

**KRANTIGURU SHYAMJI KRISHNA
VERMA KACHCHH UNIVERSITY,
KACHCHH**

Syllabus

Effective from June 2016

B.Sc. SEMESTER V

SUBJECT: ENVIRONMENT SCIENCE

Paper no.	Name
CEES-515	Computer Application, GIS, GPS and Remote Sensing
CEES-516	Environmental Hazard and Disaster Management
CEES-517	Environmental Pollution-II

B.Sc. SEMESTER V & VI - ENVIRONMENT SCIENCE

SYLLABUS FOR ENVIRONMENT SCIENCE SEMESTER - V

TYPE OF SUBJECT	SUBJECT CODE/ PAPER NO.	SUBJECT/ PAPER NAME	ASSESMENT TYPE	CREDIT	BRIEF INTRODUCTION OF SUBJECT
CORE ELECTIVE-1	CEES-515	Computer application, GIS, GPS and Remote sensing	Theory	04	Students will learn about basic concepts Computer and remote sensing.
			Practical	03	Practical related to theory syllabus.
CORE ELECTIVE-2	CEES-516	Environmental Hazard and Disaster Management	Theory	04	Students will learn about disaster its management and environmental hazards.
			Practical	03	Practical related to theory syllabus.
CORE ELECTIVE-3	CEES-517	Environmental Pollution-II	Theory	04	Student will learn about environmental pollution and its management.
			Practical	03	Practical related to Pollution.
CORE COMPULSORY	USCCEN 001	COMPULSORY ENGLISH	Theory	03	English literature and Grammar.

Environment Science Syllabus as CBCS System
Semester V
CORE ELECTIVE-I (CEES-515) Computer application, GIS, GPS and Remote sensing
Total Marks : 60

Unit – I: Basics of computer

Need for PC, parts of PC, computer programmes

Introduction of Operating systems: DOS, Windows and Linux, comparison of DOS and windows

Basic Introduction of Hardware, software

Basic Introduction of Concept of table, draw, change and copying of cells

Unit – II: Computer application

Introduction of Internet, Email, HTTP and IP address.

Use of control panel mouse notepad etc

Word, Excel (Data processing and Scientific calculation) and Power point, presentation of slides

Unit – III: Remote sensing

Application of computers in remote sensing

Use of ILWIS, ERDAS software – presentation of remote sensing data

Unit – IV: GPS and GIS

GPS introduction, principle and working application of GPS

GIS Introduction to digital image processing and geographic information system, special data models and data structures.

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**Paper No. CEES 515 Computer application, GIS, GPS and
Remote sensing**

(PRACTICALS)

1. Prepare a word document by using various formatting options. (Use: Home, Insert and Page layout menu buttons)
2. Prepare an excel document by using various formatting options. (Use: Home, Insert and Page layout menu buttons)
3. Prepare a powerpoint document by using various formatting options. (Use: Home, Insert and Page layout menu buttons)
4. Prepare email ID and send mail with attachment. (attachment must be photo, text and pdf file)
5. Prepare a map using various software. (eg. GIS)
6. To demonstrate image processing by using GRASS software.
7. Application of GIS and Remote sensing.

References:

1. Computer Fundamentals and Internet Basics by Rohit Khurana
2. Computer Fundamentals by RS Salaria
3. Handbook of Computer Fundamentals by Nasib Singh Gill
4. Introduction to Remote Sensing by James B. Campbell, Randolph H. Wynne,
5. Remote Sensing of Vegetation: Principles, Techniques, and Applications by Hamlyn G Jones , Robin A Vaughan
6. GIS Fundamentals: A First Text on Geographic Information Systems by Paul Bolstad.
7. Geographical information systems by Mehtani S. Commonwealth.
8. Fundamental of remote sensing by Joseph,

Semester V (Environment Science) Paper no : CEES 515

Total Mark: 60 (Total 4 units each carries 15 Marks)

Total Number of Question: 04

Question No.	Sub Question	Question Type	Mark
Question 1 Unit I	A	Short question (No internal Option)	05
	B	Descriptive Questions with Internal Option	10
Question 2 Unit II	A	Short question (No internal Option)	05
	B	Descriptive Questions with Internal Option	10
Question 3 Unit III	A	Short question (No internal Option)	05
	B	Descriptive Questions with Internal Option	10
Question 4 Unit IV	A	Short question (No internal Option)	05
	B	Descriptive Questions with Internal Option	10

Note: Short questions may include: one to two line question/ definition/ drawing small figures/ filling the blanks/ multiple choice question/ match the pairs etc)

- The examination pattern of the university is 60% external and 40% internal
- Each theory paper will have 4 lecture in a week and a practical will have 6 lecture per batch in a week.

**KSKV Kachchh University, Bhuj – Kachchh
Environment Science Syllabus as CBCS System
Semester V**

CORE ELECTIVE-II (CEES-516) Environmental Hazard and Disaster Management

Total Marks : 60

UNIT – I: Introduction and classification of disaster

Definition of Hazard, disaster, eco-disaster, disaster management

Natural Hazard: Nature causes, impacts, occurrences and Mitigation

Earthquakes – Volcanic activity, landslides, cyclones, floods, droughts, forest fires

UNIT – II: Industrial and Technological Hazards

Types and causes of industrial accident – physical, chemical, biological, electrical

Nature of accident – explosion, fire, toxic release and dispersion

UNIT – III: Occupational Health Hazard and Ergonomics

Occupational health hazard – Their causes & prevention. Environmental impact of technical hazards

Introduction to ergonomics, concept and methodology

UNIT – IV: Disaster Management and Planning

Components of disaster management plan – on site & off site emergency plans.

Necessity of management plan.

Basic concepts of technical hazards control system – incident reduction, incident management techniques of assessing technical hazards – PHA, HAZOP, HAZAN, MCAA

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Paper No. CEES 516 Environmental Hazard and Disaster Mnagement

(PRACTICALS)

1. Prepare study report of given topic and submit two copies to the college. (Oral examination will be taken from the given topic for Internal and External practical examination.)

References:

1. Standard methods for the examination of water and wastewater 22 ed by Rice, APHA pub.
2. Textbook of environmental studies by Bharucha, OBS pub.
3. Handbook of environmental 2 volumes by Trivedi, BSP pub.
4. Environmental science vol 1& 2 by Trivedi, Atlantic pub.
5. Environmental waste and soil analysis by P.R.Trivedi Akashdeet pub.

Semester V (Environment Science) Paper no : CEES 516

Total Mark: 60 (Total 4 units each carries 15 Marks)

Total Number of Question: 04

Question No.	Sub Question	Question Type	Mark
Question 1 Unit I	A	Short question (No internal Option)	05
	B	Descriptive Questions with Internal Option	10
Question 2 Unit II	A	Short question (No internal Option)	05
	B	Descriptive Questions with Internal Option	10
Question 3 Unit III	A	Short question (No internal Option)	05
	B	Descriptive Questions with Internal Option	10
Question 4 Unit IV	A	Short question (No internal Option)	05
	B	Descriptive Questions with Internal Option	10

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Environment Science Syllabus as CBCS System
Semester V
CORE ELECTIVE-III (CEES-517) Environmental Pollution-2

Total Marks : 60

UNIT – I: Air pollution

Sources and classification of air pollution, stationary – stacks and fugitive emission, mobile sources and primary and secondary pollutant

Air pollution from major industrial operations; effects of air pollution on human health, animals and plants

UNIT – II: Meteorology and air pollution

Wind speed, direction, wind roses; atmospheric stability and inversions, mixing heights, stack height, stack emissions, dispersion theories and models, stack sampling and analysis – online instrumental analysis and wet chemical methods, ambient air quality monitoring – high volume sampler, instrumental monitoring

UNIT – III: Air pollution control

Control of air pollution by process change; control of air pollution by equipment – control of particle emission – settling chambers, inertial separators, cyclones, filters, electrostatic precipitators, scrubbers and wet collectors; control of smokes; control of gaseous emission – combustion, adsorption, absorption, counter action orders and their control

UNIT – IV: Noise pollution and control

Noise – definition, fundamentals of sounds and vibration and standards; hearing mechanism and damages due to noise, noise measurement; noise control – acoustic absorption, vibration control and industrial noise control studies.

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Paper No. CEES 517 Environmental Pollution-2

(PRACTICALS)

1. Study of various equipments used in air pollution through specimens/models/charts.
2. Detection & identification of Pollen grains.
3. To study the detection of SO₂ gas & its effect on plants.
4. To study the detection of detection of H₂S gas & its effect on plants.
5. To study the detection of detection of NH₃ gas & its effect on plants.
6. Measurement of atmospheric temperature and relative humidity by maximum & minimum thermometer.
7. Study of various sampling techniques.
8. Demonstration of HVAS (High Volume Air Sampler).
9. Demonstration and Measurement of Noise by Noise meter (dBmeter).

References:

1. Water pollution : problems and prospects by Prabhakar ; Anmol Pub.
2. Pollution monitoring and control by Prabhakar ; Anmol Pub.
3. Recent advantage in environmental ecology 15 vol.(set) by A.P.Diwan ; Anmol Pub.
4. Environmental pollution by Katyal ; Anmol Pub.
5. Environmental air pollution by P.R.Trivedi Akashdeet Pub.
6. Noise pollution by P.R.Trivedi Akashdeet Pub.

Semester V (Environment Science) Paper no : CEES 517

Total Mark: 60 (Total 4 units each carries 15 Marks)

Total Number of Question: 04

Question No.	Sub Question	Question Type	Mark
Question 1 Unit I	A	Short question (No internal Option)	05
	B	Descriptive Questions with Internal Option	10
Question 2 Unit II	A	Short question (No internal Option)	05
	B	Descriptive Questions with Internal Option	10
Question 3 Unit III	A	Short question (No internal Option)	05
	B	Descriptive Questions with Internal Option	10
Question 4 Unit IV	A	Short question (No internal Option)	05
	B	Descriptive Questions with Internal Option	10

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Syllabus

Effective from June 2016

B.Sc. SEMESTER VI

SUBJECT: ENVIRONMENT SCIENCE

Paper no.	Name
CEES-618	Environmental Pollution-3
CEES-619	Concept of Environmental Management System and Legislation
CEES-620	Project Work/ Field visit/ Industrial Visit

B.Sc. SEMESTER V & VI - ENVIRONMENT SCIENCE

SYLLABUS FOR ENVIRONMENT SCIENCE SEMESTER - VI

TYPE OF SUBJECT	SUBJECT CODE/ PAPER NO.	SUBJECT/ PAPER NAME	ASSESSMENT TYPE	CREDIT	BRIEF INTRODUCTION OF SUBJECT
CORE ELECTIVE-1	CEES-618	Environmental Pollution-3	Theory	04	Students will learn about pollutants of Environment.
			Practical	03	Practical related to theory syllabus.
CORE ELECTIVE-2	CEES-516	Concept of Environmental Management System and Lagislation	Theory	04	Students will learn about management and legislation related to Environment.
			Practical	03	Practical related to theory syllabus.
CORE ELECTIVE-3	CEES-517	Project Work/ Field visit/ Industrial Visit	Theory	07	Students will be provided a project work/ field visit/ Industrial visit by College. They have to prepare dissertation on it.
CORE COMPULSORY	USCCEN 001	COMPULSORY ENGLISH	Theory	03	English literature and Grammar.

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Environment Science Syllabus as CBCS System
Semester VI
CORE ELECTIVE-I (CEES-618) Environmental Pollution-3

Total Marks : 60

UNIT – I: Solid waste

Types, sources and quantities of solid waste

Physical, chemical and biological characteristics of domestic, commercial and industrial solid waste and sludge

UNIT – II: Storage, transportation and processing of solid wastes

Volume reduction and storage at sources, community storages and collection systems for community and local bodies, transportation of solid waste – garbage and industrial; processing and separation of solid wastes; incineration, types, features and operation, economics and application

UNIT – III: Solid and hazardous waste

Types and sources of hazardous waste, hazardous waste disposal systems

Solid waste treatment and reuse

Municipal and industrial solid waste treatment systems (composting), ultimate disposal of solid waste, sanitary landfills and ocean dumping

Reuse and recycling of solid waste

Biogas and energy recovery process

UNIT – IV: Soil pollution

Composition of the lithosphere, inorganic and organic components in soil, micro and macro nutrients

Waste and pollution in soil, solid waste classification and disposal

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Paper No. CEES 618 Environmental Pollution-3

(PRACTICALS)

1. Collection and preservation methods of Soil samples.
2. Determination of lime by titration method.
3. Determination of organic carbon from soil samples.
4. Demonstrate the process of isolation of bacteria from soil.
5. Demonstrate the process of isolation of fungi from soil sample.
6. To study the pH of solid waste: acidic/ alkaline.
7. Determination of Moisture content of solid waste.
8. To study the process and principle of Streak plate method; Spread plate method; pour plate method used in determination of growth of microorganisms.

References:

1. Water pollution : problems and prospects by Prabhakar ; Anmol Pub.
2. Pollution monitoring and control by Prabhakar ; Anmol Pub.
3. Recent advantage in environmental ecology 15 vol.(set) by A.P.Diwan ; Anmol Pub.
4. Environmental pollution by Katyal ; Anmol Pub.
5. Environmental air pollution by P.R.Trivedi Akashdeet Pub.
6. Noise pollution by P.R.Trivedi Akashdeet Pub.

Semester VI (Environment Science) Paper no : CEES 618

Total Mark: 60 (Total 4 units each carries 15 Marks)

Total Number of Question: 04

Question No.	Sub Question	Question Type	Mark
Question 1 Unit I	A	Short question (No internal Option)	05
	B	Descriptive Questions with Internal Option	10
Question 2 Unit II	A	Short question (No internal Option)	05
	B	Descriptive Questions with Internal Option	10
Question 3 Unit III	A	Short question (No internal Option)	05
	B	Descriptive Questions with Internal Option	10
Question 4 Unit IV	A	Short question (No internal Option)	05
	B	Descriptive Questions with Internal Option	10

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**KSKV Kachchh University, Bhuj – Kachchh
Environment Science Syllabus as CBCS System
Semester VI**

**CORE ELECTIVE-II (CEES-619) Concept of Environmental Management System and
Legislation**

Total Marks : 60

UNIT – I: Environmental Management

Principles of management, levels, functions and significance of management; system approach to environmental management, concept of environmental dimensions of management – physical, social, aesthetic, economic, technical environment.

Environmental assessment and certification

Environmental Impact Assessment – definition nature, scope, objectives, benefits; Ideal EIA system, inventory (Physical, chemical, biological, cultural, socioeconomic) Forecasting

Approval bodies (National, international), clauses of certification, basic schedules and bye-laws; different standards at local/state/national and international levels including WHO and UN

UNIT – II: Environmental Auditing & Environmental economics

Auditing – internal, external, components, pollution control boards, state level, national level, High court proceeding, penalties and implementation.

Economics of natural (renewable/non-renewable) resources, methods for valuing environmental costs and benefits. Pollution taxes, tradable permits (CO₂, SO₂ and other pollutants), economic incentives for environmental protection.

UNIT – III: Environmental legislation

International conventions: Stockholm conference UNCHE; United Nations

Environmental planning (UNEP) 1972; international union for conservation of nature and natural resources (IUCN); world wide fund for nature (WWF); Bruntland commission (WCEB); Montreal protocol; Rio conference 1992; convention on international trade in endangered species

UNIT – IV: Indian acts related to Environment:

Wild life protection act 1972; Water Act (Prevention and control of pollution) 1972; Air act (Prevention and control of pollution) 1981; Environmental protection act 1986; manufacturing rules 1989; public liability insurance act 1991, coastal regulation zone notification, Environmental Impact Assessment notification.

Implementation problems and role of judiciary in protection of environment – case studies; public interest litigation relating to environment protection – case studies.

KSKV Kachchh University, Bhuj - Kachchh

Paper No. CEES 619 Concept of Environmental Management System and Legislation

(PRACTICALS)

1. Prepare study report of given topic and submit two copies to the college. (Oral examination will be taken from the given topic for Internal and External practical examination).

References:

1. Basic laws of environment by Prabhakar Anmol Pub.
2. Environmental pollution by Katyal Anmol Pub.
3. Marine pollution and prevention by Tyagi Anmol Pub.
4. Management of pollution control by Trivedi Akashdeet Pub.
5. Environmental waste and soil analysis by Trivedi Akashdeet Pub.
6. Handbook of methods in environmental studies by S.k.malti Oxford Pub.

Semester VI (Environment Science) Paper no : CEES 619

Total Mark: 60 (Total 4 units each carries 15 Marks)

Total Number of Question: 04

Question No.	Sub Question	Question Type	Mark
Question 1 Unit I	A	Short question (No internal Option)	05
	B	Descriptive Questions with Internal Option	10
Question 2 Unit II	A	Short question (No internal Option)	05
	B	Descriptive Questions with Internal Option	10
Question 3 Unit III	A	Short question (No internal Option)	05
	B	Descriptive Questions with Internal Option	10
Question 4	A	Short question (No internal Option)	05

Unit IV	B	Descriptive Questions with Internal Option	10
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Environment Science Syllabus as CBCS System
Semester VI**

**CORE ELECTIVE-II (CEES-620) Concept of Environmental Management System and
Legislation**

Total Marks : 60

Project Work/ Field Visit/ Industrial Visit:

Assessment Criteria:

- | | |
|---|-----|
| 1. Field Visit & Training based Project Report / Dissertation | 50% |
| 2. Project Report/ Dissertation based Viva-Voce | 50% |

Assessment type:

INTERNAL ASSESSMENT: 40 Marks

- ❖ Project Report: 20 Marks
- ❖ Viva-Voce: 20 Marks

EXTERNAL ASSESSMENT: 60 Marks

- ❖ Project Report: 30 Marks
- ❖ Viva-Voce: 30 Marks

DISSERTATION TO VI SEMESTER STUDENTS

- ❖ Individual/Group dissertation will be allotted to all students of VI semester on different aspects of Environment Science by the College.
- ❖ Each student will carry out his/her dissertation studies under different faculties at Government Science College, Mandvi, K.S.K.V. Kachchh University's Earth& Environmental Department and Gujarat Institute of Desert Ecology, Bhuj.
- ❖ The dissertation work and the report should be submitted by the students before 10, April for the Assessment Year or the Date fixed by the College authority every Year. The Students who are not submitting his/her Report, his/her result will be kept withheld.