CE102: Environmental Studies

By

Dr. Subrata Hait, Dept. of CEE

Objective of the Course

- The objective of Environmental Studies course is *to sensitize and create awareness about the environmental pollution, degradation, issues and protection*

Syllabus

- *Module I:* **Introduction to the Course** *(No. of contact hours: 01)*;
- *Module II:* **Environmental Issues and Systems: Local, regional, continental and global environmental issues including greenhouse gases and global warming, acid rain, ozone layer depletion, climate change - Extent of impact, scientific responses and regulatory actions; Environmental systems** *(No. of contact hour: 02)*;
- *Module III:* **Ecology and Sustainable Development – Ecosystems, Natural cycles, Biodiversity, Man and environment** *(No. of contact hours: 02)*;
- *Module IV:* **Water Resources – Hydrologic cycle and its components, Groundwater and surface water, Water quality** *(No. of contact hours: 03)*;
- *Module V:* **Environmental Legislations and Standards** *(No. of contact hours: 01)*;
- *Module VI:* **Environmental Sanitation: Conventional and ecological sanitation** *(No. of contact hours: 02)*;
- *Module VII:* **Environmental Pollution and Control – Air, Water, Soil, Noise Pollution, Solid and Hazardous Waste, Biomedical Waste, E-waste: Sources, effect, treatment and control** *(No. of contact hours: 10)*

[Total No. of Contact Hours: 21]

Books

- **Text Books / Materials:**
  - Gaur, R.C., *Basic Environmental Engineering*, New Age International, 2008.
  - Kaushik, A. and Kaushik, C.P., *Perspectives in Environmental Studies*, 4th Edition, New Age International, 2014.
  - Manahan, S.E., *Environmental Chemistry*, 7th Edition, CRC Press, 2000.
  - Sawyer, C.N., McCarty, P.L. and Parkin, G.F., *Chemistry for Environmental Engineering and Science*, 5th Edition, McGraw-Hill, 2003.

- **Reference Books:**
  - Botkin, D.B. and Keller, E.A., *Environmental Science*, 8th Edition, Wiley, 2012.
  - Cunningham, W.P. and Cunningham, M.A., *Environmental Science: A Global Concern*, 13th Edition, McGraw-Hill, 2015.
  - Davis, M.L. and Masten, S.J., *Principles of Environmental Engineering and Science*, 2nd Edition, McGraw-Hill, 2013.

Lecture Schedule

- ***Lecture Schedule:***

Mon	11:00 – 11:55 h	Online (Webex)
Tue	12:00 – 12:55 h	Online (Webex)
Fri	10:00 – 10:55 h	Online (Webex)

- ***Webex Link:*** https://iitpatna.webex.com/meet/webex17

- ***Contact:***

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Teaching Assistants (TAs)

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Attendance Policy!

- Attendance is compulsory!
- If you have less than 75% attendance, you will NOT be allowed to sit in the course examination as per the Institute norms
- Attendance will be linked to your Final Grading!

Grading Policy!

- *Relative Grading!*

Distributions:

- Home Assignments (Problem Sets for Solving): 0% *(Not to be graded)*
- LIVE Quiz (Online) (One - on any Saturday): 40%
- Final Examination (Offline) (during MSE): 60%

Emergence of Environmental Science / Engineering / Management Discipline

- Public Health Engineering
  - Water Supply → Civil Engineering
- Sanitary Engineering
  - Water Supply and Sanitation →Civil Engineering
- Environmental Engineering and Management → Inter-disciplinary → Infrastructural Engineering

Environmental Science / Engineering / Management Discipline

- Multidisciplinary or Interdisciplinary
  - Various disciplines of Science, Engineering and Management
- Several Professions and Sectors
  - Industry, Business, Academics and Research, Policy Making, Planning, Judiciary, Implementation/Administration, Journalism; Government/Semi government or Public/ Private Sector/NGOs
- Preventive Activities, Control Activities, Remedial Activities → Resource Conservation, Sustainable Development; “End of the Pipe” Solutions; Regeneration

Some Key Terms……..

Environment,

Systems,

Environmental Systems / Ecosystems

Environment

**Aggregate of surrounding things,
conditions or influences,
especially as affecting or that affect
the existence or development of
someone or something
[LIVING (*Biotic*)] or [NON LIVING (*Abiotic*)]**

Hardware/Software →Physical/Nonphysical

Systems

Collection of objects bonded together in some way so that the collection is more than an independent assemblage of parts

Micro → Macro → Mega Levels (Depending Upon the Boundaries Chosen in a Particular Context)

Ecosystems

Objects consisting of Living (*Biotic Component*) as well as Non-living (*Abiotic Component*) entities