

Savitribai Phule Pune University
Faculty of Science & Technology



Curriculum
For
First Year
Bachelor of Engineering
(Choice Based Credit System)
(2019 Course)
(With Effect from Academic Year 2019-20)

TABLE -1 First Engineering _Structure for Semester-I

Course Code	Course Name	Teaching Scheme (Hours/Week)			Examination Scheme and Marks						Credits			
		Theory	Practical	Tutorial	ISE	ESE	TW	PR	OR	Total	TH	PR	TUT	Total
107001	Engineering Mathematics-I	03	--	01	30	70	25	--	--	125	03	--	01	04
107002/ 107009	Engineering Physics / Engineering Chemistry	04	02	--	30	70	--	25	--	125	04	01	--	05
102003	Systems in Mechanical Engineering	03	02	--	30	70	--	25	--	125	03	01	--	04
103004 / 104010	Basic Electrical Engineering / Basic Electronics Engineering	03	02	--	30	70	--	25	--	125	03	01	--	04
110005/ 101011	Programming and Problem Solving / Engineering Mechanics	03	02	--	30	70	--	25	--	125	03	01	--	04
111006	Workshop [@]	--	02	--	--	--	--	25	--	25	--	01	--	01
Total		16	10	01	150	350	25	125	--	650	16	05	01	22

101007	Audit Course 1^{&}	02	Environmental Studies-I											
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Induction Program : 2 weeks at the beginning of semester-I and 1 week at the beginning of semester-II

TABLE -2 First Engineering_ Structure for Semester-II

Course Code	Course Name	Teaching Scheme (Hours/Week)			Examination Scheme and Marks						Credits			
		Theory	Practical	Tutorial	ISE	ESE	TW	PR	OR	Total	TH	PR	TUT	Total
107008	Engineering Mathematics-II	04	--	01	30	70	25	--	--	125	04	--	01	05
107002/ 107009	Engineering Physics/ Engineering Chemistry	04	02	--	30	70	--	25	--	125	04	01	--	05
103004 / 104010	Basic Electrical Engineering / Basic Electronics Engineering	03	02	--	30	70	--	25	--	125	03	01	--	04
110005/ 101011	Programming and Problem Solving / Engineering Mechanics	03	02	--	30	70	--	25	--	125	03	01	--	04
102012	Engineering Graphics ^Ω	01	02	01	--	50	25		--	75	01	01		02
110013	Project Based Learning [§]	--	04	--	--	--	25	50	--	75	--	02	--	02
Total		15	12	02	120	330	75	125	--	650	15	05	02	22

101014	Audit Course 2^{&}	02	Environmental Studies-II											
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107015		--	Physical Education-Exercise and Field Activities											
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4.	Demonstration of Drilling machine Demonstration on construction of Radial drilling machine, Tool holding devices, Concept of speed, feed and depth of cut.
5.	Demonstration on Milling machine Demonstration on construction, table movements, indexing and tooling of milling machine.
6.	Demonstration of Shaper/Grinding machine (Any one) Shaper: Crank and slotted link mechanism, Work feed mechanism Grinding: Surface grinder/Cylindrical grinding machine, Mounting of grinding wheel
7.	Term work includes one job of Carpentry Introduction to wood working, kinds of woods, hand tools & machines, Types of joints, wood turning, Pattern making, types of patterns and its allowances.
8.	Term work to include one job involving fitting to size, male-female fitting with drilling and tapping operation on Mild Steel plate; Introduction to marking, cutting and sawing, sizing of metal, shearing, Concept of fits and interchangeability, selection of datum and measurements.
9.	Term work to include one utility job preferably using sheet metal (e.g. Tray, Funnel etc.) with riveting/welding/brazing/soldering (at least one temporary and one Permanent joint either using resistance welding/Arc welding); Introduction to sheet metal operations: punching, blanking, bending, drawing.
10.	Prepare a Layout of Workshop To prepare a work shop layout.
11.	Collection of information about safety norms in any one of the following type of industry: Metalworking/Chemical/Cement/Pharmaceuticals/Defense/Atomic energy/Aerospace /Marine/Construction/Railway etc.

Reference/Text Books

1. John, K. C., (2010), "Mechanical Workshop Practice, Prentice Hall Publication, New Delhi
2. Hazra and Chaudhary, Workshop Technology-I & II, Media promoters & Publisher Pvt. Ltd.

TH:02 Hrs./week ✓ 101007: Environmental Studies-I
(Mandatory Non-Credit Course)

Course Objectives:

1. To explain the concepts and strategies related to sustainable development and various components of environment.
2. To examine biotic and abiotic factors within an ecosystem, to identify food chains, webs, as well as energy flow and relationships.
3. To identify and analyze various conservation methods and their effectiveness in relation to renewable and nonrenewable natural resources.
4. To gain an understanding of the value of biodiversity and current efforts to conserve biodiversity on national and local scale.

Course Outcomes: On completion of the course, learner will be able to-

- CO1: Demonstrate an integrative approach to environmental issues with a focus on sustainability.
 CO2: Explain and identify the role of the organism in energy transfers in different ecosystems.
 CO3: Distinguish between and provide examples of renewable and nonrenewable resources & analyze personal consumption of resources.
 CO4: Identify key threats to biodiversity and develop appropriate policy options for conserving biodiversity in different settings.

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Unit I Introduction to environmental studies (02 Hrs)
 Multidisciplinary nature of environmental studies; components of environment – atmosphere, hydrosphere, lithosphere and biosphere. Scope and importance; Concept of sustainability and sustainable development.

Unit II Ecosystems (06 Hrs)
 What is an ecosystem? Structure and function of ecosystem; Energy flow in an ecosystem: food chain, food web and ecological succession. Case studies of the following ecosystems:
 a) Forest ecosystem
 b) Grassland ecosystem
 c) Desert ecosystem
 d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Unit III Natural Resources: Renewable and Non-renewable Resources (08 Hrs)
 Land Resources and land use change; Land degradation, soil erosion and desertification. Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations.
 Water: Use and over-exploitation of surface and ground water, floods droughts, conflicts over water (international & inter-state).
 Heating of earth and circulation of air; air mass formation and precipitation.
 Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs, case studies.

Unit IV Biodiversity and Conservation (08 Hrs)
 Levels of biological diversity: genetic, species and ecosystem diversity; Biogeography zones of India; Biodiversity patterns and global biodiversity hot spots. India as a mega-biodiversity nation; Endangered and endemic species of India. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; Conservation of biodiversity; In-situ and Ex-situ conservation of biodiversity. Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.

Suggested Readings:

1. Carson, R. 2002. Silent spring. Houghton Mifflin Harcourt.
2. Gadgil, M., & Guha, R.1993. This Fissured Land: An Ecological History of India. Univ. of California Press.
3. Gleeson, B. and Low, N. (eds.) 1999. Global Ethics and Environment, London, Routledge.
4. Gleick, P.H. 1993. Water in Crisis. Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute, Oxford Univ. Press.
5. Groom, Martha J. Gary K. Meffe, and Carl Ronald carroll. Principals of Conservation Biology. Sunderland: Sinauer Associates, 2006.
6. Grumbine, R. Edward, and Pandit, M.K. 2013. Threats from India's Himalaya dams. Science, 339:36-37.
7. McCully, P.1996. Rivers no more: the environmental effects of dams (pp.29-64). Zed Books.
8. McNeil, John R. 2000. Something New Under the Sun: An Environmental History of the Twentieth Century.

107008 – Engineering Mathematics – II

Teaching Scheme: TH : 4 Hrs./Week TUT : 1 Hr./Week	Credits 05	Examination Scheme: In-Semester : 30 Marks End-Semester : 70 Marks TW : 25 Marks
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Prerequisites:
 Integration, Differential Equation, Three-dimensional coordinate systems



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Evaluation and Continuous Assessment:

It is recommended that the all activities are to be record and regularly, regular assessment of work to be done and proper documents are to be maintained at college end by both students as well as mentor (you may call it PBL work book).

Continuous Assessment Sheet (CAS) is to be maintained by all mentors/department and institutes.

Recommended parameters for assessment, evaluation and weightage:

- Idea Inception (5%)
- Outcomes of PBL/ Problem Solving Skills/ Solution provided/ Final product (50%) (Individual assessment and team assessment)
- Documentation (Gathering requirements, design & modeling, implementation/execution, use of technology and final report, other documents) (25%)
- Demonstration (Presentation, User Interface, Usability etc) (10%)
- Contest Participation/ publication (5%)
- Awareness /Consideration of -Environment/ Social /Ethics/ Safety measures/Legal aspects (5%)

PBL workbook will serve the purpose and facilitate the job of students, mentor and project coordinator. This workbook will reflect accountability, punctuality, technical writing ability and work flow of the work undertaken.

References:

- Project-Based Learning, Edutopia, March 14, 2016.
- What is PBL? Buck Institute for Education.
- www.schoolology.com
- www.wikipedia.org
- www.howstuffworks.com

TH: 02 Hr/week ✓ **101014: Environmental Studies-II**
Mandatory Non-Credit Course

Course Objectives:

1. To provide a comprehensive overview of environmental pollution and the science and technology associated with the monitoring and control.
2. To understand the evolution of environmental policies and laws.
3. To explain the concepts behind the interrelations between environment and the development.
4. To examine a range of environmental issues in the field, and relate these to scientific theory.

Course Outcomes: On completion of the course, learner will be able to—

CO1: Have an understanding of environmental pollution and the science behind those problems and potential solutions.

CO2: Have knowledge of various acts and laws and will be able to identify the industries that are violating these rules.

CO3: Assess the impact of ever increasing human population on the biosphere: social, economic issues and role of humans in conservation of natural resources.

CO4: Learn skills required to research and analyze environmental issues scientifically and learn how to use those skills in applied situations such as careers that may involve environmental problems and/or issues.

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Unit V	Environmental Pollution	(08 Hrs)
Environmental pollution : types, causes, effects and controls; Air, water, soil, chemical and noise pollution		
Nuclear hazards and human health risks		
Solid waste management: Control measures of urban and industrial waste		



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