

AC 14/7/2016, Item No. 4.64

UNIVERSITY OF MUMBAI



Bachelor of Engineering

First Year Engineering (Semester I & II), Revised course (REV-2016)from Academic Year 2061 -17,(Common for All Branches of Engineering)

**(As per Choice Based Credit and Grading System
with effect from the A. Y. 2016 - 17)**

From Co-ordinator's Desk:-

To meet the challenge of ensuring excellence in engineering education, the issue of quality needs to be addressed, debated taken forward in a systematic manner. Accreditation is the principal means of quality assurance in higher education. The major emphasis of accreditation process is to measure the outcomes of the program that is being accredited. In line with this Faculty of Technology of University of Mumbai has taken a lead in incorporating philosophy of outcome based education in the process of curriculum development.

Faculty of Technology, University of Mumbai, in one of its meeting unanimously resolved that, each Board of Studies shall prepare some Program Educational Objectives (PEO's) give freedom to affiliated Institutes to add few (PEO's) course objectives course outcomes to be clearly defined for each course, so that all faculty members in affiliated institutes understand the depth approach of course to be taught, which will enhance learner's learning process. It was also resolved that, maximum senior faculty from colleges experts from industry to be involved while revising the curriculum. I am happy to state that, each Board of studies has adhered to the resolutions passed by Faculty of Technology, developed curriculum accordingly. In addition to outcome based education, **Choice Based Credit and Grading System** is also introduced to ensure quality of engineering education.

Choice Based Credit and Grading System enables a much-required shift in focus from teacher-centric to learner-centric education since the workload estimated is based on the investment of time in learning not in teaching. It also focuses on continuous evaluation which will enhance the quality of education. University of Mumbai has taken a lead in implementing the system through its affiliated Institutes Faculty of Technology has devised a transparent credit assignment policy adopted ten points scale to grade learner's performance. Credit grading based system was implemented for First Year of Engineering from the academic year 2016-2017. Subsequently this system will be carried forward for Second Year Engineering in the academic year 2017-2018, for Third Year Final Year Engineering in the academic years 2018-2019, 2019-2020, respectively.

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**First Year Engineering (Semester I & II), Revised course from Academic Year 2016 -17,
(REV- 2016) (Common for all Branches of Engineering)**

Scheme for FE - Semester – I

Sub. Code	Subject Name	Examination Scheme							Total	
		Theory Marks				End sem. exam	Term Work	Pract .		Oral
		Internal Assessment								
		Test 1	Test 2	Average of Test 1 & Test 2						
FEC101	Applied Mathematics-I	20	20	20	80	25	-	-	125	
FEC102	Applied Physics-I	15	15	15	60	25	-	-	100	
FEC103	Applied Chemistry –I	15	15	15	60	25	-	-	100	
FEC104	Engineering Mechanics	20	20	20	80	25	-	25	150	
FEC105	Basic Electrical Engineering	20	20	20	80	25	-	25	150	
FEC106	Environmental studies	15	15	15	60	-	-	-	75	
FEL101	Basic Workshop Practice-I	-	-	-	-	50	-	-	50	
				105	420	175		50	750	

Sub Code	Subject Name	Teaching Scheme			Credits Assigned			
		Theory	Pract.	Tut.	Theory	TW/Pract	Tut.	Total
FEC101	Applied Mathematics-I	04	-	01	04		01	05
FEC102	Applied Physics-I	03	01	-	03	0.5	-	3.5
FEC103	Applied Chemistry -I	03	01	-	03	0.5	-	3.5
FEC104	Engineering Mechanics	05	02	-	05	01	-	06
FEC105	Basic Electrical Engineering	04	02	-	04	01	-	05
FEC106	Environmental studies	02	-	-	02	-	-	02
FEL101	Basic Workshop Practice-I	-	04	-	-	02	-	02
		21	10	01	21	05	01	27

Sub Code	Subject Name	Teaching Scheme			Credits Assigned			
		Theory	Pract.	Tut.	Theory	TW/Pract.	Tut.	Total
FEC106	Environmental Studies	02	-	-	02	-	-	02

Sub Code	Subject Name	Examination Scheme							Total
		Theory (out of 75)				Term Work	Pract.	Oral	
		Internal Assessment (out of 15)			End Sem. exam (out of 60)				
		Test 1	Test 2	Average of Test 1 and Test 2					
FEC106	Environmental Studies	15	15	15	60	-	-	-	75

Details of the Syllabus:-

Sr. No.	Details	Hrs
Module 1	<p>Overview of Environmental Aspects:</p> <ul style="list-style-type: none"> • Definition, Scope and Importance of Environmental Study • Need for Public awareness of environmental education • Introduction to depletion of natural resources: Soil, Water, Minerals and Forests. • Global crisis related to – Population, water, sanitation & Land. <p>Ecosystem:</p> <ul style="list-style-type: none"> • Study of ecosystems: Forest, desert and aquatic (in brief). • Energy flow in Ecosystem, overview of Food Chain, Food Web and Ecological Pyramid. • Concept of ecological succession and its impact on human beings (in brief). <p>Case Study on Chipko Movement (Uttarakhand, India), (began in 1973).</p>	4
Module 2	<p>Aspects of Sustainable Development:</p> <ul style="list-style-type: none"> • Concept and Definition of Sustainable Development. • Social, Economical and Environmental aspects of sustainable development. • Control measures: 3R (Reuse, Recovery, Recycle), • Resource utilization as per the carrying capacity (in brief). <p>Case Study on Narmada Bachao Andolan (Gujarat, India, in the mid and late 1980s).</p>	2
Module 3	<p>Types of Pollution:</p> <ul style="list-style-type: none"> • Water pollution: Sources of water pollution and Treatment of Domestic and industrial waste water (with flow-diagram of the treatment), • Land Pollution: Solid waste, Solid waste management by land filling, 	8

	<p>composting and incineration</p> <ul style="list-style-type: none"> • Air pollution: Sources of air pollution, Consequences of air pollution :- Greenhouse effect (Explanation with schematic diagram), Photochemical Smog (Explanation with chemical reaction). Cleaning of gaseous effluents to reduce air contaminants namely dust particle or particulate matters by using:- (i) Electrostatic precipitators (ii) Venturi scrubber (Schematic diagram and working). • Noise pollution: Sources, effects, threshold limit for different areas and control methods. • E-Pollution: Definition, Sources and effects. • Nuclear pollution: Sources and effects. <p>Case study on Water Pollution of Ganga River. Case study on London smog (U. K.)(December, 1952). Case Study of Fukushima Disaster (March, 2011).</p>	
Module 4	<p>Pollution Control Legislation:</p> <ul style="list-style-type: none"> • Functions and powers of Central and State Pollution Control Board. • Environmental Clearance, Consent and Authorization Mechanism. <p>Case Study of Dombivali MIDC- Boiler Blast Tragedy (Thane, Maharashtra, India), (May, 2016).</p>	3
Module 5	<p>Renewable Sources of Energy:</p> <ul style="list-style-type: none"> • Importance of renewable sources of energy. • Principle and working with schematic diagram of :- (i) Solar Energy: (a) Flat plate collector and (b) Photovoltaic cell. (ii) Wind Energy: Wind Turbines. (iii) Hydropower: Hydropower generation from water reservoir of the dam. (iv) Geothermal Energy: Utilisation of underground sources of steam for power generation. 	4
Module 6	<p>Technological Advances to overcome Environmental problems:</p> <ul style="list-style-type: none"> • Concept of Green Buildings, • Various indoor air pollutants and their effects on health. • Carbon Credit: Introduction and general concept. • Disaster Management: Techniques of Disaster Management to cope up with (i) Earthquake and (ii) Flood. <p>Case Study on Earthquake in Latur (Maharashtra, India), (September,1993). Case Study on Cloudburst and Landslides at Kedarnath (Uttarakhand, India), (June, 2013).</p>	5

Tests 1 & 2

1. Each test will be of 15 marks.
2. At least one question will be based on case study. Candidate is expected to explain the salient features of the incident and suggest preventive measures.

Theory Examination:

1. Question paper will comprise of total 6 questions, each of 15 marks.
2. Total four questions need to be solved.
3. Question Number One will be compulsory and it will be based on entire syllabus wherein sub-questions of 2 to 3 marks will be asked.
4. Remaining questions i.e. Q.2 to Q.6 will be mixed in nature and will be divided in three parts (a), (b) & (c) and they will belong to different modules.
5. In question paper, weight of each module will be proportional to number of respective lecture hours as mentioned in the syllabus.

Recommended Books:

1. Environmental Studies by Benny Joseph, TataMcGraw Hill.
2. Environmental Studies by R.Rajagopalan, Oxford University Press.
3. Environmental Studies by. AnanditaBasak, Pearson Education.
4. Essentials of Environmental Studies by Kurian Joseph &Nagendran, Pearson Education.
5. Fundamentals of Environmental Studies by Varadbal G. Mhatre, Himalaya Publication House.
6. Perspective of Environmental Studies, by Kaushik and Kaushik,New Age International.
7. Renewable Energy by Godfrey Boyle, Oxford Publications.
8. Textbook of Environmental Studies by Dave and Katewa, Cengage Learning.
9. Textbook of Environmental studies by ErachBharucha, University Press.
10. Environmental pollution control engineering by C.S. Rao, New Age International (P) Limited Publishers.