# Chhattisgarh Swami Vivekanand Technical University, Bhilai (C.G.)

## Scheme of Teaching & Examination

Master of Engineering in Environmental Science and Engineering (Part Time)

### Second Semester:

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Code</th>
<th>Board of Studies</th>
<th>Subject</th>
<th>Periods per week</th>
<th>Scheme of Exam</th>
<th>Total</th>
<th>Credits</th>
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<td>653211(53)</td>
<td>Environmental Science &amp; Engg.</td>
<td>Environmental Management</td>
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<td>100 20 20</td>
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<td>2</td>
<td>653212 (53)</td>
<td>Environmental Science &amp; Engg.</td>
<td>Environmental Geosciences and Environmental Impact assessment</td>
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<td>3</td>
<td>653213 (53)</td>
<td>Environmental Science &amp; Engg.</td>
<td>Science &amp; Engineering of Air Pollution Control</td>
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<td>100 20 20</td>
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<td>4</td>
<td>653221 (53)</td>
<td>Environmental Science &amp; Engg.</td>
<td>Environmental Geosciences and Environmental Impact Assessment Lab</td>
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<td>Total</td>
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L = Lecture, T = Tutorial, P = Practical or Term Work

Each period of 50 minutes, with 4 periods per day (6 to 9.20 PM) for six days in a week
Unit 1
Methodology of environmental management – Review national and international protocols.

Unit 2
Environmental quality criteria and standards significant sources of water and air pollution and indices of environmental quality – survey and hot spot identification.

Unit 3
Preparation of management plan – Case studies of major river basin and metropolitan air quality improvement plans.

Unit 4
Life cycle design and analysis, environmental auditing and Eco – labelling

Unit 5
Evaluation of environmental management programmes – Economic incentive and disincentives as instruments for environmental management – Tax, subsidies, fee, and tradable permits.

Text

Reference:
**Unit 1**


**Unit 2**

Evolution of EIA; EIA at Project, regional and Policy Levels; EIA process in India and other countries. EIA methodologies; screening and scooping criteria; Rapid and comprehensive EIA.

**Unit 3**

Specialized areas like Environmental Health Impact Assessment, environmental Risk Analysis; Economic Valuation Methods, Cost Benefit Analysis; Expert system and GIS applications, Uncertainties.

**Unit 4**


**Unit 5**

Case histories of applications for Industrial, Water Resources and Irrigation projects, Ports and Harbours, Mining and Transportation and other projects sectors, Regional EIA case studies for development of coastal and industrial Zones.

**Text**


**Reference**

2. Ministry of Environment and Forests, GOI, Current Documents on Guidelines for EIA.
Unit 1
Meteorology: influence of solar radiation and wind fields, lapse rate and stability conditions, characteristics of stack plumes, effective stack heights and spatial concentration distributions, Measurement techniques. Characteristics of various air pollutant particulates, health and nuisance/aesthetic considerations (PM2.5 and PM10) and gaseous pollutants (CO, SOx, NOx, etc.), their behaviour in the atmosphere, monitoring..

Unit 2
Control of gases and vapours: adsorption, absorption, combustion, and incineration. Control of sulphur oxides and oxides of nitrogen, desulphurisation, kinetics of NOx formation.

Unit 3
Photochemical reactions, role of nitrogen and hydrocarbons in photochemical reactions, air toxics, mobile sources of air pollutants, noxious pollutants, and odour control. Emissions trading.

Unit 4
Control of particulate emissions by mechanical collectors, bag filters, electrostatic precipitators and wet scrubbers.

Unit 5
Air pollution control systems for selected industries – fertilizer, cement paper, refinery, mineral and metallurgical processes

Text

Reference
Chhattisgarh Swami Vivekanand Technical University, Bhilai (C. G.)

Semester: M.E. II Sem.  
Subject: Environmental Geosciences and Environmental Impact Assessment  
Total Theory Periods: 40  
Total Marks in End Semester Exam: 100  
Minimum number of class tests to be conducted: 02  
Specialization: Environmental Science & Engg.  
Code: 653221 (53)  
Total Tutorial Periods: 12

Practical of Environmental Geosciences and Environmental Impact Assessment

1. Use of High volume sampler for determining various air pollution parameters Collection of particulate matter using Air sampler.  
   Determination of NOx and SOx  
   Determination of carbon monoxide.  
   Determination of relative humidity of atmosphere.  
2. Stack monitoring kit for determining common stack pollution parameters  
3. Analysis of air quality (SPM, Temperature)  
4. Analysis of air samples for metals (using AA spectrometer)  
5. Tour of an analytical lab and/or air pollution treatment facility  
6. Visit to industrial plants in Bhilai City and any other place to see the working of air pollution control equipments.

FIELD STUDY

In-depth study of environmental issues at least one environmentally sensitive site relevant to the discipline of the student and preparation of a report thereupon.

Text