from the issuing institution.

Thesis

Thesis Option – MS in Engineering

A thesis option is available for designated graduate programs. The thesis is required for on-campus research programs in Electrical Engineering and Computer Engineering.

Masters Thesis

The degree department will specify which course(s) may be replaced by the thesis. Criteria for topic selection are up to the degree department, as are thesis-option prerequisites, if appropriate. Information about the administrative requirements for a Masters Thesis may be obtained from the Graduate School.

A thesis committee of at least three (3) faculty members is required. Students must obtain the written consent of the individuals who will serve on the committee, starting with the professor who will be the major advisor and chair of the committee. If a student is unable to find a professor to be the major advisor, then the student will not be able to elect the thesis option. Students are urged to form the advisory committee and gain approval of a written research proposal by the end of their second term in residence. Students should plan to begin work on the thesis project by the end of their third term in residence. Registration for thesis credits requires the approval of the chair of the thesis committee. This approval is contingent upon prior approval of the research proposal by the thesis committee.

Master's theses are theory-based and goal-oriented. The criteria for success are achievement of the research goal and production of a written thesis of publishable quality.

Questions: Contact the program advisor

Information Technology

Information Technology (IT) is located in the Academic Building (AB), Room 2-340. All students have the privilege of using Kettering technology resources as long as they abide by the Acceptable Use of Information Technology Resources Policy, the Information Resources Policies, Etiquette & Rules and any other IT policies as documented. Some of the major technical services provided to students are:

Help Desk

The Help Desk provides technical support for our computing resources and is located in the Academic Building (AB), Room 2-340. During normal operations, the staff are available Monday through Friday 8:00 a.m. – 7:00 p.m. Contact us by phone at (810) 237-TECH (extension 8324) or by coming in person to 2-340 AB. You may also send e-mail to helpdesk@kettering.edu at any time. The staff will respond to support requests during normal business hours.

E-mail

All students have the privilege of having a Kettering University Google e-mail account. The Kettering e-mail account is the official way Kettering University faculty and staff communicate to students. Students are responsible for required actions conveyed to them through this communication vehicle, **whether or not they read the message**. Kettering provides each student with unlimited e-mail server storage. Our policy is to communicate by Kettering email, to ensure FERPA compliance. Therefore, do not auto forward to another e-mail service provider which may have less storage capacity, fewer features, and may hinder you to reply directly to the original email source.

Due to the proliferation of spam and phishing emails, be advised that you may receive emails that request personal information such as usernames and passwords. Although it may look authentic, pretending to originate from a legitimate source such as Kettering, do not respond. Immediately delete it recognizing that a legitimate source such as the Kettering IT department would never ask you to provide information such as passwords. Be cautious regarding any unsolicited email as it may contain elements that would prove to be detrimental to your computer.

Virus Protection

We strongly recommend that all students install virus protection software and maintain it to protect their personal PCs. Any up-to-date properly licensed or free virus protection software would be acceptable.

It is mandatory to have virus protection installed, current, and running when connected to the Kettering network.

Internet Access

Internet access is available through the Kettering University network for business and academic purposes. Faculty, staff, and students will also have access to the Internet, as well as most network resources, using their wireless devices. Students are required to use the KUW Profile for encrypted high speed access.

Web-Based Student Services

All students have access to a variety of online services through their web browser. They can view academic information such as grades, class schedules, and transcripts, as well as information about their financial account. They can also have access to view and update addresses,

telephone numbers, and email addresses to facilitate communication with Kettering University faculty and staff.

Blackboard

Many professors utilize the Blackboard Learning Management System for course syllabi, homework assignments, and tests. Access to Blackboard is available from anywhere a student has an internet connection. To help protect your privacy, security, and confidential information, you must sign on to Blackboard to access these services.

Virtualization

The Virtual Computer Lab (KUcloud) provides students virtual access to lab and classroom software typically only available while on campus. Virtualization provides access to classroom software anytime from anywhere.

Information and Help Sheets

Help for accessing the various systems, including the Internet, is available through the Help Desk and on the IT web site. The IT web pages contain valuable information to help maximize your use of the Kettering University computing resources.

Library Services

Kettering University Library

The Kettering University Library supports teaching, learning, and the university's research programs. We feature digital collections, friendly service and great space for collaborative and individual study.

Access is available in person during regular hours and 24/7 for all students, both on campus and off, through the Library website. The Library supports student research by subscribing to more than 100 databases that contain academic information resources. The collection includes books, journals, technical papers, standards, streaming films and documentaries on a variety of science, engineering, mathematics and computer science topics as well as the humanities. The reserve book collection offers a copy of all required textbooks for every class. The Library is also a great place to do research and work on group projects.

While most of the collection is available virtually through the Library website, we also have print books that are made available through a secure, touchless locker system. Resources not owned by the Library are often available through Inter-Library Loan. Linked-In Learning courses are available to catch up on specific skills and Mango Languages courses are ready for those interested in language learning.

Some helpful library telephone numbers include:

Phone Number	Contact
810-762-7814	Circulation Desk
810-762-9841	Interlibrary Loan
810-762-9598	Reference Desk
810-255-9009	Text a Librarian
800-955-4464, ext. 7814	Kettering University Toll-free Number

Kettering University Archives and Special Collections

The University Archives is located in the Durant-Dort Factory One building, at 303 W. Water Street near downtown Flint. It's just a twenty minute walk along the Flint River Trail. The Archives document America's industrial and business heritage with particular interest in the American automobile industry, the city of Flint, and the history of Kettering University.

The Charles F. Kettering Collection is one of the largest collections in the Archives and has been used by scholars worldwide. The digital photo collection now exceeds 100,000 images. A partial online catalog along with digitized photos can be found on the archives website. Kettering University's Curator of Special Collections may be reached at (810) 820-7747.

The Humanities Art Center is located on the fourth floor of the Academic Building. The gallery features world-class exhibits and collections that exemplify the craftsmanship of local and national artists. A variety of media are represented including paintings, photographs, sculpture, and ceramics. The center also holds a permanent collection of over 500 pieces. To schedule a visit to the Humanities Art Center, please contact Kettering University's Curator of Special Collections at (810) 820-7747 or the Library's Administrative Specialist at (810) 762-9840.

Alumni Engagement

The Office of Alumni Engagement connects and engages Kettering University alumni through gatherings and events with the end result being a dynamic relationship between the University and Alumni who will be more engaged and involved in volunteering, mentoring, recruiting, and giving back to the University.

By partnering with the Kettering/GMI Alumni Association Board, Admissions, Marketing, Co-op, Annual Giving, and all of University Advancement, the Office of Alumni Engagement will incrementally increase the number of alumni engaged each year, giving back to the University through well-timed and meaningful programs and activities.

Each year, programming includes regional alumni receptions throughout the country, company alumni "Bulldog Breakfasts," alumni recognition ceremonies, Alumni Connections Week, and affinity programs directed to specific alumni. Other types of programming include the Alumni Ambassador program and working to establish Alumni Regional Networks in geo-targeted areas.

The Kettering/GMI Alumni Association Board is made up of alumni who want to give back to the University with their time, talent, and resources. The Board is comprised of six committees:

1. Student Recruitment
2. Alumni Involvement & Events
3. Alumni Awards
4. Discounts and Benefits
5. Communications
6. Directorship
7. Revenue Generation/Fundraising

The Kettering/GMI Alumni Association annually recognizes outstanding and notable alumni for their professional accomplishments with the following awards:

1. Alumni Service Award
2. Young Alumni Award
3. Engineering Achievement Award
4. Entrepreneurial Achievement Award
5. Management Achievement Award
6. Civic Achievement Award
7. Outstanding Achievement Award
8. Human Relations Award
9. Distinguished Alumnus/Alumna Award

The Alumni Engagement Office and Alumni Board jointly support the Student Alumni Council (SAC) on campus. SAC is a student organization fostering interaction between alumni and students through various activities such as the Visiting Alumnus/Alumna Speaker Program. SAC

typically brings three alumni speakers on campus each term representing a diversity of industries, careers, and subjects students are interested in.

Administration and Faculty

Senior Administration

Dr. Robert K. McMahan, Jr., President

Dr. James Z. Zhang, Senior Vice President for Academic Affairs and Provost

Mr. Thomas W. Ayers, Vice President for Administration and Finance

Ms. Susan L. Davies, Vice President for University Advancement and External Relations

Ms. Tracie Jones, Vice President for Enrollment and Co-operative Services (Interim)

Dr. LB McCune, Vice President for Student Life and Dean of Students

Mr. Geoffrey Marsh, Acting Director for Instructional, Administrative and Information Technology

Dr. Christine M. Wallace, Vice President for Kettering Global

Mr. Donald G. Rockwell, University Counsel

Deans

Dr. Haseeb Ahmed, Dean, School of Management (Interim), Professor of Finance

Dr. Craig J. Hoff, Dean, College of Engineering, Professor of Mechanical Engineering

Dr. Scott W. Reeve, Dean, Graduate School and Sponsored Research, Professor of Chemistry

Dr. Kathryn Svinarich, Associate Provost for Assessment & Academic Support, Dean, College of Sciences and Liberal Arts, Associate Professor of Physics

Academic Department Heads

Dr. Babak Elahi, Department of Liberal Studies

Dr. Susan Farhat, Department of Chemical Engineering (Acting)

Dr. Michael Farmer, Department of Computer Science

Dr. Scott Grasman, Department of Industrial & Manufacturing Engineering

Dr. Daniel Ludwigsen, Department of Natural Sciences (Interim)

Dr. Matthew O'Toole, Department of Mathematics (Acting)

Dr. Bassem Ramadan, Department of Mechanical Engineering

Dr. Mark Thompson, Department of Electrical & Computer Engineering

Faculty

The Kettering University faculty listed below are able to teach the graduate courses for our programs. The majority hold doctorates and nearly all of them have consulting experience in industry and business.

Bashar AbdulNour, Professor of Practice

B.S. 1979, University of Baghdad, Iraq; M.S. in Mechanical Engineering 1982, M.S. in Applied Mathematics 1987, Ph.D. 1990, Michigan State University

Haseeb Ahmed, Dean, School of Management (Interim), Professor of Finance

B.S. 1984, The University of Texas at Arlington; M.B.A. 1988, Jacksonville State University; Ph.D. 1998, University of Mississippi

Jamal Alhiyafi, Assistant Professor of Computer Science

B.S. 2000, University of Michigan-Dearborn; M.S. 2002, University of Michigan-Dearborn; Ph.D. 2010, Wayne State University

Mohammad F. Ali, Associate Professor of Mechanical Engineering

B.S. 1967, University of Karachi, Pakistan; M.S. 1969, University of Dhaka, Bangladesh, India; M.S. 1975, University of Miami; M.B.A. 1976, Florida International University; Ph.D. 1982, Mississippi State University

Patrick J. Atkinson, Professor of Mechanical Engineering

B.S. 1991, Kettering University; M.S. 1994, Ph.D. 1998, Michigan State University

Theresa Atkinson, Associate Professor of Mechanical Engineering

B.S.M.E. 1990, Michigan State University; M.S. 1994 Michigan State University; Ph.D. 1998, Michigan State University

Javad Baqersad, Assistant Professor of Mechanical Engineering

B.S. 2005, Yazd University, Iran; M.S. 2008, Iran University of Science and Technology; M.S.E. 2014, University of Massachusetts; Ph.D. 2015, University of Massachusetts

Jennifer Bastiaan, Assistant Professor of Mechanical Engineering

B.S. 1997, GMI Engineering & Management Institute; Ph.D. 2015, University of Waterloo, Ontario

Randall Beikmann, Professor of Practice, Mechanical Engineering

B.S. 1982, Kansas State University; M.S. 1983, University of Michigan; Ph.D. 1992, University of Michigan

K. Joel Berry, Professor of Mechanical Engineering

B.S.M.E. 1979, General Motors Institute; M.S. 1981, Michigan State University; Ph.D. 1986, Carnegie Melon University; P.E., Michigan

Michael D. Callahan, Professor of Social Science

B.S. 1986, Central Michigan University; M.A. 1988, Ph.D. 1995, Michigan State University

Matthew Causley, Associate Professor of Applied Mathematics

B.S. 2006, Kettering University; Ph.D. 2011, New Jersey Institute of Technology

Ram S. Chandran, Professor of Mechanical Engineering

B.E. 1969, University of Madras; Michigan Technological Institute 1971, Indian Institute of Technology; Ph.D. 1982, Monash University, Australia

Ada Cheng, Associate Professor of Applied Mathematics

B.S. 1993, Memorial University of Newfoundland, Canada; M.S. 1995, Ph.D. 2000, University of Waterloo, Ontario, Canada

Susanta K. Das, Associate Professor of Mechanical Engineering

B.S. 1991, University of Dhaka; M.S. 1993, University of Dhaka, Bangladesh; Ph.D. 1999, Tokyo Institute of Technology, Japan

Gregory W. Davis, Professor of Mechanical Engineering

B.S. 1982, University of Michigan; M.S. 1986, Oakland University; Ph.D. 1991, University of Michigan

Christopher Dewberry, Assistant Professor of Chemistry

B.S. 2006, University of North Texas; Ph.D. 2011, University of North Texas

Gianfranco DiGiuseppe, Professor of Mechanical Engineering

B.A. 1994, Dominican University; M.S. 1997, Ph.D. 2000, Illinois Institute of Technology

Yaomin Dong, Professor of Mechanical Engineering

B.S. 1983, M.S. 1986, Northeast University; M.S. 1995, Ph.D. 1998, University of Kentucky

Raghu Echempati, Professor of Mechanical Engineering

B.S. 1970, Andhra University, Waltair, India; M. Tech, 1972; Ph.D. 1976 Indian Institute of Technology, India; M.S. 2014, Kettering University; P.E., Mississippi

William Edwards, Professor of Practice
B.S. 1990, M.S. 2003, Ph.D. 2016, Oakland University

Babak Elahi, Department Head, Liberal Studies, Professor of Communication
B.A. 1989, San Diego State University; M.A. 1992, University of California, San Diego; Ph.D. 2001, University of Rochester

Susan Farhat, Acting Department Head of Chemical Engineering, Associate Professor of Chemical Engineering
B.S. 2003, Ph.D. 2010, Michigan State University

Michael Farmer, Department Head of Computer Science, Professor of Computer Science
B.S. 1982, Columbia University; M.S. 1984, University of Michigan; M.S. 1994, University of Minnesota; Ph.D. 2004, Michigan State University

David L. Foster, Associate Professor of Practice
B.S. 1999, Kettering University; M.S. 2003, University of Michigan; Ph.D. 2008, Oakland University

Leszek Gawarecki, Professor of Applied Mathematics
M.A. 1984, Warsaw University, Poland; Ph.D. 1994, Michigan State University

Ezekiel Gebissa, Professor of Social Science
B.A. 1984, Addis Ababa University; M.A. 1991, Michigan State University; Ph.D. 1997, Michigan State University

Mohammad Ghamari, Assistant Professor of Computer Engineering
B.Eng. 2006, Leeds University, United Kingdom; M.S. 2007, Newcastle University, United Kingdom; Ph.D. 2012, Lancaster University, United Kingdom

Farnaz Ghazi-Nezami, Associate Professor of Industrial Engineering
B.S. 2005, Alazahara University, M.S., 2008, Azad University, Tehran, Iran; Ph.D. 2013, Wichita State University.

Scott E. Grasman, Department Head, Professor of Industrial Engineering
B.S.E. 1994, M.S.E. 1995, Ph.D. 2000, University of Michigan

John Grether, Professor of Practice
B.B.A. 1993, Northwood University; M.A. 1994, Central Michigan University; J.D. 2005, Michigan State University

Jeffrey B. Hargrove, Associate Professor of Mechanical Engineering
B.S. 1987, M.S. 1992, GMI Engineering & Management Institute; Ph.D. 1997, Michigan State University

Ruben Hayrapetyan, Professor of Applied Mathematics
Ph.D. 1981, Yerevan Armenia State University

Lisandro Hernández de la Peña, Associate Professor of Chemistry & Biochemistry
B.S. 1995, M.S. 1997, Institute for Nuclear Sciences & Technology, Cuba; Ph.D. 2004, Dalhousie University

Huseyin R. Hizirolu, Professor of Electrical Engineering
B.S. 1975, Gazi University, Ankara, Turkey; M.S. 1979, Middle East Technical University, Turkey; Ph.D. 1982, Wayne State University

Craig J. Hoff, Dean, College of Engineering, Mechanical Engineering, Professor of Mechanical Engineering
B.S. 1979, M.S. 1981, Michigan State University; Ph.D. 1992, University of Michigan, P.E., Michigan

James K. Huggins, Associate Professor of Computer Science
B.S. 1989, M.S. 1991, Ph.D. 1995, University of Michigan

Petros Ioannatos, Associate Professor of Economics
B.A. 1980, The Athens Graduate School of Economics and Business Science, Greece; M.A. 1983, University of Windsor, Canada; Ph.D. 1988, Wayne State University

Abishek Balsamy Kamaraj, Assistant Professor
B.E. 2010, Birla Institute of Technology and Science, Pilani, India; M.S. 2012, Ph.D. 2018, University of Cincinnati

Saroja Kanchi, Professor of Computer Science
B.S. 1983, M.S. 1985, Indian Institute of Technology, Delhi, India; M.S. 1987, M.S. 1989, University of Toledo; Ph.D. 1993, Texas A & M University

Ronald E. Kumon, Associate Professor of Physics
B.S. 1992, Michigan State University; Ph.D. 1999, The University of Texas at Austin

Christine Levecq, Professor of Humanities
B.A. 1983, State University of Liège, Belgium; M.A. 1986, University of Illinois at Urbana-Champaign; Ph.D. 1991, University of Illinois at Urbana-Champaign.

Daniel Ludwigsen, Department Head, Associate Professor of Physics and Acoustics
B.A. 1992, Beloit College; Ph.D. 2001, Brigham Young University

Omar Malik, Associate Professor of Management in the School of Management
B.A. 1989, University of the Punjab; MBA 1992 Lahore University of Management Sciences, Pakistan; Ph.D. 2006 Temple University

Araldo Mazzei, Professor of Mechanical Engineering
B.S.M.E. 1987, M.S.M.E. 1991, University of Sao Paulo; Ph.D. 1998, University of Michigan

Robert K. McMahan, Professor of Physics and President
B.S., A.B. 1982, Duke University; Ph.D. 1986, Dartmouth College

Ahmed Mekky, Assistant Professor of Mechanical Engineering
B.S. 2007, University of Khartoum, Sudan; M.S. 2012, Ph.D. 2018, Old Dominion University

Veronica Moorman, Associate Professor of Chemistry and Biochemistry
B.A. 2006, Coe College; Ph.D. 2012, University of Pennsylvania

Austin Nash, Assistant Professor of Mechanical Engineering
B.S. 2013, M.S. 2015, Rose-Hulman Institute of Technology; Ph.D. 2019, Purdue University

Hee Seok Nam, Assistant Professor of Applied Mathematics
B.S. 1991, M.S. 1993, Ph.D. 2000, Seoul National University, South Korea; M.S. 2010, The University of Iowa

Steven Nartker, Associate Professor of Chemical Engineering
B.S. 2001, Kettering University; Ph.D. 2009, Michigan State University

Lawrence Navarre, Lecturer of Business Administration

B.B.A. 1984, Kent State University; M.S.M. 1990, Purdue University

Matthew O'Toole, Associate Professor of Applied Mathematics
B.S. 2002, Hillsdale College; M.S. 2006, Ph.D. 2010, Michigan State University

Jungme Park, Assistant Professor of Computer Engineering
B.S. 1989, Korea University; M.S. 1996, University of Alabama;
Ph.D. 2001, University of Alabama

Benjamin Pauli, Assistant Professor of Social Science
B.A. 2005, University of Washington, Tacoma; M.A. 2009, Rutgers University; Ph.D. 2014, Rutgers University

Diane L. Peters, Associate Professor of Mechanical Engineering
B.S.M.E. 1993, University of Notre Dame; M.S. 2000, University of Illinois at Chicago; Ph.D. 2010, University of Michigan

Ahmad Pourmovahed, Professor of Mechanical Engineering
B.S. 1977, Arya-Mehr University of Technology, Iran; M.S.M.E. 1979, Ph.D., 1985, University of Wisconsin-Madison

Andrzej Przyjazny, Professor of Chemistry
M.Sc. 1971, Technical University of Gdansk; Ph.D. 1977, Southern Illinois University; 1986, Technical University of Gdansk

Montserrat Rabago-Smith, Associate Professor of Chemistry
B.A. 1998, Instituto Tecnológico y de Estudios Superiores de Monterrey, Monterrey, Mexico; Ph.D. 2002, Michigan State University

Corneliu I. Rablau, Professor of Physics
B.S. 1989, University of Bucharest, Romania; M.S. 1998, West Virginia University; Ph.D. 1999, West Virginia University

Uma Ramabadran, Professor of Physics
Ph.D. 1990, University of Cincinnati

Bassem Ramadan, Department Head, Mechanical Engineering, Professor of Mechanical Engineering
B.E. 1984, Beirut; M.S. 1986, Ph.D. 1992, Michigan State University

Badrinath Rao, Associate Professor of Sociology and Asian Studies
B.A. 1984, M.A. 1986, Bangalore University, India; M.A. 1992, Queen's University, Canada; Ph.D. 1999, University of Alberta, Canada; J.D. 2013, Wayne State University

Scott W. Reeve, Dean, Graduate School and Sponsored Research, Professor of Chemistry
B.A. 1987, Augsburg College, Ph.D. 1992, University of Minnesota

Joseph J. Salacuse, Professor of Applied Mathematics
B.S. 1970, Bradley University; Ph.D. 1978, State University of New York at Stony Brook

Stacy Seeley, Professor of Chemistry
B.S. 1989, Central Michigan University; Ph.D. 1995, University of Massachusetts

Peter L. Stanchev, Professor of Computer Science
M.S. 1972, Ph.D. 1975, D.Sc. Sofia University

Timothy Stiles, Assistant Professor of Physics
B.A. 1998, Grinnell College; Ph.D. 2005, University of Wisconsin-Madison

Denise Stodola, Associate Professor of Communication

B.A. 1990, M.A. 1993, University of Texas at San Antonio; Ph.D. 2003, University of Missouri – Columbia

Kathryn Svinarich, Associate Provost for Assessment & Academic Support, Dean, College of Sciences and Liberal Arts, Associate Professor of Physics
B.S. 1983, University of Michigan; Ph.D. 1991, Wayne State University

Laura L. Sullivan, Professor of Mechanical Engineering
B.S. 1984, Arizona State; M.S.E. 1988, Ph.D. 1992, University of Texas at Arlington

Nozar Tabrizi, Associate Professor of Computer Engineering
B.S.E.E. 1980, M.S.E.C.E. 1988, Sharif University of Technology, Iran; Ph.D. 1997, University of Adelaide, Australia

Ronald Tackett, Associate Professor of Physics
B.S. 2003, Eastern Michigan University, M.S. 2007, Wayne State University, Ph.D. 2008, Wayne State University

Hafez Tari, Assistant Professor of Mechanical Engineering
B.S. 2005, M.S. 2008, University of Mazandaran, Iran; M.S. 2011, University of Maryland, Baltimore County; Ph.D. 2014, The Ohio State University

Massoud S. Tavakoli, Professor of Mechanical Engineering
B.S.M.E. 1981, Louisiana State University; M.S.M.E. 1983, Ph.D. 1987, Ohio State University; P.E., Georgia

Allan Taylor, Assistant Professor of Electrical Engineering
B.S.E.E. 2009, M.S.Eng. 2011, Kettering University; Ph.D. 2019, Michigan State University

Kevin TeBeest, Associate Professor of Applied Mathematics
B.S. 1981, South Dakota State University; M.S. 1986, Ph.D. 1992, University of Nebraska-Lincoln

Levi Tenen, Assistant Professor of Philosophy
B.A. 2012, Lewis & Clark College; M.A. 2015, Ph.D. 2020, Indiana University

Girma S. Tewolde, Professor of Computer Engineering
B.S. 1992, Addis Ababa University, Addis Ababa, Ethiopia; M.S. 1995, University of New South Wales, Sydney, Australia; Ph.D. 2008, Oakland University

Mark G. Thompson, Department Head, Electrical and Computer Engineering, Professor of Electrical Engineering
B.S. 1976, M.S. 1977, Ph.D. 1980, Michigan State University

Mohammad Torfeh, Professor of Electrical Engineering
B.S. 1977, University of Isfahan; M.S. 1979, Ph.D. 1982, Wayne State University

Salomon Turgman Cohen, Associate Professor of Chemical Engineering
B.S. 2005, North Carolina State University, Ph.D. 2010, Purdue University

Giuseppe Turini, Associate Professor of Computer Science
M.S. 2004, Ph.D. 2011, University of Pisa, Italy

David R. Vineyard, Assistant Professor of Computer Science
A.B. 1974, B.S. 1981, University of Michigan; A.M. 1977, University of Michigan; Ph.D. 1989, Michigan State University

Lihua Wang, Professor of Chemistry

B.S. 1984, Fudan University, China; Ph.D. 1991, Purdue University

Yunsheng Wang, Associate Professor of Computer Science
BEng 2007, Dalin University, China; M.S. 2008, University College,
London); Ph.D. 2013, Temple University

Christine M. Wallace, Vice President for Kettering Global Campus, Clinical
Faculty in School of Management
B.S. University of Michigan; M.Ed., Georgia Regents University; Ph.D.
2004, Western Michigan University

Kenneth Williams, Assistant Professor of Business Administration
B.B.A. 1981, University of Michigan; M.B.A. 1986, Wayne State University;
Ph.D. 2016 Northcentral University

Benaiah Yongo-Bure, Associate Professor of Social Science
B.A. 1976, Makerere University, Uganda; M.A. 1979, Ph.D. 1984, Dalhousie
University, Canada

Justin Young, Associate Professor of Industrial Engineering
B.S.E. 2005, M.S.E. 2006 & 2008, Ph.D. 2011 University of Michigan

Mehrdad H. Zadeh, Associate Professor of Computer Engineering
B.Sc.C.E. 1992, Shiraz University, Fars, Iran; M.A.Sc.E.E. 2004, Concordia
University, Montreal, Canada; Ph.D. 2009, University of Waterloo, Ontario,
Canada

Ali R. Zand, Professor of Chemistry
B.S. 1989, Saginaw Valley State University; M.S. 1992, Central Michigan
University; Ph.D. 1996, Michigan State University

Paul Zang, Professor of Mechanical Engineering
B.S.M.E. 1978, Lawrence Institute of Technology; M.S.M.E. 1980,
University of Michigan; Ph.D. 1987, Michigan State University; P.E.,
Michigan

James Z. Zhang, Senior Vice President for Academic Affairs and Provost,
Professor of Electrical Engineering
B.S.E.E. 1986, Hunan University, PRC; M.A. 1993, Indiana University;
M.S.E. 1993, Purdue University; Ph.D. 2002, Purdue University

Xuan (Joe) Zhou, Associate Professor of Electrical Engineering
B.S. 2002, Taiyuan University of Technology, China; M.S. 2005, Xi'an
Jiaotong University, China; Ph.D. 2012, University of Michigan-Dearborn

Contact Information

The information below provides contact information that you may need during your studies in the Kettering University graduate program. We invite you to contact the respective person(s) as required to address your questions or concerns.

Main Graduate Contact Information	(866) KU-GRADS / gsr@kettering.edu
Admission/Application Status	admissions@kettering.edu
Blackboard/Banner Web Questions	Helpdesk: (810) 237-8324 / helpdesk@kettering.edu
Course Withdrawal	Registrar's Office: (810) 762-7476/registrar@kettering.edu
School of Management- Graduate Course Advising	som@kettering.edu
Enrollment Verification	Registrar's Office: (810) 762-7476 / registrar@kettering.edu
Financial Aid Office	(810) 762-7859 / finaid@kettering.edu
Financial Standing/Tuition payments/Receipts/Tax Info	Student Accounts Office: (810) 762-9552/studentaccounts@kettering.edu
Grades	Registrar's Office: (810) 762-7476 / registrar@kettering.edu
Graduate Assistantship	gsr@kettering.edu
Graduation Information	Registrar's Office: (810) 762-7476 / registrar@kettering.edu
Incomplete Grades/Status	The course professor / see course syllabus
Kettering University Online	Janell Beil: (810) 762-9523 / KUOnline@kettering.edu
Registration Information	Registrar's Office: (810) 762-7476 / registrar@kettering.edu
Student Change of Name, Address, Info	Registrar's Office: (810) 762-7476 / registrar@kettering.edu
Technical Support (On Campus)	Helpdesk: (810) 237-8324 / helpdesk@kettering.edu
Technical Support (KUO)	Technical Support Helpdesk: (844) 562-2864 / KUOHelpDesk@kettering.edu
Testing out of pre-requisite course	Contact course department
Transcript Request	https://www.kettering.edu/transcripts
Transfer Credits	gsr@kettering.edu
VA Benefits	Registrar's Office: (810) 762-7476 / registrar@kettering.edu

Non-Discrimination

Non-Discrimination Policy Statement

Kettering University, as an equal opportunity/affirmative action employer, complies with all applicable federal and state laws regarding nondiscrimination and affirmative action.

Kettering University is deeply committed to a policy of equal opportunity for all persons and does not discriminate on the basis of race, color, national origin, age, marital status, sex, sexual orientation including gender identity or expression, disability, religion, height, weight, genetic information, or veteran status in employment, educational programs and activities, and admissions except where religion, sex, or age are bona fide job related employment requirements.

Discrimination on the basis of race/ethnicity, color, ancestry, religion, national origin, sex, including marital status, age, disability, or status as a Vietnam-era veteran, special disabled veteran, recently separated veteran or other protected veteran is prohibited by federal and state statutes as amended, including Titles VI and VII of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, Sections 503 and 504 of the Rehabilitation Act of 1973, the Pregnancy Discrimination Act of 1978, the Age Discrimination in Employment Act of 1978, the Vietnam Era Veteran's Readjustment Assistance Act of 1974, the Americans with Disabilities Act of 1990, and the Civil Rights Act of 1991.

Inquiries or grievances may be addressed to the Director of Human Resources, Office of Human Resources, 1700 University Avenue, Flint, MI 48504, 810-762-9500.

Title IX Statement

It is the policy of Kettering University to comply with Title IX of the Education Amendments of 1972, which prohibits discrimination (including sexual harassment and sexual violence) based on sex in the University's educational programs and activities. Title IX also prohibits retaliation for asserting or otherwise participating in claims of sex discrimination. The Title IX coordinator and the deputy coordinator have been designated to oversee Kettering's compliance with Title IX and to respond to reports of violations. For more information about Title IX, go to Kettering's Title IX website. A person may also file a complaint with the Department of Education's Office for Civil Rights regarding an alleged violation of Title IX by visiting the U.S. Department of Education's website or calling 800-421-3481.

Graduate A-Z

Accounting (ACCT)

ACCT-518 Accounting/Financial Concepts 4 Credits

Prerequisites: None

Students will gain an understanding of how accounting data is developed and used by managers in making decisions. The course is divided into three sections. First, the Financial Accounting section discusses how basic financial events are recorded and presented in the accounting statements. Second, the Cost Accounting section discusses the nature and recording of manufacturing costs, development of overhead rates, job and process costing, budgeting, and control of manufacturing cost. Third, the Managerial Accounting section discusses profit volume analysis, relevant cost analysis, time value of money concepts, and capital budgeting.

Lecture: 3, Lab 0, Other 1

ACCT-639 Managerial Accounting 4 Credits

Prerequisites: ACCT-518 or MGMT-510

The use of managerial accounting information for planning and control is presented. Design, implementation and the use of planning and control systems to achieve the firm's strategies are emphasized, with a focus on managerial decision-making.

Lecture: 3, Lab 0, Other 1

ACCT-691 Special Topics in Mgr Accting 4 Credits

Prerequisites: None

Lecture: 4, Lab 0, Other 0

Business (BUSN)

BUSN-522 Business Statistics 4 Credits

Prerequisites: None

Solving complicated business programs in today's increasingly competitive global marketplace demands new thinking and new skills. This course is designed to provide insight for learners about how to collect, analyze and interpret data in order to make sound business decisions. Probability analysis, sampling, hypothesis testing, descriptive and inferential statistics along with additional tools and techniques used by business professionals in market research, business forecasting and risk mitigation are employed.

Lecture: 4, Lab 0, Other 0

BUSN-629 Entrepreneurial Finance 4 Credits

Prerequisites: FINC-619

This is a course on financing startups and other small businesses. The objective is to provide students with an understanding of how financing from venture capital and private equity funds, as well as angel investors, finds its way to entrepreneurial ventures. The course follows a basic framework for study and analysis via the life cycle of an entrepreneurial venture consisting of (a) opportunity recognition, (b) valuation and terms of financing, (c) growing the entrepreneurial venture, and (d) harvesting the venture to create profits through Initial Public Offerings (IPOs) or a sale of the business. Students will examine the financial concepts, tools, and techniques for a successful entrepreneurial venture, with an emphasis on the financial management practices needed to secure financing and using business valuation models. Students may not receive credit for both BUSN-429 and BUSN-629.

Lecture: 4, Lab 0, Other 0

BUSN-659 International Business 4 Credits

Prerequisites: None

This course provides an overview of business practices in an interdependent, integrated, global economic system. A focus will be placed on understanding the opportunities and challenges that businesses must address in the face of globalization with emphasis on best practices in international business. Students may not receive credit for both BUSN-459 and BUSN-659.

Lecture: 4, Lab 0, Other 0

BUSN-689 Organizational Behavior 4 Credits

Prerequisites: MGMT-639 or MGMT-510

Students engage in a comprehensive examination of organizational behavior theories including analysis at individual, group and organizational levels. Individual levels include perception, personality, and motivation. Group levels include decision-making, group dynamics, and team building. Organizational levels include effective communication, empowerment, leadership, diversity, cross-cultural issues, and conflict resolution. Experiential activities provide opportunity for theoretical application and real-world understanding.

Lecture: 4, Lab 0, Other 0

BUSN-779 MBA Capstone: Innovation & New Ventures 4 Credits

Prerequisites: MGMT-659 or MGMT-510

This capstone course is focused on the formation of a new company or organization based on an innovation in product, service, process or delivery. Students develop a comprehensive business plan showcasing their understanding of business management concepts. This course requires an integrative approach to produce a business plan applicable to a variety of industries.

Lecture: 4, Lab 0, Other 0

Computer Engineering (CE)

CE-612 Digital Systems Design 4 Credits

Prerequisites: None

The principles and practices used in the design of modern complex combinational and sequential digital systems are covered in this course. Digital logic design, analysis, simulation, and implementation techniques are covered. Fundamental algorithms underlying computer-aided design (CAD) tools are studied. Schematic diagrams, hardware description languages (HDL), and system-on-programmable chip (SoPC) design tools are used to specify designs targeted for implementation in technologies ranging from discrete ICs to programmable logic devices, ASICs and SoPCs. Topics in testing of logic circuits and hardware-software co-design will be covered. The course is accompanied by laboratory component that allows students to exercise the principles and practices learned.

Lecture: 3, Lab 2, Other 0

CE-620 Microcomputer Systems 4 Credits

Prerequisites: None

The architectural features, design principles, development tools and techniques of advanced embedded microcomputers are covered in this advanced level course. The topics include architectures of contemporary 16-bit and 32-bit RISC microcontrollers (considering Microchip PIC24 and PIC32 as example cases for the practical development experiences), instruction set, addressing modes, software development & debugging, parallel and serial interfacing, interrupts, timer module, ADC module, etc.; The course has a strong laboratory component, which will be carried out on a microcomputer development kit with the latest family of 16-bit and 32-bit microcontrollers. Students will also complete independent projects or research assigned by the instructor on topics such as low-power micro architectures and power-aware computing.

Lecture: 3, Lab 2, Other 0

CE-622 Computer Architecture and Organization 4 Credits

Prerequisites: None

Fundamental concepts in computer architecture and organization are presented. Laboratory assignments using VHDL simulation are a major portion of the course. Topics include fixed point and floating point computer arithmetic; assessing and understanding performance; control unit design; microprogramming; memory organization; cache design; a 32-bit instruction-set architecture; single-cycle, multicycle and pipelined CPU architectures; RISC architecture; examples of commercial computer architectures. An independent study or project will be completed.

Lecture: 3, Lab 2, Other 0

CE-624 VLSI Design 4 Credits

Prerequisites: None

Design techniques and basic theory of integrated circuit design are discussed. Topics include review of the semiconductor physics associated with NMOS and PMOS transistors; fabrication process; CMOS combinational circuits; memory cells; stick diagrams; layout techniques using CAD tools; circuit extraction and analysis. An advanced project is completed.

Lecture: 3, Lab 2, Other 0

CE-626 Real-Time Embedded Systems 4 Credits

Prerequisites: None

Implementation and applications of real-time embedded computers are studied. Topics include the case study of an embedded real-time operating system, typical applications of embedded computers, real-time hardware and software interfacing, and real-time scheduling algorithms. This course includes a lab component with several short design projects and research-oriented final project.

Lecture: 3, Lab 2, Other 0

CE-642 Mobile Robotics 4 Credits

Prerequisites: None

Fundamentals of robotics with an emphasis on mobile robots, which are intelligent integrated mechanical, electrical and computational systems functioning in the physical world will be covered. Topics include state-of-the-art technologies in mobile robotics, such as locomotion, sensing, control, communication, localization, mapping, navigation, etc. Advanced topics such as coordination of multiple mobile robots will also be explored. The course aims to provide both theoretical and practical experience to students through lectures and simulation software. Students will also complete independent projects or research on current topics covering mobile robotics technologies and related fields.

Lecture: 3, Lab 2, Other 0

CE-650 App Devel for Mobile Devices 4 Credits

Prerequisites: None

Terms Offered: Winter of even years; Spring of odd years

This course discusses an overview of how to get started developing mobile apps for Android and iOS platforms. These two app development platforms share similar challenges but have different approaches to addressing them. Both platforms will be taught to encourage students to see how the two different approaches can be used to solve similar issues. Students will choose one platform for their final design project. Topics include user interface design, network, communication, and sensor interfacing. This course includes lab components with design projects and final directed design project.

Lecture: 3, Lab 2, Other 0

CE-651 Introduction to Autonomous Driving 4 Credits

Prerequisites: None

This course provides an overview of theoretical and practical background regarding the design and development of autonomous vehicles. Topics include an overview of autonomous vehicle systems, autonomous vehicle localization technologies, perception in autonomous driving, decision and planning, and control for autonomous driving. This course aims to cover the basics of autonomous driving through lectures, lab assignments, a term project, and readings on current related topics. CE-651 students will be required to complete additional projects or independent review of research topics with approval of the instructor. Students may not receive credit for both CE-451 and CE-651.

Lecture: 3, Lab 2, Other 0

CE-652 Artificial Intelligence for Autonomous Driving 4 Credits

Prerequisites: None

This course will provide introductory theories and technologies in artificial intelligence focusing on machine learning, covering a wide range of machine learning methods, concepts and applications. Machine learning studies algorithms that learn from large quantities of data, identify patterns and make predictions on new data. The major list of machine learning fields are computer vision, robotics, autonomous driving, voice/gesture recognition, and automated planning & scheduling, etc. Students will study the concepts that underlie intelligent systems and investigate advanced topics in intelligent systems through a course project.

Lecture: 3, Lab 2, Other 0

CE-654 Computer Vision for Autonomous Driving 4 Credits

Prerequisites: None

This course will cover introductory theories and modern technologies in computer vision systems for autonomous driving. Data from visual sensors play crucial roles in many fields such as autonomous driving, surveillance camera, and robotics. The computer vision system seeks to automate tasks that the human visual system can do. The goal of this course is to learn technologies that enable a computer automatically to understand the content of visual sensors for autonomous driving. The first half of this course will focus on fundamental models and algorithms in computer vision and in the second half of the course students can learn about computer vision applications and programming skills to accomplish computer vision tasks. Graduate students taking this course are also required to complete independent review or survey of cutting edge research topics in computer vision systems, such as object-detection methods for autonomous driving, Deep Neural Network for environmental perception, and innovative applications, etc., selected by the students with approval of the instructor. The survey or research report must be presented in a conference paper format that is ready for submission to a conference.

Lecture: 3, Lab 1, Other 0

CE-672 Virtual Reality Systems: M&C 4 Credits

Prerequisites: None

This course provides the required theoretical and practical background to design and development of multimodal virtual reality (VR) systems. Particularly, the main focus is on VR-based human-in-the-loop systems that enable users to interact and/or manipulate virtual objects in simulated environments. This course aims to cover basics of these systems through lectures, homework, lab assignments, a term project, and readings on current related topics. Through lab assignments, students acquire hands-on skills to create a multimodal virtual environment. Topics include multimodal virtual reality, current VR technology and devices, human-centered simulation: human perception and psychophysics, basic control and stability analysis of VR systems, and human factors in the design of VR displays. CE-672 students will be required to complete additional projects or independent review of research topics with approval of the instructor.

Lecture: 3, Lab 2, Other 0

CE-680 Computer Networks 4 Credits

Prerequisites: None

Organization, analysis, and design of interconnected systems of computers are studied. Topics include the Open System Interconnection model and the Internet TCP/IP reference architecture. Standard protocols and technologies at each network layer will be covered, such as HTTP and a socket programming API at the application layer, TCP and UDP at the transport layer, and IPv4 and IPv6 along with fundamentals of routing at the network layer. Ethernet and Wi-Fi with their related physical mediums are discussed. The course will also introduce error detection and correction methods, basic network security principles and mobile technologies. Students are also required to complete a research project, to be determined and assigned with approval of the instructor. Students may not receive credit for both CE-480 and CE-680.

Lecture: 3, Lab 2, Other 0

CE-684 Internet of Things (IoT) 4 Credits

Prerequisites: None

The most important topics of the Internet of Things and its applications will be addressed. Topics include an introduction to network stacks and embedded operating systems, IoT architecture models, smart devices, connections and access technologies, the IoT network layer, application layer protocols relevant to IoT, and IoT security practices. Various IoT application areas will be discussed, such as industrial, home automation, manufacturing, energy, utilities, vehicles, smart cities, agriculture and health care. Students complete a term project to develop a complete IoT application. Students are also required to complete a research project, to be determined and assigned with approval of the instructor. Students may not receive credit for both CE-484 and CE-684.

Lecture: 3, Lab 2, Other 0

CE-691 Computer Engineering Special Topics 4 Credits

Prerequisites: None

Graduate level Special Topics in Computer Engineering.

Lecture: 4, Lab 2, Other 0

CE-695 Graduate Research in Computer Engineering 8 Credits

Prerequisites: None

This course is directed research towards a master's thesis. Students must take this course under the direction of a faculty advisor, and it is graded Satisfactory/Unsatisfactory. This course may be repeated for credit.

Lecture: 0, Lab 0, Other 0

CE-699 Computer Engineering Independent Study 8 Credits

Prerequisites: None

Terms Offered: As needed

Graduate level Independent Study in Computer Engineering

Lecture: 8, Lab 0, Other 0

Communications (COMM)

COMM-601 Communicating about Data 4 Credits

Prerequisites: None

Visualizations are powerful. Theories of visual rhetoric and design teach us that good visualization is not only clear and accurate but appealing as well. When executed well, visualizations enhance oral or written communication, by supporting arguments and claims, by providing insight into complex issues, and by supporting recall and decision-making in audiences. This relationship goes both ways, however, even well-crafted visualizations must be supported by effective oral and written communication. In this course, students explore both sides of this relationship, becoming familiar with common genres of visualization and with techniques both for designing them effectively and ethically, and for presenting visualizations orally and in prose.

Lecture: 4, Lab 0, Other 0

Computer Science (CS)

CS-601 Programming Methods for Data Science 4 Credits

Prerequisites: None

Introduction to computer science concepts and basic programming skills that are specifically geared toward data science, and forms a part of the introductory coursework for a Data Science & Data Analytics degree.

Course emphasizes writing programs that are capable of retrieving and manipulating large amount of data. The first half of the course focuses on Python as a first programming language, while the second half of the course covers selected advanced topics such as data visualization, web scraping, database access and others.

Lecture: 4, Lab 0, Other 0

CS-625 Parallel Programming and Algorithms 4 Credits

Prerequisites: None

Parallel computing has long played a vital role in addressing the performance demands of high-end engineering and scientific applications. Over the last decade, parallel computing has become important to a much broader audience as nearly all computer systems are being built using chips with multiple processor cores. The goal of CS-625 is to introduce students to the foundations of parallel computing including the principles of parallel algorithm design, analytical modeling of parallel programs, programming models for shared- and distributed-memory systems, parallel computer architectures, along with numerical and non-numerical algorithms for parallel systems. The course will include material on emerging multicore hardware, shared-memory programming models, message passing programming models used for cluster computing, data-parallel programming models for GPUs, and problem-solving on large-scale clusters using MapReduce. A key aim of the course is for students to gain a hands-on knowledge of the fundamentals of parallel programming by writing efficient parallel programs using some of the programming models learned in class. There will be different projects in CS-425 and CS-625. Students may not receive credit for both CS-425 and CS-625.

Lecture: 4, Lab 0, Other 0

CS-641 Foundations of Data Science 4 Credits

Prerequisites: CS-601

The concepts, principles, issues and techniques for big data and cloud computing are introduced in this course. This course will provide a foundation in data science based on data curation and statistical analysis. The primary goal of this course is to introduce data analysis concepts and techniques that facilitate making decisions from a rich data set. Students will investigate big data concepts, metadata creation, interpretation, and basics of information visualization. Students may not receive credit for both CS-441 and CS-641.

Lecture: 4, Lab 0, Other 0

CS-651 Cloud Computing: Architecture & Applications 4 Credits

Prerequisites: CS-601

A comprehensive overview of cloud computing and its application to big data and data science. Current technologies that comprise the concept of cloud computing are discussed. Exploration of major Cloud frameworks that support large data storage and applications that support data analytics.

Lecture: 4, Lab 0, Other 0

CS-661 Database Systems 4 Credits

Prerequisites: CS-601

Database design and implementation, entity-relationship model, relational model, relational query languages, physical data organization, XML, distributed database concepts, Big Data technologies, enhanced data models.

Lecture: 4, Lab 0, Other 0

CS-665 Information Retrieval and Data Mining 4 Credits

Prerequisites: CS-601

Information retrieval and data mining topics, including information storage and retrieval, file structures, precision and recall, probabilistic retrieval, search strategies, automatic classification, automatic text analysis, decision trees, genetic algorithms, nearest neighbor method, and rule induction.

Lecture: 4, Lab 0, Other 0

CS-681 Artificial Intelligence 4 Credits

Prerequisites: CS-601

Topics covered include: Types of intelligence, knowledge representation, cognitive models, Heuristic and algorithmic techniques in problem solving, knowledge representation. Selected topics from natural language processing, vision processing, game playing, pattern recognition, speech recognition, robots, and other current topics in artificial intelligence. There will be different projects in CS-481 and CS-681. Students may not receive credit for both CS-481 and CS-681.

Lecture: 4, Lab 0, Other 0

CS-682 Machine Learning 4 Credits

Prerequisites: CS-601

This course provides an introduction to machine learning. Topics include: supervised learning including generative, discriminative learning, parametric and non-parametric learning, neural networks, support vector machines; unsupervised learning including clustering, dimensionality reduction, kernel methods; learning theory bias/variance trade-offs; VC theory; large margins; reinforcement learning. The course will also include applications of machine learning to big data.

Lecture: 4, Lab 0, Other 0

CS-690 Data Science Capstone Project 4 Credits

Prerequisites: None

Lecture: 4, Lab 0, Other 0

CS-691 Data Science Special Topics 4 Credits

Prerequisites: None

Current topics in Data Science are discussed and analyzed.

Lecture: 4, Lab 0, Other 0

CS-693 Internship in Data Science 4 Credits

Prerequisites: None

Guided professional practicum experience for on-campus graduate students serving as an extension of the curriculum that facilitates the development of knowledge and skills in the application of theory to real-world problems in a non-classroom setting. This experiential learning engagement builds upon, applies, and assesses the concepts that are developed through the curriculum and advances the student's professional growth through a meaning full real-world job experience. Requires prior approval of the organization in which the internship will be done and by the Department Head of Computer Science. Four-credit hour enrollments in this course will be considered as full-time status. The course can be repeated a second time for a total of eight credit hours. Internships are graded on a Satisfactory/Unsatisfactory basis, to be entered by the Department Head upon the student's completion of all internship requirements.

Lecture: 0, Lab 0, Other 4

CS-695 Thesis in Data Science 4 Credits

Prerequisites: None

Lecture: 0, Lab 0, Other 0

CS-699 Computer Science Independent Study 4 Credits

Prerequisites: None

Graduate level Independent Study.

Lecture: 4, Lab 0, Other 0

Elect. & Computer Engrg (ECE)

ECE-601 ECE Principles for Mobility 4 Credits

Prerequisites: None

This graduate level course is designed to introduce the fundamental principles of electrical and computer engineering that are required for application in mobility systems for students with non-ECE degrees. Topics include: passive circuit components, basic laws and analysis techniques; active electronic elements and circuits, digital logic circuits, digital and analog sensors and actuators, electrical machines; power electronics and batteries; digital systems; signal processing; microcomputers and interfacing; and basic mobility system networking and CAN concepts. Approximately one week is devoted to each topic illustrated in the context of specific applications in mobility systems. Case studies with specific applications of ECE in mobility systems will be assigned.

Lecture: 4, Lab 0, Other 0

ECE-610 Modeling of Dynamic Systems 4 Credits

Prerequisites: None

This course covers modeling, simulation, and analysis of multivariable dynamic systems. Approaches to modeling a variety of dynamic physical systems are discussed using examples of dynamic systems taken from a variety of fields. The course places emphasis on modeling and analysis of electric vehicle systems and components. Transient and steady state behavior of power electronic circuits using state space models is included in this course. These systems are simulated using MATLAB simulation tools. Most of the course is devoted to the analysis of linear systems using now classical techniques based on linear algebra, state-space representations and the state transition matrix.

Lecture: 4, Lab 0, Other 0

ECE-630 Digital Signal Processing Techniques for Automotive Engineering 4 Credits

Prerequisites: None

This graduate level course is designed to introduce critical digital signal/ image processing principles/theories and techniques applied to a variety of automotive engineering applications. Special focus is given to autonomous driving and NVH analysis. Examples include, but are not limited to, edge detection methods in traffic sign recognition and identification, Kalman filtering for vehicle state estimation, Modal analysis (frequency domain) and expansion to time-frequency domain analysis of dynamic response using techniques such as wavelets and Empirical Mode Decomposition (EMD). MATLAB will be heavily used for analysis and simulations.

Lecture: 4, Lab 0, Other 0

ECE-632 Automotive Control Systems 4 Credits

Prerequisites: None

This class will focus on applying students' knowledge of fundamental principles of control systems to a variety of systems within automobiles. Specific topics will include the control of the air-fuel ratio, spark timing, idle speed, transmissions, cruise and headway, lane-keeping, and active suspensions. Other topics that may be included are antilock brakes, traction control and vehicle stability control. Simulations will be used and students will be using MATLAB/Simulink for many of the assignments.

Lecture: 4, Lab 0, Other 0

ECE-642 Machine Drives for Electric Vehicles 4 Credits

Prerequisites: None

Methods of controlling electric machines and their applications in electric vehicles are discussed. Topics include solid-state devices; various switching schemes; types of drives; characteristics of motors; controlling motors including vector control; braking of motors; and dynamics of electric drives and applications.

Lecture: 4, Lab 0, Other 0

ECE-648 Electromagnetic Compatibility 4 Credits

Prerequisites: None

In-depth classical and currents topics in the field of electromagnetic compatibility (EMC) are studied in this course. This includes signal integrity, high-speed digital design matching techniques, passive filter design, single and multilayer shielding, electrostatic discharge, high-frequency measurements, circuit board layout, and grounding methodology. Basic course work in electromagnetic compatibility is a prerequisite for this course.

Lecture: 4, Lab 0, Other 0

Electrical Engineering (EE)

EE-621 Energy Storage Sys w/ EV App 4 Credits

Prerequisites: None

The purpose of this course is to introduce the basics of energy storage systems. We will look at several competing energy storage concepts and management systems. The emphasis is on rechargeable Li-ion batteries for EV applications. The course will focus on the fundamentals of Li-ion batteries with respect to the physical principles of operation, design, manufacturing, modeling and state estimation. Students are required to complete research projects and independent review of research topics with approval of the instructor.

Lecture: 4, Lab 0, Other 0

EE-626 Power Electronics for Vehicle Electrification 4 Credits

Prerequisites: None

This is an advanced class in power electronics. Advanced converter topologies, control methods, and analyses used in electric-vehicle and power-system domains will be discussed. Topics include state-variable modeling of DC-DC converters for closed-loop control system design, isolated DC-DC converter topologies (half, full, and dual bridges) and resonant DC-DC converter topologies (series, parallel and series-parallel) for wireless power transfer and battery charging, soft-switching concepts and control methods for isolated DC-DC converters, single-phase and three-phase inverter design, inverter control methods including six-step, Sine PWM, Space Vector PWM, and Discontinuous PWM and the design and control of multilevel and modular multilevel inverters.

Lecture: 0, Lab 0, Other 0

EE-633 Digital Control Systems 4 Credits

Prerequisites: None

Control of continuous-time processes using computer-based controllers is studied. Topics include design of control algorithms for implementation, modeling of discrete time systems, application of z-transforms, stability analysis, root locus analysis, controller design via conventional techniques, state-space analysis and modeling, and design and implementation of digital controller. Implementation of real-time digital controllers is performed in the laboratory. Graduate students will be assigned an area or topic for a final class project which will be involved in researching an actual digitally controlled application, identifying all sub-systems, study of digital controller, analysis of system performance using topics covered in the class, developing Simulink model for the control system and finally proposing alternative solution for the controller for system response improvement. Students may not receive credit for both EE-433 and EE-633.

Lecture: 3, Lab 2, Other 0

EE-646 Vector Control of AC Electric Machines 4 Credits

Prerequisites: None

Methods of controlling electric machines and their applications in electric vehicles are discussed. Topics include the theory of permanent-magnet and induction machines; coordinate-frame transformations; analysis and tuning of torque and speed control systems; modeling and dynamics of electric drives and vehicles, power-electronic devices, power-electronic circuits and switching schemes; rotor-flux oriented vector control; regenerative braking; and rotor-flux position-sensing methods. Machine and vehicle models will be developed using MATLAB Simulink. A low-voltage permanent-magnet machine and power-electronic inverter will be analyzed and tested. Students are also required to complete a research project, to be determined and assigned with approval of the instructor. Students may not receive credit for both EE-446 and EE-646.

Lecture: 3, Lab 2, Other 0

EE-682 Robot Dynamics and Control 4 Credits

Prerequisites: None

Review of mathematical principle for robotics including matrix operations and their concepts. Principles of robot analysis, design, and operation are presented. Topics include review of historical robotics evolutions and applications, robot coordinate system placement rules, kinematic model development, kinematic solutions and analysis, trajectory planning and movement optimization, collision avoidance and path planning, feedback control system for robotics, feedforward, study of sensors for robotics applications, vision system types and application for robotics and mobile robots. Graduate students will complete an advanced robotic application project to integrate and highlight the application of course materials. Examples of application area include surgery, space exploration, radioactive material handling, agriculture automation. Students may not receive credit for both EE-482 and EE-682.

Lecture: 4, Lab 0, Other 0

EE-691 Graduate Special Topics in EE 4 Credits

Prerequisites: None

Graduate Level Special Topics in Electrical Engineering.

Lecture: 4, Lab 0, Other 0

EE-695 Graduate Research in Electrical Engineering 8 Credits

Prerequisites: None

This course is directed research towards a master's thesis. Students take the course under the direction of a faculty advisor. This course may be repeated for credit.

Lecture: 0, Lab 0, Other 0

EE-699 Graduate Level Independent Study in Electrical Engineering 8 Credits

Prerequisites: None

Graduate level Independent Study in Electrical Engineering.

Lecture: 8, Lab 0, Other 0

Engineering (ENGR)

ENGR-693 Internship in Engineering 4 Credits

Prerequisites: None

Lecture: 0, Lab 0, Other 0

Financial (FINC)

FINC-619 Financial Management 4 Credits

Prerequisites: ACCT-518 or MGMT-510

The purpose of this course is to provide students with an overview of financial management within organizations. The focus of this course is on the theoretical valuation of stocks and bonds and the capital markets in which they are traded. There is also emphasis on both the use of financial leverage by the firm and working capital management. The purpose is to enable managers to participate fully in financial decision-making.

Lecture: 4, Lab 0, Other 0

Healthcare Management

HMG-609 Healthcare Management 4 Credits

Prerequisites: None

In this course students gain a broad understanding of the organization, financing and issues in health care delivery systems in the US. Students will apply core business skills and knowledge of health care unique functional areas in analyzing health care case studies. Students will critically evaluate health care issues and policies and their effect on health care system performance.

Lecture: 4, Lab 0, Other 0

Indust/Manufctrng Engrg (IME)

IME-564 Ethics and Practice of Engineering 4 Credits

Prerequisites: None

Minimum Class Standing: Senior

The professional and ethical consideration of an engineer in contemporary society is covered in this course. Discussions include the code of ethics for engineers, case studies on conflict of interest, team, engineering/management responsibilities, environmental considerations and professional registration. This class requires live weekly discussion.

Lecture: 3, Lab 0, Other 1

IME-601 IME Principles for Mobility Systems 4 Credits

Prerequisites: None

This graduate level course is designed to introduce the fundamental principles of industrial and manufacturing engineering that are required for application in mobility systems for students with non-IME degrees. Topics include: product and process design, work design, production systems, quality/six sigma, and management/leadership. Approximately two weeks are devoted to each topic illustrated in the context of specific applications in mobility systems. Case studies with specific applications of IME in mobility systems will be assigned.

Lecture: 4, Lab 0, Other 0

IME-603 Numerical Control Machining 4 Credits

Prerequisites: None

The fundamentals of computer numerical control (CNC) programming and computer-aided manufacturing (CAM) are introduced in this course. The fundamental theoretical and operational concepts of machining are also presented. The course focuses on the programming of cutting operations; tool materials, selection, and uses. Significant topics include: G-code programming, Introduction to CAM software, Taylor's tool life model, Criteria for tool selection, and the Orthogonal Cutting Model. Laboratories use CNC machine tools for programming and cutting, and are designed to illustrate theoretical concepts and methods for solving practical engineering machining problems.

Lecture: 3, Lab 2, Other 0

IME-608 Industrial Robotics 4 Credits

Prerequisites: None

Basic concepts of robotic system theory and applications are presented. Human and robotic system interface with diverse real environments are discussed. Human and robotic safety is stressed. Advantages, limitations, business case justifications of investment and benefits of robotic systems for LEAN and quality operations are emphasized. Flexible manufacturing operations, Work cell design, cycle time, work path, end-effectors, collaborative robots are covered. Robotic computer model simulation is included in the course. Hands on Labs are included. Graduate students analyze more in-depth applications of robotic systems, simulations and current industry applications. Students may not receive credit for both IME-608 and IME-408.

Lecture: 3, Lab 2, Other 0

IME-622 Simulation 4 Credits

Prerequisites: None

An understanding and need for simulation in practice will be developed. The course will focus on basic and advanced concepts in simulation including comparing the simulated results with analytical results, and successfully develop simulation models useful in production/manufacturing, supply chains, transportation, and other areas related to Industrial and Manufacturing Engineering. Simulation package such as ARENA will be integrated and used throughout the course. Graduate students will create advanced digital simulation models. Students may not receive credit for both IME-622 and IME-422.

Lecture: 4, Lab 0, Other 0

IME-652 Designing Value in the Supply Chain 4 Credits

Prerequisites: None

Students gain an understanding of the decision-making tools necessary to design value in the global supply chain from concept to customer. Quantitative methods are employed to aid the decision-making process of demand forecasting and enterprise planning for the purpose of increased profit and value to stakeholders. Basic concepts in strategy, forecasting, demand planning, inventory control and value stream mapping will be taught and utilized to enable the decision-making process to be based on quantitative metrics.

Lecture: 4, Lab 0, Other 0

IME-654 Enterprise Resource Planning 4 Credits

Prerequisites: None

An understanding of the integrated approach to enterprise planning and its evolution from MRP I and MRP II is provided in this course. It describes the core structure of ERP systems and highlights the characteristics of emerging ERP based organizations. Various ERP tools and techniques are described and compared. The fundamental success factors in moving from traditional business functions to an integrated process-based ERP environment are introduced.

Lecture: 3, Lab 0, Other 1

IME-656 Engineering for Healthcare Systems 4 Credits

Prerequisites: None

This course examines the technical structure of the healthcare delivery system and the role that industrial and systems engineering (ISE) plays in its design and improvement. Included will be how healthcare systems work in hospitals, medical offices, clinics and other healthcare organizations. Traditional ISE methods for improving quality, patient safety, and employee productivity and satisfaction will be presented within a systematic application of value chain engineering designed to produce lean processes.

Lecture: 3, Lab 0, Other 1

IME-660 Design for Manufacture and Assembly 4 Credits

Prerequisites: IME-601

A study of the current methodologies associated with product design for manufacture and assembly. Topics include DFMA overview, Design for Function, Design for Assembly Principles, BDI-DFA Manual Methodology, Creative Concept Development, and Concept Selection Methodologies.

Note: Students who have taken IME-474, Design for Manufacture or its equivalent are not eligible to enroll in this course but must substitute another engineering course approved by their faculty advisors.

Lecture: 3, Lab 0, Other 1

IME-662 Ergonomics 4 Credits

Prerequisites: None

Human factors and ergonomics concepts for design of work. Topics include functional anatomy, bio-mechanical analysis of physical work, work physiology, manual material handling, cumulative trauma disorders, hand tool design, and human factors related to applied job design.

Graduate students will create and analyze additional, in-depth job simulations using industry-current software tools. Students may not receive credit for both IME-662 and IME-462.

Lecture: 3, Lab 2, Other 0

IME-663 Safety & Human Factors 4 Credits

Prerequisites: None

An introduction to occupational safety; including injury statistics, mandatory and voluntary specification and performance regulations, standards, and guidelines. Electrical, machine, fire and life safety, confined spaces, and fall hazards (among others) are discussed in the context of traditional safety and human factors engineering. Students apply systems safety analysis methods in real-world hazard analysis and control projects. Graduate students will be required to research and present to the class safety strategy and policy trends related to new technology disruption and how engineers and policy makers will approach safety for these systems in the future. Students may not receive credit for both IME-663 and IME-463.

Lecture: 4, Lab 0, Other 0

IME-665 Human-Computer Interaction and Interface Design 4 Credits

Prerequisites: None

New technology is increasingly being integrated into our minute-to-minute lives. This multidisciplinary course provides theoretical and practical skills that are needed to design, develop, and evaluate human interaction with computer and machine interfaces and virtual environments. Course topics are anchored around fundamentals of physical and cognitive human capabilities and their relationship to product design and testing. Example topics include human psychological and physical capabilities, cognition and models of interaction, heuristic evaluation. Rapid prototyping, usability testing, experimental evaluation of input devices and peripherals, haptics, virtual and augmented reality, and brain interfaces. Topics are reinforced through readings, guest lectures, hands-on experimentation and evaluation, current research trends, and a term design project. Graduate students will supplement course content by investigating and presenting late-breaking research findings and trends in the area of new technology HCI/HMI design. Students may not receive credit for both IME-465 and IME-665.

Lecture: 4, Lab 0, Other 0

IME-671 Quality Assurance 4 Credits

Prerequisites: None

The basics of modern methods of quality control and improvement that are used in the manufacturing and service industries are covered in this course. It includes quality philosophy and fundamentals, statistical methods of quality improvement, concept of variation and its reduction, statistical process control, acceptance sampling, designed experiments in quality improvements, and quality in the service sector. Deming's quality concepts will also be discussed. Graduate students will research additional industry-current quality methods. Students may not receive credit for both IME-471 and IME-671.

Lecture: 4, Lab 0, Other 0

IME-672 Reliability & Maintainability 4 Credits

Prerequisites: None

Basic knowledge and skills of reliability techniques that can be used by practicing engineers is provided in this course. The primary emphasis is on the problem of quantifying reliability in product design and testing. The topics include reliability definition and concepts, life testing and data analysis, system reliability models, and repairable systems reliability. Accelerated life testing will also be discussed. Graduate students will create a detailed analysis and report of a model dealing with reliability and maintainability. Students may not receive credit for both IME-472 and IME-672.

Lecture: 4, Lab 0, Other 0

IME-676 Lean Six Sigma 4 Credits

Prerequisites: None

This techniques to maximize production efficiency and to maintain control over each step in the process are examined in this course. The structured problem-solving methodology DMAIC (Define-Measure-Analyze-Improve-Control) will provide the framework for the course. Students may not receive credit for both IME-476 and IME-676.

Lecture: 3, Lab 0, Other 1

IME-680 Computer Integrated Manufacturing 4 Credits

Prerequisites: IME-601

CIM is defined with current terminology and recent concepts. It includes the relationships among the three major functions - design, manufacturing and business. CIM examples, obstacles to development and future trends are covered. Flexible manufacturing is highlighted. Key components of CIM are explored with special emphasis on robotic automation and control through interaction with the environment, CAD-CAM link with numerical control, computer supervisory control, process planning and quality assurance. Concurrent Engineering will be used in process and product quality selection. Lean manufacturing principles will be applied. Communication and networking, the artery of CIM, will be studied in the context of data compatibility and hierarchical control. Manufacturing analysis tools will be used to plan and implement a CIM system.

Lecture: 3, Lab 0, Other 1

Information Systems (ISYS)

ISYS-669 Enterprise Information System Models 4 Credits

Prerequisites: None

Students gain an overview of information systems (IS) including the strategic role of IS and a process-oriented view of the organization, and its importance in relationships with suppliers, customers, and competitors. An overview is provided of how information systems can contribute to the effective management of processes to support achieving strategic objectives and transforming the organization. The major focus of the course is how organizations utilize information systems to address enterprise resource planning (ERP), supply chain management (SCM), customer relationship management (CRM), Product Lifecycle Management (PLM) and social networks. Course content includes an overview of IS infrastructure and addresses key IS management topics. Students will also learn about the ethical and legal implications of the use of information systems.

Lecture: 4, Lab 0, Other 0

Mathematics (MATH)

MATH-627 Probability and Stochastic Modeling 4 Credits

Prerequisites: None

This is a calculus-based introduction to probability theory and stochastic modeling. Students will learn fundamentals of probability, discrete and continuous random variables, expectation, independence, Bayes' rule, important distributions and probability models, joint distributions, conditional distributions, distributions of functions of random variables, moment generating functions, central limit theorem, laws of large numbers. Markov chains and Markov Chain Monte Carlo methods will be discussed. Programming language R will be introduced and used throughout the course.

Lecture: 4, Lab 0, Other 0

MATH-637 Statistical Inference and Modeling 4 Credits

Prerequisites: MATH-627

A study of statistics including point and interval estimation, consistency, efficiency, and sufficiency, Minimum Variance Unbiased Estimators, Uniformly Most Powerful tests, likelihood ratio tests, goodness of fit tests, an introduction to non-parametric methods Linear models, including regression analysis and Analysis of Variance are included. Bayesian methods are introduced. Programming language R will be used throughout the course.

Lecture: 4, Lab 0, Other 0

MATH-650 Statistical Methods for Data Science 4 Credits

Prerequisites: None

This is a course on statistical methods for data science with an emphasis on statistical learning. It provides a set of tools for modeling and understanding big and complex data. This course concentrates on applications and practical execution of the methods rather than on mathematical details. Areas discussed include various regression models, classification methods, resampling, non-linear techniques, tree-based analysis, support vector machines, and unsupervised learning. Programming language R will be introduced and used throughout the course.

Lecture: 4, Lab 0, Other 0

Mechanical Engineering (MECH)

MECH-510 Analysis and Design of Machines and Mechanical Assemblies 4 Credits

Corequisites: MECH-330

Prerequisites: MECH-300 and MECH-310 and MECH-312

The main aim of this course is to integrate the concepts of kinematic & dynamic analyses to the design of machines and mechanical assemblies used in automotive, medical equipment and other applications. These include (but are not limited to) the analysis and design of reciprocating engine sub-systems such as, piston cylinder mechanism, steering linkages, window and door-lock mechanisms, over-head valve linkage system, flywheel, gears & gearboxes, universal couplings and automotive differential. Synthesis of mechanism systems used in medical equipment area will also be covered. Kinematic and dynamic characteristics such as displacement, velocity, acceleration and forces are analyzed by graphical and analytical methods. CAE tools will be used to perform kinematic, dynamic and stress analyses and fatigue design of these systems using CAE tools. Temperature effects will also be included wherever appropriate in the design. Several practical design projects will be assigned during the term of this course.

Lecture: 4, Lab 0, Other 0

MECH-515 Failure and Material Considerations in Design 4 Credits

Corequisites: MECH-412

Prerequisites: None

Designing components that are safe and reliable requires efficient use of materials and assurance that failure will not occur. Even still, components do fail. In this course, students will be introduced to the techniques of designing for life and material considerations involved in that process. In addition, students will also study how to analyze those components which do fail, and evaluate safe-life and remaining life in a design through the study of real-life component design and current failures.

Lecture: 4, Lab 0, Other 0

MECH-523 Applied Computational Fluid Dynamics 4 Credits

Prerequisites: MECH-322 and (MATH-313 or MATH-418 or MATH-423)

This course includes solution methods to the Navier-Stokes equations in a discrete domain. Grid generation, coordinate transformation, discretization, explicit, implicit, semi-implicit, a variety of algorithms, post-processing, and interpretations of results are discussed. Solution techniques for compressible and incompressible flows, their applicability, robustness, and limitations are covered. External and internal flows with and without chemical reactions are also discussed. The learning process involves hands-on experience on grid generation, setting up a CFD code, post-processing, and a thorough discussion on the results. The students will work on a final project that is a practical problem of significant magnitude and importance to industry. This work must be publishable in the student's journal or presentable in a conference.

Lecture: 4, Lab 0, Other 0

MECH-525 Introduction to Multiphysics Modeling and Simulation in Fluid Mechanics and Heat Transfer 4 Credits

Prerequisites: MECH-322 and MECH-420

This course solves a variety of engineering problems with the aid of computational software mainly in the field of fluid mechanics and heat transfer. Pipe flow, incompressible flow, laminar and turbulent flow, drag, and lift are subjects covered during the first part of the course. In the second part, topics in heat transfer are used such as conduction in solids, fin design, convection, heat exchangers, and radiation. In a third part, selected topics in electrical conductive media and reaction engineering are also covered. This course compliments MECH-322 and MECH-420 and could be considered an extension of the two courses where problems are solved in 2D and 3D using computational software. Different types of meshes will be discussed, post-processing of data will be analyzed through graphical techniques, and graphical results will be compared to well-known analytical solutions. Students will also complete a final project where both fluid mechanics and heat transfer physics will be used to solve practical engineering problems.

Lecture: 4, Lab 0, Other 0

MECH-562 Compressible Flow/Gas Dynamics 4 Credits

Prerequisites: MECH-322

The derivation and physical interpretation of the Navier-Stokes equations for compressible flows. Analysis of one-dimensional flows with discussions on normal, oblique, and bow shocks. Sound waves and unsteady wave motion are also covered. The method of characteristic (MOC) is taught and standard JANNAF CFD codes is utilized to understand the compressible flows and shock formation and behavior. The study is then further carried out to nozzle flows and jet/shock layer interaction. The students are required to not only understand the conventional methods used to obtain solution for compressible flow problems, but also to be able to utilize CFD and experimental methods to obtain solution for complex problems.

Lecture: 3, Lab 2, Other 0

MECH-564 Aerodynamics and Wing Theory 4 Credits

Prerequisites: MECH-322 and (MATH-305 or MECH-600)

Discussions on fundamentals of inviscid and viscous incompressible flows. Important topics in fluid mechanics such as potential flow, vortices, point sources, and coupling of inviscid and boundary layer flows are covered. Two and three dimensional wings (or airfoils) and some exact solutions to such flow problems are discussed. Semi-analytical methods for disturbance distribution on wings are introduced by perturbation method. The computational Panel method for two and three dimensional aerodynamics problems is discussed. Commercial computer programs are used to solve realistic problems in a three dimensional space.

Lecture: 4, Lab 0, Other 0

MECH-595 Automotive Seminar I 4 Credits

Prerequisites: None

Kettering has a partnership with the Society of Automotive Engineers (SAE) to offer both a certificate in Automotive Systems, as well as, a graduate degree in either Automotive Systems or the Mechanical Cognate. This seminar course would be comprised of a total of four Continuing Education Units (CEU) from SAE seminars, which have been reviewed and approved by a faculty review committee, consistent with Graduate academic policy. The transfer of credit must be supported by documentation from SAE for each individual applicant seeking such transfer.

Lecture: 4, Lab 0, Other 0

MECH-596 Automotive Seminar II 4 Credits

Prerequisites: None

Kettering has a partnership with the Society of Automotive Engineers (SAE) to offer both a certificate in Automotive Systems, as well as, a graduate degree in either Automotive Systems or the Mechanical Cognate. This seminar course would be comprised of a total of four Continuing Education Units (CEU) from SAE seminars, which have been reviewed and approved by a faculty review committee, consistent with Graduate academic policy. The transfer of credit must be supported by documentation from SAE for each individual applicant seeking such transfer.

Lecture: 4, Lab 0, Other 0

MECH-600 Engineering Mathematics with Applications 4 Credits

Prerequisites: (MATH-305 or MATH-307) and MECH-420

The objectives of this course are to introduce students to various analytical and numerical methods used in the modeling, analysis, and design of engineering systems. The theory and application of these methods will be introduced. Applications to real-world mechanical and thermal-fluid systems will be performed.

Lecture: 3, Lab 0, Other 1

MECH-601 ME Principles for Mobility Systems 4 Credits

Prerequisites: None

This course introduces the basic principles of mechanical engineering that are required for application in mechanical automotive systems. Major topics include machine design, thermodynamics, fluid mechanics, heat transfer, and dynamic systems. Applications include chassis systems, suspension, steering, brakes, aerodynamics, powertrains, climate control, fuel cells, turbines, compressors, transmission systems, HVAC systems, shafts, and safety systems.

Lecture: 4, Lab 0, Other 0

MECH-610 Mechanics of Materials I: Linear Elasticity 4 Credits

Prerequisites: None

Introduction to the general model of deformation and displacements; and, their application to linear elastic solids are taught in this course. The formulation of deformation gradients, displacement gradient, strain, and stress tensors will be discussed. The derivation of the general equation of motion of a deforming solid will be conducted. The general constitutive relation of elastic materials will be introduced. The linearized general deformation measures and constitutive relation will be utilized with the general equation of motion and compatibility conditions to develop the general theory of linear elasticity. The developed theory will then be applied to solve for the deformation and stresses of elastic solids under plane strain, plane stress and beam theory conditions.

Lecture: 3, Lab 0, Other 1

MECH-611 Mechanics of Material II: Nonlinear Elastic-Plastic Behavior 4 Credits

Prerequisites: MECH-610

General nonlinear theory of deformation and its application to elastic-plastic behavior of materials is taught in this course. The linear elastic behavior will be reviewed along with its application to deformation of plates and shells. The geometric nonlinear deformation measures will be discussed. The application of the general equation of motion to nonlinear deformation of solids will be conducted. The nonlinear theories of elasticity and plasticity materials will be introduced. The nonlinear deformation measures and constitutive relation will be utilized with the general equation of motion to address the nonlinear deformation of elastic-plastic materials. The developed relations will then be applied to solve for the deformation and stresses of several nonlinear problems.

Lecture: 3, Lab 0, Other 1

MECH-613 Nonlinear Finite Element Analysis 4 Credits

Prerequisites: MECH-611

Introduction to the theory and application of nonlinear finite element analysis in engineering design is covered in this course. The classification and formulation of different nonlinear behaviors and computational techniques will be discussed. Material and geometric nonlinear behaviors will be studied. The computational techniques for solving the different classes of nonlinear problems will be formulated. These techniques include implicit and explicit methods. Commercial software will be used to apply the formulated algorithms to the analyses of nonlinear crash and metal forming engineering problems.

Lecture: 3, Lab 0, Other 1

MECH-615 Engineering Optimization 4 Credits

Prerequisites: MECH-600

Introduction to the general model of numerical optimization and its application to engineering design. The formulation and classification of the optimization problems will be discussed. The computational search techniques for solving the different classes of optimization problems will be studied. These techniques include single and multivariable, zero and first order constrained and unconstrained, linear and nonlinear search algorithms. The developed algorithms will be used to find the optimum solutions for a variety of engineering design problems.

Lecture: 3, Lab 0, Other 1

MECH-621 Applied Transport Phenomena 4 Credits

Prerequisites: MECH-420

Introduction to concepts normally not covered in undergraduate Heat Transfer and Fluid Flow courses. Concepts relating to advanced heat convection and mass diffusion, turbulent and laminar boundary layer flows with heat transfer and mass transfer will be introduced. Topics in advanced heat conduction and droplet evaporation will also be introduced. Heat transfer for internal and external flow problems will be considered. The relationship between fluid flow, heat, and mass transfer in engineering systems will be discussed. Analytical and approximate solutions to these problems will be presented.

Lecture: 3, Lab 0, Other 1

MECH-622 Computational Heat and Mass Transfer 4 Credits

Prerequisites: MECH-600

Introduction to the use of numerical methods that are commonly used to solve transient, non-linear, three-dimensional engineering problems with complicated geometries. Analytical methods that could be used to solve these types of problems will be presented. Some of these analytical methods can only be used to solve problems with simple geometries and simple boundary conditions. However, numerical methods can be used to solve problems with complicated geometries and boundary conditions. Engineering problems involving several different physical phenomena simultaneously, such as fluid flow with heat transfer and mass transfer, will be considered. In this case, the governing differential equations are coupled and should be solved simultaneously. Methods on how to treat non-linear terms will be discussed. Moreover, the method of staggered grids and upwind schemes that are used to solve fluid flow problems will be presented. For transient problems, implicit and explicit methods will also be presented. The student will be required to write his or her own computer code to implement these methods to solve engineering problems. For very complicated geometries, the student will be required to use a commercial or existing code. The student will be able to relate the computer output to the performance/behavior of the physical system. The limitations and convergence/stability issues associated with these numerical methods will be discussed.

Lecture: 3, Lab 0, Other 1

MECH-626 Hydrogen Generation, Storage and Safety 4 Credits

Prerequisites: None

This various methods of hydrogen production are covered: water electrolysis using photovoltaics, steam reformation and partial oxidation techniques of various types of conventional and alternative fuels. Various methods of hydrogen storage – compressed gas, liquefied gas, metal and chemical hydrides and nanotubes are included. Codes for underground and above ground pressurized hydrogen gas storage systems and safety aspects are covered. A comparison is made between hydrogen properties and known conventional fuels such as, methane (natural gas), gasoline, methanol and ethanol. Infrastructure design studies, dispensing transportation, codes and standards are covered. A hydrogen storage/production/safety laboratory for experimental studies is planned to be a major component of this course.

Lecture: 3, Lab 0, Other 1

MECH-627 Green Energy Conversion 4 Credits

Prerequisites: MECH-420

Radiant energy transfer from the sun and its application to solar exchangers are covered. Basic theory, energy balances for solar exchangers, economics, and practice of solar energy applications are included. The concepts are applied to renewable energy systems such as solar heating and cooling systems for homes, businesses, and industry. Windmill theory and applications as well as system design are also covered. Data obtained on large scale solar and windmill systems will be analyzed and discussed.

Lecture: 3, Lab 0, Other 1

MECH-641 Advanced Auto Power Systems 4 Credits

Prerequisites: MECH-420

Terms Offered: Winter, Spring

This course serves to expand student's knowledge of automotive power systems. Topics covered include, detailed thermodynamic cycle analysis of various power cycles, emerging alternative fuels and power systems for automotive use (current topics include high-blend alcohol/gasoline fuels, gasoline direct injections (GDI) engines, hybrid electronic Powertrains, and fuel-cells). Students are also expected to work on design projects which are determined by the instructor. Students are expected to work on projects leading to the development of presentations and/or technical papers for professional society meetings (i.e. SAE, Global Powertrain Congress, etc.). This course is an advanced version of MECH-441. Students in MECH-641 are required to complete additional project challenges and a final project in addition to the workload for MECH-441.

Lecture: 4, Lab 0, Other 0

MECH-643 Noise, Vibration & Harshness 4 Credits

Prerequisites: None

An integrated approach to the analysis of Noise, Vibration and Harshness of automotive engineering is presented. Techniques for evaluating the vibration and acoustic characteristics of vehicle systems are discussed. Then the principles of noise and vibrations control are presented through automotive applications.

Lecture: 3, Lab 0, Other 0

MECH-644 Introduction to Automotive Powertrains 4 Credits

Prerequisites: None

Terms Offered: Winter, Spring

An introduction to the performance of motor vehicle and the design of automotive power transmission systems. Topics covered include, loads on the vehicle, evaluation of various engine and vehicle drive ratios on acceleration performance and fuel economy, manual transmission design, and automatic transmission design. This course is an advanced version of MECH-444. Students in MECH-644 are required to complete additional project challenges and a final project in addition to the workload for MECH-444.

Lecture: 4, Lab 0, Other 0

MECH-645 Hybrid Electric Vehicle Propulsion 4 Credits

Prerequisites: None

An introduction to the principles of hybrid electrical vehicle propulsion systems for Mechanical and Electrical Engineering students. A major emphasis of the course will be to broaden the mechanical engineering student's knowledge of electrical engineering so that he/she can understand the fundamentals of electrical motors, electrical motor controls, and electrical energy storage systems. The course is also intended to strengthen the knowledge of electrical engineering students relative to automotive powertrain design. With this background, the integration of these hybrid electric components into the hybrid electric vehicle powertrain system will be studied, including electric energy storage (batteries, flywheels, ultra-capacitors) and electrical energy production-fuel cells. Relevant codes and standards will be emphasized. This course is an advanced version of MECH-445. Students in MECH-645 are required to complete additional project challenges and a final project in addition to the workload for MECH-445.

Lecture: 4, Lab 0, Other 0

MECH-646 Advanced Vehicle Dynamics 4 Credits

Prerequisites: None

Advanced vehicle dynamics is the study of the motion of rubber-tired ground vehicles. Dynamic vehicle responses result from the tire, gravitational, and aerodynamic forces that a vehicle is subjected to. Ride quality, handling characteristics, performance, and safety can be evaluated by examining a vehicle's dynamic responses. This course provides an advanced understanding of vehicle dynamics behavior and the means to model it from a mathematical point of view. Special emphasis is placed on dynamic systems modeling approaches, including the creation and numerical evaluation of state space mathematical models.

Lecture: 4, Lab 0, Other 0

MECH-647 Combustion & Emissions 4 Credits

Prerequisites: None

Introduction to the basic principles of combustion and how to apply them to basic engineering problems. Various technologies of this field will be explored. However, a large portion of the course will cover the fundamentals of combustion. Topics relating to flame speed, flame thickness, flame spread, flame quenching, blow-off, stabilization, ignition energy, flammability limits, and flashback will be presented. Laminar and turbulent premixed and diffusion flames will be discussed. These topics will be related to combustion and emissions in spark-ignition and diesel engines.

Lecture: 3, Lab 0, Other 1

MECH-650 Automotive Bioengineering: Occupant Protection and Safety 4 Credits

Prerequisites: None

Terms Offered: Winter, Spring

A discussion and application of the following fundamental concepts: (1) an overview of Federal Motor Vehicle Safety Standards; (2) basic anatomy and physiology of the overall human body; (3) introduction to injury biomechanics including rate, load, and acceleration dependent injury mechanisms; (4) overview of injury prevention strategies including a variety of air bags, multipoint restraint systems, and occupant sensing methodologies; (5) the basic structure and function of anthropomorphic test devices; (6) introduction to experimental crash simulation; (7) virtual occupant simulation; (8) develop the necessary algorithms to filter crash sensor data using the appropriate CFC per SAEJ211; (9) develop a simulation of a pretensioner; (10) develop a method to determine the relevant due care criteria from a crash simulation in addition to the mandated criteria.

Lecture: 4, Lab 0, Other 0

MECH-682 Mechanics and Design Simulation of Fiber-Reinforced Composite Materials 4 Credits

Prerequisites: None

The properties, mechanics, and design simulation aspects of fiber-reinforced composite materials are covered in this course. Topics include: constituents and interfacial bonding, microstructure and micromechanics, theory of anisotropy, classical laminate theory, material characterization, failure and damage, manufacturing techniques, composite structure design, and introduction of nanocomposite.

Lecture: 4, Lab 0, Other 0

MECH-697 ME Elective Credit 4 Credits

Prerequisites: None

Lecture: 4, Lab 0, Other 0

Lean/Manufacturing Ops (MFGO)

MFGO-601 Globally Integrated Manufacturing Company 4 Credits

Prerequisites: None

This course is an introduction and integrated overview of contemporary global manufacturing operations. The focus is on the importance of agility and the introduction of lean concepts in business and manufacturing. Instruction will emphasize the application of attitudes, skills, and knowledge required of managers, supervisors, team leaders, and manufacturing professionals in a cross-functional and cross-cultural manufacturing environment. Topics include a brief historical overview of global manufacturing, and a strong emphasis on process re-engineering. Students are required to use the concepts from the class to analyze their own work environment.

Lecture: 3, Lab 0, Other 1

MFGO-619 Six Sigma for Manufacturing 4 Credits

Prerequisites: None

Students examine techniques to maximize production efficiency and to maintain control over each step in the production process. DMAIC (Define-Measure-Analyze-Improve-Control), the structured problem-solving methodology, provides the framework for the course.

Lecture: 3, Lab 0, Other 1

MFGO-633 Lean Production Systems 4 Credits

Prerequisites: None

Minimum Class Standing: NA

Terms offered: Fall, Spring

This course begins with an overview of the theory and application of lean production systems. Systems thinking and business dynamics are presented along with contemporary lean thinking principles, lean enterprise development, and value stream mapping. Specific emphasis will be devoted to modern enterprise improvement techniques such as Six Sigma, Theory of Constraints, and Business Process Reengineering. Lecture: 3, Lab 0, Other 1

MFGO-635 Work Analysis for Lean Production Application 4 Credits

Prerequisites: MFGO-633

This course addresses a critical issue facing organizations in the design of a competitive and low-cost manufacturing operation. The intent of this course is to survey the basic techniques of methods design, work measurement, business process analysis, and ergonomics. The student will be expected to solve complex problems encountered during the design, analysis, or operation of a facility that produces goods or services. Lecture: 3, Lab 1, Other 0

MFGO-639 Quality Assurance and Reliability 4 Credits

Prerequisites: None

This course covers topics in quality assurance including an introduction to quality and quality philosophy, statistical methods of quality improvement, the concept of variation and its reduction, statistical process control, and acceptance sampling. In this course, students will make extensive use of statistical software. Lecture: 3, Lab 0, Other 1

MFGO-649 Metrics for Lean Production Improvement 4 Credits

Prerequisites: MFGO-635 or MFGO-639

This course is intended to provide the operations professional with an understanding of the data typically available within a manufacturing or service environment, and how to use information derived from such data employing a lean paradigm to improve operations. The course covers basic financial accounting, activity-based metrics, trend analysis, decision making and linking operational decisions to strategic considerations. Lecture: 3, Lab 0, Other 1

MFGO-659 Integrative Capstone Project 4 Credits

Prerequisites: MFGO-649

Students should take this course as one of their last two core courses. The focus of this course is on a business-focused, project-oriented perspective applicable to the integrated operating environment. Project Management tools and techniques, recognized as part of the body of knowledge by the Project Management Institute, are examined in detail. The Final Project is designed to enable students to apply project management concepts, and techniques to ensure application of lean principles to a process or service. Lecture: 3, Lab 0, Other 1

Management (MGMT)

MGMT-510 Foundations of Business 4 Credits

Prerequisites: None

This course provides the prerequisite knowledge necessary for studying management in a graduate program. Students are introduced to both a theoretical understanding, and practical application, of concepts in the disciplines of management, marketing, accounting, finance, economics, and statistics. Through readings, videos, discussion questions, and assignments, students are introduced to basic content from each topic area, as well as APA writing style, in preparation for entry into a graduate management program. Lecture: 4, Lab 0, Other 0

MGMT-521 Statistical and Quantitative Methods for Managerial Decision 4 Credits

Prerequisites: None

Learn about the principles and techniques for collecting, analyzing, interpreting, and communicating information based on data. Data analysis emphasizes the fundamentals behind designing data collection strategies that lead to useful information for problem solving and process and product improvements. Data analysis techniques include descriptive statistics, basic hypothesis testing, experimental design, and regression analysis. Use of a statistical software will be made to illustrate important data analysis concepts with a focus on understanding the computer output. The project requirement is expected to enable students to apply the data analysis concepts learned in the class. In summary, this course will assist the students to become knowledgeable consumers of data analysis, its applications and limitations. Lecture: 3, Lab 0, Other 1

MGMT-550 Mgmt Concepts and Applications 2 Credits

Prerequisites: None

Both the art and the science of management will be introduced and examined through multiple perspectives within a global and ethical context. An examination of the functions of a manager builds upon the elements of organizational and behavioral theory. Principles of organizational structure and design will also be discussed. The importance of management in dealing with the complexity of modern organizations will be emphasized throughout. Lecture: 2, Lab 0, Other 0

MGMT-609 Technology Management 4 Credits

Prerequisites: None

This course is an overview of the management of technology and its impact on contemporary organizational performance. The focus of the course is on the application of skills, and knowledge required of managers and professionals responsible for technology implementation in a product or service development environment. Concepts of cybersecurity and managing technology in the future are considered. Case studies and simulations are used to bring to life the critical challenges confronting managers of technology. Lecture: 4, Lab 0, Other 0

MGMT-619 Project Management 4 Credits

Prerequisites: ACCT-518 or MGMT-510

This course covers managing projects within an organizational context, including the processes related to initiating, planning, executing, controlling, reporting, and closing a project. Concepts such as project integration, scope, time, cost, quality control, and risk management are highlighted. Identifying project champions, working with user teams, training, and documentation are key concepts of project management that are detailed in the course. Lecture: 4, Lab 0, Other 0

MGMT-620 Business Communication and Presentation 4 Credits

Prerequisites: None

The ability to listen and craft well-written messages verbally, in writing, and within digital spaces are valued skills among employers regardless of industry. This course is designed to provide opportunities for you to sharpen your writing, improve your editing, hone your critical thinking skills, and create effective persuasive messages. Course content also includes best practices for organizing, revising and presenting information in-person and remotely.

Lecture: 4, Lab 0, Other 0

MGMT-621 Diversity, Equity, and Inclusion in the Workplace 4 Credits

Prerequisites: None

Leading and managing organizations rich in diversity (race, gender, socioeconomic class, ethnicity, religion, sexual orientation, and life experience) can be both challenging and rewarding. This course is designed to explore the scope of diversity and its impact on building and maintaining productive professional relationships. Personal assessment of cultural competence, as well as identifying strategies for improving cross-cultural communication and harnessing the strength of diverse perspectives in the workplace are highlighted. Increasing the ability to lead diverse teams and departments can enrich individuals personally and provide a distinct competitive advantage for the organizations with whom they work.

Lecture: 4, Lab 0, Other 0

MGMT-622 Organized Labor and Management Relations 4 Credits

Prerequisites: None

Since the Industrial Revolution, unions have been formed in various industries to secure improvements in working conditions and fair wages for their members. This course is designed to offer key details, insights, skills, and techniques for improved working relationships in a union environment. A major focus of this course will include the perspectives of both management working with union members, and union members working with management.

Lecture: 4, Lab 0, Other 0

MGMT-623 Data Analytics 4 Credits

Prerequisites: CS-601

The rise of big data and machine learning has transformed the business world. In fact, these tectonic shifts in the business landscape are labeled as the fourth industrial revolution. Data is the new oil, creating enormous wealth and opportunity for businesses. This course will introduce the strategic importance and applications of these new Artificial Intelligence (AI) technologies. This is a hands-on learning course towards developing skills in using the Python language for data cleaning, exploration and modeling. The overarching aim is to provide a strong start towards developing skills that will eventually lead towards becoming an accomplished data scientist, who understands and is able to apply these skills towards achieving organizational competitive advantage. Students may not receive credit for both MGMT-423 and MGMT-623.

Lecture: 4, Lab 0, Other 0

MGMT-624 Data Visualization 4 Credits

Prerequisites: CS-601

This course encompasses the principles, techniques, aesthetics, and applications of data visualization. Starting with development of the basics of computer programming for visualization, the students learn methods to develop effective univariate, multivariate, and high dimensional data visualizations. The course also covers geographic and text-based visualization techniques. The course uses the highly demanded Python-based packages: Matplotlib, Seaborn, and Plotly. Students will also develop skills in using the grammar of graphics approach encapsulated in ggplot. Students may not receive credit for both MGMT-424 and MGMT-624.

Lecture: 4, Lab 0, Other 0

MGMT-625 Digital Strategy and Competitive Advantage 4 Credits

Prerequisites: None

This course is the intersection of strategic management with data-science. Cases and simulations are used to examine how firms use strategy and data-science to build competitive advantage. The course explores the strategy and dynamics of Artificial Intelligence (AI) based firms. It also brings the perspectives of practicing data-scientists and expand on their roles in reshaping the competitive landscape of their industries. Students may not receive credit for both MGMT-425 and MGMT-625.

Lecture: 4, Lab 0, Other 0

MGMT-629 Management Science 4 Credits

Prerequisites: (MATH-258 or MATH-408) or MGMT-521 or MGMT-510

This course is intended to develop student facility with a variety of quantitative techniques to facilitate the managerial decision-making process. Simulation approaches are covered along with optimization techniques such as linear programming and stochastic techniques such as queuing models. In this course, students will develop spreadsheet modeling skills, and emphasis will be placed on the application of these quantitative techniques to a variety of managerial areas.

Lecture: 4, Lab 0, Other 0

MGMT-639 Managing People & Organization 4 Credits

Prerequisites: MGMT-550 or MGMT-510

This course is intended to prepare students for management positions in various organizations. Students are introduced to concepts and issues concerning management, and leadership of organizational staff. Subjects include technology-related leadership, organizational communication, change management, lean thinking, human resource issues, decision-making, ethics and persuasion.

Lecture: 4, Lab 0, Other 0

MGMT-649 Ethics and Leadership 4 Credits

Prerequisites: MGMT-639 or MGMT-510

The focus of this course is preparing students for leadership roles in the workplace, and in society, by facilitating knowledge of management and leadership from an ethical perspective. The course includes an overview of the evolution of ethical theories and the role of the leader within the business context. Students use their understanding of business, leadership, team development and the processes of moral reasoning to examine contemporary issues related to organizational leadership and building community partnerships.

Lecture: 3, Lab 0, Other 1

MGMT-659 Strategy 4 Credits

Prerequisites: BUSN-659 and FINC-619 and MGMT-639 and MRKT-679

This course focuses on the formulation, implementation, and evaluation of organizational policy and strategy from the perspective of the senior manager/strategy planner. Additional consideration is given to information technology, global operations, ethics, legal perspectives and the functional level strategies of the organization. The Final Project is an integrative approach designed to have direct application to a current job or future career.

Lecture: 4, Lab 0, Other 0

MGMT-661 Operations Management in Service Organizations 4 Credits

Prerequisites: MATH-258 or MATH-408 or MGMT-521 or MFGO-619

This course provides students with an exposure to the core concepts and tools of operations management in both manufacturing and service enterprises. Course content includes an overview of the fundamental importance of coordinated operational activities as students examine how to integrate effective operations across all functional areas of the organization. Emphasis is placed on the importance of adding value, and customer satisfaction, to the long-term viability of both for-profit and not-for-profit firms.

Lecture: 4, Lab 0, Other 0

MGMT-665 Strategic Management 4 Credits

Prerequisites: None

The focus of this course is on strategic investigation, analysis, and planning within organizations. Emphasis is placed on combining analytical and emergent views to produce strategic thinking maps designed to assist leaders in: acknowledging the reality of change, questioning current assumptions and activities, collecting and reviewing data relevant to the industry, and facilitating future organizational development.

Lecture: 4, Lab 0, Other 0

MGMT-669 Supply Chain Operations 4 Credits

Prerequisites: None

In this course, students are presented with a conceptual framework for understanding Supply Chain Management (SCM). The course covers concepts, trends, and technologies that enable global SCM. Students consider how customer needs, competitive advantage, operational measures, and financial performance support successful implementation of SCM. Topics covered include aligning information systems, procurement, demand planning and forecasting, inventory management and logistics to support organizational goals.

Lecture: 4, Lab 0, Other 0

MGMT-679 Leadership 4 Credits

Prerequisites: None

A comprehensive examination of different leadership theories and models along with leadership development with emphasis on relevant empirical evidence and application of these constructs to case studies that involve leadership and group functioning. Additionally, process of decision-making in a variety of leadership settings will be introduced, including the processes of leading independently or with direct authority. The distinction between leadership and management, crucial role of leadership when managing groups and teams, and the importance of ethical conduct and persuasion in effective leadership are covered. This course cannot be repeated to earn credits for both MGMT-479 and MGMT-679 and there will be different course requirements for undergraduate and graduate levels.

Lecture: 3, Lab 0, Other 1

MGMT-693 Internship in Management 4 Credits

Prerequisites: None

Guided professional practicum experience for on-campus graduate students serving as an extension of the curriculum that facilitates the development of knowledge and skills in the application of theory to real-world problems in a non-classroom setting. This experiential learning engagement builds upon, applies, and assesses the concepts that are developed through the curriculum and advances the student's professional growth through a meaning full real-world job experience. The internship should be substantial and practical, including analysis, evaluation, and application of management concepts. At least 240 clock hours of on-site work over the term are required for four credit hours. Requires prior approval of the organization in which the internship will be done by the Dean of the School of Management and appropriate review and approval of the specific experience gained. Four-credit hour enrollments in this course will be considered as full-time status. The course can be repeated a second time, however, it will not count toward degree completion once four credit hours are earned. Internships are graded on a Satisfactory/Unsatisfactory basis, to be entered by the Dean upon the student's completion of all internship requirements.

Lecture: 0, Lab 0, Other 0

Marketing (MRKT)

MRKT-570 Marketing Concepts and Applications 2 Credits

Corequisites: MGMT-550

Prerequisites: None

An overview of consumer marketing's role in business is provided in this course. Marketing Concepts and Applications are integrated into a marketing discipline that enables students to become effectively engaged in consumer to customer product and service related endeavors.

Lecture: 2, Lab 0, Other 0

MRKT-679 Marketing Management 4 Credits

Prerequisites: MRKT-570 or MGMT-510

In this course, students will gain a managerial perspective on how organizations understand and select target markets, and then how they attract, retain and grow customers within those selected markets. A strategic perspective of how firms create, deliver, and communicate superior customer value for competitive advantage will be emphasized. Students will gain understanding of the analysis, planning, implementation, and control of activities to develop and sustain beneficial exchanges with target buyers.

Lecture: 4, Lab 0, Other 0

Supply Chain Management (SCM)

SCM-610 Foundations Supply Chain Management 4 Credits

Prerequisites: None

Students receive an overview of effective strategies for managing supply chains as well as an introduction to operations within complex networks and logistics. Practical skills to increase service levels and reduce costs are examined. Additional areas of examination include the following: strategic planning and operation of an effective supply chain design, advantages of competitive supply chains and how weaknesses in the chain impact operations, key drivers of supply chain performance, application of analytical methodologies to impact demand planning in supply chains, and an overview of the use of technology in supply chain management.

Lecture: 4, Lab 0, Other 0

SCM-611 Collaboration Supply Chain Management 4 Credits

Prerequisites: None

Students in this course examine traditional approaches to supply chain management as well as electronic commerce and issues related specifically to Internet delivery and evaluate innovative approaches to create efficiencies that enhance collaboration and decision-making. Technology structure for information sharing, team management, as well as issues of leadership and power are also examined.

Lecture: 4, Lab 0, Other 0

SCM-612 Customer Relationship Management 4 Credits

Prerequisites: None

Customer Relationship Management is at the core of all effective supply chains. Students in this course examine the comprehensive set of processes and technologies necessary for managing potential and current customers. Students in this course examine effective ways of managing the customer relationship to ensure an effective supply of materials required for product development. A range of CRM software is examined.

Lecture: 4, Lab 0, Other 0

SCM-613 Supply Chain Logistics 4 Credits

Prerequisites: None

An overview of strategic and tactical elements of logistics management is the focus of this course. Transportation, including multi-modal freight operations, high-tech automated warehousing, and order delivery are fundamental. Critical analysis of logistics with an emphasis on effective decision-making and innovation is primary. Students review basic distribution and logistics issues that impact overall business performance with the goal of analyzing and resolving distributions and logistics challenges evident in today's business environment.

Lecture: 4, Lab 0, Other 0

SCM-614 Procurement and Risk Management 4 Credits

Prerequisites: None

This course provides an overview of purchasing and strategic procurement of products and services to gain a competitive advantage. The focus is on contract negotiation and supplier management with the goals of identification, mitigation, and reduction of risks to ensure effective supply chains.

Lecture: 4, Lab 0, Other 0

SCM-615 Supply Chain Planning 4 Credits

Prerequisites: None

This course provides an overview of effective strategies for companies with global operations. These strategies consider the full spectrum of the supply chain from raw material to finished product. Emphasis is placed on planning and integration of supply chain components into a coordinated system. A range of tactics are explored to produce optimal outcomes in supply chains and provide competitive advantage including the appropriate technology, and software solutions applicable to the Final Project. The final capstone project allows for the analysis of a supply chain to provide insight into ways to streamline a current supply chain. Another option, students may choose is to provide an in-depth response to a supply chain challenge in a current or former workplace.

Lecture: 4, Lab 0, Other 0

INDEX

A

About the Catalog	2
Academic Advising/Standing/Status	29
Academic Calendar	3
Academic Policies and Regulations	29
Academic Programs	5
Accelerated Masters	19
Accounting (ACCT)	53
Administration and Faculty	48
Admissions	24
Alumni Engagement	47
Attendance	30

B

Business (BUSN)	53
-----------------------	----

C

Certificate Programs	21
College of Engineering	6
College of Sciences and Liberal Arts	11
Communications (COMM)	56
Computer Engineering (CE)	54
Computer Science (CS)	56
Conduct Expectations	31
Contact Information	52
Course Descriptions and Numbering Schema	23

D

Data Analytics	21
----------------------	----

E

Elect. & Computer Engrg (ECE)	57
Electrical Engineering (EE)	57
Engineering (ENGR)	58
Enrollment	36

F

Family Educational Rights and Privacy Act (FERPA)	39
Financial (FINC)	58
Foundation of Data Science	21

G

Global Leadership	21
Grades	40
Graduate A-Z	53

Graduate Catalog	2
Graduate School & Research	12
Graduation	42

H

Healthcare Management	21
Healthcare Management	59

I

Indust/Manufctrng Engrg (IME)	59
Information Systems (ISYS)	61
Information Technology	45
International Students	43

L

Lean/Manufacturing Ops (MFGO)	64
Learning Outcomes	20
Library Services	46

M

Management (MGMT)	65
Marketing (MRKT)	67
Master of Business Administration	13
Mathematics (MATH)	61
Mechanical Engineering (MECH)	61
Modern Business Practices	21
MS Engineering: Computer Engineering	7
MS Engineering: Electrical & Computer Engineering-Advanced Mobility ..	8
MS Engineering: Electrical Engineering	8
MS Engineering: Mechanical Engineering	9
MS Engineering: Mobility Systems	6
MS in Applied Data Science and Data Analytics	11
MS in Engineering Management	15
MS in Lean Manufacturing	12
MS in Operations Management	16
MS in Supply Chain Management	17

N

Non-Discrimination	53
--------------------------	----

O

Operations Management	21
-----------------------------	----

S

School of Management	13
Second Master's Degree	19
Student Records	44
Supply Chain and ERP	22

Supply Chain Management Level I 22
Supply Chain Management Level II 22
Supply Chain Management (SCM) 67

T

Technical Master of Business Administration 14
Technology Leadership 22
Thesis 44
Tuition and Fees 28