RK.UNIVERSITY

SYLLABUS

Course Title	**Environmental Sciences**
Course Code	ES111
Course Credit	Lecture :03
	Practical :00
	Tutorial :00
	Total :03

Course Learning Outcomes :

After Successful completion of the above course, students will be able to:

- **Understand** the importance of environment.
- **Analyze** the importance of environment in engineering.
- **Apply** their own ideas and **demonstrate** advanced technologies that will be useful to protect environment.
- **Employ** awareness among the society about environmental problems and natural disasters.
- **Practice** according to the present and future environmental issues

Detailed Syllabus

Sr. No.	Name of chapter & Details	Hours Allotte
	Section – I	
1	**Introduction of Environment** Definition of environment, Importance and Requirement of environmental education in engineering, Component of environment, Technology, clean technology, effect of technology on environment.	**2**
2	**Water pollution** Sources of water, Type of impurities found in waste water, Different method to remove the impurities, Water treatment plant, Water quality standard by WHO, Eutrphication.	**5**
3	**Air pollution** Composition of air, Structure of atmosphere, Sources of air pollution, Technology used in control of air pollution, Prevention for air pollution, Air quality standard comparison with Euro. standard.	**6**
4	**Land pollution** Structure of lithosphere, Type of solid waste, Step to control land pollution, Landfill and incineration method to control land pollution.	**5**
5	**Noise pollution** Introduction of sound and noise, Sources of noise pollution, Effect of noise pollution, Control of noise pollution, Noise pressure and noise level (at fetal).	**2**

6	**Industrial pollutions and its controls:** Pollution due to different industrial sectors, inclusive of thermal power plants, its causes, prevention and remedial measure, Bag filter electrostatic precipators and scrubbers for air pollution control, common effluent treatment plant (CETP), for industrial effluent hazardous waste disposal-TSDF and incineration.	**3**
	Total Hours	
	Section – II	
7	**Global environmental problem** Global warming.(mechanism, effect, control), Acid rain.(mechanism, effect, control), Ozone layer depletion. (mechanism, effect, control).	**4**
8	**Ecological aspects of environment** Introduction.(Ecology, Ecosystem), Component and structure of Ecosystem, Food chain and food web,Bio-diversity and Bio-diversity index, Bio-geo-chemical cycle, Ecological pyramid.	**6**
9	**Human population dynamic** Definition of population and population growth, Exponential population growth, Logistic population growth, Demographic projection of human population. Different method to find out population growth.	**4**
10	**Fundamental of seismic engineering** Basic terminology related earthquake,Earthquake, Focus, Epicenter, Seismology, Seismogram, seismograph, Earthquake zone in Gujarat., Type of earthquake wave. P-wave, S-wave ,L-wave Magnitude of earthquake, Richter scale, What to DO and not to DO during earthquake.	**7**
	Total Hours	

Instructional Method and Pedagogy:

- Delivery of lectures using multi-media projectors.
- Individual interaction with students.

Reference books:

1. *"Environmental Studies"* R. Rajagopalan, Oxford University Press
2. *"Environmental Pollution Causes, Effects and Control"* by K.C. Agrawal
3. *"Environmental Science"* by Richard T Wright and Bernard J Nebel
4. *"Environmental Science"* by Deniel B Botkin Edward A Keller
5. *"Environment and Ecology"* by Dr Gourkrishna Dasmohpatra
6. *"Environment & Ecology"* by Dr Gourkrishna Dasmohapatra
7. *"Essential of environment and seismic engineering"* Atul prakashan

Additional Resources :

- http://en.wikipedia.org/wiki/Water_pollution
- http://environment.nationalgeographic.com/environment/global-warming/pollution-overview/
- http://www.nrdc.org/air/
- http://eschooltoday.com/pollution/noise-pollution/what-is-noise-pollution.html
- http://greenlining.org/issues/2014/californias-climate-revolution-change-national-conversation/