

Text Books:

1. Narayan Panigrahi, “Geographical Information Science”, ISBN 10: 8173716285 / ISBN 13: 9788173716287, University Press 2008.
2. Basudeb Bhatta, “Remote sensing and GIS”, ISBN:9780198072393, Oxford University Press 2011
3. Kang – Tsurg Chang, “Introduction to Geographic Information System”. Tata McGraw Hill Education Private Limited 2015.
4. Lillesand, Kiefer, Chipman, “Remote Sensing and Image Interpretation”, Wiley 2011.

Reference Books:

1. Chor Pang Lo and Albert K.W Yeung, “Concepts & Techniques of GIS”, PHI, 2006
2. John R. Jensen, “Remote sensing of the environment”, An earth resources perspective – 2nd edition – by Pearson Education 2007.
3. Anji Reddy M., “Remote sensing and Geographical information system”, B.S. Publications 2008.
4. Peter A. Burrough, Rachael A. McDonnell, and Christopher D. Lloyd, “Principals of Geo physical Information system”, Oxford Publications 2004.
5. S Kumar, “Basics of remote sensing & GIS”, Laxmi publications 2005.

Course Title: Occupational Health and Safety**Open Elective 1**

[As per Choice Based Credit System (CBCS) scheme]

SEMESTER:V

Subject Code	15CV564	IA Marks	20
Number of Lecture Hours/Week	03	Exam Marks	80
Total Number of Lecture Hours	40	Exam Hours	03
CREDITS – 03		Total Marks-100	

Course Objectives: This course will enable students to

1. Gain an historical, economic, and organizational perspective of occupational safety and health;
2. Investigate current occupational safety and health problems and solutions.
3. Identify the forces that influence occupational safety and health.
4. Demonstrate the knowledge and skills needed to identify workplace problems and safe work practice

Modules	Teaching Hours	Revised Bloom’s Taxonomy (RBT) Level
Module -1		
Occupational Hazard and Control Principles: Safety, History and development, National Safety Policy. Occupational safety and Health Act (OSHA), Occupational Health and Safety administration - Laws governing OSHA and right to know. Accident – causation, investigation, investigation plan, Methods of acquiring accident facts, Supervisory role in accident investigation	8 hours	L1,L2,L3
Module -2		
Ergonomics at Work Place: Ergonomics Task analysis, Preventing Ergonomic Hazards, Work space Envelops, Visual Ergonomics, Ergonomic Standards, Ergonomic Programs. Hazard cognition and Analysis , Human Error Analysis – Fault Tree Analysis – Emergency Response - Decision for action – purpose and	8 Hours	L2,L3,L4,L5

considerations		
Module -3		
Fire Prevention and Protection: Fire Triangle, Fire Development and its severity, Effect of Enclosures, early detection of Fire, Classification of fire and Fire Extinguishers. Electrical Safety, Product Safety: Technical Requirements of Product safety.	8 Hours	L2,L3,L4,L5
Module -4		
Health Considerations at Work Place: types of diseases and their spread, Health Emergency. Personal Protective Equipment (PPE) – types and advantages, effects of exposure and treatment for engineering industries, municipal solid waste. Environment management plans (EMP) for safety and sustainability	8 Hours	L2,L3,L4,L5
Module -5		
Occupational Health and Safety Considerations: Water and wastewater treatment plants, Handling of chemical and safety measures in water and wastewater treatment plants and labs, Construction material manufacturing industries like cement plants, RMC Plants, precast plants and construction sites. Policies, roles and responsibilities of workers, managers and supervisors	8 Hours	L3,L4,L5.L6
<p>Course Outcomes: After studying this course, students will be able to:</p> <ol style="list-style-type: none"> 1. Identify hazards in the workplace that pose a danger or threat to their safety or health, or that of others. 2. Control unsafe or unhealthy hazards and propose methods to eliminate the hazard. 3. Present a coherent analysis of a potential safety or health hazard both verbally and in writing, citing the occupational Health and Safety Regulations as well as supported legislation. 4. Discuss the role of health and safety in the workplace pertaining to the responsibilities of workers, managers, supervisors. 5. Identify the decisions required to maintain protection of the environment, workplace as well as personal health and safety. 		
<p>Program Objectives:</p> <ul style="list-style-type: none"> • Engineering knowledge • Problem analysis • Interpretation of data 		
<p>Question Paper Pattern:</p> <ul style="list-style-type: none"> • The question paper will have 5 modules comprising of ten questions. Each full question carrying 16 marks • There will be two full questions (with a maximum of three subdivisions, if necessary) from each module. • Each full question shall cover the topics as a module • The students shall answer five full questions, selecting one full question from each module. If more than one question is answered in modules, best answer will be considered for the award of marks limiting one full question answer in each module. 		
Text Books:		

1. Goetsch D.L., (1999), "Occupational Safety and Health for Technologists, Engineers and Managers", Prentice Hall.
2. Heinrich H.W., (2007), "Industrial Accident Prevention - A Scientific Approach", McGraw-Hill Book Company
3. National Safety Council and Associate (Data) Publishers Pvt. Ltd., (1991), "Industrial Safety and Pollution Control Handbook

Reference Books:

1. Colling D.A., (1990), "Industrial Safety Management and Technology", Prentice Hall, New Delhi.
2. Della D.E., and Giustina, (1996), "Safety and Environmental Management", Van Nostrand Reinhold International Thomson Publishing Inc.

Course Title: Geotechnical Engineering Lab			
[As per Choice Based Credit System (CBCS) scheme]			
SEMESTER: V			
Subject Code	15CVL57	IA Marks	20
Number of Lecture Hours/Week	03 (1hr tutorial + 2hr laboratory)	Exam Marks	80
Total Number of Lecture Hours	42	Exam Hours	03
CREDITS – 02		Total Marks-100	
<p>Course Objectives: Provide students with a basic understanding</p> <ul style="list-style-type: none"> • To carry out laboratory tests and to identify soil as per IS codal procedures • To perform laboratory tests to determine index properties of soil • To perform tests to determine shear strength and consolidation characteristics of soils 			
Modules		Teaching Hours	Revised Bloom's Taxonomy (RBT) Level
1. Visual soil classification. Water content determination by oven drying method and infrared moisture method. Specific gravity test (pycnometer and density bottle method).		6 Hours	L1, L2
2. Grain size analysis <ol style="list-style-type: none"> i. Sieve analysis ii. Hydrometer analysis 		3 Hours	L1, L2
3. In-situ density tests <ol style="list-style-type: none"> i. Core-cutter method ii. Sand replacement method 		3 Hours	L1, L2