Bachelor Degree in Occupational Safety Engineering

1. University Graduation Requirements

To receive a bachelor's degree in Occupational Safety Engineering, a student must fulfill all requirements related to credit hours, grade point average, program of study, and courses.

2. Degree Requirements

Type of Requirement	Credit Hours
University Requirements	37
College Requirements	40
Specialization Requirements	70
Specialization Electives	12
Total	**159**

3. University Requirements

➢ University Requirements: 37 credit hours distributed as follows:

Course ID	Course Title	Credit Hours	Prerequisite
ENG 100	General English	3	
MATH 100	Mathematics I	3	
STAT 100	Introduction to Probability and Statistics	3	MATH 100
IT 100	Information Technology	3	
ARAB 101	Basic Academic Arabic	3	
ARAB 201	Advanced Academic Arabic	3	ARAB 101
ENGL 101	Basic Academic English I	3	ENGL 100
ENGL 102	Basic Academic English II	3	ENGL 101
SOCS 101	Islamic Civilization I	3	
ENGL 203	Advanced Academic English I	3	ENGL 102
ENGL 206	Technical Writing	3	ENGL 102
PHE 101	Physical and Health Education	1	
	Free elective	3	
Total		**37**	

➢ A Free Elective Course: 3 credit hours from the following list:

Course Number	Course Title	Credit Hours	Prerequisite
FREN 101	Basic French I	3	
CIT 101	Future Technologies	3	
SOCS 201	Islamic Civilization II	3	SOCS 101
SOCS 203	History of the Kingdome of Saudi Arabia	3	

ASTR 150	Introduction to Astronomy	3	
CHEM 150	Chemistry & Society	3	
SOCS 202	World Civilization	3	

4. College Requirements

➢ College Requirements (40 credit hours):

Course ID	Course Title	Credits	Pre-/Co-requisites
MATH 101	Calculus I	3	STAT 100
CSC 101	Introduction to Computing for engineers	3	IT 100
CHEM 101	General Chemistry I	3	
CHEM 101L	General Chemistry Lab	1	CHEM 101
PHYS 101	General Physics I	3	
PHYS 102	General Physics II	3	PHYS 101
PHYS 103L	General Physics Lab	1	PHYS 102 (co)
CIVE 205	Engineering Drawing	1	CSC 101
ELEE 230	Programming for Engineers	3	CSC 101
MATH 102	Calculus II	3	MATH 101
MATH 201	Calculus and Analytic Geometry III	3	MATH 102
MATH 202	Differential equations	3	MATH 102
MATH 215	Linear algebra and Numerical Techniques	3	MATH 202
STAT 230	Probability and Statistics	3	MATH 102
COEN 300	Engineering Economy	3	STAT 230
COEN 401	Communication Skills and Ethics	1	ENGL 203
Total		**40**	

5. Program Specialization Requirements

Program specialization requirements consist of **82** credit hours (**70** compulsory credit hours and **12** elective credit hours) distributed as follows:

➢ Compulsory Specialization Requirements (70 credit hours):

Course ID	Course Title	Credits	Pre-/Co-requisites
MECH 201	Mechanical Engineering Graphics	1	CIVE 205
MECH 210	Thermodynamics	3	PHYS 101, CHEM 101
MECH 225	Engineering Mechanics	3	PHYS 101
MECH 230	Engineering Materials	3	CHEM 101
ELEE 212	Circuits for non-Electrical Students	3	PHYS 102
SAFE 210	Introduction to Safety Engineering	3	CHEM 101
MECH 231	Strength of Materials	3	MECH 225
MECH 231L	Strength of Materials Lab	1	MECH 231
ELEE 212L	Circuits Lab	1	ELEE 212
MECH 341	Fluid Mechanics	3	PHYS 101, MATH 202 (co)

Course ID	Course Title	Credits	Pre-/Co-requisites
MECH 342	Heat Transfer	3	MECH 210, MATH 202 (co)
MECH 345	Thermo Fluids Lab	1	MECH 341, MECH 342
MECH 352	Instrumentation and Measurements	2	ELEE 212
MECH 352L	Instrumentation and Measurements Lab	1	MECH 352 (co)
SAFE 320	Explosion and Fire Dynamics	3	MECH 342
SAFE 340	Human Factors and Ergonomics	3	SAFE 210, MECH 352
SAFE 340L	Human Factors Lab	1	SAFE 340
SAFE 350	Environmental Health and Safety	3	SAFE 210
SAFE 364	Occupational Health and Safety	3	SAFE 340
SAFE 400	Summer internship training	1	*Last Summer*
SAFE 431	Industrial Hygiene and Toxicology	3	CHEM 101, SAFE 364
SAFE 442	Fire Protection Engineering	3	SAFE 320
SAFE 446	Safety in Mechanical Engineering Systems	3	MECH 231, MECH 342, SAFE 364, MECH 341
SAFE 448	Safety in Electrical Engineering Systems	3	ELEE 212, SAFE 364
SAFE 449	Structural Safety and Failure Analysis	3	MECH 231, SAFE 364
SAFE 450	Risk Assessment and Management	3	SAFE 446, SAFE 448, SAFE 449
SAFE 466	Legal Aspects of Safety and Regulations	3	SAFE 364
SAFE 498	Final Year Project I	1	108 credits
SAFE 499	Final Year Project II	3	SAFE 498
Total		**70**	

➢ Elective Specialization Requirements (12 credit hrs. from the following):

Course ID	Course Title	Credits	Pre-/Co-requisites
SAFE 472	Renewable Energy Safety	3	SAFE 364
SAFE 475	Emergency Preparedness	3	SAFE 350
SAFE 478	Radiation Safety	3	SAFE 431
SAFE 484	Emerging Technologies in Safety Engineering	3	SAFE 450
SAFE 486	Safety Leadership and Culture	3	SAFE 466
SAFE 488	Safety Audits and Inspection	3	SAFE 450
SAFE 482	Cybersecurity for Safety	3	SAFE 448
SAFE 487	Disaster Risk Reduction	3	SAFE 475
SAFE 490	Safety Instrumented Systems and Automation	3	SAFE 448
SAFE 492	Special Topics in Safety Engineering	3	Department approval

Proposed Sequence of Study

Year I

➢ ***First Semester*** ***18 Credit hours***

Course	Title	Credits	Pre-requisites
ENG 100	General English	3	
IT 100	Information Technology	3	
MATH 100	Mathematics I	3	
ARAB 101	Basic Academic Arabic	3	
SOCS 101	Islamic Civilization I	3	
PHYS 101	General Physics I	3	
Total		**18**	

➢ ***Second Semester*** ***19 Credit hours***

Course	Title	Credits	Pre-requisites
ENGL 101	Basic Academic English I	3	ENG 100
STAT 100	Introduction to Probability and Statistics	3	MATH 100
CSC 101	Introduction to Computing for Engineers	3	IT 100
PHYS 102	General Physics II	3	PHYS 101
ARAB 201	Advanced Academic Arabic	3	ARAB 101
PHE 101	Physical and Health Education	1	
CHEM 101	General Chemistry I	3	
Total		**19**	

Year II

➢ ***Third Semester*** ***14 Credit hours***

Course	Title	Credits	Pre-requisites
ENGL 102	Basic Academic English II	3	ENGL 101
MATH 101	Calculus I	3	STAT 100
PHYS 103L	General Physics Lab	1	PHYS 102
CHEM 101L	General Chemistry Lab	1	CHEM 101
MECH 225	Engineering Mechanics	3	PHYS 101
ELEE 212	Circuits for non-Electrical Students	3	PHYS 102
MECH 210	Thermodynamics	3	PHYS 101, CHEM 101
CIVE 205	Engineering Drawing	1	CSC 101
Total		**18**	

➢ ***Fourth Semester*** ***16 Credit hours***

Course	Title	Credits	Pre-requisites
ENGL 203	Advanced Academic English I	3	ENGL 102
MATH 102	Calculus II	3	MATH 101
ELEE 230	Programming for Engineers	3	CSC 101
MECH 230	Engineering Materials	3	CHEM 101
ELEE 212L	Circuits Lab	1	ELEE 212
MECH 231	Strength of Materials	3	MECH 225
SAFE 210	Introduction to Safety Engineering	3	CHEM 101

Total		**19**	

Year III

➢ ***Fifth Semester*** ***19 Credit hours***

Course	Title	Credits	Pre-requisites
MECH 201	Mechanical Engineering Graphics	1	CIVE 205
MECH 342	Heat Transfer	3	MECH 210, MATH 202 (co)
MATH 201	Calculus and Analytic Geometry III	3	MATH 102
MATH 202	Differential equations	3	MATH 102
MECH 341	Fluid Mechanics	3	PHYS 101, MATH 202 (co)
MECH 231L	Strength of Materials Lab	1	MECH 231
MECH 352	Instrumentation and Measurements	2	ELEE 212
MECH 352L	Instrumentation and Measurements Lab	1	MECH 352 (co)
Total		**17**	

➢ ***Sixth Semester*** ***16 Credit hours***

Course	Title	Credits	Pre-requisites
MATH 215	Linear algebra and Numerical Techniques	3	MATH 202
MECH 345	Thermo Fluids Lab	1	MECH 341, MECH 342
ENGL 206	Technical Writing	3	ENGL 102
STAT 230	Probability and Statistics	3	MATH 102
SAFE 320	Explosion and Fire Dynamics	3	MECH 342
SAFE 340	Human Factors and Ergonomics	3	SAFE 210, MECH 352
Total		**16**	

Year IV

➢ ***Seventh Semester*** ***15 Credit hours***

Course	Title	Credits	Pre-requisites
COEN 300	Engineering Economy	3	STAT 230
SAFE 340L	Human Factors Lab	1	SAFE 340
SAFE 350	Environmental Health and Safety	3	SAFE 210
SAFE 364	Occupational Health and Safety	3	SAFE 340
	Free Elective	3	
COEN 401	Engineering Ethics	1	ENGL 203
		14	

➢ ***Eighth Semester*** ***15 Credit hours***

Course	Title	Credits	Pre-requisites
SAFE 442	Fire Protection Engineering	3	SAFE 320
SAFE 446	Safety in Mechanical Engineering Systems	3	MECH 231, MECH 342, SAFE 364, MECH 341
SAFE 448	Safety in Electrical Engineering Systems	3	ELEE 212, SAFE 364
SAFE 449	Structural Safety and Failure Analysis	3	MECH 231, SAFE 364
		12	

➢ ***Summer Semester 1 Credit hours***

Course	Title	Credits	Pre-requisites
SAFE 400	Summer Internship	1	Last summer in study
Total		**1**	

Year V

➢ ***Ninth Semester 14 Credit hours***

Course	Title	Credits	Pre-requisites
SAFE 450	Risk Assessment and Management	3	SAFE 446, SAFE 448, SAFE 449
SAFE 431	Industrial Hygiene and Toxicology	3	CHEM 101, SAFE 364
SAFE 498	Final Year Project I	1	108 credits
	Specialization Elective	3	
	Specialization Elective	3	
		13	

➢ ***Tenth Semester 12 Credit hours***

Course	Title	Credits	Pre-requisites
	Specialization Elective	3	
	Specialization Elective	3	
SAFE 466	Legal Aspects of Safety and Regulations	3	SAFE 364
SAFE 499	Final Year Project II	3	SAEE 498
Total		**12**	

Course Description

1. Required Courses:

MECH 201 - Mechanical Engineering Graphics 1(0, 0, 2)

Principles and techniques of 3D surface and solid modeling; Feature-based and constraint-based modeling systems; Data transfer between systems; Relationship of geometric modeling to manufacturing; Analysis and rapid prototyping; Development of 2D drawing from the solid model database: Design annotation including mechanical fastener specification, geometric Dimensioning and tolerance**.** ***Prerequisites: CIVE 205***

ELEE 212 - Circuits for non-Electrical Students **3(3, 0, 0)**

A course on fundamentals of electric circuits, basic elements and laws, Kirchhoff's current law (KCL), Kirchhoff's voltage law (KVL), techniques of circuit analysis: nodal and mesh analysis, superposition, source transformation, AC analysis, Thevenin and Norton equivalents; inductors and capacitors, A.C. Analysis, Phasor concept. ***Prerequisite: PHYS 102***

ELEE 212L Circuits Lab **1(0, 0, 2)**

A practical course on measurement devices (Ammeters, Voltmeters, Oscilloscope), DC Circuit Analysis (Ohm's Law, KCL, KVL, Current Division, Voltage Division, Series/Parallel Combinations of Resistors, Thevenin's and Norton's Equivalent Circuits, Maximum Power Transfer), Frequency Response of RL and RC Circuits, Phase Measurements using the Oscilloscope,

Prerequisite: ELEE 212L

MECH - 210 Thermodynamics **3(3, 0, 0)**

Thermodynamic concepts and definitions, states, properties, systems, control volume; processes, cycles, and units; pure substances, equation of states, table of properties; work and heat; the first law, internal energy and enthalpy; conservation of mass; SSSF and USUF processes; the second law, heat engines and refrigerators, reversible processes, Carnot cycle; entropy, Clausius inequality, principle of the increase of entropy, Efficiencies. ***Prerequisite: PHYS 101, CHEM 101***

MECH 225 - Engineering Mechanics **3(3, 0, 0)**

A course outlining vector mechanics of forces and moments; free-body diagrams; equilibrium of particles and rigid bodies in two and three dimensions; plane and space trusses. Kinematics of particles; Rectilinear and curvilinear motion in various coordinate systems, Kinetics of particles; Newton's second law, Central force motion. Axial loading, Material properties obtained from tensile tests, Stresses and strains due to axial loading. Thermal Stresses. ***Prerequisite: PHYS 101***

MECH 230 - Engineering Materials **3(3, 0, 0)**

The course introduces fundamental concepts in materials science as applied to engineering materials: crystalline structures; imperfections, dislocations, and strengthening, mechanisms; diffusion; phase diagrams and transformations. Ferrous and non-ferrous metal alloys, ceramics, and polymers. Structure-property relationships. Material selection case studies. ***Prerequisite: CHEM 101***

MECH 231 - Strength of Materials **3(3, 0, 0)**

Axial loading, Material properties obtained from tensile tests, Stresses and strains due to axial loading, Thermal Stresses, Elementary theory of torsion, Solid and hollow shafts, Thin-walled tubes, Rectangular cross-section, Stresses in beams due to bending, shear and combined forces. Composite

beams, Analysis of plane stress, Mohr's Circle, Combined stresses, Thin-walled pressure vessels, Deflection of beams, buckling of columns. ***Prerequisite: MECH 225***

MECH 231L - Strength of Materials Lab **1(0, 0, 2)**

A laboratory course consisting of standard mechanical characterization tests on metals. Stress-strain plots, derived properties, fracture toughness, crystallography, hardness, and other properties.

Prerequisite: MECH 231

SAFE 210 – Introduction to Safety Engineering **3(3, 0, 0)**

This course introduces the fundamental principles of occupational safety and health (OSH), focusing on hazard identification, risk assessment, and mitigation strategies. Topics include workplace hazards such as physical, chemical, biological, and ergonomic risks, as well as regulatory frameworks like OSHA, NFPA, and ISO 45001 ***Prerequisite: CHEM 101***

SAFE 320 – Explosion and Fire Dynamics **3(3, 0, 0)**

This course covers the science behind fires, explosions, and combustion, emphasizing fire prevention and control strategies. Students will study fire chemistry, ignition sources, flammability limits, and the mechanisms of deflagration and detonation. The course also explores fire suppression techniques, including sprinkler systems, foam applications, and CO_2 suppression. Compliance with NFPA fire codes and explosion risk assessments will be covered, with practical applications in laboratory experiments and fire simulations. ***Prerequisite: MECH 342***

SAFE 340 – Human Factors and Ergonomics **3(3, 0, 0)**

This course explores how human behavior, capabilities, and limitations influence workplace safety. Topics include ergonomic risk factors such as posture, repetition, and force, as well as workplace layout optimization and cognitive ergonomics. Students will study the effects of fatigue, stress, and human error on safety. The course integrates OSHA ergonomic standards and best practices for injury prevention. Practical applications include conducting ergonomic assessments and redesigning workstations for improved safety. ***Prerequisite: MECH 210, MECH 352***

SAFE 340L – Human Factors Lab **1(0, 0, 2)**

This laboratory course provides hands-on experience in evaluating ergonomic risks and workplace safety factors. Students will conduct experiments on human motion, posture, and force analysis, as well as participate in simulations to assess cognitive workload and error rates in safety-critical environments. ***Prerequisite: SAFE 340***

SAFE 350 – Environmental Health and Safety **3(3, 0, 0)**

This course covers the principles of environmental health and workplace safety, with an emphasis on pollution control, hazardous waste management, and industrial hygiene. Students will explore the risks of air, water, and soil contamination, as well as noise and vibration hazards. The course also discusses chemical hazard communication, including MSDS and GHS labeling.

Practical applications include environmental impact assessments and industrial compliance audits. ***Prerequisite: SAFE 210***

SAFE 364 – Occupational Health and Safety **3(3, 0, 0)**

Focusing on workplace health risks, this course examines the causes and prevention of occupational diseases such as respiratory illnesses, hearing loss, and repetitive strain injuries. Students will learn hazard control measures, including substitution, isolation, engineering controls, and personal protective equipment (PPE). Topics also include workplace safety inspections, emergency response procedures, and first aid training. Legal frameworks such as OSHA regulations and Saudi labor laws will be covered. ***Prerequisite: SAFE 340***

MECH 341 - Fluid Mechanics **3(3, 0, 0)**

Basic and definitions, units, fluid proprieties, hydrostatics, basic control volume approach, continuity equation, Bernoulli equation, Euler's equation, energy equation, momentum principle and its applications, flow through orifice, pipe, major and minor losses in pipe.

Prerequisite: PHYS 101, MATH 202 (co)

MECH 342 - Heat Transfer **3(3, 0, 0)**

A course investigating steady and transient heat conduction; extended surfaces; numerical simulations of conduction in one and two-dimensional problems; external and internal forced convection of laminar and turbulent flows; natural convection; heat exchanger principles; thermal radiation, view factors and radiation exchange between diffuse and gray surfaces as well as the use of computer packages in problem solving. ***Prerequisite:***

MECH 345 - Thermo fluids Lab **1(0, 0, 2)**

One-dimensional conduction heat transfer. Heat transfer through composite walls. Thermal conductivity of insulating material. Transient heat transfer. Forced convection heat transfer inside a heated tube. Forced convection from a circular cylinder subjected to cross flow. Natural convection from a vertical flat plate. Overall heat transfer coefficient in a double pipe heat exchanger. Heat exchanger test – shell and tube heat exchanger. Pressure Measurements: Manometers, Flow visualization: streak-lines and streamlines, Measurement of velocity distribution using Pitot-static tube. Jet impact on a flat plate- linear momentum. Volume flow measurements: orifice, nozzle and venture, Reynolds Experiment: Laminar and Turbulent flows. Losses in Pipes. Pumps.

Prerequisite: MECH 341, MECH 342

MECH 352 - Instrumentation and Measurements **2(2, 0, 0)**

This course introduces general concepts of measurement systems; classification of sensors and sensor types; interfacing concepts; data acquisition, manipulation, transmission, and recording; introduction to LabVIEW; applications; team project on design, and implementation of a measuring device.

Prerequisite: ELEE 212.

MECH 352L - Instrumentation and Measurements Lab **1(0, 0, 2)**

Temperature Measurement and Calibration of Thermocouple, Pressure Measurement Calibration, Deflection Sensor, Force Sensor, Torque Sensor, Response of First Order Measuring System, Flow Sensor, Calibration of a Velocity Sensor Measurement of sound.

Co-requisite: MECH 352

SAFE 400 - Summer Internship **(1 Credit)**

This is an 8-week professional internship providing students with hands-on experience in occupational safety engineering. Students will work in industrial, construction, or manufacturing environments, applying safety engineering concepts, conducting safety audits, and participating in on-site risk assessments.

Prerequisite: Senior standing.

SAFE 431 – Industrial Hygiene and Toxicology 3(3, 0, 0)

This course explores the principles of industrial hygiene, focusing on exposure assessment and toxicology. Topics include the dose-response relationship, airborne contaminant monitoring, and the toxic effects of industrial chemicals, heavy metals, and solvents. Students will analyze ventilation control strategies and personal protective measures.

Prerequisite: CHEM 101, SAFE 364

SAFE 442 – Fire Protection Engineering 3(3, 0, 0)

This course examines fire prevention and suppression techniques, including fire detection systems, smoke and gas sensors, sprinkler system design, and passive fire protection measures. Students will learn about building fire codes and emergency evacuation planning.

Prerequisite: SAFE 320

SAFE 450 – Risk Assessment and Management 3(3, 0, 0)

This course teaches qualitative and quantitative risk assessment techniques, including fault tree analysis, failure mode and effects analysis (FMEA), and risk matrices. Students will learn how to evaluate and mitigate risks in various industries.

Prerequisites: SAFE 446, SAFE 448, SAFE 449

SAFE 446 - Safety in Mechanical Engineering Systems 3(3, 0, 0)

This course examines safety principles and risk management strategies specific to mechanical systems, including rotating equipment, manufacturing processes, and thermal/fluid systems. Topics include hazard identification, mechanical integrity assessments, fire/explosion prevention, and compliance with safety standards (e.g., OSHA, ANSI, ISO). Students will learn to design engineering controls, implement preventive maintenance protocols, and evaluate safety performance in industrial environments.

Prerequisites: MECH 231, MECH 341, MECH 342, SAFE 364.

SAFE - 448 Safety in Electrical Engineering Systems 3(3, 0, 0)

This course focuses on identifying and mitigating electrical hazards, including shock, arc flash, and circuit failures. Topics include grounding, circuit protection, and compliance with NFPA

70E standards.

Prerequisites: ELEE 212, SAFE 364

SAFE 449 – Structural Safety and Failure Analysis 3(3, 0, 0)

This course examines the principles of structural safety, including load calculations, material stress analysis, and failure modes. Students will explore earthquake-resistant designs and risk factors in construction. Practical applications include structural safety audits and case studies of historical failures.

Prerequisites: MECH 231, SAFE 364

SAFE 466 – Legal Aspects of Safety and Regulations (3 Credits)

This course explores legal frameworks governing workplace safety, including Saudi labor laws, OSHA regulations, and international safety standards. Students will analyze employer and employee responsibilities, liability cases, and compliance strategies. Practical applications include regulatory audits and legal case studies.

Prerequisite: SAFE 364

SAFE 498 - Final Year Project I (1 Credit)

This is the first phase of a capstone project where students identify a safety-related problem, conduct a literature review, and develop a research methodology.

Prerequisite: 108 credit hours.

SAFE 499 - Final Year Project II (3 Credits)

In this second phase, students apply their knowledge to solve a safety engineering challenge. They collect data, analyze results, design solutions, and present findings in a formal report.

Prerequisite: SAFE 498.

COEN 300 - Engineering Economy 3(3, 0, 0)

A course that covers principles, basic concepts and methodology for making rational decisions in the design and implementation of real engineering projects; time value of money, depreciation, comparing alternatives, effect of taxes, inflation, capital financing and allocation, and decision under uncertainty.

Prerequisite: STAT 230.

COEN 401 - Communication Skills and Ethics 1(1, 0, 0)

A course on engineering ethics covering responsibility in engineering; framing the moral problem; organizing principles of ethical theories; computers, individual morality, and social policy; honesty, integrity, and reliability; safety, risk, and liability in engineering; engineers as employees; engineers and the environment; international engineering professionalism; and future challenges.

Prerequisite: ENGL 203

2. Elective Courses

SAFE 472 – Renewable Energy Safety **3(3,0 ,0)**

Covers safety standards, risk management, and hazard prevention in solar, wind, and nuclear energy sectors. ***Prerequisite: SAFE 364***

SAFE 475 – Emergency Preparedness **3(3, 0, 0)**

Focuses on disaster planning, response strategies, and crisis management.

Prerequisite: SAFE 350

SAFE 478 – Radiation Safety **3(3, 0, 0)**

Examines radiation hazards, exposure limits, and protective measures in medical and industrial applications. ***Prerequisite: SAFE 431***

SAFE 484 – Emerging Technologies in Safety Engineering **3(3, 0, 0)**

Explores the role of AI, IoT, and automation in workplace safety.

Prerequisite: SAFE 450

SAFE 486 – Safety Leadership and Culture **3(3, 0, 0)**

Studies leadership principles, organizational safety culture, and behavioral safety approaches.

Prerequisite: SAFE 466

SAFE 488 – Safety Audits and Inspection **3(3, 0, 0)**

Covers compliance audits, safety inspections, and corrective action planning.

Prerequisite: SAFE 450

SAFE 482 – Cybersecurity for Safety **3(3, 0, 0)**

Addresses cyber threats to industrial safety systems and critical infrastructure.

Prerequisite: SAFE 448

SAFE 487 – Disaster Risk Reduction **3(3, 0, 0)**

Discusses hazard assessment, risk mitigation strategies, and community resilience.

Prerequisite: SAFE 475

SAFE 490 – Safety Instrumented Systems and Automation 3(3, 0, 0)

Focuses on programmable safety systems, fail-safe design, and automation in hazardous industries. ***Prerequisite: SAFE 448***

SAFE 492 – Special Topics in Safety Engineering 3(3, 0, 0)

Covers emerging research topics, regulatory updates, and specialized industry case studies.

Prerequisite: Department Approval