30.11.2008

Department of Environmental Science and Engineering
Indian School of Mines University, Dhanbad

II Semester M.Tech (Mineral Engineering and Bio-informatics)
Session 2008-2009; Winter Semester

Lecture plan

ES E521 06 Pollution Control and Waste Management		3-0-0
1.	Solid wastes: Characteristics, methods of stock-pilling, safety hazards, problems and control.	4
2.	Solid and liquid wastes in mineral industry, impact on environmental pollution, problems of disposal	3
3.	Refuse disposal area: design and construction of tailing ponds: stability, vegetation management of radioactive tailings	5
4.	Processing and utilization of tailings and rejects	4
5.	Effluent characterization and treatment.	4
6.	Preparation plant water quality, characterization of water contaminants from preparation plants.	5
7.	Effects of water quality on unit operations.	4
8.	Quality of effluent and methods of waste water treatment.	3
	Total	**32**

Dr.M.K.Ghose

30.11.2008

Department of Environmental Science and Engineering
Indian School of Mines University, Dhanbad
II Semester M.Tech (Env. Sc. & Engineering)
Session 2008-2009 ; Winter Semester

Lecture plan

ES C521 03: Solid & Hazardous Waste Management & Land Reclamation [3-1-2]

1,	Municipal Solid Waste Management - Engineering principles, sources, nature and characteristics; quantitative and qualitative aspects;	2
2.	Solid waste problems: Industrial, mining, agricultural and domestic (urban) wastes	2
3.	Hydraulic aspects of solid waste management	2
4.	Regulatory aspects of solid wastes management	2
5.	Solid waste disposal: Sanitary land filling, site selection, design and Operation, equipment, cost, pollution problems, dump closure	4
6.	Aerobic land fill stabilization, biological oxidation, composting, optimum conditions for composting	3.
7.	Pyrolysis; Incineration: waste characterization, combustion calculation, unit operations, supply of air, products of combustion, furnace temperature, furnace calculation. storage of refuse, waste reduction and environmental control.	2
8.	Industry specific solid waste management: Agriculture, Process inc Mineral and Metallurgical industry, Disposal of industrial and mill ta Resource and energy recovery; Recycling of solid waste	2
9.	Biomedical waste categorization, generation, collection, transport, treatment and disposal.	2
10.	Hazardous waste – landmark episodes, classification, generation. Guidelines for HWM. Regulatory framework in the USA, EU and India, Basal Convention and other international statistics. Treatment and disposal; remediation of contaminated sites.	3
	Total	24

P. T. O.

Suggested books

1. Quarry Reclamation--N.J.Coppin and A.D.Bradsaw, Mining Journal Limited Books, London

2. Hand Book Solid Waste Management—Kreith , F. McGraw Hill

3. Surface Mining Environmental Monitoring and Reclamation Handbook—L.V.A. Sendelien , H.Yazcigil and C.L.Carison, Elsivier o

4. Solid Wastes : Originn, Collection , Processing and Disposal—C.L. Mante, John –Willey and Sons.

5. Solid Wastes: Engineering Principles and Management Issues—G. Tchobanoglous, H.Thiesen and Eliassen, McGra Hill

6. Environmental Engineering—H.S.Peavy, D.R.Rowe and G. Tchobanoglous

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Department of Environmental Science and Engineering
Indian School of Mines University, Dhanbad
II Semester M.Tech. (ESE)

Session 2008-2009 Winter Semester

ES C522 02: Solid and Hazardous Waste Management & Land Reclamation (Practical) (0-0-2)

1. Sample preparation; sampling techniques; conning and quartering --2 Method; overburden and other wastes sampling.

2. Profile sampling. site description; estimation of rooting depth and --2 litter-fall. Determination of coarse fraction,;

3. pH & buffered pH, KCl & $CaCl_2$ solution, EC determination --2

4 Exchangeable Na & K; non-exchangeable K & HNO_3-soluble -K. --2 ESP and SAR. unrealisable -N and total nitrogen in profile samples.

5 CEC Determination of organic matter and organic carbon C:N ratio;--2

6. Determination of plant available P and total P; Determination of ---2 P-fixing characteristics of OB samples; in OB samples of different depth and Observe any variation with respect to depths.

7. DTPA -extractable micronutrients and trace elements in OB samples--2

8. Determination of Microbial activity by CO_2 evolution method in—2 the laboratory

Total--16

Examination: 1st Semester M.Tech. (Env. Sc.& Engg), **Session.** : 2008-2009
Semester: Monsoon **Time: 3 hours**

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Department of Environmental Science and Engineering
Indian School of Mines University, Dhanbad

VI Semester B.Tech (Env. Sc. & Engineering)
Session 2008-2009; Winter Semester

Lecture plan

ESC 161 02: Air Pollution Control **[3-1-0]**

1.	Review of general principles of air pollution control	3
2	Design of Stack., Design of Hood and Duct.	2
3.	Control of particulate matter : Design and operation of Cyclones	2
4.	Design and operation of Wet Scrubbers	3
5.	Dust control and abatement measures– dust suppression, dust extraction and dust consolidation.	3
6.	Design of control devices for gaseous pollutants with special emphasis on adsorption, absorption, mass transfer, condensation and combustion	2
7.	Control of motor vehicle emissions. Indoor air pollution control. Economics of pollution control.	3
	Total	18

Suggested books

1. Environmental chemistry---S.E.Manahan
2. Air pollution---H.C.Perkins
3. Environmental pollution control engineering---C.S.Rao
4. Fundamentals of air pollution---A.C.Stern
5. The design of air quality monitoring net work--- R.E.Munn
6. Fundamentals of air pollution engineering---R.A.C Flagan &J.H.Sniffed.

Dr.M.K.Ghose

30.11.2008

Department of Environmental Science and Engineering
Indian School of Mines University, Dhanbad

VI Semester BTech (Env. Sc. & Engineering)
Session 2008-2009 ; Winter Semester

Lecture plan

	ES C 161 03 Solid waste management	3-1--2
1,	Municipal Solid Waste Management - Engineering principles, sources, n and characteristics; quantitative and qualitative aspects;	4
2.	Solid waste problems: Industrial, mining, agricultural and domestic (urban) wastes	4
3.	Hydraulic aspects of solid waste management	2
4.	Regulatory aspects of solid wastes management	2
5.	Solid waste disposal: Sanitary land filling, site selection, design and Operation, equipment, cost, pollution problems, dump closure	4
6.	Aerobic land fill stabilization, biological oxidation, composting, optimum conditions for composting	3.
7.	Pyrolysis; Incineration: waste characterization, combustion calculation, unit operations, supply of air, products of combustion, furnace temperature, furnace calculation, storage of refuse, waste reduction and environmental control.	4
8.	Industry specific solid waste management: Agriculture, Process industry, Mineral and Metallurgical industry, Disposal of industrial and mill tailings, Resource and energy recovery; Recycling of solid waste	7
	Total	**30**

P. T. O.

Suggested books

1. Quarry Reclamation--N.J.Coppin and A.D.Bradsaw, Mining Journal L Books, London

2. Hand Book Solid Waste Management—Kreith , F. McGraw Hill

3. Surface Mining Environmental Monitoring and Reclamation Handbook—I Sendelien , H.Yazcigil and C.L.Carison, Elsivier o

4. Solid Wastes : Originn, Collection , Processing and Disposal—C.L. Mante, Willey and Sons.

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Department of Environmental Science and Engineering
Indian School of MinesUniversity, Dhanbad
VI Semester B.Tech. (Solid Waste Management)

Session 2008-2009 Winter Semester

ESC 162 03: Solid Waste Management (Practical) **[0-0-2]**

1.	Sample preparation; sampling techniques; conning and quartering Method; overburden and other wastes sampling.	2
2.	Profile sampling, site description; estimation of rooting depth and litter-fall. Determination of coarse fraction,;	2
3.	pH & buffered pH, KCl & $CaCl_2$ solution, EC determination	2
4	Exchangeable Na & K; non-exchangeable K & HNO_3-soluble -K. ESP and SAR, unrealisable -N and total nitrogen in profile samples.	2
5	CEC Determination of organic matter and organic carbon C:N ratio;	2
6.	Determination of plant available P and total P; Determination of P-fixing characteristics of OB samples; in OB samples of different depth and Observe any variation with respect to depths.	2
7.	DTPA -extractable micronutrients and trace elements in OB samples	2
8.	Determination of Microbial activity by CO_2 evolution method in laboratory	2

Total-16

30.12.2008

Department of Environmental Science and Engineering
Indian School of Mines University, Dhanbad
II Semester B.Tech. (Common)

Session 2008-2009 Winter Semester

Lecture plan

	Global energy scenario and energy security of India	3-0-0
1.	Definition of energy, primary and secondary energy; difference Between power and electricity	2
2.	Renewable and non-renewable sources of energy; The concept and significance of renewability	2
3.	Social, economic, political and environmental dimensions of energy Natural gas hydrates, hydrogen energy	2
4.	Major types of energy at the at the global and national level Indian energy perspective, strategies for meeting the coal demand in Environmentally sustainable manner,	3
5.	Technological solutions for environment friendly coal mining Mine technology, Underground coal gasification, coal bed methane	3
	Total	**12**

Reference Books :

7. Non-Conventional Energy Sources, G.D. Rai
8. A Textbook of Power Plant Engineering, R.K. Rajpur
9. World Coal Institute Website.
10. Uranium Information Center Website.
11. World Energy Council Website.
12. Integrated Energy Policy, GOI.