

BS-MS Major in Physics

Semester VI						
Sr No	Course Code	Course Name	L	T	P	C
1	CE 301	Environmental studies	3	0	0	6
2		Program Elective-II	2	1	0	6
3		Institute Elective – 1	2	1	0	6
4		Institute Elective – 2 / Minor Project-I	0	0	6	6
5	PH 311	Environmental studies	0	0	3	3
6	EE 212	Devices and circuit Lab	0	0	3	3
		Total Credits				30

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1	Title of the course (L-T-P-C)	Environmental studies (3-0-0-6)
2	Pre-requisite courses(s)	Nil
3	Course content	<p>Module A: Natural Resources, Ecosystems, Biodiversity and its conservation: Natural resources and ecosystems, Forest, grassland, desert and aquatic ecosystems, biodiversity at global, national and local levels, conservation of biodiversity</p> <p>Module B: Air Pollution Introduction to understanding air quality management, fundamental processes of meteorology, Air Pollutants – Gaseous and particulate, Criteria for pollutants, ambient and source standards, Aerosols: Characterisation of aerosols, size distributions, measurement methods; Transport behaviour: diffusion, sedimentation, inertia; Visibility; principles of particulate control systems.</p> <p>Module C: Water Treatment Discussion of water quality constituents and introduction to the design and operation of water and wastewater treatment processes.</p> <p>Module D: Solid Waste Management and Climate Change Different aspects of solid and hazardous waste management. Climate change and greenhouse gas emissions, technologies would reduce the greenhouse gas emissions. Climate change and its possible causes.</p> <p>Module E: Sociology/Environmentalism Description: Environmentalism in sociological tradition, Sustainability, North-South divide, Political economy approaches in environmental studies, Debates over environmental issues.</p> <p>Module F: Economics Energy economics and financial markets, Market dynamics, Energy derivatives, Energy Efficiency; Sustainable Development: Concept, Measurement & Strategies, Interaction between Economic Development and the Environment</p> <p>Module G: Philosophy Environmental ethics, Deep ecology, Practical ecology, Religion and attitude towards environmental ethics, Ecofeminism and its evolution.</p> <p>Module H: Field work and project: visit to a local area to document environmental assets, case studies of a simple ecosystem and group discussions on current environmental issues.</p>

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4	Texts/References	<ol style="list-style-type: none">1. Cunningham W.P. and Cunningham M.A. (2002), Principles of Environmental Science, Tata McGraw-Hill Publishing Company, New Delhi2. Dasgupta, P. and Maler, G. (eds.), (1997), The Environment and Emerging Development Issues, Vol. I, Oxford University Press, New Delhi.3. Jackson, A.R.W. and Jackson, J.M. (1996), Environmental Sciences: The Environment and Human Impact, Longman Publishers.4. Nathanson, J.A., (2002), Basic Environmental Technology, Prentice Hall of India, New Delhi.5. Redclift, M. and Woodgate, G. (eds.), (1997), International Handbook of Environmental Sociology.6. Srivastava, K.P. (2002), An Introduction to Environmental Study, Kalyani Publishers, Ludhiana.7. Review articles from literature
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1	Title of the course (L-T-P-C)	Devices and circuits Lab (0-0-3-3)
2	Pre-requisite courses(s)	--
3	Course content	<p>This lab will reinforce concepts thought in Electronic devices and analog circuits. It will have experiments on Device characterization and circuits design and characterization. The following is the tentative list of experiments for this lab:</p> <ol style="list-style-type: none"> 1. LED and Photodiode characterization 2. BJT biasing and CE amplifier 3. Solar cell characterization 4. Diode Temperature characteristics 5. NMOS characterization and CS amplifier 6. MOS differential amplifier 7. basic opamp circuits 8. Active filters 9. Multivibrators 10. Audio amplifiers
4	Texts/References	<ol style="list-style-type: none"> 1. J.V.Wait, L.P.Huelsman and GA Korn, Introduction to Operational Amplifier theory and applications, 2nd edition, McGraw Hill, New York, 1992. 2. J. Millman and A. Grabel, Microelectronics, 2nd edition, McGraw Hill, 1988. 3. Behzad Razavi, Fundamentals of microelectronics, Wiley Publications 4. A.S.Sedra and K.C. Smith, Microelectronic Circuits, Saunder's College Publishing, Edition IV, 2017. 5. Ramakant Gayakwad, Op-amps and Linear Integrated Circuit, 4th edition, Pearson, 2000.