CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Scheme of Teaching & Examination

M. Tech. (Industrial Safety Engineering)

III Semester

S. No.	Board of Study	Subject Code	Subject	Periods per Week			Scheme of Examination Theory / Practical			Total Marks	Credit L+(T+P)/ 2
				L	T	P	ESE	CT	TA		
1	Mechanical Engg.	586311(37)	Disaster Control & Emergency Planning	3	1	-	100	20	20	140	4
2	Mechanical Engg.	586312(37)	Corrosion Engineering	3	1	-	100	20	20	140	4
3	Mechanical Engg.	586321(37)	Preliminary work on Dissertation	-	-	28	100	-	100	200	14
4	Mechanical Engg.	586322(37)	Seminar on Industrial Training and Dissertation	-	-	03	-	-	20	20	2
Total				6	2	31	300	40	160	500	24

L- Lecture T- Tutorial
P- Practical , ESE- End Semester Exam
CT- Class Test TA- Teacher's Assessment

CHHATISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: M. Tech. - III **Branch: Mechanical Engg.**
Subject: Disaster Control & Emergency Planning **Code: 586311(37)**
Total Theory Periods: 40 **Total Tutorial Periods: 12**
Total Marks in End Semester Exam. : 100
Minimum number of Class Test to be conducted: 02

Unit-1

Environmental Hazards & Disasters.

a) Meaning of Environmental hazards, Environmental Disasters and Environmental stress.

b) Concept of Environmental Hazards, Environmental stress & Environmental Disasters.

c) Different approaches & relation with human Ecology

- Landscape Approach
- Ecosystem Approach
- Perception approach

d) Human ecology & its application in geographical researches.

Unit –2

a) Natural Hazards-Planetary Hazards/ Disasters, Extra Planetary Hazards/ disasters, Planetary Hazards-Endogenous Hazards, Exogenous Hazards, Volcanic Eruption, Earthquakes, Landslides, Cyclones, Lightning, Hailstorms Cyclones, Floods, Droughts, Cold waves, Heat waves

b) Man induced Hazards /Disasters:- Physical hazards/ Disasters-Soil Erosion, Chemical hazards/ disasters, Biological hazards/ disasters, Population Explosion

Unit -3

Emerging approaches in Disaster Management- Three Satges

1. Pre- disaster stage (preparedness):- Preparing hazard zonation maps, Predictability/ forcasting & warning, Preparing disaster preparedness plan, Land use zoning, Preparedness through (IEC) Information, education & Communication Pre-disaster stage (mitigation), Disaster resistant house construction, Population reduction in vulnerable areas, Awareness
2. Emergency Stage:- Rescue training for search & operation at national & regional level, Immediate relief, Assessment surveys
3. Post Disaster stage-Rehabilitation:- Political Administrative Aspect, Social Aspect, Economic Aspect, Environmental Aspect

Unit –4

Natural Disaster Reduction & Management

a) Provision of Immediate relief measures to disaster affected people

b) Prediction of Hazards & Disasters

c) Measures of adjustment to natural hazards

Unit-5

a. A regional survey of Land Subsidence, Coastal Disaster, Cyclonic Disaster & Disaster in Hills with particular reference to India

b. Ecological planning for sustainability & sustainable development in India-Sustainable rural development:A Remedy to Disasters Role of Panchayats in Disaster mitigations

c. Environmental policies & programmes in India- Institutions & National Centres for Natural Disaster reduction, Environmental Legislations in India, Awareness, Conservation Movement, Education & training

References

1. R.B.Singh (Ed) Environmental Geography, Heritage Publishers New Delhi,1990.
2. Savinder Singh Environmental Geography, Prayag Pustak Bhawan, 1997.
3. Kates,B.I & White, G.F The Environment as Hazards, oxford, New York, 1978.
4. R.B. Singh (Ed) Disaster Management, Rawat Publication, New Delhi, 2000.
5. H.K. Gupta (Ed) Disaster Management, Universiters Press, India, 2003.
6. R.B. Singh, Space Technology for Disaster Mitigation in India (INCED),University of Tokyo, 1994.
7. Dr. Satender , Disaster Management in Hills, Concept Publishing Co., New Delhi, 2003.

CHHATISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: M. Tech. - III **Branch: Mechanical Engg.**
Subject: Corrosion Engineering **Code: 586312(37)**
Total Theory Periods: 40 **Total Tutorial Periods: 12**
Total Marks in End Semester Exam. : 100
Minimum number of Class Test to be conducted: 02

Unit 1.
CORROSION PRINCIPLES:- Electrochemical and thermodynamic principles, electrode potential of metals, EMF and galvanic series, merits and demerits, Pourbaix diagram and its importance to iron, aluminium and magnesium metals, corrosion rate expressions. Exchange current density, polarization - concentration, activation and resistance, Tafel equation, passivity, electrochemical behaviour of active-passive metals, factors governing metals exhibiting passivity, mixed potential theory and its application.

Unit 2.
FORMS OF CORROSION :- Atmospheric, galvanic, crevice, pitting, stress corrosion cracking, intergranular corrosion, corrosion fatigue, hydrogen damage, cavitation, fretting corrosion and high temperature oxidation-description, causes and remedial measures.

Unit 3.
CORROSION TESTING:- Purpose of testing, laboratory, semi-plant and field tests, susceptibility tests of IGC, stress corrosion cracking and pitting, sequential procedure for laboratory and on site corrosion investigations, ASTM standards for corrosion testing; polarization methods to measure corrosion rate.

Unit 4.
CORROSION PREVENTION :- Corrosion prevention by design improvements, anodic and cathodic protection, metallic, non-metallic and inorganic coatings, mechanical and chemical methods and various corrosion inhibitors

Unit 5.
CORROSION IN INDUSTRIES :- Corrosion in fossil fuel power plants, automotive industry, chemical processing industries, corrosion in petroleum production operations and refining, corrosion of pipelines.

TEXT BOOKS

1. Denny A. Jones, “Principles and Prevention of Corrosion”, 2nd edition, Prentice Hall, USA, 1996.
2. Fontana, M.G., Greene, N.D., “Corrosion Engineering”, 2nd edition, McGraw-Hill, USA, 1983

REFERENCES

1. Raj Narayan, “An Introduction to Metallic Corrosion and its Prevention”, 1st edition, Oxford & IBH, New Delhi, 1983

2. ASM Metals Handbook, Vol. 13, “Corrosion”, Metals Park, Ohio, USA, 1994.

3. Uhlig Hebert H, “Corrosion and Corrosion Control”, 2nd edition, John Wiley, USA 1971.