

DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING AND INDUSTRIAL SYSTEMS AND TECHNOLOGY

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- Civil Engineering (B.S.) Environmental Engineering Concentration (<https://jsums-public.courseleaf.com/undergraduate/college-science-engineering-technology/department-civil-environmental-engineering-industrial-systems-technology/civil-engineering-bs-environmental-engineering/>)
- Civil Engineering (B.S.) General Civil Engineering Concentration (<https://jsums-public.courseleaf.com/undergraduate/college-science-engineering-technology/department-civil-environmental-engineering-industrial-systems-technology/civil-engineering-bs-general-civil-engineering/>)
- Industrial Technology (B.S.) Computer Technology Concentration (<https://jsums-public.courseleaf.com/undergraduate/college-science-engineering-technology/department-civil-environmental-engineering-industrial-systems-technology/industrial-technology-bs-computer-technology/>)
- Industrial Technology (B.S.) Electronic Systems Technology Concentration (<https://jsums-public.courseleaf.com/undergraduate/college-science-engineering-technology/department-civil-environmental-engineering-industrial-systems-technology/electronic-systems-technology-concentration/>)
- Industrial Technology (B.S.) Emergency Management Technology Concentration (<https://jsums-public.courseleaf.com/undergraduate/college-science-engineering-technology/department-civil-environmental-engineering-industrial-systems-technology/emergency-management-technology-concentration/>)

Course Descriptions

CIV 201 ENGINEERING GRAPHICS (2 Hours)

This course is designed to equip students with skills to visualize and represent three-dimensional objects graphically. The course covers principles of computer-aided drafting and design (CADD) and includes substantial use of the AutoCAD software or equivalent. Students learn orthographic projection, two and three-dimensional drafting and pictorial drawings, graphics and charts as well as applications in various engineering approaches.

CIV 222 ENGINEERING MECHANICS I (3 Hours)

This course covers the calculus-based statics of particles and rigid bodies, equilibrium, distributed forces, centroids, structures, trusses, frames, machines, forces in beams and cables, friction, moments of inertia, as well as real life examples for engineering applications and systems approach.

CIV 223 ENGINEERING MECHANICS II (3 Hours)

This course covers calculus-based kinematics and kinetics of particles, planar kinetics of a rigid body including force and acceleration, work and energy, impulse and momentum, and vibrations with real life examples.

CIV 240 STRENGTH OF MATERIALS (3 Hours)

The course covers topics including forces and stresses, axial loading, torsion, pure bending, transverse loading, shear force and bending moment diagrams, transformation of stress and strain, design of beams and shafts, deflection of beams, statically indeterminate problems, and real-life examples.

CIV 310 ENGINEERING SURVEYING (2 Hours)

Prerequisite: PHY 211; Co-requisite: CIV 311.

Plane surveying, measurement of distances and angles, differential leveling, traverse adjustment and area computations, topographic surveying and contours, horizontal and vertical curves, surveying computations, elements of site plan, professional ethics in surveying.

CIV 320 STRUCTURAL ANALYSIS (3 Hours)

Prerequisite: EN 240.

Analysis of statically determinate and indeterminate structures for fixed and moving loads. Equations of equilibrium and compatibility. Influence lines, and shear and moment envelopes. Analysis of forces and deflections in structures by methods of moment distribution, consistent deformation, and virtual work, computer analysis of structures, real life examples.

CIV 330 FLUID MECHANICS LECTURE (3 Hours)

Prerequisite: EN 223, 240, and MATH 368; Co-requisite: CIVL 330.

Fluid properties and definition; fluid statics; fluid dynamics; Bernoulli equation and linear momentum; viscous flow; drag forces and boundary layer concepts; ideal flow; velocity potential and stream functions; dimensional analysis and dynamic similitude, real life problems.

CIV 340 INTRO TO ENVIRONMENTAL ENGINEER (3 Hours)

CIV 355 ENGINEERING ECONOMY (3 Hours)

This course covers the economic principles of multidisciplinary engineering problems and applications of the principles in real-world projects. The course acquaint students with calculations of capitalized costs, present worth, prospective rates of return, and annual costs, and economy of equipment replacement, market forces, and firm analysis.

CIV 360 DESIGN OF STEEL STRUCTURES (3 Hours)

Prerequisite: CIV 320.

Engineering properties of steel, behavior and design of members subjected to fatigue, and combined loading and compression, plate girders composite beams, open-web joists and connections. Methods of allowable design stress, and load resistance factor design. Elements of plastic analysis and design. Framing systems and loads for industrial buildings and bridges, design constraints.

CIV 370 WATER RESOURCES ENGINEERING (3 Hours)

Prerequisite: CIV 330 and CIVL 330.

This course is designed to review the fundamentals and practices of water resources engineering. Students will explore water resources engineering processes in the theoretical and applied realm in the fields of closed conduit (pipe) flow, open channel flow, surface water hydrology, and groundwater flow. Application of probability and statistical concepts along with the legal, economic and environmental considerations to the analysis and design of complex hydraulic and hydrologic systems will prepare interested student for future careers in water supply, wastewater, flood plain, storm water, and groundwater management.

CIV 380 INTRO TO GEOTECHNICAL ENGINEER (3 Hours)

Prerequisite: EN 240, and CIV 330.

Co-requisite: CIVL 380. Engineering soil classification, flow of water in soils, soil permeability and seepage, concepts of effective stress, stress and compressibility of soils, primary and secondary consolidation settlement, time rate of settlement, soil compaction, soil shear strength, introduction to slope stability, critical thinking and engineering judgment.

CIV 390 INTRO TO TRNSPRTN ENGINEERING (3 Hours)

Co-requisite: CIV 380. Introduction to planning practice and procedure, design, operation, management, and maintenance of transportation systems, with emphasis on urban issues. General characteristics of transportation engineering systems including streets, highways, transit, airways. Capacity considerations including time-space diagrams. Elementary dynamics of traffic and functional consideration of routes and terminals. Components of transportation engineering facility design including geometric design, earthwork, and pavements.

CIV 410 CAPSTONE DESIGN I (3 Hours)

Prerequisite: CIV 340, 360, 390, and senior standing in civil engineering. Group projects are introduced for senior students to work in teams to analyze and design civil engineering systems, and to consider various factors for design. These projects are aimed at understanding multi-disciplinary systems, interaction between design and construction professionals, realistic design constraints, economical issues, professional practice issues including importance of professional licensure and continuing education, contemporary issues, procurement of work, bidding vs. quality based selection processes. Oral presentation and written report are required.

CIV 411 CAPSTONE DESIGN II (3 Hours)

Prerequisite: or co-requisite: CIV 410.

Continuation of Capstone Design I. Group projects for senior students to work in teams to design civil engineering systems. Understanding of multi-disciplinary systems, interaction between design and construction professionals, realistic design constraints, professional practice issues including importance of professional licensure and continuing education, procurement of work, bidding vs. quality based selection processes, engineering professionalism and ethics. Oral presentation and written report are required.

CIV 420 DESIGN OF CONCRETE STRUCTURES (3 Hours)

Prerequisite: CIV 320.

Engineering properties of concrete for design, analysis and design of reinforced concrete beams, columns, one-way and two-way slabs, footings, retaining walls, and frames, design of multi-story buildings, design constraints, major design project, introduction to prestressed concrete.

CIV 430 FOUNDATION ENGINEERING (3 Hours)

Prerequisite: CIV 380.

Shallow foundation analysis and factors to consider for design, subsurface investigations for design, bearing capacity and settlement, mat foundations, piles, caissons, lateral earth pressures and retaining walls, site improvement techniques, design of sheet pile walls and support systems, critical thinking and engineering judgment, ethical considerations.

CIV 431 TRAFFIC ENGINEERING (3 Hours)**CIV 432 BRIDGE DESIGN (3 Hours)**

Prerequisite: CIV 360

This course covers design of new bridges and evaluation of existing bridges in accordance with current American Association of State Highway and Transportation Officials (AASHTO) specifications. The procedures and requirements of bridge design and evaluation will be discussed, and the corresponding AASHTO code provisions will be explained through examples. Main topics include overview and history of bridge engineering, bridge design and evaluation methods and procedures, bridge superstructure design, bridge substructure design, fatigue and fracture of steel bridges, bridge load rating, advanced methods and technologies for bridge condition assessment, and case studies.

CIV 441 WATER AND WASTEWATER TREATMENT (3 Hours)

Prerequisite: CHEM 141, CHML 141, CIV 340, and CIVL 340.

Theories, engineering principles, and design of modern water supply and wastewater treatment processes. Physical-chemical process, including screening, sedimentation, aeration, coagulation, flocculation, filtration, absorption, softening, and disinfection. Biological processes including activated sludge process and anaerobic processes for wastewater and sludge digestion, with emphasis on urban issues. Completion of a design project.

CIV 451 COMPTR METHODS IN CIV ENGINEER (3 Hours)

This course is designed to acquaint Civil Engineering students with the uses of computer programs including Microsoft Excel, MATLAB, MathCAD, ArcGIS-based HEC-RAS and HEC-HMS, and MicroStation in solving civil engineering problems and designing civil engineering systems.

CIV 452 Construction Project Management (3 Hours)

Prerequisite: CIV 201, CIV 240, and CIV 355

The course covers fundamental knowledge of Construction Management functions including Project Management, Cost Management, Time Management, Quality Management, Contract Management, and Safety Management. Emphasis is put on the application of each function throughout the project phases in developing problem solving skills for real world engineering applications.

CIV 453 CONSTRUCTION ESTIMATING (3 Hours)

Prerequisite: CIV 201, CIV 240, and CIV 355

The course covers the fundamental knowledge of quantity take-off and cost estimating of construction resources including materials, labor, and equipment. Topics include types of cost estimates, budget estimates, preconstruction services estimates, quantity take-off, self performed work estimates, subcontractor work estimates, and bid preparation in developing problem solving skills for real world engineering applications.

CIV 454 CONSTRUCTION SCHEDULING (3 Hours)

Prerequisite: CIV 355

This course aims to increase and improve the working knowledge of students in project scheduling and to train them as professional construction managers as stated in the program mission. Students will be provided an understanding of planning, scheduling, and monitoring of construction projects including development of critical path networks, Gantt bar charts and construction cost control and reporting practices. The students will also learn how to use the software tools to accurately prepare and analyze the project schedule and to effectively communicate the schedule to the management team.

CIV 455 BUILDING INFORMATION MODELING AND INTEGRATED PROJECT DELIVERY (3 Hours)

Prerequisite: CIV 355

This course covers the Building Information Modeling (BIM) and Integrated Project Delivery (IPD) approaches that address and resolve the perceived inefficiencies in the construction industry. BIM covers geometry, spatial relationships, geographic information, quantities, and properties of building components and can be used to demonstrate the entire building lifecycle including the processes of construction and facility operation. IPD deals with the integration of people, systems, business structures and practices into a single process and collaboratively harness the talents and insights of all participants on a particular construction project in order to optimize project results, increase value to the owner, reduce waste, and maximize efficiency through all phases of design, fabrication, and construction.

CIV 461 PROF & ETHCL IS IN CIVIL ENGR (1 Hour)

Prerequisite: senior standing in civil engineering.

The task of this course is to reflect on the professional and ethical responsibilities of engineers, which can sometimes conflict with technical responsibilities. This course will articulate an ethical framework for engineers by critically reflecting on engineering practice and examining the ethical challenges that confront engineers working within teams and organizations. The course covers issues such as the social responsibility of engineers, attitudes, truth-telling and disclosure, whistleblowing, professionalism, contemporary issues, and risk-assessment.

CIV 466 ADV D DESIGN OF HYDRAULIC STRUC (3 Hours)

Prerequisite: CIV 370.

Analysis and characteristics of flow in open channels (natural and artificial); channel design considerations including uniform flow (rivers, sewers), flow measuring devices (weirs, flumes), gradually varied flow (backwater and other flow profiles, flood routing), rapidly varied flow (hydraulic jump, spillways), and channel design problems (geometric considerations, scour, channel stabilization, sediment transport); analysis and design of hydraulic structures such as dams, spillways, etc., based on economic, environmental, ethical, political, societal, health, urban issues, and safety considerations.

CIV 468 HAZARDOUS WASTE ENGINEERING (3 Hours)

Prerequisite: CHEM 241, CHML 241, CIV 340, and CIVL 340.

Comprehensive study of the complex, interdisciplinary engineering principles involved in hazardous waste handling, collection, transportation, treatment, and disposal. Also covered are waste minimization, site re-mediation, and regulations important for engineering applications. Design constraints, engineering judgment, and ethical responsibility are covered. Contemporary hazardous waste issues and urban issues are also addressed.

CIV 475 PAVEMENT DESIGN (3 Hours)

Prerequisite: CIV 380 and 390.

Aggregate, binder systems. Theory and design of pavement structures, rigid and flexible pavement design, subgrade materials, pavement management, nondestructive testing, pavement maintenance, design constraints, infrastructure maintenance, major design project.

CIV 476 ADV D DESIGN OF STEEL STRUCTURE (3 Hours)

Prerequisite: CIV 360.

Behavior and design of members subjected to fatigue, dynamic, combined loading. Methods of allowable design stress, and load resistance factor design. Design of continuous beams, plate girders, composite beams, open-web joists, connections, torsion and plastic analysis and design. Framing systems and loads for industrial buildings and bridges, design constraints and a major design project.

CIV 477 ADV D DESIGN OF CONCRETE STRUCT (3 Hours)

Prerequisite: CIV 420.

Theory and design of reinforced concrete continuous beams, slender columns, two-way slabs, footings, retaining walls, shear walls and multi-story buildings. Design for torsion and design constraints. Framing systems and loads for buildings and bridges, design constraints and a major design project.

CIV 481 SPCL PROBLEMS IN CIV ENGR (3 Hours)

Prerequisite: departmental approval.

Individual investigation in a recognized major area of civil engineering of particular interest to the students that are not normally covered in regular courses. May include a co-op project.

CIV 491 INTRNSHPS IN CIV ENGINEERING I (1-3 Hours)**CIV 492 INTRNSHPS N CIV ENGINEERING II (1-3 Hours)****CIVL 310 ENGINEERING SURVEYING LAB (1 Hour)**

Prerequisite: PHY 211; Co-requisite: CIV 310.

Field experience to measure surveying parameters including distances, angles, and elevations. Field notes, surveying equipment; critically analyze and interpret data, report writing.

CIVL 330 FLUID MECHANICS LAB (1 Hour)

Co-requisite: CIV 330. Laboratory experience to measure fluid properties and apply principles for application in engineering design. The experiments will include pressure and velocity measurement, application of mass, energy, and momentum principles, energy losses, forces on immersed bodies, and flow measurement devices; critically analyze and interpret data, report writing.

CIVL 340 ENVIRONMENTAL ENGINEERING LAB (1 Hour)

Prerequisite: CHEM 141; Co-requisites: CIV 330, 340, CIVL 330.

Experiments for the analysis of water, wastewater and certain solid wastes. Selected experiments may include determinations of water's or wastewater's pH, alkalinity, turbidity, hardness, and electric conductivity, solids, nitrogen species, dissolved oxygen, biochemical oxygen demand (BOD), chemical oxygen demand (COD), total organic carbon, and chlorinated compounds. Also included will be contaminant leaching test of some solid or hazardous wastes and absorption of contaminants by solid media. Critical analysis of experimental and interpretation of data and scientific presentation (reporting) of results are emphasized.

CIVL 380 GEOTECHNICAL ENGINEERING LAB (1 Hour)

Co-requisite: CIV 380. Laboratory experiments to be performed by students to obtain soil parameters for designed problems. Engineering classification of soils, grain size distribution, Atterberg limits, specific gravity, unconfined compression, compaction, in-situ field tests, consolidation, and shear strength determination, application to design problems, critically analyze and interpret data, report writing.

CIVL 421 STRUCTURES & MATERIALS LAB (1 Hour)**IT 100 INTRO TO INDUSTRIAL TECHNOLOGY (1 Hour)**

A survey of the technology field as it relates to the academic background and opportunities for industrial technology graduates. (F, S)

IT 300 INTERNSHIP/INDUSTRIAL EXPERIEN (3 Hours)

Prerequisite: Junior standing or approval of academic advisor.

This course provides a supervised practical work experience with an approved industrial enterprise, coordinated by employer, faculty, and student. (F, S, Sum)

IT 490 SENIOR CAPSTONE (3 Hours)

Prerequisite: Senior standing.

This course is designed to give student experience in real work applications through project in business and industry that will encompass all the different subject areas covered in an area related to the student's concentration. (F, S)

ITD 114 COMPUTER-AIDED DRAFTING (3 Hours)

The fundamentals of planning and drawing, orthographic projections, graphical and technical analysis, visualization, delineation and communication of special problems. Computer-aided drafting (CAD) will be used as a tool to solve the various problems. (F, S)

ITD 203 ADV COMPUTER-AIDED DRAFTING (3 Hours)

Prerequisite: ITD 114.

Instruction includes drafting and design aids in AUTOCAD and MICROCAD with emphasis on architectural and engineering drafting. (S)

ITD 327 MACHINE DESIGN (3 Hours)

Prerequisite: ITD 203.

Pattern drafting, machine drawing and design tolerance and fabrication drawings. (F, S)

ITE 111 BASIC ELECTRONICS (1-5 Hours)

Prerequisite: MATH 111.

An introductory study of laws, theorems, concepts, and principles of electricity and electronics. (F, S)

ITE 112 INTERMEDIATE ELECTRONICS (1-5 Hours)

Prerequisite: ITE 111.

A study of DC/AC current, resistance, magnetism, inductance, capacitance, transformers, etc. (F, S)

ITE 180 Introduction to Robotics (3 Hours)

This course is designed to provide an understanding of the basics of robotics; sensors and actuators; educational robot drive-train mechanisms and motor controls; educational robot designing and building; programming educational robotics modules for autonomous and remote controlled navigation; semester-end group projects (teamwork).

ITE 221 DEVICES AND CIRCUITS I (3 Hours)

Prerequisite: ITE 111 112.

Current flow in doped semiconductors, PN junctions, bipolar junction transistors, and single-staged amplifiers. Emphasis is placed on current control with PN Junction, and on recognition of and characteristic of the three basic amplifier configurations. (F)

ITE 320 Introduction to Robotics Process Automation (3 Hours)

This course is an introduction to the fundamentals of Robotics Process Automation (RPA) and covers basics of software based robotics, programming process automation using Ui Path Studio or similar packages, digitize and automate processes commonly encountered in industrial and business applications. Pre-requisites: Junior or Senior Standing:

ITE 338 DIGITAL LOGIC (3 Hours)

Prerequisite: ITE 111 112.

A study of single source transistor biasing, differential amplifier, diode-resistor gate, flip-flops, logic AND gate of AND & OR gates,, binary number encoders and decoders, R-s, T-D flip flops, ripple counters, programming a ripple counter, etc. (S)

ITE 410 Robotics Systems (3 Hours)

Prerequisite: Junior or Senior Standing.

Designing mobile robotic platforms; Building autonomous and remote-controlled educational robotics systems; Interfacing sensors; Interfacing vision and audio devices; Microcontroller developing boards and programming; Single board computer boards and programming; Robot Operating System (ROS); Object detection – OpenCV and Deep Learning; AI – obstacle navigation, pick and place objects.

ITE 438 PROGRAMMABLE LOGIC CONTROLLER (3 Hours)

Prerequisite: ITE 338 or Instructor's permission.

This course provides practical experience on PLC's through its operation, programming, and uses in the control of production, manufacturing, industrial, and other processes. (F)

ITE 449 NETWORK THEORIES (3 Hours)

Prerequisite: ITE 338.

A study of electric networks and analysis of the behavior of networks in terms of natural modes, or the natural frequencies of response due to arbitrary excitation. (F, S)

ITE 450 ANALOGICAL COMMUNICATION SYSTE (3 Hours)

Prerequisite: ITE 221, MATH 221.

Study of complete communications systems selected from broadcast radio, broadcast television, closed circuit television or radar, AM, FM and phase-shift modulation and demodulation techniques. (S)

ITE 465 MICROPROCESSORS & APPLICATION (4 Hours)

Prerequisite: ITE 221, 338.

Logical organization of single-chip microprocessors, their timing and interface requirements. Applications in the control of external devices. (F)

ITE 466 MICROPROCESSOR TROUBLESHOOTING (3 Hours)

Prerequisite: ITE 221, 338.

This course is designed for senior standing students to study professional techniques in microprocessor troubleshooting. Students will learn how to write sample programs for use in troubleshooting, troubleshoot bus, processor, and I/O failures by analyzing signals, and design testable microcomputer. (S)

ITE 475 MICROPROCESSOR SOFTWARE/HARDWA (3 Hours)

Prerequisite: ITE 221, 338.

This course is designed for senior standing students with an overview of microcomputer systems in software, hardware and interface. Basic microcomputer hardware design at chip level, software programming at the machine language level, and interface to sensors, actuators, and external devices will be introduced. (S)

ITE 476 REAL TIME SYSTEM DESIGN (3 Hours)

Prerequisite: ITE 221, ITE 338, ITE 465, CSC 215.

The topics of this course include the general concepts of real-time systems, design and implementation techniques and specific examples. The instruction is divided into three parts. The first introduces the general concepts of real-time systems, the design and implementation process, with emphasis on the techniques useful for real-time applications. The third part is a detailed examination of specific system organization and their appropriate implementation techniques. (S)

ITEL 112 INTERMEDIATE ELECTRONICS LAB (1 Hour)

Prerequisite: ITEL 111.

A laboratory course which covers network analysis, measurement of DC and AC current and voltage, power in AC circuits, resonance, RL circuits, RC circuits, and RLC circuits. (F, S)

ITEL 221 DEVICE AND CIRCUITS LAB I (1 Hour)

Prerequisite: ITE 111 112.

A laboratory course which studies oscilloscope operation, oscilloscope voltage calibration and frequency measurements, characteristics of an inductance, characteristics of a series RC circuits, RC time constants, characteristics of a capacitor, characteristics of a series RLC circuit, RF signal generator, parallel resonant circuit, diodes, and characteristics of amplifiers. (F)

ITEL 338 DIGITAL LOGIC LAB I (1 Hour)

Prerequisite: ITE 111 112.

A laboratory course which covers logic OR gate, logic NOT, AND gate, integrated circuit gates, half-adder circuit full-adder circuit, colpitt: Oscillator, and Karnaugh map, and triggered monostable multivibrator. (S)

ITEL 449 NETWORKING LAB (1 Hour)

Prerequisite: ITEL 338.

This course provides practical instruction on the networks connection and trouble shooting. Students will be introduced to telecommunications cabling technology and learn the systems used for distribution of data, voice, and video communications. This course will cover identification and application of appropriate connectors, cable types, safety concerns, and testing of systems. (F, S)

ITEM 301 PRINCIPLES OF EMERGENCY MNGT (3 Hours)

The course introduces basic theory of emergency management. It identifies the roles of federal, state, local government, and community in case of emergency. The course also discusses disaster prevention, mitigation, recovery, technology support, and litigation issues.

ITEM 302 INTRO TO INCIDENT COMMAND SYS (3 Hours)

This course covers the emergency management practices used by responders during an emergency. The structure and responsibilities of the Incident Command System, the management of facilities, and typing of resources are covered in this class. The National Incident Management System (NIMS) principles are also included in this course.

ITEM 303 COMMUNITY EMERGENCY RESPN TEAM (3 Hours)

This course provides students with the skills required by Federal Emergency Management Agency (FEMA) to serve as a Community (Citizen) Emergency Response Team (CERT) member within their society. Students will also be required to complete Community Emergency Response Team training, which will provide them with basic skills needed for immediate response in the aftermath of disasters. By working 391 together, CERT members can assist in saving lives and protecting property by using the basic techniques learned from this course.

ITEM 304 INTERNSHIPS (3 Hours)

Prerequisite: ITEM 301, 302, or approval by instructor.

The internship is designed primarily for students who have had little exposure to the field of emergency management. Students will file their placement (with the assistance and approval of the instructor) at national laboratories or DHS's funded COE laboratories to gain hands-on practical experience with a public, private, or nonprofit organization that has significant emergency management responsibilities.

ITEM 311 INTRODUCTION TO NUCLEAR TECH (3 Hours)

This course introduces the students to the fundamental principles of nuclear technology. The topics include nuclear radiology, nuclear power, nuclear safety, radiation protection, radiation detection, nuclear health, and nuclear waste management.

ITEM 401 APP OF EMRGNCY MNGT CMPTR TEC (3 Hours)

The purpose of this course is to develop an in-depth understanding and practical knowledge of the most frequently used software such as WISER, HAZUS, and CAMEO, which were designed by Federal Government agencies. This course will enable students to effectively use a computer in an emergency. The students can apply this skill to analyze, predict, and prevent an emergency incident.

ITEM 402 BASIC GEOG INFO SYS REMOTE SEN (3 Hours)

This course introduces the theory and techniques of Geographic Information System (GIS) and remote sensing and their application to environmental analysis. Topics include the concepts of remote sensing, characteristics of spectromagnetic waves, types of remotely sensed data, sensor types, the theory of photogram metric techniques, and digital image analysis for acquisition of geographical information. Several lab activities involve the following learning the basics of ERDAS imagine, data acquisition through internet search for satellite images, importing datasets, band characteristics, and visual presentation.

ITEM 403 DISASTER MANAGEMENT (3 Hours)

The course explores important functions to be performed before, during, and after disaster strikes. It also identifies the strategies, tools, challenges, and concerns relevant to the emergency manager and others involved in disaster management. The theoretical basis of emergency management will be the central focus of the course, but practical knowledge, skills and abilities relating to planning will also be addressed throughout the semester. Students are expected to think critically about controversial issues and policies pertaining to the emergency and disaster arenas.

ITEM 404 SPECIAL PROJECT (3 Hours)

This course includes the following emergency management concepts: program planning and management, financial planning, and management, managing information, managing people and time, personality types, leadership styles, followership styles, decision-making skills, team-building skills and group dynamics, community-building skills, intergovernmental relationships, negotiating skills, communication skills, emergency management ethics, and professionalism.

ITEM 407 TECHNOLOGY IN EMERGENCY RESPONSE AND MANAGEMENT (3 Hours)

Prerequisite: Junior or Senior Standing

This course aims to increase and improve the knowledge of students in emerging technology. This course focuses on the rapidly advancing technology in data analytics, Internet of Things (IoT), artificial intelligence and machine learning, drones, and its applications, Hazus-Multi-Hazards, and virtual reality. This course includes six modules and laboratory exercises.

ITHM 300 PRIN OF HAZARDOUS MATERLS MNGT (3 Hours)

Prerequisite: CHEM 141.

An introductory survey course for the hazardous materials management program. Provides firm foundation on basic hazardous materials management principles. Topics include definitions of hazardous materials, regulatory overview, technology for storage and disposing hazardous materials, air and water quality Issues Industrial hygiene and hazardous waster management. (F)

ITHM 301 REGULATORY FRAMEWORK (3 Hours)

Prerequisite: ITHM 300, CHEM 141.

A study of legislation and regulations surrounding hazardous materials and toxic waste. A study of major legislative/regulatory areas which include: RCRA, TSCA, OSHA, HMTA, CERCLA, and EPA. (S)

ITHM 302 TECH FOR STR TREATMENT DIP HM (3 Hours)

Prerequisite: ITHM 300, CHEM 141.

A study of basic principles of hazardous waste management. Methods of treatment and disposal. A comprehensive look at the technologies and related issues in hazardous waste management. (S)

ITHM 402 INDUSTRIAL HYGIENE (3 Hours)

Prerequisite: ITHM 300, CHEM 141.

An overview of occupational health hazards, their recognition, evaluation, and control. Emphasis on how industries are regulated and how occupational health standards are promulgated. (F, S)

ITHM 405 RISK ASSESSMENT (3 Hours)

Prerequisite: ITHM 300, CHEM 141.

Examines the risk assessment process and its application in various situations, ranging from setting hazardous facilities to regulation and control of toxic substances in the environment. Risk analysis methods and their interaction with social economic and political factors. (F, S)

ITMA 105 INDUSTRIAL SAFETY & MANAGEMENT (3 Hours)

Designed to emphasize the importance of safety in an industrial community. (F, S)

ITMA 325 INDUSTRIAL PSYCHOLOGY (3 Hours)

rerequisite: PSY 201. Designed to acquaint students with the study of human behavior as it relates to production of goods and services of our society. A study of psychology as it relates to the employees of American industries. (F, S)

ITMA 328 THE AMERICAN INDUSTRY (3 Hours)

This course presents practical and successful strategies for implementing the new system, procedures, practices, and cultural attitudes essential for becoming world-class competitive. (S)

ITMA 410 1ST LINE SUPRVSN & FRMAN (3 Hours)

A management development course for business, industrial, and institutional supervisors. The topics covered include motivation, leadership, decision-making and supervisory skills. (F, S)

ITMA 411 INVENTORY MANAGEMENT (3 Hours)

Deals primarily with inventory classifications, inventory control, optimum inventory, and feature trends in inventory management. (F, S)

ITMA 420 LABOR & INDUSTRIAL RELATIONS (3 Hours)

Prerequisite: ITMA 325.

Discussions of who individuals, groups, and organizations in unions, management, and government act as they do in industrial relations with emphasis on psychological and sociological factors. (S)

ITMA 424 QUALITY CONTROL (3 Hours)

Prerequisite: MNGT 250 (school of business).

The problem associated with improving design, specifications, and control of product quality. (S)

ITMA 425 PLANT LAYOUT & MAT HANDLING (3 Hours)

Prerequisite: ITD 114.

The fundamental theories, practices, and methods for the design of manufacturing facilities; materials handling equipment and services. (S)