

SCHOOL OF INDUSTRIAL SCIENCES AND TECHNOLOGY GRADUATE STUDENT HANDBOOK

MS Industrial Management

MS Technology

Graduate Certificate Lean Six Sigma

Graduate Certificate Network Security

PhD Technology Management



COLLEGE OF HEALTH SCIENCE AND TECHNOLOGY

Warrensburg, Missouri

Fall 2023



UNIVERSITY OF
**CENTRAL
MISSOURI**
LEARNING TO A GREATER DEGREE

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Disclaimer:

The materials included in this document are published as supplemental to the University of Central Missouri Graduate School Catalog. All information must comply with adopted policy and procedures set forth in the current edition of the Graduate Catalog.

Welcome

Dear prospective students:

Thank you for your interest in our graduate programs at University of Central Missouri (UCM). The goal is to provide students with professional and technical knowledge and skills necessary for successful career in management, technology, and applied engineering. With campus support services and highly effective and friendly faculty, we offer opportunities for students to be creative in scholarly work and to build networks with industrial professionals. This hand-on experience assists students in improving communication, teamwork, problem solving, and research skills.

The M.S. in Industrial Management (MSIM) and M.S. in Technology (MST) programs currently have 180 majors and graduated an average of 44 per year. The majority of domestic students who work full-time can complete the online degree program within 2.5-3 years (1 or 2 classes per semester). The international full-time students taking classes on campus can finish a degree within 18 months including summer study. According to the 2022 follow-up survey of our graduates, 100% of 89 respondents rated 'excellent' (67.4%) and 'good' (32.6%) to their overall educational experience at UCM, 97.8% currently employed with full-time job. The majority has annual salary between \$60,000 – \$90,000 USD.

Our graduate degrees are Science, Technology, Engineering and Mathematics (STEM) programs and they have been nationally accredited since 2008 from the Association of Technology, Management, and Applied Engineering (ATMAE). In addition, our ASQ-UCM Student Chapter was named the Outstanding Student Branch for the 4th consecutive year in 2019 by American Society for Quality Region 13. Once again, we appreciate your participation and interest; we trust you will be pleased with your graduate education at The University of Central Missouri.

Sincerely,

Dr. Sue Rodchua

Suhansa Rodchua, PhD.
Professor-School of Industrial Sciences and Technology
Graduate Program Coordinator



School of Industrial Sciences & Technology

Mission

The School of Industrial Sciences & Technology at the University of Central Missouri provides broad multi-disciplinary career preparation opportunities with programs at the pre-professional, bachelor's, master's, and doctoral levels. Our programs have been structured with industry input to meet the ever growing technical and management demands of global enterprises. The Mission of the School of Industrial Sciences and Technology is to prepare students as management oriented technical professionals and entrepreneurs for positions in business, industry, and government. The School of Industrial Sciences and Technology was established, in part, to support the University of Central Missouri's Statewide Mission in Professional Applied Sciences and Technology.

Our School of Industrial Sciences & Technology offers two Master of Science degree programs in Industrial Management (MSIM) and Technology (MST) and two certification programs in Lean Six-Sigma and Network Security to satisfy the needs of industry and to meet employers' demands. The school is also one of the four consortium members of the Doctoral Degree in Technology Management at Indiana State University.

Accreditation

University of Central Missouri (UCM) is a state leader in program-specific accreditations through national associations, and we are fully accredited by the Higher Learning Commission (HLC). HLC accredits degree-granting post-secondary education institutions in the North Central region.



HIGHER LEARNING COMMISSION

Program Accreditation

In 2008, the Industrial Management and the Technology Programs were the first two Master's degrees to be fully accredited by the Association of Technology, Management, and Applied Engineering (ATMAE), formerly the National Association of Industrial Technology. The programs renewed the accreditation in 2014 and 2022.



Program Structure

Our programs are developed based on the collaborative efforts of our Industrial Advisory Boards and faculty. This combination of experience and expertise allows us to offer one of the finest Master's Degree programs available to aspiring professionals. The university outcomes, program outcomes, and curriculum competencies serve as the foundation for the departmental coursework. The University Outcomes are:

- **Communication** - The ability to prepare and deliver, effectively, written, oral, and graphic modes of communication, including listening.
- **Critical Thinking** - The ability to assimilate the many modes of thought and synthesize into a strategic order of systems.
- **Interacting** - The ability to respond to conditions involving individuals or groups and exhibit professional qualities of leadership while performing diverse goal-related relationships.
- **Valuing** - The ability to protect and develop ideas, thoughts and things considered worth continuing for societal and global support while applying the professional code of ethics.
- **Learning** - Demonstrate skill in personally continuing the learning process, continue to exhibit the self-assessment necessary to merit technical growth.

M.S. Industrial Management

Introduction (Online option is available.)

The Master of Science in Industrial Management degree program is designed for students who desire work in management or supervisory positions in industry. We offer both live (in-person) on the main campus and 100% online delivery. Participants in the Master of Science degree program develop skills useful to business and industry. The program provides a balanced curriculum focusing on the human element of the workplace as well as a variety of industrial systems. Specific skills will be developed in the field of leadership, problem solving, and decision-making. The entire curriculum is delivered via the Internet to meet the demand for those students who work full-time or live at a distance.

To be accepted into this program, a student shall have a minimum Grade Point Average (GPA) of 2.60 in the undergraduate major. A student not meeting this requirement may petition the department for admittance on a conditional basis. GRE or GMAT scores are not required. Once again, courses in this program are also offered via the Internet. Courses are scheduled with the capability of completing the degree program in two calendar years, including one summer session. MSIM website is located at <https://www.ucmo.edu/academics/programs/masters-degrees/industrial-management/index.php>

Strengths of this program are the flexibility built into the cognate coursework and culminating experience. The program allows several curricular paths leading to graduation and facilitates articulation to a Doctorate degree in Technology Management. In a recent 2022 follow-up survey of our graduates, the annual salary ranged between US\$ 50,000 – 120,000. Some occupational titles include Project Manager, Operations Manager, Supply Chain Manager, Risk Management specialist, Quality Assurance Engineer, Continuous Improvement Specialist, Packaging Lead, Quality Manager, Plant Quality Engineer, AWS DevOps Engineer, Field Service Operations Manager, Plant Manager, Chief Operating Officer, Project Sourcing Manager.

Our goals are:

1. To provide students with professional and technical knowledge and skills necessary for entering and continuing in Industrial Management careers.
2. To continue an effort to improve the quality of management science and related activities.
3. To improve public awareness of the career “Industrial Organization Manager - 189.117-022”, as defined by the Dictionary of Occupational Titles.

4. To enhance faculty professional and technical development in the field of industrial management.
5. To encourage faculty research and creative endeavors, grant writing and consulting for the management sciences.

Occupational Titles:

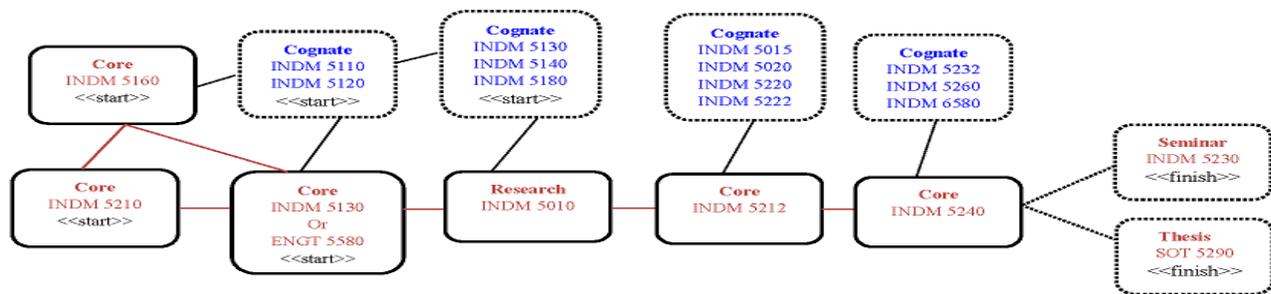
MANAGER, INDUSTRIAL ORGANIZATION - 189.117-022, alternate titles: general manager, industrial organization; manager, general; plant superintendent, industrial organization.

Directs and coordinates activities of industrial organization to obtain optimum efficiency and economy of operations and maximize profits: Plans and develops organization policies and goals and implements goals through subordinate administrative personnel. Coordinates activities of divisions or departments, such as operating, manufacturing, engineering, planning, sales, maintenance, or research and development, to effect operational efficiency and economy. Directs and coordinates promotion of products manufactured, or services performed to develop new markets, increase share of market, and obtain competitive position in industry.

Analyzes division or department budget requests to identify areas in which reductions can be made and allocates operating budget. Confers with administrative personnel, and reviews activity, operating, and sales reports to determine changes in programs or operations required. Directs preparation of directives to division or department administrator outlining policy, program, or operations changes to be implemented. Promotes organization in industry, manufacturing, or trade associations. Workers are usually identified according to industry in which employed, such as petroleum production or refining, iron and steel, electrical equipment; type of organization, such as air, rail, motor, or water transportation; or type of product, such as paper, chemical, or plastics products. GOE: 11.05.01 STRENGTH: L GED: R5 M4 L5 SVP: 8 DLU: 86

Program Outcomes

The Master of Science in Industrial Management program is designed to prepare professional managers who possess skills and knowledge acquired through education and on-site experience necessary to manage manufacturing processes including bid preparation, project acquisition, project management, quality, safety, and supervision of the industrial enterprise. The diagram below illustrates the suggested articulation for this degree.



Management Skills

Outcome #1 - Apply management skills and concepts to specific situations.

The student will apply the principles and philosophy of management systems, cost accounting, and economics to industry, including the interpretation of contracts, and the value of team building.

The student will execute industrial safety standards including the ability to interpret the OSHA industry standards, establish safety and health procedures on the project site, and perform hazardous material and process analysis.

Project Management

Outcome #2 - Plan and implement a project.

The student will identify the appropriate management principles necessary to complete a business plan, evaluate supply chains, and produce project plans. The student will create change orders, organize contract agreements, interpret engineering drawings, operations schedules, and develop a return-on-investment analysis. The student will prepare a complete project schedule, develop a procurement timetable, and establish a control manual. The student will develop a plan showing the logical sequence of activities and time duration to monitor progress and update schedules.

Human Resources

Outcome #3 - Analyze and develop a human relations strategy.

The student will identify the management code of ethics for organizations and management individuals. Students will investigate union operations and labor relations within the industrial enterprise.

Communications Skills

Outcome #4 - Demonstrate the ability to communicate effectively.

The student will apply oral, written, graphic and listening skills as each enhances the behavioral principles or attitude and effective communications. The student graduating from the program will be a manufacturing service provider and marketer of management skills and knowledge. Students will

demonstrate the skills necessary to incorporate the technological tools used in industry to effectively communicate and collaborate with other professionals at a distance.



Industrial Economy

Outcome #5 - Explain and apply the basic concepts of an Industrial Economy.

The student will complete the estimating, cost accounting, and bidding sequence necessary for project job acquisition and completion. The student will prepare a complete cost control analysis including the ability to establish an enterprise budget, prepare cost reports, and forecast expenditures.

Technical Skills

Outcome #6 - Introduce and adapt technical expertise to a given process or product.

The student will implement the various forms of technology necessary to complete the task of process management, utilizing the computer and electronic data processing. The student will create complete word-processing, database, spreadsheet, and presentation applications for delivery on the information highway. The student will understand the science of materials and methods of manufacturing.

Research Skills

Outcome #7 - Perform, interpret, and explain research.

The student will apply scientific knowledge of the mathematical, physical, and management sciences to the economic utilization of materials and forces of nature affecting operations of the industrial enterprise. The student will effectively communicate in this digital and information technology era,

Students will practice techniques for developing innovative concepts and adding value to product/process.

Curriculum – Industrial Management (Minimum of 33 credit hours)

Required Core Graduate Courses		18
IndM 5130	Lean and Quality Management	3
IndM 5160	Organizational Dynamics	3
IndM 5210	Industrial Management	3
IndM 5212	Productions & Operations Management	3
IndM 5240	Engineering Economy	3
SOT 5010	Applied Research for Technology	3
Culminating Experience		3-6
(Taken in the last semester(s) of student's program)		
IndM 5230	Seminar in Industrial Management (or)	3
SOT 5290	Thesis	3-6
Cognate Requirements		9-12
(Choose any 3 courses with Thesis or 4 courses with Seminar)		
IndM 5110	Current Issues in Industry	3
IndM 5120	Human Factors Engineering	3
IndM 5130	Lean and Quality Management	3
IndM 5140	Facilities Engineering	3
IndM 5150	Project Management	3
IndM 5180	Industrial Statistics	3
IndM 5015	Legal Aspects of Industry	3
IndM 5020	International Technology Management	3
IndM 5220	Applied Operation Research	3
IndM 5222	Principles and Practices of Lean Systems	3
IndM 5232	Seminar in Lean Six Sigma Implementation	3
IndM 5260	System Analysis & MIS	3
IndM 6580	Advanced Strategic Quality and Standard	3
Minimum Program Total		33

NOTE: Thesis (SOT 5290) should be enrolled in two consecutive semesters for three semester hours each to total six credit hours. To read descriptions of INDM courses, go to page 34.

M.S. Technology

The Master of Science degree in Technology is focused on preparing students for professional positions in technology related organizations, enterprises, and activities. Graduates are prepared in a range of rapidly evolving technological disciplines, as entrepreneurs and members of an organizational enterprise.

Applicants must have an appropriate distribution of undergraduate course work including a minimum of 18 semester hours of relevant technology, discipline specific related courses and/or work experience. Students can select coursework to meet their individual career goals. The program of study will include a blend of advanced technologies, management, communication, safety, research, quality assurance and relevant computer applications depending on a specific discipline.

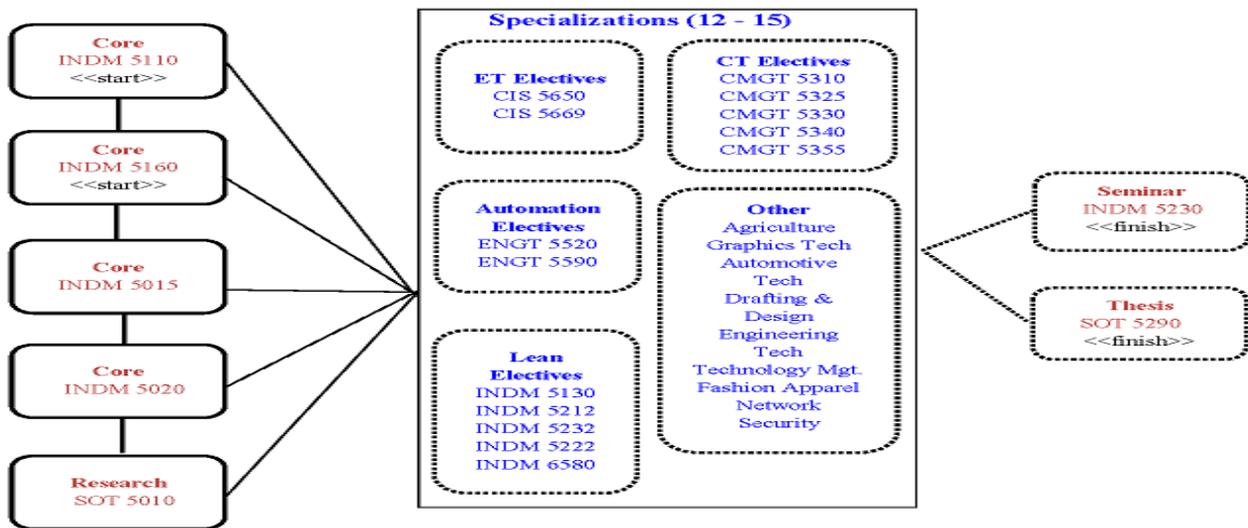
Prior to admission to this program, a student must submit to the Graduate Studies Office all official transcripts indicating a minimum grade-point average of 2.50 in the undergraduate major, a "Career Goals Statement of Purpose", a Resume` including three contact references, and an application form. More information is available on the program website at

<https://www.ucmo.edu/academics/programs/masters-degrees/technology-ms-53-589/index.php>.

Students selecting the thesis option must enroll in 3 hours for two consecutive semesters to total a minimum of 6 semester hours. A student must also pass a comprehensive examination before completion of the program. The objectives of the Master of Science in Technology are to:

1. Provide a sound academic background in various technical areas of:
 - Agriculture,
 - Computer-Aided Drafting & Design Technology,
 - Computer Sciences (CS), Big Data, CIS
 - Construction Management,
 - Engineering Technology,
 - Industrial Technology,
 - Lean and Six Sigma (100% online option),
 - Manufacturing Management,
 - Computer Integrated Manufacturing,
 - Robotics and Automation
 - Networking Security
2. Provide an atmosphere conducive to creative intellectual specialties.
3. Provide courses that will enhance an individual's quality of life through increased knowledge and skills needed for the technical age.
4. Provide the opportunity to apply the scientific method of research to technical problems.

The program of study is designed to be completed in two calendar years. The diagram below illustrates the suggested articulation for this degree.



Program Outcomes:

The graduate with a Master of Science degree in Technology will use the knowledge and skills obtained in the program to develop:

An Organizational Style

- Acquire advanced skills for managing complex projects including planning and implementation.
- Apply organizational skills and concepts to effectively manage available resources.
- Be adaptable and focused on fostering continuous growth and development.
- Analyze current global systems, national interactions, and local business industry workflow.

A Global Orientation

- Demonstrate the ability to communicate effectively and interact in the global environment
- Analyze and develop processes and workflows
- Demonstrate multi-cultural awareness in a global and technological society
- Understand the importance of global functional integration
- Explain the importance of contemporary, global, and societal issues as they relate to careers.

Quality Systems Knowledge

- Recognize the characteristics that define quality relative to a specific discipline.
- Identify, develop, and implement quality strategies.
- Implement appropriate software applications for optimum quality and productivity.

Technology Management Skills

- Understand scientific principles and technology relative to specialty area.
- Select and implement discipline specific technology.
- Develop, evaluate, and integrate technological systems to meet strategic goals.
- Understand legal issues affecting the use and implementation of evolving technology.
- Explain the significance of life-long learning for the purpose of enhancing discipline specific technical competencies.

Technological Ethics and Professionalism

- Develop advanced professional and personal competencies in technology.
- Practice within the specific profession to meet the highest social and ethical standards.
- Explain and apply the basic concepts of a supply and demand economy in an information based society.
- Demonstrate knowledge of professional integrity and ethical standards.

Research skills for Innovation

- Apply advanced quantitative problem solving and decision-making techniques.
- Develop the ability to conduct applied experimental research.
- Demonstrate integration techniques for new technologies related to a field of study.
- Foster entrepreneurs through innovation, collaboration, and managed technological change.
- Research foundational and developing systems and make predictions concerning emerging technologies.

Curriculum – Industrial Technology (Minimum of 33 credit hours)

Required Core Graduate Courses		18
IndM 5110	Current Issues in Industry	3
IndM 5160	Organizational Dynamics	3
IndM 5020	International Technology Management	3
IndM 5015	Legal Aspects of Industry	3
SOT 5010	Applied Research for Technology	3
Research		3-6
IndM 5230	Seminar in Industrial Management	3
	(OR)	
SOT 5290	Thesis	3-6
*Approved Graduate Electives in Technology		12-15

Agriculture, Graphic Technologies, Automation, Computer Sciences, Construction Management, Computer Information Systems, Big Data, Drafting and Design technology, Engineering Technology, Fashion: Textile and Clothing in Business, General Technology, Lean Six sigma, Manufacturing Management, Network Security, or other approved departments.

Graduate electives are to be taken at UCM and may include a concentration of study in Technology.

Minimum Total **33**

NOTE: Thesis (SOT5290) should be enrolled in two consecutive semesters for three semester hours each to total six credit hours.

Automation Technology emphasis 12-15 semester hours

Work with an automation faculty member to choose the sequence of courses and/or substitutions for the courses below.

SOT 5000 Special Problems in Technology (CNC) (3)

ENGT 5520 Robotics and Automation (3)

ENGT 5590 Computer Integrated Manufacturing (3)

ENGT 5221 Manufacturing Problem Solving (3)

Construction Management emphasis minimum of 12 - 15 semester hours

Choose any two from the list below: 6-9 semester hours

CMGT 5310 Construction Safety (3)

CMGT 5325 Advanced Estimating & Cost Analysis (3)

CMGT 5355 Computer-Based Project Control (3)

Choose any two from the list below: 6-9 semester hours

CMGT 5330 Mechanical Systems for Buildings (3)

CMGT 5340 Solar Energy for Building Construction

CMGT 5380 Heavy Construction: Methods and Materials

SOT 5022 Internship in Applied Sciences (3)

Drafting and Design Technology emphasis minimum of 12 - 15 sem. hrs.

Required Specialization Courses: 6 to 9 semester hours

CADD 5180** Industrial Design (3)

SOT 5570 Computer Graphics (3)

Electronics & Computer Technology emphasis minimum of 12 - 15 semester hours

Choose any two from the list below: 3-6 semester hours

IndM 5260 Syst Analysis & Mgmt Information Systems (3)

CIS 5650 Managing Corporate Information Systems (3)

CIS 5669 Communications Network Management (3)

Choose one option below: 9 Semester hours

Network Security

NET 5500 Managerial Design for Secure Networks (3)

NET 5501 Network Security Management I (3)

NET 5502 Network Security Management II (3)

Approved Substitutions:

CIS 5660 Legal Environment of Information Systems may substitute for IndM 5015

Fin 5800 Managerial Finance may substitute for IndM 5020

Engineering Technology emphasis 12-15 semester hours

Work with an automation faculty member to choose the sequence of courses and/or substitutions from the courses below.

IndM 5240 Engineering Economy (3)

IndM 5260 Systems Analysis and Management Information Systems (3)

ENGT 5520 Robotics and Automation (3)

ENGT 5221 Manufacturing Problem Solving (3)

SOT 5000 Special Problems in Technology (3)

Fashion and Apparel Merchandising emphasis minimum of 12-15 s. h.

Required Specialization Courses: 6 Semester Hours

FAME 5460 Seminar in Textiles and Clothing (3)

FAME 5490 Internship (3)

Elective: Choose 6 to 9 semester hours

Select any three from the following courses:

FAME 5410 Architectural Interiors (3)

FAME 5414 Advanced Technical Problems (3)

FAME 5424 Pattern Design (3)

FAME 5433 International Apparel Technology (3)

FAME 5442 Advanced Textiles (3)

FAME 5445 Senior Seminar in Fashion (3)

FAME 5450 Special Problems in Textiles and Clothing (3)

Lean Six Sigma Graduate Certificate (15 semester hours)

IndM 5130 Lean & Quality Management (3) OR Engt 5580 Quality System Engineering (3)

IndM 5212 Production & Operations Management (3)

IndM 5222 Principles and Practices of Lean Systems (3)

IndM 5232 Seminar in Lean Six Sigma Implementation (3)

IndM 6580 Advanced Strategic Quality and Standard (3)

Industrial Management emphasis 12-15 semester hours

Required Specialization Courses: 6 Semester Hours

IndM 5212 Production & Operations Management (3)

IndM 5240 Engineering Economy (3)

Elective: Choose 6 to 9 semester hours

IndM 5120 Human Factors Engineering (3)

IndM 5140 Facilities Engineering (3)

IndM 5180 Industrial Statistics (3)

IndM 5260 Systems Analysis and MIS (3)

Manufacturing Management emphasis 12-15 semester hours

Work with an automation faculty member to choose the sequence of courses and/or substitutions for the courses below.

IndM 5140 Facilities Engineering (3)

IndM 5212 Production & Operations Management (3)

IndM 5240 Engineering Economy (3)

SOT 5000 Special Proj. in Technology

Other areas of specialization:

Agricultural, Big Data, Computer Sciences, CIS, Safety Sciences, Industrial Technology, and others.

Students can go directly to their program to check on the available courses. Here is a link to the Master's degrees at UCM -- <https://www.ucmo.edu/academics/programs/masters-degrees/>

Graduate Certificate Programs

The School of Industrial Sciences & Technology offers two graduate certificate programs. To be admitted applicants must have completed a baccalaureate degree from an accredited college or university with a GPA of 2.5 overall. Contact your advisor and Instructor for consent to enroll in this sequence of courses. Applicants must also demonstrate proficiency in English communication and an ability to work in a technology management-driven environment. Students must maintain a grade point average of 3.0. The certificate can be completed in one calendar year. Additionally, candidates seeking the Network Security area must have an Electronics Technology degree with an emphasis in Networking OR satisfy one of the following two choices:

1. Bachelor's degree in a *related field* **AND** NET 5100 - Network Device Configuration **OR** Instructor's consent based on experience and skills testing.
2. Bachelor's degree in a *non-related field* **AND** NET 5100 - Network Device Configuration **AND** Instructor's consent based on experience and skills testing.

This program is a non-degree graduate program. However, courses completed as part of the certificate curriculum can be included in a program of study leading to a Master of Science degree. The School of Technology graduate coordinator and advisor will advise students and confirm completion of certificate requirements.

Lean Six-Sigma Graduate Certificate

The Lean Six-Sigma program consists of **fifteen semester hours** intended for industrial and service managers, supervisors and others who desire to bridge their companies' productivity to "Lean-Six Sigma" methods.

Program Description

This online certificate program is designed for industrial professionals seeking insight to techniques of Lean Six Sigma systems while preparing for the Lean Certification by the Society of Manufacturing Engineers (SME), Six Sigma Green Belt Certification and/or the Manager of Quality/Organizational Excellence Certification from the American Society for Quality (ASQ). The five required courses will integrate with the Industrial Management and Technology master's degree programs as an area of specialization. The program will be delivered via the Internet using web-based tools for effective learning.

In order to award the certificate, student will complete all five required courses for the overall GPA, "B" or above. These courses must be completed within six calendar years, beginning with the date the student first registers as a graduate level certificate student.

Program Objectives

Students will gain the most recent skills and knowledge in Lean systems, Six Sigma, quality tools, and quality management principles while preparing for certification examinations.

Specific Objectives:

- Apply lean concepts in various industrial situations to eliminate waste and maximize quality.
- Use seven statistical tools and quality techniques to problem solve a given industrial scenario.



- Develop a continuous improvement plan using quality standards criteria established by the International Standards Organization series and Malcolm Baldrige Awards program.
- Organization series and Malcolm Baldrige Awards program.
- Prepare for Lean certification by the Society of Manufacturing Engineers (SME) and/or the Manager of Quality/Organizational Excellence Certification from the American Society for Quality (ASQ).

This online graduate certificate program utilizes the same format to present all five courses included in the program of study. Course deliverables and materials will have a complete set of course components, including learning outcomes, instructional modules, handouts, assignments, and assessment. Interactive discussions with peers and course facilitators in a virtual class meeting, video conference, discussion board, and telephone conferences are encouraged.

Students will take five, three-semester hour courses:

Fall Semester

- **IndM 5212 Production and Operation Management.** Production/operations concepts with emphasis upon systems, systems design and analysis, strategies, productivity, planning, forecasting, deterministic and stochastic inventory control, MRP scheduling, and project planning.
- **IndM 5222 Principles and Practices of Lean Systems.** A survey of theory, goals, and applications of Lean principles and strategies in industrial organizations. Applying Lean and Six Sigma (DMAIC) concepts to business strategy, product design, tools for finding and eliminating waste and for continuous improvement. Mapping the value stream, error proofing, failure analysis, and the lean metrics are covered.

Spring Semester (Enroll in INDM 5130 or ENGT 5580)

- **IndM 5130 Lean and Quality Management.** Relationship between quality and competitiveness, design strategy for performance excellence, and discussion of cases in Lean systems and Six Sigma.
- **IndM 5232 Seminar in Lean Six Sigma.** Individual research directly related to Lean implementation applied to business and service processes. Alignment and systematic business and service process design focusing on implementing and validate solutions and control plan. Measuring business results with business profit and customer satisfaction.

Summer Session

- **IndM 6580 Advanced Strategic Quality and Standards.** An investigation of advanced quality techniques for production/quality managers, global standards criteria (ISO series and Malcolm Baldrige Award), leadership, empowerment and human development, and standard certification training for quality managers and professionals.

Program Costs

The estimated cost is \$413.50 per credit hour (online course) plus the cost of textbooks and software. (Note: tuition and other costs are subject to change)

Network Security Graduate Certificate

The **Network Security** program includes **fifteen semester hours** designed for networking professionals seeking to enhance their skill set in designing and implementing Cisco Systems hardware-based network security measures. Students will gain the most recent skills and knowledge in securing corporate network infrastructure.

Students will take five, three-semester hour courses:

- **NET 5500 Managerial Design for Secure Networks.** Utilizing Cisco Systems Architecture for Voice, Video and Integrated Data networks to apply modular design practices to ensure the enterprise solution is highly available and optimized for business and technical needs.
- **NET 5501 Network Security Management I.** Utilizing Cisco Systems routers for network and overall security processes focusing on designing and implementing solutions that will reduce the risk of revenue loss and vulnerability.
- **NET 5502 Network Security Management II.** An emphasis on security policy design and management, security technologies, firewall and secure router design, installation, configuration and maintenance, AAA and VPN implementation using Cisco Systems routers and firewalls. (Substitute NET5000/NET4062).
- **INDM 5015 Legal Aspects of Industry.** Identify, discuss, and research legal issues affecting industry related to corporate planning, decision making, and management. The role of corporate and social responsibility will also be developed.
- **INDM 5260 Systems Analysis and Management Information Systems.** Development of material requirements planning within the context of management information systems.

Program Description

This certificate program is designed for networking professionals seeking to enhance their skill set in designing and implementing Cisco Systems hardware-based network security measures. The five courses are currently integrated with the Industrial Technology Master's Degree program as an area of specialization. The courses would also serve as electives for other CAST graduate programs.

Program Objectives

Students will gain the most recent skills and knowledge in securing the corporate network infrastructure. Specific objectives include:

- Security policy design and management.
- Security technologies, products, and solutions.
- Firewall and secure router design, installation, configuration, and maintenance.
- Intrusion Prevention (IPS) implementation using routers and firewalls.
- Virtual Private Network (VPN) implementation using routers and firewalls.
- Preparation for Cisco Firewall Specialist certification.

Program Costs

The estimated cost is \$413.50 per credit hour (online course) plus the cost of textbooks, software, and CD's (Note: tuition and other costs are subject to change).

Roadmap to Graduation

The materials contained in this section were compiled from the UCM Graduate Catalog. Student Accepted into the School of Industrial Sciences & Technology Master's program is assigned a graduate advisor. Each graduate student in the School of Industrial Sciences and Technology is responsible to contact the program advisor, engage in intellectual study at a high level and comply with all policies and procedures from the school. A roadmap to graduation includes the following steps:

1. To begin your study, we suggest that you set up a study plan using these major documents:
 - Articulate Diagram (page 7 for IM program OR page 10 for Technology program)
 - Course Schedule 2024-2030
 - Graduate Handbook and read the "Graduation Requirement". This information is also available at <https://www.ucmo.edu/graduate/current/require.cfm>
2. Take courses following your study plan, minimum 33 credits hours to graduation. The M.S. in Technology will require a minimum of 15 hrs of elective (specialization) courses. You may contact the Graduate School at 660-543-4092 for assistance with enrollment or use your student Portal to enroll the classes by yourself.
3. Create an Application for Approval of Program of Study form within a month of completion of 12 hours of graduate study, see appendix B for example. The program advisor will assist in creating the plan of study. This plan will be followed throughout your study until the final semester.
4. While taking courses, make sure you keep and organize all electronic files of all your course materials in every class (e.g., course syllabus, research papers, assignments, lecture notes, handouts, and other supplements). The electronic portfolio is required for submission in IndM 5230 Seminar in Industrial Management.
5. In your final semester, first week, you will complete the graduation application, go to your Student Portal, then select "Apply for Graduation" Please note that if you also complete the LSS or NS Graduate Certificate, you will require to fill out the graduation application as well.

The M.S. in Technology requires students to pass the comprehensive exam prior to the graduation. Students need to contact the program advisor to take an exam in the final semester.

- IndM 5230 should be enrolled in the final semester with course instructor' permission.
- If students select to work on SOT 5290 Thesis, 6 credit-hrs with two semesters (instead of IndM 5230).

Students will consult with the committee chair to recruit another 2 committee members. The final draft of your thesis must be signed by all committee members and submit to the Graduate Office 3 weeks prior the graduation. See Example of writing a brief proposal of creative project/thesis on pages 43-44.

The UCM thesis manual is available online at <https://www.ucmo.edu/offices/graduate-education-and-research/thesis-and-writing-resources/index.php>

6. The program advisor will check your program information and sign the paper. Students can apply to graduate in Spring (May), Summer (August) or Fall (December) semester. The UCM commencement ceremony is held every Spring (in May) and Fall (in December) semester.

Graduation Fees:

The Revenue Office will bill you for graduation fees. Final clearance for graduation begins after semester grades are posted for the semester. Diplomas are mailed in about 6-8 weeks after final clearance.

Commencement:

If you intend to participate in the commencement ceremony you must pick up your commencement packet from the Graduate School, Ward Edward 1800, or commencement packets can be mail upon request (660)-543-4621. Check with The Graduate School for the date commencement packet will be available.

Cap & Gown, Graduation Announcement:

University Bookstore

Union 128

(660)-543-4370

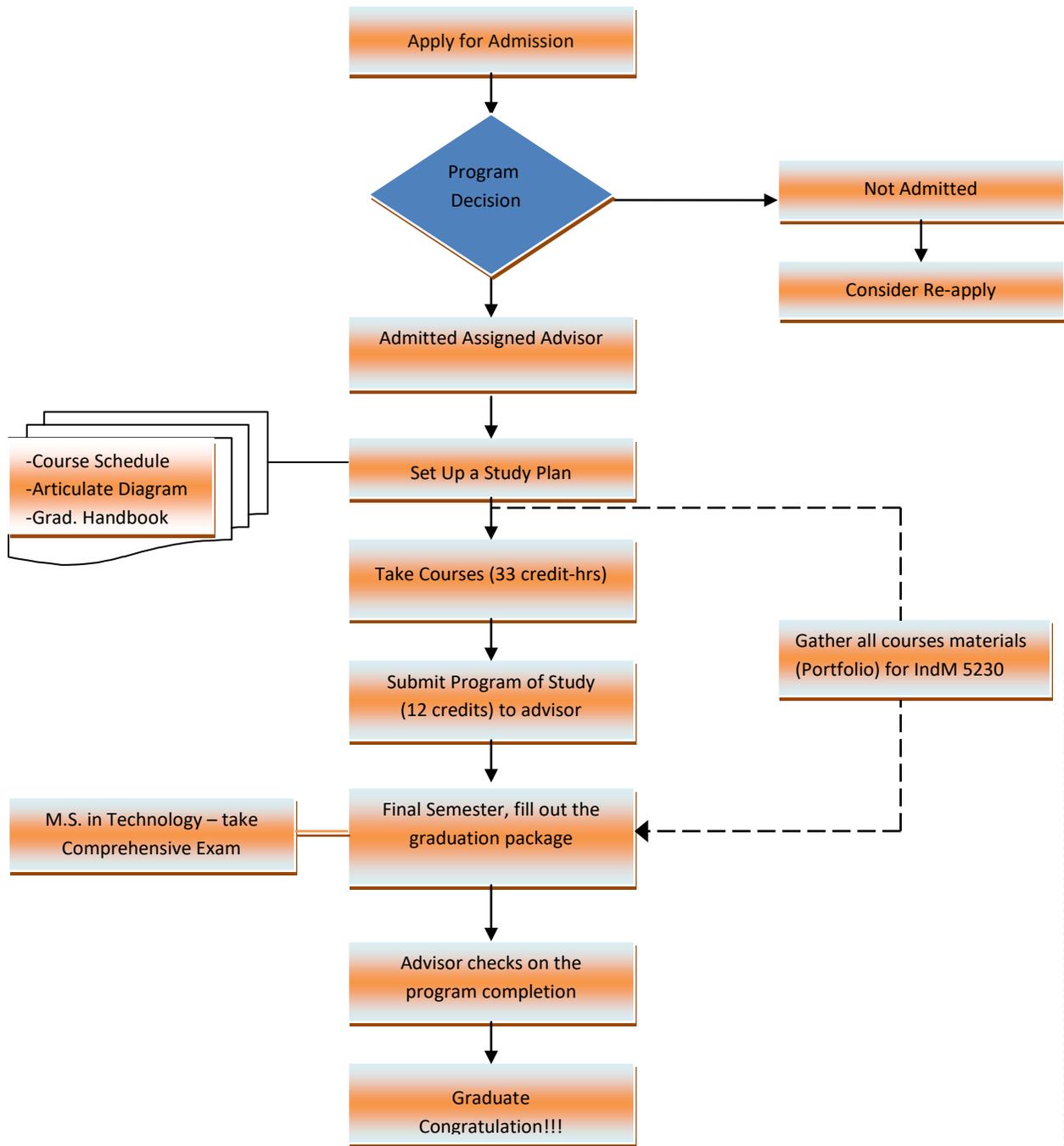
Official Transcripts:

Office of the Registrar

Ward Edwards 1000

(660)-543-4900

MS Program Flow Chart
M.S. Program - Flow Process



M. S. Student Progress Checklist

Graduate Student Orientation

- All new graduate students should complete the online orientation at <https://www.ucmo.edu/graduate/future/orientation/>
- International graduate students should also attend the International Graduate Student Orientation and complete the health screening and some other required processes.
- International graduate students should also attend the program orientation and enroll in the classes on that day.

Set-up a Study Plan and Enroll in classes

- Use the Course Schedule 2024-2030 on page 51 to plan for your study, contact your graduate advisor for questions/suggestions.
- Enroll in classes each semester.
- Enroll on the web <https://mycentral.ucmo.edu/cp/home/displaylogin> or by calling The Graduate School 660-543-4729.
- IndM 5230 Seminar in Industrial Management should be enrolled in your final semester, seek approval from course instructor to enroll in this course.
- Grade replacement policy, students are allowed to retake the same courses with a maximum of 2 courses or 6 credit-hrs.

Program of Study

- Students must fill out the Program of Study (POS) prior to completing 12 hours of graduate coursework, then forward it to your advisor for approval. The form in Excel format is available via email. Make sure you email your advisor for a form and work with him/her to complete it. See sample of POS in Appendix B.

Thesis

- Students deciding to complete a thesis will enroll in IndM 5290; Thesis for six credit hours and it is suggested to enroll in three credit hours for two consecutive semesters. Students should obtain a Thesis Manual from the Graduate School to preparing a thesis or visit a link at <https://www.ucmo.edu/offices/graduate-education-and-research/thesis-and-writing-resources/index.php>

Comprehensive Exam

- Students majoring in Technology must pass the comprehensive examination; contact the advisor at the beginning of your final semester to plan for the exam.

Graduation

The commencement ceremony is held in spring and fall semester, fill out the graduation application on My Central, "Apply for Graduation". make sure you complete all the program requirements:

- Earn a minimum of 33 semester hours of graduate credits applicable on an approved program, all graduate courses must have been in 5000/6000 level.
- All U grades (incomplete grades) must be removed prior to graduation.
- Complete the application for graduate degree in a commencement packet and pay the graduation fee.

- To graduate, a minimum of 3.0 GPA. Students are allowed to have a maximum of 2 C grade.

Graduate Program Admission

Admission Process:

For U.S. Citizens, Legal Alien, Permanent Residence: **students from U.S. territories and internationals. (For specifics on International Applications, see next section “International”)**

An applicant for admission to a master's degree program must have a bachelor's degree. Prerequisite degrees must be from institutions accredited by agencies recognized by the University of Central Missouri.

Admission to The Graduate School, which permits enrollment in classes, is not equivalent to admission for a particular program or degree. Degree seeking students meeting the requirements for admission to graduate study will be forwarded to the department, as designated by the student, for consideration and recommendation. Department admission requirements, including standardized tests, for specific graduate programs, are listed in the Graduate Catalog, available online at

<https://www.ucmo.edu/current-students/office-of-the-registrar-and-student-records/catalogs/index.php>

To Apply go to: <https://giss.admissions.ucmo.edu/apply/>

Your online application will be held until the fee and your official transcript(s) are received. Please request your transcripts be sent.

Update documents into your portal (“Supplement” area)

- A brief statement describing educational objectives and career goals, 1-2 pages essay type
- A current Resume and 3 contact references.

Returning Central Graduate Students

If you are returning to The Graduate School at Central after an absence of a year or more, please call 660-543-4092 and request re-admission.

Graduate School Application Deadlines:

All application materials should be received by the Office of Graduate Studies at least three weeks prior to the beginning of the semester in which the student wishes to register.

Note: Before applying, we strongly suggested you visit the website <https://www.ucmo.edu/future-students/admissions/graduate-admissions/index.php>

Semester Deadline:	Fall-June 1 st
For Domestic Student	Spring-October 1 st
	Summer-March 1 st

Admission Process: For International Students

To apply to the Graduate School at the University of Central Missouri:

Application available via online at: <https://giss.admissions.ucmo.edu/apply/>

- Complete the International Student Application
- Pay the non-refundable \$75 application fee*
- Prove English proficiency.
- Provide financial support letter.
- Provide a bank statement with adequate funds.
- Official Transcripts
- Photocopy of passport

*May not apply to all student types

Online Application

This fee is \$75.00 USD and non-refundable.

Demonstration of English Proficiency

Proficiency may be demonstrated by one of the following:

- a. TOEFL exam score of 79 IBT or 550 PBT
- b. IELTS exam score of 6.0
- c. Duolingo composite exam score of 120
- d. UCM Proficiency Test of 79

If you do not meet this requirement, you may participate in our Intensive English Program to master's track.

Transcripts

All graduate students are required to upload unofficial transcripts to their student portal (created upon application submission) and submit official transcripts to our office. These transcripts will be used for advisement purposes. Please reference International Admissions Process for more information on submitting transcripts.

Declaration of Financial Support

This document is required to demonstrate sufficient financial support while attending UCM.

Official Bank Statement/Certification

This document is required as verification that adequate funds are currently and subsequently available to you in support of your tuition and living expenses while at UCM. The cost per academic year of attending the University of Central Missouri as an on campus graduate student is approximately (in US Dollars): Please refer to the website <https://www.ucmo.edu/future-students/admissions/international-admissions/international-admissions-requirements/index.php> , for detailed information on international

student's application instructions.

Update documents into your portal ('Supplement' area)

- A brief statement describing educational objectives and career goals, 1-2 pages essay type
- A current Resume and 3 contact references.

International Application Deadlines

Students are encouraged to complete and forward their applications to the University of Central Missouri as early as possible. This allows for sufficient time to obtain visas and arrange for transportation. The priority deadlines for receipt of all admission materials are listed below. Applications received after these deadlines will automatically be processed for the following semester.

Semester Deadline:

Fall	(May 1) for international student. (June 1) for transfer students (Already in the U.S)
Spring	(September 1) for international student (November 1) for transfer students (Already in the U.S)
Summer	No admission for international student (April 1) for transfer students (Already in the U.S)

Students staying in their home country :(2-3 weeks prior to the start of the semester)

The admissions team for international students is eager to help answer your questions. Please feel free to contact them at the email addresses below:

Contact

Graduate & International Student Services
University of Central Missouri
Ward Edwards 1800
Tel: 660-543-4092
intladmit@ucmo.edu

Career Goal Statement (Guideline)
University of Central Missouri
School of Industrial Sciences and Technology
Career Goal Statement of Purpose

Each student wishing to pursue a graduate degree program in the School of Industrial sciences and Technology will prepare a written career goal statement of purpose containing the following components.

Name _____ Student # _____

Address _____

Telephone/Fax _____ E-Mail _____

Program Requested:

M.S. In Industrial Management _____

M.S. In Technology _____ Emphasis Area _____

PhD in Technology Management _____ Emphasis Area _____

Semester you wish to start: _____ Part-time or Full-time: _____

On Campus: _____ Off Campus: _____

Please read the program outcomes and course descriptions included in the graduate catalog before writing your career goal statement and/or answering these questions.

Writing 1–2-page essay type

1. Why do you want to pursue a graduate degree with an industrial technology/industrial management specialization?
2. What career objectives do you hope to achieve upon completion of this program? For example, what job title or job description are you seeking upon graduation?
3. What are the primary skills/competencies you plan to develop in your graduate program?
4. Please supply three references with contact information and any other general comments you may have concerning the graduate degree.

Note:

This statement may be submitted as a separate document and must thoughtfully address all questions above. It must be at least one page in length, single spaced, and word processed (no handwritten forms will be accepted). This statement may not exceed two pages in length.

** The form is also available online at <https://www.ucmo.edu/academics/programs/masters-degrees/technology-ms-53-589/career-goal-statement.pdf>, link "Career Goal Statement".

Graduation Application Process

The following forms need to be submitted before graduation to initiate the clearing process for receipt of your degree.

Please check this link for more information on applications and forms:

<https://www.ucmo.edu/current-students/office-of-the-registrar-and-student-records/graduation-and-commencement/graduation-application/>

Lean Six Sigma Graduate Certificate application: Go to

<https://www.ucmo.edu/academics/programs/undergraduate-certificates/applied-lean-six-sigma-quality-certificate/index.php>.

Application for Degree Card: How your name appears on the diploma depends on how the Application for Degree Card is filled out. Make certain that the name on this card appears as how you want it on your diploma. **The diploma name for international students must match the name on the passport.** The address on the card is the address where the diploma will be mailed. The diploma will take up to 6 weeks after graduation to arrive. Make certain that you are able to receive your diploma from the address stated on the Application for Degree Card.

Thesis: All these (if applicable) are due in the Graduate School **3 weeks prior** to commencement. Please follow the routing process outlined in the Policies and Procedures section of *the Central Thesis Manual*. After completing the routing process, a binary number will be issued by the Graduate School and must be reported to your advisor. Bound copies are to be ordered for you advisor and the JCK Library.

U Grades: All U grades (incomplete) must be removed prior to graduation.

Graduation Fee: The Revenue Office will bill you for graduation fees. Final clearance for graduation begins after semester grades are posted for the semester. Diplomas are mailed in about 4-6 weeks after final clearance.

Commencement: If you intend to participate in the Commencement ceremony you must pick up your commencement packet from the Graduate School, Ward Edward 1800, or commencement packets can be mailed upon request (660)-543-4621. Check with The Graduate School for the date commencement packet will be available.

Cap & Gown, Graduation Announcement:
University Bookstore
Union 128
(660)-543-4370

Official Transcripts:
Office of the Registrar
Ward Edwards 1000
(660)-543-4900

Frequently Asked Questions (FAQ)
MS in Industrial Management (MSIM)
MS in Technology (MST)

School of Industrial Sciences and Technology

This FAQ is prepared to assist prospective and current students to learn about the MS programs in the School of Industrial Sciences and Technology (SIST). The information and URL addresses are subject to change. Further questions/concern, please contact the program coordinator, Dr. Sue Rodchua, email: rodchua@ucmo.edu

Future Students:

1. What are the specific admission requirements for the M.S. in Industrial Management and M.S. in Technology programs?

- A minimum requirement for the undergraduate GPA – 2.5 for MST and 2.6 for MSIM
- 1-2 pages Career goal statement
- A resume, and 3 contact references

Learn more about the MS in Industrial Management, check the link :

<https://www.ucmo.edu/academics/programs/masters-degrees/industrial-management/index.php>

Learn more about the MS in Industrial Technology, check the link:

<https://www.ucmo.edu/academics/programs/masters-degrees/technology/index.php>

2. What is the process for changing majors within the school (SIST)?

Need to submit a request to change your major, you can use the link to check the form:

<https://www.ucmo.edu/offices/international-student-services/internal-resources/student/international-student-information-and-forms/>

3. What specific documents are required for the CPT I-20 application, and how should I submit them? The CPT students will enroll in SOT 5022 Internship.

Follow the link for all CPT related questions and forms: <https://www.ucmo.edu/offices/international-student-services/internal-resources/student/international-student-information-and-forms/>

4. What is the process for applying for OPT, and where can I find the necessary application forms?

Follow the link for all OPT related questions and forms: <https://www.ucmo.edu/offices/international-student-services/internal-resources/student/international-student-information-and-forms/>

5. What are the graduate certificates offered alongside the master's degree?

SIST graduate programs at the University of Central Missouri offers two graduate certificates alongside the master's degree programs. These graduate certificates are designed to provide specialized knowledge and skills in specific areas of technology. The two graduate certificates offered are: Lean Six Sigma Graduate Certificate and Network Security Graduate Certificate. Check the links for information:

<https://www.ucmo.edu/academics/programs/graduate-certificates/lean-six-sigma-graduate-certificate/index.php>

<https://www.ucmo.edu/academics/programs/graduate-certificates/network-security-graduate-certificate/index.php>

6. What is the application process for a Graduate Assistantship and what are the key requirements or qualifications that applicants need to meet?

The application process for a Graduate Assistantship can be found on the link: <https://www.ucmo.edu/offices/graduate-studies/graduate-assistantship/>

Note: The MSIM and MST programs offer 2 GA positions each year. The selected candidates normally in their first year and show high academic performance and leadership in the classroom. These positions are highly competitive. There are also some other GA positions available in other programs throughout the campus.

7. What is the nature of the M.S. Industrial Management online program?

The program provides a balanced curriculum focusing on the human element of the workplace as well as a variety of industrial systems. Specific skills will be developed in the field of leadership, problem solving, and decision-making. The program is delivered online 100% via Internet (Blackboard courseware). Students must be highly self-motivated and goal-oriented with excellent study skills and time management. Instructors will hold virtual class meetings in the evening (5pm, 6pm, and 7pm central time) to discuss the course materials. Each class may have online virtual meetings once in every two weeks, or 7-8 meetings per semester, 50-60 minutes for each session.

8. What type of background should I have?

The successful applicant should have at least 2 years of work experience in the related fields of industry/business/education/government and have an appropriate background bachelor's degree. Those without this background education or work experience may be required to take some prerequisite courses.

9. What are the website addresses to learn more about the programs and financial aid?

School of Industrial Sciences and Technology: www.ucmo.edu/technology

SIST Graduate Program: <https://www.ucmo.edu/sotgrad>

M.S. Industrial Management: <https://www.ucmo.edu/academics/programs/masters-degrees/industrial-management-ms-53-141/index.php>

M.S. Technology: <https://www.ucmo.edu/academics/programs/masters-degrees/technology-ms-53-589/index.php>

Student Financial Services: www.ucmo.edu/sfs/

UCM Online: <http://www.ucmo.edu/ucmonline/>

10. How do I apply?

You can apply online at <https://www.ucmo.edu/academics/graduate-studies/>. For international students, please visit the International Center at <https://www.ucmo.edu/offices/international-student-services/international-students/>

11. When can I enroll?

Domestic students are eligible to enroll when you have a campus ID (700#) and ucmo.edu email account; please contact the program advisor for your Program of Study prior to the enrollment.

International students must attend the campus orientation and complete all the required documents prior to the enrollment.

12. How long will it take to complete the M.S. program?

The MSIM and MST are 33 credit hours program completion. If enrolled as a full-time student, 9 credit hours for each spring and fall and 3-6 credit hours in summer, it can take one and half years (18 months) to complete. It is normal for the Domestic students working full-time to enroll in only 3-6 credits hours per semester; they may take 2.5-3 years for completion. The program also provides some summer session courses, only online delivery in summer semester.

13. How much are tuition fees?

For the latest information (2023/2024) on tuition and fees, visit <http://www.ucmo.edu/costs/>.

Missouri residents: Online – \$413.50 per credit hour; and Live or in-person main campus \$356.00 per credit hour.

International students: Online/hybrid and Lees' Summit campus - \$413.50 per credit hour; Live or in-person main campus \$712.00 per credit hour.

14. How does an online program work?

The [Office of Extended Studies](#) provides detailed information on distance learning. View the FAQ's about taking an online class at <https://www.ucmo.edu/academics/ucm-online/>

15. Is financial aid available?

Yes, there are several types of financial aid at UCM. The Student Financial Services website is <https://www.ucmo.edu/future-students/financing-your-education/financial-aid-policies/>.

16. Do I have to pay the entire fee before enrolling?

No, you don't have to pay the entire fee before enrolling. The university has a flexible fee payment plan for all the students. The payment plan enables the student to pay up before the end of the semester.

See more information here: <https://www.ucmo.edu/future-students/tuition-and-costs/payment-options/payment-information/semester-payment-information/>

17. When is the best time to apply?

Depending on your plan, you can always apply for either Fall or Spring Semester.

Domestic students: Spring – November; Fall – June

International students: Due to the limited slots of Visa interview in each country, try to apply early, about 4-6 months prior to the semester starts.

<https://www.ucmo.edu/future-students/admissions/graduate-admissions/>

18. Can I apply for a PhD as an international student?

No. the PhD in Technology Management does not grant an F-1 visa for international students.

19. Can someone who does not have an Engineering background enroll in the program?

Yes. You don't necessarily have to have an engineering background before enrolling in the MSIM and MST Program.

Current Students:

1. What are some job titles for MS in Industrial Management? Current Salary?

The job titles from our graduates include Project Manager, Operations Manager, Supply Chain Manager, Risk Management specialist, Quality Assurance Engineer, Continuous Improvement Specialist, Packaging Lead, Quality Manager, Plant Quality Engineer, Quality Consultant Engineer, Field Service Operations Manager, Plant Manager, Project Manager, Project Sourcing Manager. According to the program graduate follow-up survey in December 2022, the current annual salary is in a range between US\$55,000 – \$120,000

2. What are some job titles for MS in Technology?

The job titles from our graduates include Data Analyst, Technology Analyst, Investment Banking Analyst, SAP Sales and Distribution Consultant, I.T. Systems Administrator, Application Developer, Lead .NET

Developer, DEVOPS Engineer, Network consulting Engineer, Network Security Engineer, Testing Engineer, AWS DEVOPS Engineer, Senior Software Engineer.

According to the program graduate follow-up survey in December 2022, the current annual salary is in a range between US\$55,000 – \$120,000.

3. Is it mandatory to take courses in Summer?

Not mandatory, there is no requirement to enroll classes in summer semester. However, students can utilize the semester for Internship/CPT.

4. How to register for Internship/CPT course?

Need to submit offer letter and fill out the application form at <https://www.ucmo.edu/offices/international-student-services/internal-resources/student/international-student-information-and-forms/>

5. Can someone who couldn't find a place to do an internship still graduate?

Yes, Internship is not required for the program graduation. It is considered as an elective course.

6. What does it take to become a Graduate Assistant or a Student worker?

Good work experience and academic background with some required skills as stated on the UCM Employment website. To apply for a Graduate Assistantship, you can read details and download the application form at <https://www.ucmo.edu/offices/graduate-studies/graduate-assistantship/>

7. Is there any possibility of joining any Student Organizations?

Students can join some student organizations such as the American Society for Quality (ASQ) and benefit in actively participating with seminars, increasing the networking capabilities.

8. What kind of industrial experience can we get as a part of the course?

Students can get an opportunity to join a few seminars, and workshops and participate in the facility tours that can be organized by the school of industrial sciences and technology along with course curriculum.

9. Who should I contact if I have questions on course enrollment or general questions about the programs?

You can contact your advisor or the program coordinator, Dr. Sue Rodchua, rodchua@ucmo.edu.

Ph.D. in Technology Management

The Doctor of Philosophy in Technology Management is designed to prepare students for positions of leadership in the public and private sectors of society. At the conclusion of the program, graduates will have developed skills in research procedures, will have acquired expertise in instructional processes, and will be able to provide service to the industrial and educational community. The program maintains most of the traditional requirement's characteristic of advanced graduate study but is unique in using the resources of a consortium of five universities linked together by alternative communication systems. These member universities have programs staffed by faculty having expertise in many areas of technology. Coursework for this program is delivered online. For more information visit

<https://www.ucmo.edu/academics/programs/cooperative-doctoral-degree/technology-management-phd/>

The program offers five specializations:

- **Construction Management** - Coursework within the construction management specialization is directed toward applied research, the advancement of the construction organization, and professional management leading to the effective and efficient control of the construction process.
- **Digital Communications** - The need for faster and more efficient transmission, reception, storage, and retrieval of information in our high-change society has caused digital communications to be one of the fastest growing fields in technology. The purpose of advanced studies in this area is to increase the knowledge about the design and implementation of systems to communicate in a cost-effective manner.
- **Human Resource Development and Training**- Human Resource Development & Industrial Training (HRD&IT) means the integrated use of training and development, organizational development, and career development to improve individuals, group, and organizational effectiveness. HRD&IT relies on more than one subject discipline and draws on theories and insights from education, management, industrial and individual psychology, communication, counseling, economics, sociology, and related areas of research.
- **Manufacturing Systems** - A Manufacturing System can be defined as the means to operate and control processes that add value to a product. Another key characteristic of a manufacturing system is its ability to replicate the product profitably. While traditional manufacturing programs have focused on manufacturing technologies, manufacturing systems concentrate on all activities and practices used to integrate an enterprise's production.
- **Quality Systems** - The QSS program provides people with corporate leadership abilities and faculty for the profession. Graduates shall have a global vision encompassing quality systems. The primary QSS focus is to provide people with the ability to manage complex organizations to meet the requirements of customer satisfaction in public and private sectors.

Program Curriculum (See Appendix B)

Major Area of Specialization (18 credits): Specialization in technical concentration and is achieved by completing six PhD level courses. Examples of program specializations have been identified for manufacturing, construction, digital communications, and others. It is anticipated that additional

specializations will be developed with the changing nature of technology studies. These specializations shall be reviewed and recommended for adoption, modification, or deletion by the Graduate Consortium Coordinating Council to the Ph.D. Graduate Program Coordinator. The approved recommendation shall be sent to the Dean of the School of Graduate Studies at Indiana State University.

Research Core (27 credits): The research component of the program is composed of course work in research design, research methodology, and statistical analysis. A dissertation of eighteen credits shall be completed after advancing to candidacy for the degree.

Technology Core (12 credits): The general technology core of studies is designed to provide a conceptual framework for studies in technology. This core emphasizes the relationship of technology to the societal context from which it operates. The core will be taught using internet technologies, or other approaches capitalizing on the unique expertise of professors at consortium member institutions. These courses will be required of all students

Professional Studies (9 credits): The area of study may be inclusive of previous graduate work Internship and Field Research Study and is designed to provide concentrated study in technology. Recommendations for approval shall be made by the student's program committee.

Application Procedure

Admission and application information can be obtained from the School of Graduate Studies, Indiana State University. The application form is the School of Graduate Studies - Application for Admission at Indiana State University. Application materials must include:

- Indiana State University School of Graduate Studies Application form
- Pay application fee.
- Graduate Record Examination Scores sent directly to Indiana State University, School of Graduate Studies (GRE scores must be current - taken in the past 5 years.).
- Original transcripts sent directly to Indiana State University, School of Graduate Studies.
- Three years of work experience verified by employer letter.
- Completion of Career Goal Statement. Download form (Word document, requires Microsoft Office Software or the free viewer)
- Five letters of recommendation from persons who are familiar with your ability to do advanced graduate work.
- A current Vita.

Indiana State University's Ph.D. in Technology Management Program admits a limited number of students several times during a calendar year. A candidate's application materials are not evaluated until all required application materials are completely submitted to the School of Graduate Studies at Indiana State University. Once complete, those materials are evaluated for admission at the next available admission date. For more details, visit the website at

<http://technology.indstate.edu/consortphd/>

University of Central Missouri – Fast Facts

University Profile

The University of Central Missouri is an innovative school that offers a high-quality education while remaining one of the most affordable universities in the country. The institution is a state-assisted, four-year comprehensive university governed by a state-appointed Board of Governors. In 1996, the University of Central Missouri was designated Missouri's lead institution for professional technology, an area long recognized as one of the university's greatest strengths. UCM has the highest graduation rate among our competitors and is the only public school in Missouri that pays you to graduate in four years with the Learning to a Greater Degree 15-to-Finish scholarship.

Central offers Engaged learning, future-focused academics, culture of service and worldly perspective. Our university believes in enriching each student's perspective through a cumulative academic experience that integrates applied learning and servant-leadership opportunities.



Total Enrollment

Nearly 11,500 students attend Central, with 55 percent of them female, 45 percent male, 9 percent ethnic minority and 4 percent international. Nearly 80 percent of the undergraduate campus population is made up of full-time students. The student-to-faculty ratio is 18 to one, and the average size of undergraduate classes is 25 students. Students come from 44 states and 62 foreign countries.

Teaching Staff

Total Faculty- 428 (77% of whom hold a PhD & other terminal degree)

Academic Areas

Students choose from more than 150 areas of study in an atmosphere of personalized attention and individualized instruction. Seventy-three percent of our faculty members hold earned doctorates, and full professors teach many beginning classes in addition to advanced courses and seminars. This means Central students learn from top-ranking academicians beginning with their first day of classes. In addition, Central features 10 pre-professional programs, 27 areas of teacher certification and 50 graduate programs.

Accreditations (within School of Industrial Sciences and Technology)

Association of Technology, Management, and Applied Engineering

American Council for Construction Education

American Design Drafting Association

Council for Technical Teacher Education
International Association for Management Education
Missouri State Board of Nursing
Association of Technology, Management, and Applied Engineering (ATMAE)
National League for Nursing
North Central Association of Schools and Colleges



Affordability, Fees, and Scholarships

Affordability: You can afford to attend The University of Central Missouri. Hope Scholarships and an array of other state and federal programs are now available to help students and their families meet the cost of attending the university, which is already one of Missouri's best education values. These benefits are broadening access to Central and allowing more students to join the ranks of well-paid professionals, whose skills are valued by top employers.



Costs & Fees: Central has one of the most affordable tuition rates in the state. There are institutional and general Fees for resident and non-resident graduate students. For latest information on tuition fees, visit <https://www.ucmo.edu/offices/student-financial-services/>

Federal Financial Aid: A student who has been fully admitted to a graduate degree program at Central is eligible to be considered for several types of Federal financial assistance. This aid is authorized and regulated by the United States government and is designed to help students pay the educational and living expenses associated with pursuing their programs. For further information, please contact the Office of Financial Aid Services 1100 Ward Edwards, Warrensburg, MO 64093, or by telephone: 600-543-8266, FAX: 660-543-8080, or you can find more info at <https://www.ucmo.edu/future-students/tuition-costs-and-financial-aid/financing-your-education/applying-for-financial-aid/>

Scholarships and Award: At Central, we strive to make your educational and career goals a reality. Our fees are very competitive when compared to other public universities and thousands of dollars less than those charged by private institutions offering similar degrees. Some applicable scholarships are listed below. Use the Scholarship Finder feature to find and apply to available scholarships.

<https://www.ucmo.edu/future-students/financing-your-education/scholarships/>

- **Graduate Student Achievement Award:** The annual Graduate Student Achievement Award is applicable only to student fees. This award waives \$500 of the recipient's fall and spring fees, and \$300 of the recipient's summer fees. The award is based on high academic achievement and leadership qualities. Deadline: March 1. Students who receive a full-time Graduate Assistantship are NOT eligible for a Graduate Student Achievement Award.
- **Graduate Non-Resident Scholarship:** Covers the non-resident fees for graduate study at Central for all students enrolling no later than the fourth semester following graduation from an

undergraduate program at Central; the student must have earned a minimum of 60 hours at Central with a 3.0 or higher UCM GPA; renewable for six semesters if student maintains a graduate GPA of 3.4 or higher. Deadline: Open. Application Form. Window of Opportunity for Alumni: Any past graduate who meets the eligibility criteria and enrolls by fall 2005 qualifies for the scholarship. Application form: <https://www.ucmo.edu/future-students/tuition-costs-and-financial-aid/financing-your-education/scholarships/documents/grad-nonresident-schol-app.pdf>

- **Warren C. Lovinger Graduate Student Scholarship:** This award has been given annually since 1980 in honor of Dr. Warren C. Lovinger, past president of Central. Applicants must have received an undergraduate degree from Central and have been admitted to a graduate program at Central. Students must have at least 16 credit hours remaining on their graduate program to be eligible for this award. Deadline: March 1.
- **The Reid Hemphill Outstanding Graduate Student Award:** This cash award is given to the university's outstanding graduate student. The award was funded and established by Dr. Reid Hemphill, Central's first Graduate Dean. Nominations are made by faculty members to their deans. The deans of Central's four colleges then nominate one student from the college for the award. The recipient is selected by the Graduate Council. Deadline: March 1.
- **The Presidential Scholarship for First-Generation Graduate Students:** This is an award of \$1,000 per academic year, a student may receive the award only once per academic year. To be eligible:
 - a) You must be the first generation in your family to attend graduate school (no parents or grandparents attended graduate school).
 - b) You must also have a minimum undergraduate GPA of 2.50
 - c) You must meet an income requirement to show financial need. Central's Office of Student Financial Assistance can determine if you meet the income requirement if you have filed your Free Application for Federal Student Aid (FAFSA).
 - d) Deadline: March 1 for scholarships awarded the following fall.

Application Forms: Most forms are available at <https://www.ucmo.edu/future-students/tuition-costs-and-financial-aid/financing-your-education/scholarships/index.php>. You will need to have Adobe Acrobat Reader to retrieve these forms. Adobe Acrobat Reader is available for download free of charge from the <http://www.adobe.com/>

Graduate Assistantship: To apply for an assistantship, submit online application

<https://jobs.ucmo.edu/>

Fulfills three important objectives at University of Central Missouri:

- Students are provided with meaningful, professional experiences that will enhance educational and career goals,
- Students provide a service to a department or unit within the University, and Students are provided with financial assistance.
- Students are provided with financial assistance.

Policies for Graduate Assistantships: A student may be awarded an assistantship for a maximum of four semesters, excluding summers. An Education Specialist student, who has had an assistantship while working on a Master's degree, may have two additional semesters, for a total of six semesters as a graduate assistant, excluding summer sessions.

Graduate Assistant and Doctoral Fellows Compensation: The compensation for a full-time Graduate Assistant is two 3-hour courses per semester or whose assignment involves twenty hours per week is \$3,750 per semester or \$7,500 for two semesters. The Doctoral Teaching Fellows facilitate two 3-hour courses per semester and keep an active research agenda for the School of Technology Graduate Programs. The compensation for Graduate Assistants with a partial assignment is reduced proportionately. (This is subject to change.)

Instructional Fee Waiver: Your instructional fees are covered by a fee waiver in proportion to your GA appointment. Courses taken for undergraduate credit or audit will not be included in the instructional fee.

Departmental Scholarships: Some scholarships and awards are offered within departments. Students should contact their departments for additional information.

Robert E. Goetz Award

Available to graduate students from the College of Applied Sciences and Technology. Two reference letters are required to support the application. Application deadline March 15.

Wayne Kay Graduate Fellowship (Society of Manufacturing Engineers)

Supported by the Wayne Kay scholarship Fund and annually makes available ten \$5,000 graduate fellowships. Applicants must have proven scholastic ability, exemplary character and leadership capability and have demonstrated their potential for future leadership in the profession. Available online at www.sme.org

Dr. Clois E. Kicklighter Doctoral Student Scholarship Award Program

The ATMAE Foundation established the "Dr. Clois E. Kicklighter Doctoral Student Scholarship Award Program" in 2003. The program was endowed by a generous gift from Dr. Kicklighter and provides \$2,500 scholarship awards for applicants planning for a career in Technology, Applied Technology, Engineering Technology, or a Technology Related Discipline and has been accepted in a doctoral level program designed to prepare for that career.

Research Funding: Willard North Research Awards for Graduate Students: This award is named in honor of Dr. "Will" North who devoted many years to fostering research activities at University of Central Missouri. The awards are supported by the Willard North Endowment Fund which is part of the

University of Central Missouri Foundation: The purpose of these awards is to promote and encourage the highest levels of graduate research and scholarly investigation. Dr. North was a proponent of sound research design, appropriate statistical techniques, and proper interpretation of results. Willard North Research awards are for students of all disciplines. Because of Dr. North's professional involvement in teaching psychology and counselor education, students in those academic disciplines are especially encouraged to apply. Proposed projects are usually considered as joint student/faculty research or student thesis development. Proposals may be submitted at any time.

Questions or requests for forms should be directed to the Office of Sponsored Programs, (660) 543-4264, Ward Edwards 1800. Warrensburg, MO 64093

Graduate Student Research Awards: The purpose of the Graduate Student Research Award competition is to bring recognition and reward to the authors of exemplary research in Central's graduate programs. Faculty members identify and submit outstanding student theses to the competition.

Questions or requests for forms should be directed to the Office of Sponsored Programs, (660) 543-4264, Ward Edwards 1800. Warrensburg, MO 64093

Additional Research Funding: Federal and foundation directories that list additional funding sources for research and projects are housed in the Office of Sponsored Programs. Interested students may visit the Office of Sponsored Programs in Ward Edwards 1800. Warrensburg, MO 64093 or call them at (660) 543-4264 to utilize these resources or obtain further assistance.

Contact Information

For further information, please contact:

Graduate and International Student Services (GISS)

(Admission process, Letters of Acceptance and Proof of Enrollment, Graduation):

Website: <http://www.ucmo.edu/graduate/about/contact.cfm>

University of Central Missouri, Ward Edwards 1800, Warrensburg, MO 64093, U.S.A.

Phone: (660) 543-4621 (Monday ~ Friday 8:00am-5:00pm, Central Time)

Email: giss@ucmo.edu

Enrollment in Courses: (660) 543-4621 or <http://www.ucmo.edu/registrar/enrollment/>

Graduate Education and Research (GER)

(Graduate student support and resources, thesis manual, research funding, appeals)

Phone: (660) 543-4729, email: ger@ucmo.edu

Office of Registrar

(Request official transcript, Central Degree Audit)

Phone: (660) 543-4900 or <http://www.ucmo.edu/registrar/>

University Bookstore (<https://www.ucmo.edu/offices/bookstore-university-store/>)

(Textbooks, Cap & Gown, Graduation Announcement)

Phone: (660)-543-4370, email: ucmbookstore@ucmo.edu

Student Financial Services

Payment of Courses, Financial Services, Billing Questions

Phone: (660)-543-8266 or <https://www.ucmo.edu/future-students/tuition-costs-and-financial-aid/financing-your-education/contact-student-financial-services/>

SOT Graduate Program Faculty

Program Coordinator: Dr. Suhansa (Sue) Rodchua, phone: 660-543-4438, email:

rodchua@ucmo.edu

Main Program faculty:

Dr. Marietta Joleen Watson, email: mjwatson.ucmo.edu

Dr. Jeff Ulmer, email: julmer@ucmo.edu

School Chair: Dr. Ronnie Rollins, email: rollins@ucmo.edu

Appendix A

Course Descriptions

INDM - Industrial Management

INDM 4015/5015 Legal Aspects of Industry (3 Credits)

Identify, discuss, and research legal issues affecting industry related to corporate planning, decision making, and management. The role of corporate and social responsibility will also be developed.

INDM 4010/5110 Current Issues in Industry (3 Credits)

Identify, discuss, and research current issues, trends, and technological changes affecting industry as related to corporate planning, decision making, and managing for the future. Prerequisite: Junior or senior status for undergraduate credit.

INDM 4210/5210 Industrial Management (3 Credits)

A survey of operations management in industry today. Industrial management principles and applications, management science, operations analysis and design, manufacturing processes, process life cycle, production inventory, and quality control are emphasized.

INDM 4220/5120 Human Factors Engineering (3 Credits)

Integration of concepts involved in providing safe and comfortable workplaces (Ergonomics) with concepts directed toward increased productivity and profitability (Work Design).

INDM 4230/5130 Lean Quality Management (3 Credits)

Relationship between quality and competitiveness, design strategy for performance excellence, and discussion of cases in lean systems and Six Sigma.

INDM 4240/5140 Facilities Engineering (3 Credits) Provides students and practitioners with practical resources that describe the techniques and procedures for developing an efficient facility layout and an introduction to computer simulations.

INDM 4250/5150 Project Management (3 Credits)

This course is designed to provide students with applied knowledge in project management organizational contexts, project selection, portfolio management, project leadership, scope management, team building, conflict management, risk management, scheduling, networking, resource management, project evaluation, project control, and project termination.

INDM 4260/5160 Organizational Dynamics (3 Credits) Various types and styles of supervisory leadership in the industrial setting. Emphasis is placed on human relations aspects of leadership in the line and staff organizational structure.

INDM 4280/5180 Industrial Statistics (3 Credits) Statistical methods designed for industrial and applied research.

Some of the quantitative methods used for solving industrial problems, including measurement system analysis, statistical process control, probability distribution, testing hypotheses, multiple regression analysis, design of experiment, and nonparametric statistics commonly used in industry. Prerequisite: MATH 1111 or instructor consent.

INDM 5020 International Technology Management (3 Credits) Develop an understanding of international technology management for graduate students in the international environment.

INDM 5212 Production and Operations Management (3 Credits) Production/operations concepts with emphasis upon systems, systems design and analysis, strategies, productivity, planning, forecasting, deterministic and stochastic inventory control, MRP scheduling, and project planning.

INDM 5220 Applied Operations Research (3 Credits) Systems and modeling in industrial management situations. General models, and models such as linear programming, transportation assignment, dynamic programming, and queuing theory are discussed.

INDM 5222 Principles and Practices of Lean Systems (3 Credits) A survey of theory, goals, and applications of Lean principles and strategies in industrial organizations. Applying Lean concepts to business strategy, product design, tools for finding and eliminating wastes and for process continuous improvement. Prerequisite: Background in quality management or ENGT 4580 or instructor consent.

INDM 5230 Seminar in Industrial Management (1-3 Credits) To provide individual research and experimentation opportunities for industrial management majors. May be repeated for a maximum of 3 semester hours. Prerequisite: Ten semester hours of graduate study in industrial management.

INDM 5232 Seminar in Lean-Six Sigma Implementation (3 Credits) An investigation of problems and specific issues in Lean-Six Sigma implementation in the manufacturing and service environment is presented. The emphasis is on case study analysis and individual research projects on industrial core operations and support functions, with the business results of Lean and Six Sigma processes. Prerequisite: Background in quality management or ENGT 4580 or instructor consent.

INDM 5240 Engineering Economy (3 Credits) Principles and techniques needed for making decisions about the acquisition and retirement of capital goods by industry. Emphasis on techniques which produce long-run economy in industrial operations.

INDM 5260 Systems Analysis and Management Information Systems (3 Credits) Development of material requirements planning within the context of management information systems.

INDM 6580 Advanced Strategic Quality and Standards (3 Credits) A course of study in total quality techniques, quality standards and criteria, and quality certification training utilized by quality professionals in dynamic organizations. Prerequisite: ENGT 4580 or instructor consent.

Further courses, please check in the UCM Graduate Catalog.

SOT - School of Technology

SOT 5000 Special Problems in Technology (2-6) meets individual student needs for additional research and/or laboratory experiences in the development of technical knowledge and skills in the areas of manufacturing and construction. May be repeated for a maximum of 6 semester hours.

SOT 5010 Applied Research for Technology (3 Credits) Research investigation of a technical problem. The course will culminate in a research report. May be repeated to a maximum of 6 semester hours per degree program.

SOT 5022 Internship in Applied Sciences (1-6) Provides experience for students in cooperating industries.

Students rotate assignments. Written reports are required. May be repeated for a maximum of 6 semester hours. Prerequisites: Graduate adviser consent and Technology Internship coordinator consent; graduate GPA 3.0 or above; minimum of one semester graduate work completed.

SOT 5290 Thesis (3-6) A special investigation of selected problems in Industrial Management which culminates in the completion of a thesis. Must be repeated for a total of 6 semester hours.

Prerequisite: Graduate status.

TMD - Technology Management Doctoral

TMD 6015 Legal Aspects of Technology and Innovation (3 Credits) This course is a study of legal aspects of managing technology, innovation, and technological policy analysis for United States and international organizations. Prerequisites: Permission of the Program Coordinator.

TMD 6315 Advanced Legal Aspects of Construction (3 Credits) An advanced course in legal aspects of the construction process. Prerequisite: INDM 5015 or TMD 6015.

TMD 6525 Manufacturing Economy (3 Credits) Managerial related economic factors pertaining to a manufacturing enterprise and the influence of these factors on manufacturing in a global society. Prerequisites: ITEC 6050 and admission in the Ph.D. in Technology Management program.

TMD 7320 Ethics and Professional Issues of the Construction Process (3 Credits) Develops the ability to think critically and systematically about the issues of relevance to any practicing professional in construction. Prerequisite: INDM 5015 or TMD 6015.

TMD 7550 Current Issues in manufacturing (3 Credits) Issues and trends in manufacturing and their implications and impact on manufacturing in a global society. Prerequisites: ITEC 6050 and admission in the Ph.D. in Technology Management program.

TMD 8590 Internship (1-6) Practicum designed to provide direct, supervised experiences for doctoral students, usually in the areas of technical specialization. The experiences are tailored to provide an opportunity to test and experiment with regard to industry, research organizations, government agencies, and other appropriate experiential ventures associated with technology utilization, transfer, and innovation. The area in which the internship is taken will be designated on the student's transcript, i.e., Internship: Quality Systems. No more than 6 hours may count toward meeting degree requirements. Prerequisite: Admission to candidacy in the Ph.D. in Technology Management program.

TMD 8920 Field Research Projects (1-3) Provides opportunity for doctoral students to test a theory or hypothesis in technology or management. Field research projects will be designed, conducted, and results evaluated. Prerequisite: Admission to candidacy in the Ph.D. in Technology Management program.

TMD 8990 Dissertation (18) A requirement for all doctoral students. Offered by arrangement with the chairperson of the student's dissertation committee. Credit registration must have 9 hours of the 18 hours from Indiana State University and 9 from Central Missouri State University. Prerequisite: Admission to candidacy in the PhD in Technology Management program.

Note: Additional graduate level courses are available in other program areas. Please check the Graduate Catalog for a complete listing. Doctorate degree courses will be taken from each of the four Consortium Universities: Bowling Green State University (BGSU), University of Central Missouri (UCM), East Carolina University (ECU), and Indiana State University (ISU)

Computer Requirement

The programs are extensively integrated with Internet access and digital media to enhance communications and promote efficient content delivery. The following is a list suggesting minimum computer hardware and software configuration.

As UCM students, you can download Office 365 for free with your UCM email address, for more information, go to <https://www.ucmo.edu/offices/office-of-technology/internal-resources/shared/technology-support-center/index.php>.

The following bulleted items are students **MINIMUM required hardware and software** items, other items are optional:

Suggested Hardware:

- High performance computer, Window or Mac
- Broadband Ethernet, an Internet Service Provider, and an active E-mail account
- Webcam and microphone

Note: UCM e-mail accounts are provided but must be activated by the student through the UCM Help Desk.

Software/Format:

- Word Processor – updated MS Office Windows
- Video/Audio (WMV/WMA)- Windows Media Player - Free Download
- Universal PDF - Adobe Reader - Free Download

Suggested software includes (updated version):

- Presentations - MS PowerPoint
- Spreadsheet - MS Excel
- Database and analytical software- MS Access
SPSS, MiniTab
- Graphics Editor
(GIF/JPG) - Paint Shop
Pro MS Office,
MS Project

Statistical Package for Social Sciences (SPSS) is required for SOT 5010 Applied Research for Technology and/or Thesis, Special Project. Computer Lab at the library provide a full version of SPSS for free. Online students can install the 30-days demo version for free from www.spss.com. The instruction for downloading SPSS step-by-step is located in the course SOT 5010.

Minitab is also used in IndM 6580 Advanced Strategic Quality and Standard and it may be used in some other classes in Lean Six Sigma Graduate Certificate. Online students can install the 30-days demo version for free from www.minitab.com. The instruction for downloading Minitab step-by-step is located in the course IndM 6580.

Creative Project/Thesis (Example - a brief proposal)

Category: Technical Management
Title: Curriculum Currency for an Industrial Management Master's Degree
Name: John Smith, M.S. in Industrial Management
Address: TRG
318D, School of Technology
University of Central Missouri
Warrensburg, MO 64093
Phone: (660) 543-4438, Email address: jsmith@ucmo.edu

Need for Project:

The purpose of this study is to identify knowledge, skills, and managerial competencies that are perceived to be necessary and useful for the Industrial Management Master's Degree students at UCM. This study will also be used as a tool to guide revisions to the Industrial Management (IM) curriculum. It gathered results from four sources:

- A research survey of UCM Industrial Management graduates from 1980 through 1998
- A review of similar graduate programs in the United States.
- Then a brainstorming session with industrial experts will be facilitated to determine necessary skills and knowledge areas.
- Finally, benchmarking will be used to refine and validate the competencies identified.

Overview Statement:

As a result of the rapidly changing environment in industry and technology during the last decade of this century, business and industry leaders have indicated a definite shift from factual or theoretical knowledge needed in traditional industries to more group dynamics, communication skills and the use of information technology in the workplace. A review of University of Central Missouri (UCM) graduate catalogs from 1980 through 1998 revealed that the IM curriculum had not changed significantly in the eighteen-year period. To meet the current needs of today's business and industry managers, it was necessary to conduct a complete review of all course curriculum and materials to update the knowledge and skills to be more relevant to current managerial careers.

Major Points:

- The knowledge areas of the IM program perceived by graduates to be most useful were Industrial Supervision, Production and Operations, and Quality Control.
- The most important perceived skills were interpersonal relations and communication, while technical skills received the lowest needed rating.
- Professionals in the field identified thirty-eight needed skills while grouping them into eight benchmark curricular areas. The areas were Management Skills, Project Management, Human Resources, Communications, Industrial Economy, and Technical.
- IM curriculum revisions will also be reported from 1980-2001(22 years) at UCM.

Conclusions:

The curriculum review includes a survey of past program graduates, a summary of similar curricular programs in the U.S., an advisory board brainstorming session with follow-up competency validation and finally a topic benchmarking activity with professional managers. These competencies will be arranged in a table of existing course titles. This table will then be presented as the guide for creating a list of individual course expectations and anticipated outcomes.

Course Schedule 2024-2030

School of Industrial Science and Technology - Graduate Programs (Course Schedule 2024-2030) Master Plan (Revised 07/2023)

		includes course roll-out for Lean Six Sigma Graduate Certificate; O: Online, F: Face-to-Face																							
Course No.	Course Title	Fa 23	Sp 24	Su 24	Fa 24	Sp 25	Su 25	Fa 25	Sp 26	Su 26	Fa 26	Sp 27	Su 27	Fa 27	Sp 28	Su 28	Fa 28	Sp 29	Su 29	Fa 29	Sp 30	Su 30	Fa 30		
Required Courses (18 credits IM) (15 credits T)																									
IndM 4010/ 5110	Current Issues in Industry (3) T	O		O	O		O	O		O	O		O	O		O	O		O	O		O	O		
IndM 4210/ 5210	Industrial Management (3) IM	O	O-F	O			O	O-F																	
IndM 4230/ 5130	Lean and Quality Management (3) IM	O	O		O	O	O		O	O		O	O		O	O		O	O		O	O			
IndM 4260/ 5160	Organizational Dynamics (3) IM & T	O-F	O-F	O	O-F	O-F	O	O-F	O-F	O	O-F	O-F	O	O-F	O-F	O	O-F	O-F	O	O-F	O-F	O	O-F		
EngT 4580/ 5580	Quality Systems Engineering (3) IM	O	F	O		F	O		F	O		F	O		F	O		F	O		F	O			
IndM 4015/ 5015	Legal Aspects of Industry (3) T		O	O		O			O	O		O			O	O		O			O	O			
IndM 5020	International Technology Management (3) T	O	F		O		O	O	F	O		O	O	F	O		O	O	F	O		O	O		
IndM 5212	Production & Operations Management (3) IM	O-F			O-F			O-F			O-F			O-F			O-F			O-F			O-F		
IndM 5240	Engineering Economy (3) IM		O-F			O-F			O-F			O-F			O-F			O-F			O-F				
SOT 5010	Applied Research for Technology (3) IM & T	F	O		F	O		F	O		F	O		F	O		F	O		F	O		F		
Culminating Experience / Research (3-9 credits, take the last semester of student's program)																									
IndM 5230	Seminar in IM (3 credits) IM & T	O-F	O-F	O	O-F	O-F	O	O-F	O-F	O	O-F	O-F	O	O-F	O-F	O	O-F	O-F	O	O-F	O-F	O	O-F		
SOT 5290	Thesis (3-6 credits) IM & T	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O		
Cognate, Electives & Specialization (9-12 credits IM) (12-15 credits T)																									
IndM 4220/ 5120	Human Factors Engineering (3)				O						O						O						O		
IndM 4240/ 5140	Facilities Engineering (3)	O						O						O						O					
IndM 4250/ 5150	Project Management (3)	O-F	O-F	O	O-F	O-F	O	O-F	O-F	O	O-F	O-F	O	O-F	O-F	O	O-F	O-F	O	O-F	O-F	O	O-F		
IndM 5222	Principles and Practices of Lean Systems (3)	O			O			O			O			O			O			O			O		
IndM 5232	Seminar in Lean-Six Sigma Implementation (3)		O			O			O			O			O			O			O				
IndM 5260	System Analysis & Mgt information Systems (3)		F	O			O			O			O			O			O			O			
IndM 6580	Advanced Strategic Quality and Standard (3)				O			O			O			O			O			O			O		
SOT 5022*	Internship in Technology (1-3)	F	O-F																						
TMD 6015	Legal Aspects of Technology and Innovation (3)		O						O					O					O				O		
TMD 6315	Advanced Legal Aspects of Construction (3)					O					O						O					O			
TMD 6525	Manufacturing Economy (3)	O						O						O						O					
TMD 7320	Ethics and Prof Issues of the Const Process (3)				O						O						O						O		
TMD 7550	Current Issues in Manufacturing (3)					O					O						O						O		
TMD 8590	Internship (3)	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O		
TMD 8920	Field Research Project (3)		O						O					O					O				O		
TMD 8990	Dissertation (1-9)	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O		

Notes:

- 1) This schedule is subject to change depending on student enrollments and faculty workload.
- 2) SOT 5022* Internship is offered as a live class on campus, but students will be at the work site or remotely.
- 3) Lean Six Sigma Grad Certificate (15 credits-hrs) includes IndM 5130 (or EngT 5580), IndM 5212, IndM 5222, IndM 5232, and IndM 6580
Required courses for MSIM: IndM 5210, 5130 (or EngT 5580), 5160, 5212, 5230, 5240, and SOT 5010. Another 12 credits-hrs are Cognate/Elective courses
Required courses for MST: IndM 5110, 5160, 5015, 5020, 5230, and SOT 5010. Another 15 credit-hrs are Elective courses.

Program of Study (Samples of MSIM and MST)

Program of Study - Master of Science Degree (MS) <i>Example</i>						
			<i>MS in Industrial Management</i>			
Name:		James E. Smith	Date:	20-Jan-20		
Email address:		jes00005@ucmo.edu, james@gmail.com				
Phone number:		(660) 543-4444				
Major/Concentration:		M.S. in Industrial Management (MSIM)				
Graduate Certificate		Yes/No, if Yes.....				
Program advisor:						
Proposed graduate course requirements:						
	Prefix	Course #	Course Title	Credit-hr	Grade	Sem/Year
Req	INDM	5210	Industrial Management	3	A	Fall19
Req	INDM	5130	Lean & Quality Management (Sub. For Engt 4580)	3	A	Fall19
Req	SOT	5010	Applied Research for Technology	3		Spring20
Cognate	INDM	5015	Legal Aspects in Industry	3		Spring20
Cognate	INDM	5150	Project Management	3		Sum20
Req	INDM	5212	Production and Operation Management	3		Fall20
Cognate	INDM	5020	International Tech Management	3		Fall20
Req	INDM	5240	Engineering Economy	3		Spring21
Req	INDM	5160	Organizational Dynamics	3		Spring21
Cognate	INDM	5110	Current Issues in Industry	3		Fall21
Req	INDM	5230	Seminar in Industrial Management	3		Fall21
			Graduate Program Semester Hour Total	33		
Note:	.....				
					

Program of Study - Master of Science Degree (MS)						
			<i>MS in Industrial Management with GC - LSS</i>			
Name:			James E. Smith	Date:	20-Jan-20	
Email address:			jes00005@ucmo.edu, james@gmail.com			
Phone number:			(660) 543-4444			
Major/Concentration:			M.S. in Industrial Management			
Graduate Certificate			Yes/No, if Yes, Lean Six Sigma			
Program advisor:						
Proposed graduate course requirements:						
	Prefix	Course #	Course Title	Credit-hr	Grade	Sem/Year
Req	INDM	5210	Industrial Management	3	A	Fall19
Req/LSS	INDM	5130	Lean & Quality Management (Sub. For Engt 4580)	3	A	Fall19
Req	SOT	5010	Applied Research for Technology	3		Spring20
LSS	INDM	5232	Seminar in Lean Six Sigma	3		Spring20
LSS	INDM	6580	Advance Strategic Quality and Standards	3		Sum20
Req/LSS	INDM	5212	Production and Operation Management	3		Fall20
LSS	INDM	5222	Principles and Practices of Lean Systems	3		Fall20
Req	INDM	5240	Engineering Economy	3		Spring21
Req	INDM	5160	Organizational Dynamics	3		Spring21
Cognitive	INDM	5150	Project Management	3		Fall21
Req	INDM	5230	Seminar in Industrial Management	3		Fall21
			Graduate Program Semester Hour Total	33		
Note:	.....				
					

Program of Study - Master of Science Degree (MS) <i>Example</i>						
<i>MS in Technology</i>						
Name:	James E. Smith				Date:	20-Jan-20
Email address:	jes00005@ucmo.edu, james@gmail.com					
Phone number:	(660) 543-4444					
Major/Concentration:	M.S. in Technology (MST)					
Graduate Certificate	Yes/ No , if Yes,					
Program advisor:						
Proposed graduate course requirements:						
	Prefix	Course #	Course Title	Credit-hr	Grade	Sem/Year
Req	INDM	5020	International Technology Mgt	3	A	Fall19
			Elective	3	A	Fall19
Req	SOT	5010	Applied Research for Technology	3		Spring20
Req	INDM	5015	Legal Aspects of Industry	3		Spring20
			Elective	3		Sum20
Req	INDM	5110	Current Issues in Industry	3		Fall20
			Elective	3		Fall20
Elective	INDM	5150	Project Management	3		Spring21
Req	INDM	5160	Organizational Dynamics	3		Spring21
			Elective	3		Fall21
Req	INDM	5230	Seminar in Industrial Management	3		Fall21
			Graduate Program Semester Hour Total	33		
Note:	.....				
					
					
					
Program of Study - Master of Science Degree (MS)						

			<i>MS in Technology with GC-LSS</i>			
Name:			James E. Smith	Date:	20-Jan-20	
Email address:			jes00005@ucmo.edu, james@gmail.com			
Phone number:			(660) 543-4444			
Major/Concentration:			M.S. in Technology (MST)			
Graduate Certificate			Yes/No, if Yes, Lean Six Sigma			
Program advisor:						
Proposed graduate course requirements:						
	Prefix	Course #	Course Title	Credit-hr	Grade	Sem/Yea r
Req	INDM	5020	International Technology Mgt	3	A	Fall19
LSS	INDM	5130	Lean & Quality Management	3	A	Fall19
Req	SOT	5010	Applied Research for Technology	3		Spring20
Req	INDM	5015	Legal Aspects of Industry	3		Spring20
LSS	INDM	6580	Advance Strategic Quality and Standards	3		Sum20
LSS	INDM	5212	Production and Operation Management	3		Fall20
LSS	INDM	5222	Principles and Practices of Lean Systems	3		Fall20
LSS	INDM	5232	Seminar in Lean Six Sigma	3		Spring21
Req	INDM	5160	Organizational Dynamics	3		Spring21
Req	INDM	5110	Current Issues in Industry	3		Fall21
Req	INDM	5230	Seminar in Industrial Management	3		Fall21
			Graduate Program Semester Hour Total	33		
Note:	.....				
					

Program of Study - Master of Science Degree (MS)

Blank Sheet

Name:	.....	Date:	.....
Email address:	.....	
Phone number:	.....	
Major/Concentration:	.....	
Graduate Certificate	Yes/No, if Yes,		
Program advisor:	.....	

Proposed graduate course requirements:

Prefix	Course #	Course Title	Credit-hr	Grade	Sem/Year
Graduate Program Semester Hour Total					

Note:

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Commencement Ceremony at UCM

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