A. Programme Mission and Objective:

JSS University is culmination of half a century of perseverance in the field of education steered by philosophy of noble minds. The University was established in the Year 2008 and has been contributing towards quality healthcare and training professionals to meet the ever increasing demand of qualified trained human resources in the healthcare sector. JSS University has created a vigorous and intellectually stimulating ambience conducive to learning and reflection. BSc in Microbiology is a unique, interesting and leading course designed to encourage aspiring students with a cutting edge training to innovate young minds power of thinking, cater them apt practical training and making them industry ready for a rewarding professional career.

PGDEHSM as an add-on course and regular professional diploma course will be offering enormous carrier opportunities in industrial sectors, hospitals and related firms. Moreover, PGDEHSM is a good opportunity to the current employees from various industries to update their skills which are necessarily required for the promotion and development in the field of Environment, Health and Industrial Safety. their practical and theoretical insights so that you emerge from your degree with an understanding of how to measure, evaluate, and make decisions about environmental issues. The student will have the opportunity to learn sophisticated laboratory techniques and data analysis, such as the utilization of Geographical Information Systems. You will have the opportunity to work and learn in inspiring places where you will gain practical field experience. Our programme encourages pursuing student’s interests and shaping their ambitions. Our degree offers meaningful opportunities to develop research, or to gain insights from industry leaders in the environmental private sector and non-governmental organizations. International standard curriculum that helps students to find their potential and which will increase their career competitiveness.
The core mission is to impart knowledge with quality teaching and research with a special focus on contemporary national needs. Our vision is to grow into an institution of national importance, with international standing and internationally recognized centre of excellence and research in Environmental sciences.

(a) **Rationale : The main reason for offering this programme are :**

- JSS University is well prepared to offer such programme. Cooperation from constituent colleges in JSS University will be sought to keep the parity between regular and distant mode.
- The programme will strengthen and connect ties with scientific community, which in turn will fortify the undergraduate science programmes of JSS University.
- The Post-Graduation Diploma in Environment, health & safety management course is structured to give students a holistic understanding of the subject giving a balanced weightage to both core contents and techniques used in environment science as per UGC guidelines.
- JSS University will ensure to adopt the newer approach included by UGC “Virtual Lab”, for conducting practical classes.

(b) **Goals and objectives :**

To develop highly qualified professional manpower the basic requirement lies on systematic quality based coaching and training in Advanced Science and Technologies for Environment, Health, and Safety management. Therefore, the course is designed to train and provide expert human resource to Environment, Health, and Safety management and expected to bring direct benefits to industry and society.

The course is based on following objectives:

1. To develop an expert manpower to handle the complex industrial environment.
2. To give knowledge about occupational health, industrial hygiene, accidental prevention techniques to the students.
3. To make the student aware about safety auditing and management systems, pollution prevention techniques etc.
4. To train the students about environmental and safety risk assessment and management.
5. To train the students about environmental policy, industrial safety and occupational health regulation.
6. To train the students about environmental and safety standards and certification such as ISO certification, environmental trading and green innovation, etc.

B. Relevance of the programme with HEI’s Mission and Goals:

The programme is entirely in line with the JSS Universities strategic goals as well as its Mission to provide superior professional education, nurturing translational and transformational research in health care sector for the benefit of the society. The programme is also consistent with Higher Education vision 2020 to transform society towards knowledge society and making education an imperave tool to realize knowledge, economy and society.

C. Nature of prospective target group of learners:

Any Bachelor Degree (B.Sc/B.A/B.Com/BBA/B.E/B.Pham/MBBS/BDS or equivalent degree) recognized by UGC with any specializations and they should be secured 55 % marks.

Any Master Degree (M.Sc/M.A/M.Com/MBA/M.E/M.Pham/MDS or equivalent degree) recognized by UGC with any specializations and they should be secured 55 % marks.

In case applicant number is more, the entrance test will be conducted.

D. Appropriateness of programme to be conducted in open and distance learning mode to acquire specific skills and competence

This course is intended for professional’s practitioners, researchers and students from wide range of backgrounds who aim to develop their knowledge and insights pertaining to the environment. The course in designed to provide critical and practical skills to analyse, evaluate, design and implement solution and strategies with regards to water and health issues. The
course offers core papers theory and practical. Overall mission of PGD Environment Health & Safety Management is effective delivering of curricula to students who freshly completed their school educations. Along with development of scientific knowledge and biology underpinnings in students, providing nationally and internationally recognized innovative research programs under the multidisciplinary scientific skills is the major goal. Students completing this programme will be able to:

1) Understand and apply theoretical as well as practical knowledge in the area of Science and Technology with specialization in various branches of Environmental Sciences.
2) Channelize the background knowledge to take up their higher studies in emerging areas of Energy resources, Hydrology, Forest Conservation, Renewable resource, etc.,
3) The programme will help as a launch pad for higher level competency both in state and National spheres.

E. Instructional Delivery Mechanism

JSS University follows a modern ICT enabled approach for instruction. The methodology of instruction in JSS University is different from that of the conventional /regular programs. Our system is learner-oriented and the learner is an active participant in the teaching-learning process. Most of the instructions are imparted through online and distance mode. Academic delivery systems of JSS University are:

- **Print Material:** JSS University mainly focuses on Self Learning Material (SLM) and their upgradation by eminent teachers/academicians both from JSS University and other reputed universities/institutions. As text information plays a vital role in distance education, print based instruction has a critical role in JSS University distance learning initiatives.
- **Audio-Visual Material Aids:** The learning package contains audio and video programmes which have been produced by the University for the enhancement of understanding of the course material given to the student. The video lectures are uploaded in the University website for the student’s access.
- **Online/Virtual Classes:** Delivery of classroom-like lectures will also be available in the student portal for enhanced learning experience.
- **Laboratory facilities:** JSS University has advanced laboratory for practical training for younger minds to get hands on experience in cutting edge techniques.

I) Identification of Media

Print, Audio-Video and Online media will be utilized for the dissemination of knowledge relevant to the program enrolled.
II) Student support system

JSS University provides an exclusive online portal for students to cater to all of their academic related matters such as notification of contact classes, assignment details, course material, and examination schedule. In addition, each student has provision to seek guidance, counseling and career guidance throughout the program.

F. Procedure for admissions, curriculum transaction and evaluation

Admission to all the programs is through notification in newspaper and on University website. The admission procedure involves submission of filled application by the candidates after paying the prescribed fees. The admission scrutiny committee evaluates all the submitted applications and recommend the eligible candidates. The selected candidates are notified through admissions office and also on the University website. The selected candidates are expected to report within the stipulated timeframe for provisional admission to the program.

Curriculum transaction for the program is through the designated online student portal as detailed above in Section E.

Evaluation: Evaluation will be done as follows:

- University end semester examination: 75 marks for each subject
- Internal Assessment: 25 marks for each subject (theory test, seminars, assignments)
- Independent Project work (for PG and PGD programs): 350 marks
- Project Viva Voce (for PG and PGD programs): 150 marks

Basic Structure and Distribution of Courses

<table>
<thead>
<tr>
<th>Part</th>
<th>Study Component</th>
<th>Papers x credit</th>
<th>CIA Marks</th>
<th>University Examinations</th>
<th>Total Marks</th>
<th>Total Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Paper (I,II,III &amp; IV)</td>
<td>Core Paper</td>
<td>4x4</td>
<td>25</td>
<td>75</td>
<td>400</td>
<td>16</td>
</tr>
<tr>
<td>Practicals (I &amp; II)</td>
<td>Practicals</td>
<td>6x2</td>
<td>25</td>
<td>75</td>
<td>400</td>
<td>12</td>
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<tr>
<td>Project</td>
<td>Dissertation</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>200</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1000</td>
<td>40</td>
</tr>
</tbody>
</table>

G. Requirement of the Laboratory support and the library resources
The University has designated laboratory space to meet the curriculum requirements of all the programs.

Library resources: For the enhanced learning opportunities of each of the students enrolled under the open and distance learning mode, JSS University has mobilized the required textbooks, journals and articles for access in the department library. These materials are in addition to the printed study material available for each student.

H. Cost estimate of programme and provisions

Cost estimate of each student/year is as follows:

Certificate Program – Distance Mode = Rs. 10,000

UG Program – Distance Mode = ranges from Rs. 15,000 – Rs. 20,000

PG and PGD Program – Distance Mode = ranges from Rs. 15,000 – Rs. 75,000

The provisions include the following: study material both print and online materials, hiring faculty members for contact program, contact program laboratory charges, TA/DA for faculty members and coordinators, classroom and laboratory hiring charges for the contact program.

I. Quality assurance mechanism and expected programme outcomes

The syllabus is prepared considering the need and expectations from various stakeholders, feedback, and consultation with academicians, industry experts, scholars from relevant field. The teaching and learning methods incorporate contact classes, online and offline methods. Hands-on training is provided for practical orientation and independent project work stimulates problem analysis, techniques for resolving the problem and probable solutions to the same providing opportunities to apply theoretical knowledge to real time problems in organizations. The evaluation incorporates transparency and all activities are carried out according to preplanned academic calendar. The syllabus has clear defined course objective and course outcome for each of the courses.

Programme Outcome

The programme aims to cater learners to acquire and demonstrate competency in Environment Health & Safety, making them Knowledgeable and competent to make a prospective career in Industry.
PG Diploma in Environment Health & Safety Management -
Syllabus

Detailed Syllabus:

Paper I (EHSM T1) - Introduction to Environment, Health and Safety Management (40 Hours)

Unit I:
Introduction, importance of environmental safety in industry, Occupational Health Hazards, Promoting Safety, Safety and Health training, Importance of environmental safety, role of safety department, Safety committee and Function, Concept and Significance of ISO standards and internal auditing, Industrial Pollution, Accident and Environmental Damage, Conservation of Environment, Restoration of ecosystem

Unit II:
Concept of work safety and health, development and accident prevention: accident, workplace injuries and damage, work environment; Occupational: Characteristics of Occupational Illness, Human Resources Important to Occupational Health Practice, Ethical Considerations; Risk assessment: Risk Assessment Basics, Exposure Assessment, Dose–Response Assessment, Comparative Risk Analysis, Risk Communication.

Unit III:
Occupational Health: The causes of work related ill health and the steps to control and prevent it, The appropriate measures to control the hazards associated with work related ill health including: (a) Noise, (b) Repetitive strain injury (RSI), (c) Display screen equipment (DSE), (d) Viral and bacterial infections, e.g. legionnaires disease, hepatitis B. (e) Stress.

Unit IV:
General Working Environment: That the following are all features of a healthy and safe workplace: (a) Workstations, (b) Room dimensions and space, (c) Floors & Gangways, (d) Stairways, (e) Lighting, (f) Temperature, (g) Ventilation, (h) Housekeeping –Safe storage, Falling objects, (j) Toilets and Washing Facilities, (j) Smoking, (k) Welfare provision, (l) Personal hygiene, (m) First Aid provision, (n) Rest Areas, The importance of safety signs and their usage, Principles of accidents prevention & First aid, Plant layout for safety,
Unit V:

References:
8. Physical and Biological Hazards of the work place (2 Edition Illustrated) (2002) : Peter H. Wald, Gregg M. Stave Proctor and Hughes, Wiley & Sons Ltd.

Paper - II (EHSM T2) - Occupational Health and Hazards (40 Lectures)

Unit I:
Safety and Health Management:
1. Occupational Health Hazards, Promoting Safety, Safety and Health training, Stress and Safety.
3. Importance of Industrial safety, role of safety department, Safety committee and Function

Unit II:
Radiation and Industrial Hazards
1. Types and effects of radiation on human body, Measurement and detection of radiation intensity. Effects of radiation on human body, Measurement – disposal of radioactive waste, Control of radiation
2. Industrial noise -Sources, and its control, Effects of noise on the auditory system and health, Measurement of noise,
3. Different air pollutants in industries, Effect of different gases and particulate matter,acid fumes,smoke, fog on human health
4. Vibration - effects, measurement and control measures
5. Industrial Hygiene.

Unit III:
Electrical Hazards and Hazards in Construction Industry
Safe limits of amperages, voltages, distance from lines, etc., Joints and connections, Overload and Short circuit protection, Earthing standards and earth fault protection, Protection against voltage fluctuations, Effects of shock on human body Hazards from Borrowed nutrals, Electrical
equipment in hazardous atmosphere, Criteria in their selection, installation, maintenance and use, Control of hazards due to static electricity,

Unit - IV
Introduction of Construction industry, Scaffolding and Working plat form, Welding and Cutting, Excavation Work, Concreting and Cementing work, Transportation of men and material, Handling and Storage of compressed gas.

Unit - IV
Fire and other Hazards
i. General causes and classification of fire, Detection of fire, extinguishing methods, fire fighting installations with and without water.
ii. Machine guards and its types, automation. High pressure hazards, safety, emptying, inspecting, repairing, hydraulic and nondestructive testing, hazards and control in mines.

References:

Paper III (EHSM T3) Safety at Workplace (40 Lectures)

Unit I:
Safe use of machines and tools
i. Safety in the use of : 1) Grinding 2) CNC’s 3) Shearing 4) Bending 5) Milling 6) Boring 7) Shaping Safe use of hand tools: Safe use of various types of hand tools used for metal cutting, torsion tools, shock tools, non sparking tools, portable power tools
ii. Ergonomics of machine guarding, Guarding of different types of machinery including special precautions for paper, rubber and printing machinery, wood working.

Unit II:
i. Working in different areas: Working in confined spaces, Working Underground, Working at heights - use of stairways, clamps, working platforms, ladders of different types, Boatswain’s chair and safety harness working on roofs, Lifting machinery lifts and hoists, 
ii. Operation, inspection and maintenance of industrial trucks, loose gears conveyors, Safe working load for mechanical material handling equipments.

**Unit III:**
Plant design and Housekeeping

i. Plant layout, design and safe distance, Ventilation and heat stress, Significance of ventilation, Natural ventilation, Mechanical ventilation Air conditioning

ii. National Building code part VIII and Building service, Thermal comfort, Indices of heat stress, Physiology of heat regulation,

iii. Safety and good housekeeping, Disposal of scrap and other trade wastes, Spillage prevention, Use of colour as an aid of housekeeping, Cleaning methods, Inspection and Checklists, Advantages of good housekeeping

**Unit IV:**
Industrial Lighting
Purpose of lighting, Uses of good illumination, Recommended optimum standards of illumination, Design of lighting installation, Standards for lighting and colour.

**Unit V:**
Vibration and Noise
Activities related to vibrations, its impact on human health, abatement Sources, effects of noise on man, Measurement and evaluation of noise, Silencers, Practical aspects of control of noise

**References:**
2. Industrial Safety -National Safety Council of India.

**Paper IV (EHSM T4) - Accident Prevention Techniques (40 Lectures)**

**Unit I:**
Principles of accidents prevention

Definition: Incident, accident, injury, dangerous occurrences, unsafe acts, unsafe conditions, hazards, error, oversight, mistakes, etc.


Unit II:
Theories and principles of accident causation
i. The effect of accident, unsafe act, unsafe condition, unpredictable performance, Human factors contributing to accidents - causes for unsafe acts,
ii. Safety and psychology - Theories of motivation and their application to safety. Consequences of accident, accident prevention programmers, Role of safety.

Unit III:
First aid- i. Body structure and Functions, Position of causality, the unconscious casualty, fracture and dislocation, Injuries in muscles and joints, Bleeding, Burns, Scalds and accidents caused by electricity, Respiratory problems, Rescue and Transport of Casualty. Cardiac massage, poisoning, wounds.

Unit IV:
ii. Personal Protective Equipments: Need, selection, supply, use, care and maintenance, Personal protective devices for head, ear, face, eye, foot, knee and body protection, Respiratory personal protective devices.

Unit V:
Plant layout for safety
i. Design and location, distance between hazardous units, colour coding, Lighting, ventilation, Flow charts, pilot plant applications and machine guarding and it’s types, Housekeeping.

References:

**Paper V (EHSM T5) - Safety Management System and Law (40 Lectures)**

**Unit I:**

**Unit II:**

**Unit III:**
Performance measurements to determine effectiveness of PSM

**Unit IV:**
Competence Building Technique (CBT),
Concept for training, application of computer, multimedia, communication.
Relevance of WTO regarding safety, Health and environment.
Employee participation in safety - Role of Trade union in safety, health and environment. Safety promotion and safety awards, safety, competitions, audio visual publication.

**Unit V:**
Directing safety - Definition, process, principles and techniques.
Leadership - role, function and attribution of a leader.
Essential rules in communication with employees with conducting training, team building and group dynamics.
Financial cost to individual worker and family, organisation and society. Procedures for compilation, utility and limitations of cost data, budgeting for safety, role of trade unions in safety.

**References:**
1. The Factories Act with amendments 1987, Govt. of India Publications DGFASLI, Mumbai
3. Industrial Safety –National Safety Council of India

**EHSM P1: Industrial Training and Visits report and Viva voce examination**

i. In-plant training of 8 weeks is compulsory and a Report to be submitted to the Department with due Certification of the industry where training is sought.
ii. Minimum 5 Industrial Visits are compulsory.
iii. Students should explain/demonstrate the training during viva voce examination

**EHSM P2: Internship/Project report viva voce examination**

i. About 10-12 month compulsory Project/internship on Industrial Safety to be completed and a Report to be submitted to the Department with due Certification of the industry where training is sought.
ii. Students should explain/demonstrate the training during viva voce examination.
iii. Students should explain/demonstrate the project work/internship carried out during viva voce examination.