SUBBALAKSHMI LAKSHMIPATHY COLLEGE OF SCIENCE
AN AUTONOMOUS INSTITUTION
Affiliated to Madurai Kamaraj University and Re-accredited with B+ Status by NAAC
TVR Nagar, Aruppukottai Road, Madurai 625 022, TamilNadu
Landline : 73977 88615
e-mail : slcs@slcs.edu.in website : www.slcs.edu.in

DEPARTMENT OF FIRE AND INDUSTRIAL SAFETY

PG DIPLOMA IN FIRE & INDUSTRIAL SAFETY - PGFS1061

VISION OF THE DEPARTMENT

To offer a competent program that meets industry standards and to inculcate ethical values in the graduates to become successful safety professionals.

MISSION OF THE DEPARTMENT

DM 1 To impart fire and industrial safety knowledge and protective skills to maintain a safe Working environment in industries.

DM 2 To instill a sense of discipline with moral values so as bring about a positive occupational health and safety environment.

DM 3 To produce globally certified graduates with a thirst for continuous learning, competent enough to work around the world.

PROGRAMME OUTCOMES:

PO1: **Disciplinary Knowledge -** Apply the knowledge of fire and industrial safety by exhibiting their skills in different disciplines.

PO2: **Communication skills** - Express their views effectively through Written and Oral Communication to industry workers and the Public for ensuring the safety standards.

PO3: **Critical thinking –** Develop analytical thinking to handle Critical situations.

PO4: **Problem solving** - Apply knowledge to mitigate real life hazardous situations.

PO5: **Analytical reasoning** - Analyze the relevance of industrial safety Norms and Regulations.

PO6: **Research-related skills** - Investigate the causes of injuries and fatalities in industries so as to prevent Accidents and maintain Safety.

PO7: **Cooperation/Team work** - Work in diverse teams effectively through Concurrence and Participation.

PO8: Scientific reasoning - Interpret industrial hazardous situations and accidents and derive solutions by Reasoning.

PO9: **Reflective thinking** - Perform facility audits and checks on the condition of safety In workplaces.

PO10: **Information/Digital Literacy** - Use ICT Tools to evaluate hazardous zones through simulation.

PO11: **Self directed learning** –Develop their self learning capabiity through industrial Internships and projects.

PO12: **Multicultural competence** -Collaborate effectively with a diverse workforce society at large.

PO13: **Moral and Ethical awareness/Reasoning** – Imbibe good morals and Ethical Values combined with Professionalism.

PO14: **Leadership readiness/Qualities** - Motivate and inspire team members by ensuring Safety measures with statutory regulations.

PO15: Lifelong learning -Learn Life-long through e-learning tools by updating the latest technology and regulations in Fire and Industrial Safety

PROGRAMME EDUCATIONAL OBJECTIVES:

Graduates will be able to

PEO 1 : Possess health safety and environment knowledge to attain the standards required in their profession.

PEO 2: Work as safety professionals in manufacturing sectors, global oil & gas industries or to pursue higher education.

PEO 3: Become socially responsible citizen by holding ethical and professional values.

PEO 4: Adapt to new fire and safety technology with a yen for lifelong learning.

PROGRAMME SPECIFIC OUTCOMES

Graduates will be able to,

PSO 1: Become Safety Professionals in various industries.

PSO 2: Learn and implement rules and regulations in industries as safety personnel's.

PSO 3: Create awareness about safety among workers.

PSO4: Conduct Safety Programmes and deliver the importance of safety regulations to the public.

****

COURSE OUTCOMES

Course Code and Course Name	Course Outcomes At the end of this course the students will be able to
22PGFS101- Principles of Safety Management System	**CO1**: Explain the basics concept of safety management system **CO2**: Interpret about safety planning and organizing in industries **CO3**: Apply the safety education and training in Industries **CO4**: Determine the Behavior based safety in Industries **CO5**: Identify the roles of employees and employer about safety in industries
22PGFS102 - Safety in Engineering Industries	**CO1:** Explain the greatest co-ordination of layout design and maintenance **CO2**: Identify and assess the documents of the various hazards in the machine guards **CO3**: Practice the various handling and storage methods of materials **CO4**: Differentiate and analyse the safety issues and procedures in various domains **CO5**: Classify the various electrical hazards and electrical standards
22PGFS103 - Fire Engineering and Explosion Control	**CO1:** Describe the details of fire engineering and fire protection systems **CO2:.**Differenciate between the fire and explosion and its types **CO3:** Determine the effects of toxic gas releases and the assessments

Course Code and Course Name	Course Outcomes At the end of this course the students will be able to
	CO4: Analyze the gas dispersion modelling **CO5**: Examine the various explosion protection systems.
21PGFS104 - Industrial Safety Analysis	CO1: Explain about the selection of plant layout and control techniques CO2: Discuss about the hazards identification and risk assessment used in Industries CO3: Classify the various types of Accident and hazard control techniques used in Industries CO4: Explain the various types of Accident Investigation procedure and Safety performance Measurement CO5: Classify the various types of Personal protective equipment used in Industries
22PGFS110 P -Fire Fighting and Field Training Lab	CO1: Experiment with various types of Fire Fighting Equipments CO2: Experiment with all types of Fire CO3: Discuss about the various types of Breathing Apparatus CO4: Explain about the Maintenance of Fire Fighting Appliances CO5: Experiment with all type of knots & fire man carry & drag methods
22PGFS111 P - Project I	**CO1**: Train them-selves to conduct hazard analysis in Industries **CO2**: Know the norms and standards for Industries. **CO3**: Recognize hazards and assess or evaluate them by using various techniques

Course Code and Course Name	Course Outcomes At the end of this course the students will be able to
	CO4: Suggest suitable measures to prevent hazards by referring the literature **CO5**: Establish the environment protection access
22FSPG105 - Disaster Management	**CO1**: Discuss about the types of various disaster & its mitigation **CO2**: Manipulate the various emergency situation while disaster **CO3**: Interpret about the Bio-Diversity & Environmental impact **CO4**: Evaluate the various hazard waste management **CO5**: Establish the environment protection access
22FSPG106 - Radiation Hazards and Safety	**CO1**: Describe the Radiation quantities Weighting Factors **CO2**: Discuss the biological effects to humans **CO3**: Determine the exposure limits of radiation **CO4**: Prepare the transportation of radioactive materials **CO5**: Analysis the accident and regulation aspects in radiation
22PGFS107 - DOCK SAFETY	CO 1: Outline the different acts and rules for safe dock operations. CO 2: Explain the student to familiar of various operations carried out in a dock CO 3: Interpret the operation of various types of material handling equipments. CO4: Classify the various problems associated with the use of lifting equipments and in the storage yards. CO 5: Classify the prepared to response at the time of emergency in a dock.

Course Code and Course Name	Course Outcomes At the end of this course the students will be able to
22PGFS108- Safety in Textile Industries	CO 1: Outline the various process and operation of Textile Industries. CO 2: Classify the various hazards in processing textile industry CO 3: Interpret the various hazards, dyeing, and punting, mechanical finishing operation in textile Industries. CO 4: Summarize the various health and welfare activities for worker in textile Industries. CO 5: Explain the safety norms for the textile Industries as per the Factories act and could implement statutory requirements
22PGFS109- Safety in Construction	**CO1:** Summarize the causes of accidents, and designing aids for safe construction. **CO2:** Classify the hazards during construction of power plant, road works and high rise buildings. **CO3:** Outline the safety procedure for working at heights during construction. **CO4:** Summarize the selection, operation, inspection and testing of various construction machinery. **CO5:** Explain the construction regulations and Indian standards for construction and demolition work.
22PGFS201 - Environment Health Safety Laws And Standards	**CO1**: Discuss about the ILO and History of Safety Legislation **CO2**: Classify the factories act and their rules **CO3**: Explain about the employee welfare act and other Industrial Safety acts used in Industries **CO4**: Extent safety legislation used in Industries **CO5**:

Course Code and Course Name	Course Outcomes At the end of this course the students will be able to
	Discuss various standard used in India
22PGFS202 - Occupational Health Safety And Industrial Hygiene	CO1: Practice Industrial hygiene and occupational health CO2: Classify and explain various health risk and their control methods CO3: Interpret work ergonomics CO4: Explain the causes of various occupational physiologies CO5: Apply occupational toxicology and first aid.
222PGFS203- Safety in Chemical Industries	**CO1**: Implement Safety measures in Chemical Industry **CO2**: Extend the process of Instrumentation for Safe plant operation in various types of Industries **CO3**: Explain the pressure vessel and reaction vessels used in industries **CO4**: Interpret the process of safety management **CO5**: Discuss the Emergency planning and response
22PGFS204 - Environmental Safety	CO1: Illustrate and familiarize the basic concepts scope of environmental safety CO2: Understand the standards of professional conduct that are published by professional safety organizations and/or certification bodies CO3: Explain the ways in which environmental health problems due to air and water pollution CO4: Illustrate the role of hazardous waste management and use of critical thinking to identify and assess environmental health risks CO5: Discuss concepts of measurement of emissions and

Course Code and Course Name	Course Outcomes At the end of this course the students will be able to
	design emission measurement devices
22PGFS210 P - Industrial Safety Lab	**CO1**: Interpret about various types of safety equipments and PPE used in fire fighting **CO2**: Explain about basic first aid **CO3**: Examine about various types of Road signs and symbols **CO4**: To infer about various types of rescue techniques and usage of fire fighting hoses **CO5**: Manipulate about different types of knots and recharge of fire extinguishers
22PGFS211 P - Internship Training	CO1: Select and analysis the effective industry safety methods for the given field applications CO2: To develop the skill of students for building a safety device to control the hazard. CO3: Students can prepare the emergency planning for industry problems CO4: Students would understand the problems and find innovative solutions while industries facing problems in commissioning and maintenance stages CO5: To inculcate the habit of working in teams
22PGFS212 P - Project II	**CO1**: This course would make students to train themselves to conduct hazard analysis and suggest solutions to control risks **CO2**: Course would be helpful for the students to know the norms and standards for an Industry **CO3**: Recognize hazards and assess or evaluate them by using

Course Code and Course Name	Course Outcomes At the end of this course the students will be able to
	various techniques **CO4**: Suggest suitable measures to prevent hazards by referring the literature **CO5**: Establish the environment protection access
22PGFS205- Safety In Fire Works Industries	**CO1**: Interpret about properties of fire work chemicals **CO2**: Discuss about various Personal protective Equipments used in Pollution Control **CO3**: Distinguish about Fire prevention and control, risk related fire work industries **CO4**: Explain about handling of factory materials and transportations **CO5**: Identify the wastes that used in fire industries
22PGFS206- Safety in Oil and Gas Industries	CO1:.Discuss the risk management techniques CO2:.Classify various work permit system in safety management CO3:.Explain the control methods in offshore and onshore CO4: Analyze the fire protection and emergency response CO5: Compare different transport operations in Industry
22PGFS207- Safety in Mines	CO1:.Discuss the open cast mine accident and its causes CO2: Explain the underground mine accident and its causes CO3: Extend prevention of Tunneling accident CO4: Identify the risk assessment in mine industries CO5: Develop the accident analysis and Management in Mine Industries
22PGFS208 - Solar and Advanced Energy Storage System	CO1: Explain the basics of solar thermal energy conversion system. CO2: Explicate Photovoltaic principle and techniques of solar

Course Code and Course Name	Course Outcomes At the end of this course the students will be able to
	energy conversions systems CO3: Depict the role of super conductors in energy storage system. CO4: Evaluate the performance of different energy generation technologies and Superconducting magnetic energy storage system. CO5: Choose fuel cells for various applications
22PGFS209- Plant Layout and Materials Handling	CO1: Identify equipment requirements for a specific process and working conditions. CO2: Understand the benefit of an efficient plant layout for various applications CO3: Understand hazards and prevention methods in mechanical material handling system CO4: know different working conditions for effective productivity CO5: know the different manual material handling methods and lifting tackles

COURSE OUTCOMES

Course Code and Course Name	Course Outcomes At the end of this course the students will be able to
22PGFSW101- Principles Of Safety Management System	**CO1:** Explain the basics concept of safety management system **CO2:** Interpret about safety planning and organizing in industries **CO3:** Apply the safety education and training in Industries **CO4:** Determine the Behaviour based safety in Industries **CO5:** Identify the roles of employees and employer about safety in industries
22PGFSW102 - Safety in Engineering Industries	**CO1:**Explain the greatest co-ordination of layout design and maintenance **CO2:** Identify and assess the documents of the various hazards in the machine guards **CO3:** Practice the various handling and storage methods of materials **CO4:**Differentiate and Analyse the safety issues and procedures in various domains **CO5:** Classify the various electrical hazards and electrical standards
22PGFSW103 - Fire Engineering and Explosion Control	**CO1:**Describe the details of fire engineering and fire protection systems **CO2:.**Differenciate between the fire and explosion and its types **CO3:**Determine the effects of toxic gas releases and the assessments **CO4:** Analyze the gas dispersion modelling **CO5:** Examine the various explosion protection systems
21PGFSW104- Industrial Safety Analysis	**CO1:**Explain about the selection of plant layout and control techniques **CO2:**Discuss about the hazards identification and risk assessment used in Industries

Course Code and Course Name	Course Outcomes At the end of this course the students will be able to
	CO3: Classify the various types of Accident and hazard control techniques used in Industries **CO4:**Explain the various types of Accident Investigation procedure and Safety performance Measurement **CO5:**Classify the various types of Personal protective equipment used in Industries
22PGFSW108 P- Fire Fighting and Field Training lab	**CO1:** Experiment with various types of Fire Fighting Equipments **CO2:** Experiment with all types of Fire **CO3:** Discuss about the various types of Breathing Apparatus **CO4:** Explain about the Maintenance of Fire Fighting Appliances **CO5:** Experiment with all type of knots & fire man carry & drag methods
22PGFSW105 - Disaster Management	**CO1:** Discuss about the types of various disaster & its mitigation **CO2:** Manipulate the various emergency situation while disaster **CO3:** Interpret about the Bio-Diversity & Environmental impact **CO4:** Evaluate the various hazard waste management **CO5:** Establish the environment protection access
22FSPGW106 - Radiation Hazards And Safety	**CO1:** Describe the Radiation quantities Weighting Factors **CO2:** Discuss the biological effects to humans **CO3:** Determine the exposure limits of radiation **CO4:** Prepare the transportation of radioactive materials **CO5:** Analysis the accident and regulation aspects in radiation
22PGFSW107- AVIATION	**CO1:** Generalize aviation safety program and

Course Code and Course Name	Course Outcomes At the end of this course the students will be able to
SAFETY MANAGEMENT	accident prevention concepts. **CO2:** Indicate the different of flight safety and ground safety. **CO3:** Review the human factors in hazardous situations. **CO4:** Classify the aircraft accidents and investigation reporting. **CO5:** Examine the concepts of quality and reliability.
22PGFSW201-Environment Health Safety Laws And Standards	**CO1:** Discuss about the ILO and History of Safety Legislation **CO2:** Classify the factories act and their rules **CO3:** Explain about the employee welfare act and other Industrial Safety acts used in Industries **CO4:** Extent safety legislation used in Industries **CO5:** Discuss various standard used in India
22PGFSW202- Occupational Health Safety And Industrial Hygiene	**CO1:** Practice Industrial hygiene and occupational health **CO2:** Classify and explain various health risk and their control methods **CO3:** Interpret work ergonomics **CO4:** Explain the causes of various occupational physiologies **CO5:** Apply occupational toxicology and first aid.
22PGFSW203 - Safety in Chemical Industries	**CO1:** Implement Safety measures in Chemical Industry **CO2:** Extend the process of Instrumentation for Safe plant operation in various types of Industries **CO3:** Explain the pressure vessel and reaction vessels used in industries **CO4:** Interpret the process of safety management **CO5:** Discuss the Emergency planning and response

Course Code and Course Name	Course Outcomes At the end of this course the students will be able to
22PGFSW204 - Environmental Safety	**CO1:** Illustrate and familiarize the basic concepts scope of environmental safety **CO2:** Understand the standards of professional conduct that are published by professional safety organizations and/or certification bodies **CO3:** Explain the ways in which environmental health problems due to air and water pollution **CO4:** Illustrate the role of hazardous waste management and use of critical thinking to identify and assess environmental health risks **CO5:** Discuss concepts of measurement of emissions and design emission measurement devices.
22PGFSW210 P-Industrial Safety Lab	**CO1:** Interpret about various types of safety equipments and PPE used in fire fighting **CO2:** Explain about basic first aid **CO3:** Examine about various types of Road signs and symbols **CO4:** To infer about various types of rescue techniques and usage of fire fighting hoses **CO5:** Manipulate about different types of knots and recharge of fire extinguishers
22PGFSW211 P - Technical Seminar	**CO1**: Students will develop skills to read, write, comprehensive and present research papers **CO2:** Students shall give presentations on recent areas of research in industrial safety Domain **CO3**: Studentslearn Depth of understanding, coverage and quality of presentation **CO4**: communication skill of the student will be taken as measures for evaluation **CO5**: students will able to find out industrial communication methods
22PGFSW212 P- Project II	**CO1**: This course would make students to train themselves to conduct hazard analysis and suggest solutions to control risks **CO2**: Course would be helpful for the students to know the norms and standards for an Industry

Course Code and Course Name	Course Outcomes At the end of this course the students will be able to
	CO3: Recognize hazards and assess or evaluate them by using various techniques **CO4**: Suggest suitable measures to prevent hazards by referring the literature **CO5**: Establish the environment protection access
22PGFSW205 - Safety In Fire Works Industries	**CO1**: Interpret about properties of fire work chemicals **CO2**: Discuss about various Personal protective Equipments used in Pollution Control **CO3**: Distinguish about Fire prevention and control, risk related fire work industries **CO4**: Explain about handling of factory materials and transportations **CO5**: Identify the wastes that used in fire industries
22PGFSW206- Safety in Oil and Gas Industries	**CO1:**Discuss the risk management techniques **CO2:**Classify various work permit system in safety management **CO3:.**Explain the control methods in offshore and onshore **CO4:**Analyze the fire protection and emergency response **CO5:** Compare different transport operations in Industry
22PGFSW207 - Safety in Mines	**CO1:**Discuss the open cast mine accident and its causes **CO2:** Explain the underground mine accident and its causes **CO3:** Extend prevention of Tunneling accident **CO4:** Identify the risk assessment in mine industries **CO5:** Develop the accident analysis and Management in Mine Industries
22PGFSW208- Solar and Advanced Energy Storage System	**CO1:** Explain the basics of solar thermal energy conversion system. **CO2:** Explicate Photovoltaic principle and techniques of solar energy conversions systems

Course Code and Course Name	Course Outcomes At the end of this course the students will be able to
	CO3: Depict the role of super conductors in energy storage system. **CO4:** Evaluate the performance of different energy generation technologies and Super conducting magnetic energy storage system. **CO5:** Choose fuel cells for various applications
22PGFSW209- Plant Layout and Materials Handling	**CO1:** Identify equipment requirements for a specific process and working conditions. **CO2:** Understand the benefit of an efficient plant layout for various applications **CO3:** Understand hazards and prevention methods in mechanical material handling system **CO4:** know different working conditions for effective productivity **CO5:** know the different manual material handling methods and lifting tackles