


**Courses which address the Professional Ethics,
Gender Issues, Human Values, Environment and
Sustainability into the curriculum**


Principal
A.D.P. College
Nagaon (Assam)

Courses which address the Professional Ethics

Subject	Course code/paper code	Course name and Description
Education	EDU-HC-5026	Guidance and Counselling
Philosophy	PHI-HC-3036	Ethics

Courses which address the Gender Issues

Subject	Course code/paper code	Course name and Description
English	ENG-HC-5026	Women's Writing: Themes: Gender, sexual/textual politics, feminism, body, identity, class, location, voice, space, gender and narrative.
Philosophy	PHIL-HC-4026	Political and Social Philosophy
Pol. Science	POL HG 2026	Feminism: Theory and Practice
Pol. Science	POL HE 6036	Women, Power and Politics

Courses which address the Human Values

Subject	Course code/paper code	Course name and Description
Education	EDU-HC-3036	Value and Peace Education
Sanskrit	SKT- HC-2026	Self-Management in the Gita

Courses which address Environment and Sustainability

Subject	Course code/paper code	Course name and Description
All UG students	ENV-AE-2014	Environmental Science: Ability Enhancement Compulsory Course (AECC) for all students
Botany	BOT-HE-5016	Natural Resource Management
Botany	BOT-HE-6016	Industrial and Environmental Microbiology
Economics	ECO-HE-6016:	Environmental Economics
Geography	GGY - HC - 4016	Environmental Geography and Disaster Management
Zoology	ZOO-HE-6046	WILDLIFE CONSERVATION AND MANAGEMENT
Zoology	ZOO-SE-4024:	Wildlife Photography and Ecotourism

SIXTH SEMESTER DSE
(Any Two per Semester)

ECO-HE-6016: ENVIRONMENTAL ECONOMICS

Course Description

This course focuses on economic causes of environmental problems. In particular, economic principles are applied to environmental questions and their management through various economic institutions, economic incentives and other instruments and policies. Economic implications of environmental policy are also addressed as well as valuation of environmental quality, quantification of environmental damages, tools for evaluation of environmental projects such as cost-benefit analysis and environmental impact assessments. Selected topics on international environmental problems are also discussed.

Course Outline

1. Introduction

Basic concepts: Environment, Ecology, Economy and the ecosystem. Definition and scope of environmental economics, why study environmental economics. Interaction between the environment and the economy, environmental economics and ecological economics, environmental economics and resource economics. Review of microeconomics and welfare economics: the utility function, social choice mechanism, the compensation Principle and social welfare function (concepts only).

2. The Theory of Externalities

Pareto optimality or Pareto efficiency, Externalities: meaning and types of externality, market failure: meaning, market failure in the presence of externalities; market failure and public goods, is environment a public good? Property rights and the Coase theorem.

3. The Design and Implementation of Environmental Policy

Environmental Policies: an overview; Nonmarket and market based instruments of Environmental Policy: command and control (CAC) approach, economic instruments like Pigovian taxes and effluent fees, tradable permits and mixed instruments. Monitoring and Enforcement: What is monitoring and enforcement? Penalties, cost of abatement. Damages from pollution. Incentives to sources to comply with environmental regulations.

4. International Environmental Problems

Nature of environmental problems: transboundary pollution –Climate change, global warming, ozone depletion and bio-diversity loss; Trade and environment: pollution haven hypothesis.

5. Measuring the Benefits of Environmental Improvements

Non-Market values: use and non-use values and optional value, measurement methods: Direct method-contingent valuation and indirect method-hedonic pricing methods, value of statistical life; their applications and limitations.

6. Sustainable Development

Conventional development model: a critique, Alternative approach: Sustainable Development and its origin, objectives of Sustainable Development, Approaches to Sustainable Development: weak sustainability, strong sustainability, Safe minimum standard approach, ecological perspective and social perspective, Rules and indicators of Sustainable Development.

Readings:

1. Charles Kolstad, *Intermediate Environmental Economics*, Oxford University Press, 2nd edition, 2010.
2. Robert N. Stavins (ed.), *Economics of the Environment: Selected Readings*, W.W. Norton, 5th edition, 2005.
3. Roger Perman, Yue Ma, James McGilvray and Michael Common, *Natural Resource and Environmental Economics*, Pearson Education/Addison Wesley, 3rd edition, 2003.
4. Maureen L. Cropper and Wallace E. Oates, 1992, —Environmental Economics: A Survey, I *Journal of Economic Literature*, Volume 30:675-740.
5. Subhashini Muthukrishnan, *Economics of Environment*, PHI Learning Private Limited, 2nd edition, 2015.
6. Bhattacharyya R, *Environmental Economics*, Oxford University Press.
7. Nick Hanley, Jason F. Shogren and Ben White, *Introduction to Environmental Economics*, Oxford University Press.
8. Gautam Purkayastha, *Environmental Economics: Theory ,Problems and Solutions*, Kalyani Publishers , Reprinted 2016

ECO-HE-6026: INTERNATIONAL ECONOMICS

Course Description

This course develops a systematic exposition of models that try to explain the composition, direction and consequences of international trade, and the determinants and effects of trade policy. It then builds on the models of open economy macroeconomics developed in courses 08 and 12, focusing on national policies as well as international monetary systems. It concludes with an analytical account of the causes and consequences of the rapid expansion of international financial flows in recent years. Although the course is based on abstract theoretical models, students will also be exposed to real-world examples and case studies.

Course Outline

1. Introduction

What is international economics about?, subject matter of International Economics, An overview of world trade- its changing pattern.

2. Theories of International Trade

The Ricardian theory- comparative advantage, Heckscher-Ohlin model, specific factors model, new trade theories- Leontief Paradox, factor-intensity reversal, international trade in the context of

SKT- HC-2026
Self Management in the Gītā

Total Credits 6

[A] Prescribed Course:	Marks
Unit I	Gītā: Cognitive and emotive apparatus 25
Unit II	Gītā: Controlling the mind 30
Unit III	Gītā: Self management through devotion 25

[B] Course Objectives:

The objective of this course is to study the philosophy of self-management in the Gītā. The course seeks to help students negotiate the text independently without referring to the traditional commentaries so as to enable them to experience the richness of the text.

[C] Unit-Wise Division:

Unit I

Gītā: Cognitive and emotive apparatus

Hierarchy of *indriya*, *manas*, *buddhi* and *ātman*
III.42; XV. 7

Role of the *ātman* –XV.7; XV.9

Mind as a product of *prakṛti* VII.4

Properties of three *guṇas* and their impact on the
mind – XIII. 5-6; XIV.5-8, 11-13; XIV.17

Unit II

Gītā: Controlling the mind

Confusion and conflict

Nature of conflict I.1; IV.16; I.45; II.6

Causal factors – Ignorance – II.41; *Indriya* – II.60,
Mind – II.67; *Rajoguna* – III.36-39; XVI.21;
Weakness of mind- II.3; IV.5

Means of controlling the mind

Meditation–difficulties –VI.34-35; procedure
VI.11-14

Balanced life- III.8; VI.16-17

Diet control- XVII. 8-10

Physical and mental discipline – XVII. 14-19, VI. 36.

Means of conflict resolution

Importance of knowledge – II. 52 ; IV.38-39; IV.42

Clarity of *buddhi* – XVIII.30-32

Process of decision making – XVIII.63

Control over senses – II.59, 64

Surrender of *kartr̥bhāva* –XVIII .13-16; V.8-9

Desirelessness- II.48; II.55

Unit III

Gītā: Self management through devotion

Surrender of ego – II.7 ; IX.27; VIII.7; XI.55 ; II.47

Abandoning frivolous debates – VII.21, IV.11; IX.26

Acquisition of moral qualities - XII.11; XII.13-19

Suggested Books/Readings:

- 1.Śrīmadbhagavadgītā - English commentary by Jayadayal Goyandka, Tattvavivecinī Gītā Press, Gorakhpur, 1997.
2. Śrīmadbhagavadgītārahasya - The Hindu Philosophy of Life, Ethics and or Karmayogaśāstra Religion, Original Sanskrit Stanzas with English Translation, Bal Gangadhar Tilak & Balchandra Sitaram Sukthankar, J.S.Tilak & S.S.Tilak, 1965.
3. Śrīmadbhagavadgītā - A Guide to Daily Living, English translation and notes by Pushpa Anand, Arpana Publications, 2000.
- 4.Śrīmadbhagavadgītā - The Scripture of Mankind, text in Devanagari with transliteration in English and notes by Swami Tapasyananda, Sri Ramakrishna Math, 1984.
- 5.Chinmayananda - The Art of Man Making (114 short talks on the Bhagavadgītā), Central Chinmaya Mission Trust, Bombay, 1991.
- 6.Panchamukhi, V.R.- Managing One-Self (Śrīmadbhagavadgītā : Theory and Practice), R.S. Panchamukhi Indological Research Centre, New Delhi & Amar Grantha Publications, Delhi, 2001.
- 7.Sri Aurobindo - Essays on the Gītā, Sri Aurobindo Ashram, a. Pondicherry,1987.

EDU-HC-3036
VALUE AND PEACE EDUCATION
Total Marks: 100 (External: 80 and Internal: 20)
Credit-6

Course Objectives:

After completion of this course the learner will be able to:

- Understand the concept and meaning of value.
- Become aware about the role of educational institutions in building a value based society.
- Understand the meaning and concept of peace and its importance in human life.
- Understand the meaning and importance of peace education and its relevance at national and international level.
- Identify the different issues/ challenges in imparting peace education.
- Identify the strategies and skills in promoting peace education at institutional level.

Course contents

Unit	Contents
Unit-1	Value <ul style="list-style-type: none"> • Concept and characteristics of value. • Sources of values • Impact of globalization on culture and values. • Importance of values in human life
Unit-2	Types of values, their characteristics, functions and educational significance <ul style="list-style-type: none"> • Core values. • Social values • Moral values • Religious and spiritual values. • Aesthetic values. • Personal values
Unit-3	Value education <ul style="list-style-type: none"> • Concept, characteristics, Objectives and Importance of value education. • Value education at different stages – <ul style="list-style-type: none"> - Primary - Secondary - Higher education. • Role of teacher and family in imparting value education.
Unit-4	Peace education

	<ul style="list-style-type: none"> • Meaning, definition and characteristics of peace. • Importance of peace in human life. • Teacher's role in promoting peace. • Concept, need and characteristics of peace education • Curricular contents of peace education at different levels – Primary, Secondary and Higher Education • Strategies and skills in promoting peace education • Relevance of peace education in national and international context
Unit-5	<p>Challenges of Peace education and Role of Different Organisations</p> <ul style="list-style-type: none"> • Challenges of peace education • Role of national and international organizations for promoting peace education – <ul style="list-style-type: none"> - International Institute for Peace(IIP), - UNESCO, - International Peace Bureau (IBP), - UNO - UNICEF, - Global Peace Foundation(GPF), - Mahatma Gandhi Institute of Education for Peace and Sustainable Development.

Recommended Readings:

- Agarwal, J.C.(2005). *Education for Values, Environment and Human rights*. New Delhi: Shipra Publication.
- Chakrabarty, M. (1997). *Value education: Changing Perspective*. New Delhi: Krishna Publishers Distribution.
- Chitakra, M.G. (2007). *Education and Human Values*. New Delhi APH Publishing Corporation.
- Mishra, L (2009). *Peace education-Framework for teachers*. New Delhi: APH Publishing Corporation.
- Panda. P.K.(2017). *Value Education*. Guwahati: Nivedita Book Distributors.
- Rajput, J.S.(2002). *Human Values in School Education*. New Delhi: Anmol Publication.
- Singh, S.P. (2011). *Education for World Peace*. New Delhi: Discovery Publishing House.
- Suryanarayana. N.V.S.(2017). *Education and Human Value*. Guwahati: Nivedita Book Distributors.

Semester III
PHI-HC-3036
Ethics

Unit I

Nature, Scope and Utility of study of Ethics
Object of Moral Judgement, Moral Obligation
Postulates of Morality

Unit II

Virtue Ethics: Aristotle
Deontological Ethics: Kant
Utilitarianism: Bentham, Mill

Unit III

Theories of Punishment
Professional Ethics
Environmental Ethics

Unit IV

Law of Karma, Varṇa and Aśrama Dharma, Puruṣārtha
Buddhist Pañcaśīla; Brahmavihāra
Jaina Triratna, Aṇuvrata and Mahāvratā

Books Recommended:

Dasgupta, S.N.:	<i>A History of Indian Philosophy</i>
Frankena, Williams.:	<i>Ethics, Prentice Hall of India</i>
Hiriyana, M.:	<i>Outlines of Indian Philosophy</i>
Hudson, W.D.:	<i>Modern Moral Philosophy</i>
Lillie, William.:	<i>An Introduction to Ethics</i>
Mackenzie, J.N.:	<i>Manual of Ethics</i>
Moore, G.E.:	<i>Ethics</i>
Radhakrishnan, S.:	<i>Indian Philosophy</i>
Singer, Peter.:	<i>Applied Ethics</i>
Singer, Peter.:	<i>Practical Ethics</i>
Tiwari, Kedar Nath:	<i>Classical Indian Ethical Thought: A Philosophical Study of Hindu, Jaina and Buddhist Morals</i>

EDU-HC-5026
GUIDANCE AND COUNSELLING
Total Marks: 100 (External: 80 and Internal: 20)
Credit-6

Course Objectives:

After completion of this course the learner will be able to:

- Help the students to understand the concept, need and importance of Guidance and Counselling
- Enable the students to know the different types and approaches to Guidance and Counselling
- Acquaint the students with the organization of guidance service and school guidance clinic
- Enable the learners to understand the challenges faced by the teacher as guidance worker.

Course contents

Units	Contents
Unit-1	Introduction to Guidance <ul style="list-style-type: none">• Meaning, objectives and scope of guidance• Need and principles of guidance• Types of guidance and their importance : Educational guidance, Vocational guidance, Personal guidance, Social guidance, Health guidance
Unit-2	Introduction to Counselling <ul style="list-style-type: none">• Meaning, objectives and scope of counselling• Need and principles of counselling• Types of counselling : Directive, Non-directive and Eclectic counselling• Relation between Guidance and Counselling
Unit-3	Organization of guidance service <ul style="list-style-type: none">• Meaning of guidance service• Need and principles of organizing guidance service• Components of guidance service: counselling service, techniques of counselling service• Qualities of a good counsellor
Unit-4	Guidance needs of students

	<ul style="list-style-type: none"> • Guidance needs of students in relation to home-centred and school-centred problems • Group guidance and Group counselling • Guidance for CWSN • School Guidance Clinic
Unit-5	<p>School guidance programme</p> <ul style="list-style-type: none"> • Importance of guidance and counselling cells in educational institutions • Follow-up Services • Role of the Head of the institution and parents in guidance and counselling • Challenges and functions of the teacher as guidance provider/ counsellor

Recommended Readings:

- Agarwal, Rashmi(2010).*Educational, Vocational guidance and Counselling, Principles, Techniques and programmes.* New Delhi: Shipra Publication.
- Aggarwal J.C. (1989):*Educational and Vocational Guidance and Counselling.* New Delhi: Doaba House.
- Bhatia,K.K.(2009). *Principles of Guidance and Counselling.* New Delhi: Kalyani Publishers.
- Kochhar,S.K. (2010).*Educational and vocational guidance in secondary schools.* New Delhi: Starling Publishers Pvt. Ltd.

CBCS-based U.G. Course in Geography, 2019

Syllabus of Core Course

Name: Environmental Geography and Disaster Management

Paper Code: GGY-HC-4016

Total Credit: 6 (4+2)

Total Marks: 100

(Theory: 60, Practical: 20 and Internal Assessment: 20)

Course objectives

- This is a core paper which intends to introduce students to geography and environment interface.
- It seeks to develop new insights among students on the relevance of environmental studies from a spatial perspective.

Course outcomes

- This paper will be useful for students in developing ideas on environmental issues including disasters that geographers usually address.
- This paper will be useful for students preparing for different competitive exams including the civil services.

Part I: Theory

Credit: 4 (60 Marks)

(40 Classes of 1 hour each)

1. Environmental Geography: Nature, Scope and Significance **(4 Classes)**
2. Human-Environment Relationships – Historical progression, Adaptation in different Biomes. **(6 Classes)**
3. Major Global Environmental Problems: Pollution, Deforestation, Desertification, Global Warming, and Bio-Depletion. **(10 Classes)**
4. Meaning of Hazard, Disaster, Risk and Vulnerability; Types of hazard/disaster (Natural and Manmade). **(4 Classes)**
5. Disaster Management Cycle and Phases: Prevention, Preparedness, Response, Rehabilitation, Reconstruction and Mitigation, **(4 Classes)**
6. Major Hazards and Disasters, and their Management: Flood, Earthquake, Wildfire, and Chemical and Nuclear explosions. **(6 Classes)**
7. National Environmental Policy and National Disaster Management Plan: Environmental Protection Act 1986 and Disaster Management Act 2005. **(6 Classes)**

Part II: Practical
Credit: 2 (20 Marks)
(20 classes of two hour duration each)

Unit I: Practical Works (16 Marks)

(Two questions of 8 marks each)

1. Exploring satellite imageries and toposheets to observe bank line change of Brahmaputra river from any selected stretch in three different time periods and preparation of map therefrom. (1 exercise)
(Goalpara, Palashbari, Nimatighat, etc.)
Satellite images can be downloaded from <https://earthexplorer.usgs.gov/>
Survey of India toposheets can be downloaded freely from <https://soinakshe.uk.gov.in/mtr/>
2. Mapping of major wetlands in a district and computation of shape and size (area) based distribution. (1 exercise)
3. Preparation of a map of a nearby wetland and identify the changes in dimension, water level and encroachment it faced during the last one decade. Present your data in tabular form along with the map (field-based). (1 exercise)
4. Preparation of a long-term precipitation time series curve for any selected station of N.E. India using moving average method by downloading the annual rainfall data for any district/station of Assam for at least 30 years from the portal https://www.indiawaterportal.org/met_data/. Students can also explore the web portal <https://mausam.imd.gov.in/> to get an idea of different types of weather data in India and their historical and present distribution. (1 exercise)
5. Drawing of a diagram of disaster management cycle with reference to some disasters (flood and earthquake) in North-East India and to indicate the activities associated with each step. (2 exercises)
6. Drawing of a map of Assam showing the major fault lines thereon. Also to plot at least 50 epicentres in last few years and to explain the areas of their concentration by taking the help of Bhookamp app. (1 exercise)
7. Preparation of a disaster vulnerability map of Assam/ N.E. India based on data of natural disasters (Flood/earthquake/landslide/bank erosion) with respect to their occurrence and frequency in different areas. (1 exercise)

Unit II: Practical Note-Book and Viva-voce (4 Marks)

1. Evaluation of Practical Note-Book (2 Marks)

2. Viva-voce (2 Marks)

Reading List:

1. Chandna R. C., 2002: Environmental Geography, Kalyani, Ludhiana.
2. Cunningham W. P. and Cunningham M. A., 2004: Principals of Environmental Science: Inquiry and Applications, Tata Macgraw Hill, New Delhi.
3. Goudie A., 2001: The Nature of the Environment, Blackwell, Oxford.
4. Singh, R.B. (Eds.) (2009) Biogeography and Biodiversity. Rawat Publication, Jaipur
5. Miller G. T., 2004: Environmental Science: Working with the Earth, Thomson BrooksCole, Singapore.
6. MoEF, 2006: National Environmental Policy-2006, Ministry of Environment and Forests, Government of India.
7. Singh, R.B. and Hietala, R. (Eds.) (2014) Livelihood security in Northwestern Himalaya: Case studies from changing socio-economic environments in Himachal Pradesh, India. Advances in Geographical and Environmental Studies, Springer
8. Odum, E. P. et al, 2005: Fundamentals of Ecology, Ceneage Learning India.
9. Singh S., 1997: Environmental Geography, PrayagPustakBhawan. Allahabad.
10. UNEP, 2007: Global Environment Outlook: GEO4: Environment For Development, United Nations Environment Programme.
11. Singh, M., Singh, R.B. and Hassan, M.I. (Eds.) (2014) Climate change and biodiversity: Proceedings of IGU Rohtak Conference, Volume 1. Advances in Geographical and Environmental Studies, Springer
12. Singh, R.B. (1998) Ecological Techniques and Approaches to Vulnerable Environment, New Delhi, Oxford & IBH Pub..
13. Alcántara-Ayala, I. (2002). Geomorphology, natural hazards, vulnerability and prevention of natural disasters in developing countries. *Geomorphology*, 47(2-4), 107-124.
14. Goudie, A., & Ayala, I. A. (2010). *Geomorphological hazards and disaster prevention*. Cambridge University Press.
15. <https://www.undrr.org/publications>
16. <http://sdmassam.nic.in/dmp.html#ddmp>
17. https://ndma.gov.in/sites/default/files/PDF/DM_act2005.pdf
18. http://sdmassam.nic.in/pdf/publication/undp/disaster_management_in_india.pdf.

1

BOT-HE-5016 Natural Resource Management

Total Lectures : 60 Credits : 6 (Theory - 4, Practical - 2)

1.1 THEORY

- Unit 1 : *Natural resources*** (2 lectures)
Definition and types.
- Unit 2 : *Sustainable utilization*** (8 lectures)
Concept, approaches (economic, ecological and socio-cultural).
- Unit 3 : *Land*** (8 lectures)
Utilization (agricultural, pastoral, horticultural, silvicultural); Soil degradation and management.
- Unit 4 : *Water*** (8 lectures)
Fresh water (rivers, lakes, groundwater, aquifers, watershed); Marine; Estuarine; Wetlands;
Threats and management strategies.
- Unit 5 : *Biological Resources*** (10 lectures)
Biodiversity-definition and types; Significance; Threats; Management strategies; Bio-prospecting; IPR; CBD; National Biodiversity Action Plan).
- Unit 6 : *Forests*** (6 lectures)
Definition, Cover and its significance (with special reference to India); Major and minor forestproducts; Depletion; Management.
- Unit 7 : *Energy*** (6 lectures)
Renewable and non-renewable sources of energy.

Unit 8 : *Contemporary practices in resource management*

(8 lectures)

EIA, GIS, Participatory Resource Appraisal, Ecological Footprint with emphasis on carbon footprint, Resource Accounting; Waste management.

Unit 9 : *National and international efforts in resource management and conservation*

(4 lectures)

1.2 PRACTICAL

1. Estimation of solid waste generated by a domestic system (biodegradable and non-biodegradable) and its impact on land degradation.
2. Collection of data on forest cover of specific area.
3. Measurement of dominance of woody species by DBH (diameter at breast height) method.
4. Calculation and analysis of ecological footprint.
5. Uses of GPS and GIS (Mapping of an area).

Suggested Readings

1. Vasudevan, N. (2006). *Essentials of Environmental Science*. Narosa Publishing House, New Delhi.
2. Singh, J. S., Singh, S.P. and Gupta, S. (2006). *Ecology, Environment and Resource Conservation*. Anamaya Publications, New Delhi.
3. Rogers, P.P., Jalal, K.F. and Boyd, J.A. (2008). *An Introduction to Sustainable Development*. Prentice Hall of India Private Limited, New Delhi.

3

BOT-HE-6016

Industrial and Environmental Microbiology

Total Lectures : 60 Credits : 6 (Theory - 4, Practical - 2)

3.1 THEORY

Unit 1 : *Scope of microbes in industry and environment* (6 lectures)

Unit 2 : *Bioreactors/Fermenters and fermentation processes* (12 lectures)

Solid-state and liquid-state (stationary and submerged) fermentations; Batch and continuous fermentations. Components of a typical bioreactor, Types of bioreactors-laboratory, pilotscale and production fermenters; Constantly stirred tank fermenter, tower fermenter, fixed bed and fluidized bed bioreactors and air-lift fermenter.

A visit to any educational institute/ industry to see an industrial fermenter, and other downstream processing operations.

Unit 3: *Microbial production of industrial products* (12 lectures)

Microorganisms involved, media, fermentation conditions, downstream processing and uses; Filtration, centrifugation, cell disruption, solvent extraction, precipitation and ultrafiltration, lyophilization, spray drying; Hands on microbial fermentations for the production and estimation (qualitative and quantitative) of Enzyme: amylase or lipase activity, Organic acid (citric acid or glutamic acid), alcohol (Ethanol) and antibiotic (Penicillin)

Unit 4: *Microbial enzymes of industrial interest and enzyme immobilization* (8 lectures)

Microorganisms for industrial applications and hands on screening microorganisms for casein hydrolysis; starch hydrolysis; cellulose hydrolysis. Methods of immobilization, advantages and applications of immobilization, large scale applications of immobilized enzymes (glucose isomerase and penicillin acylase).

Unit 5: Microbes and quality of environment. (6 lectures)

Distribution of microbes in air; Isolation of microorganisms from soil, air and water.

Unit 6: Microbial flora of water. (8 lectures)

Water pollution, role of microbes in sewage and domestic waste water treatment systems. Determination of BOD, COD, TDS and TOC of water samples; Microorganisms as indicators of water quality, check coliform and fecal coliform in water samples.

Unit 7: Microbes in agriculture and remediation of contaminated soils. (8 lectures)

Biological fixation; Mycorrhizae; Bioremediation of contaminated soils. Isolation of root nodulating bacteria, arbuscular mycorrhizal colonization in plant roots.

3.2 PRACTICAL

1. Principles and functioning of instruments in microbiology laboratory
2. Hands on sterilization techniques and preparation of culture media.
3. Pure culture techniques.

Suggested Readings

1. Pelzar, M.J. Jr., Chen E.C. S., Krieg, N.R. (2010). Microbiology: An application based approach. Tata McGraw Hill Education Pvt. Ltd., Delhi.
2. Tortora, G.J., Funke, B.R., Case. C.L. (2007). Microbiology. Pearson Benjamin Cummings, San Francisco, U.S.A. 9th edition.

REPRODUCTIVE BIOLOGY

PRACTICAL

(CREDITS 2)

1. Study of animal house: set up and maintenance of animal house, breeding techniques, care of normal and experimental animals.
2. Examination of vaginal smear rats from live animals.
3. Examination of histological sections from photomicrographs/ permanent slides of rat/human: testis, epididymis and accessory glands of male reproductive systems; Sections of ovary, fallopian tube, uterus (proliferative and secretory stages), cervix and vagina.
4. Sperm count and sperm motility in rat
5. Study of modern contraceptive devices

SUGGESTED READINGS

- Austin, C.R. and Short, R.V. reproduction in Mammals. Cambridge University Press.
- Degroot, L.J. and Jameson, J.L. (eds). Endocrinology. W.B. Saunders and Company.
- Knobil, E. et al. (eds). The Physiology of Reproduction. Raven Press Ltd.
- Hatcher, R.A. et al. The Essentials of Contraceptive Technology. Population Information Programme.

CODE: ZOO-HE-6046

WILD LIFE CONSERVATION AND MANAGEMENT

THEORY

(CREDITS 4)

Unit 1: Introduction to Wild Life

Values of wildlife-positive and negative; Conservation ethics; Importance of conservation; Causes of depletion; World conservation strategies.

Unit 2: Evaluation and management of wild life

Habitat analysis, Physical parameters : Topography, Geology, Soil and water; Biological Parameters: food, cover, forage, browse and cover estimation; Standard evaluation procedures: remote sensing and GIS.

Unit 3: Management of habitats

Setting back succession; Grazing logging; Mechanical treatment; Advancing the successional process; Cover construction; Preservation of general genetic diversity; Restoration of degraded habitats

Unit 4: Population estimation

Population density, Natality, Birth rate, Mortality, fertility schedules and sex ratio computation; Faecal analysis of ungulates and carnivores: Faecal samples, slide preparation, Hair identification, Pug marks and census method.

Unit 5: Management planning of wild life in protected areas

Estimation of carrying capacity; Ecotourism/wildlife tourism in forests; Concept of climax persistence; Ecology of perturbation.

Unit 7: Management of excess population

Bio-telemetry; Care of injured and diseased animal; Quarantine; Common diseases of wild animal

Unit 8: Protected areas

National parks & sanctuaries, Community reserve; Important features of protected areas in India; Tiger conservation - Tiger reserves in India; Management challenges in Tiger reserve.

WILD LIFE CONSERVATION AND MANAGEMENT

PRACTICALS

(CREDITS 2)

1. Identification of flora, mammalian fauna, avian fauna, herpeto-fauna
2. Demonstration of basic equipment needed in wildlife studies use, care and maintenance (Compass, Binoculars, Spotting scope, Range Finders, Global Positioning System, Various types of Cameras and lenses)
3. Familiarization and study of animal evidences in the field; Identification of animals through pugmarks, hoofmarks, scats, pellet groups, nest, antlers etc.
4. Demonstration of different field techniques for flora and fauna
5. PCQ, Tentree method, Circular, Square & rectangular plots, Parker's 2 Step and other methods for ground cover assessment, Tree canopy cover assessment, Shrub cover assessment.
6. Trail/transect monitoring for abundance and diversity estimation of mammals and bird (direct and indirect evidences)

SUGGESTED READINGS

- Caughley, G., and Sinclair, A.R.E. (1994). *Wildlife Ecology and Management*. Blackwell Science.
- Woodroffe R., Thirgood, S. and Rabinowitz, A. (2005). *People and Wildlife, Conflict or Co-existence?* Cambridge University.
- Bookhout, T.A. (1996). *Research and Management Techniques for Wildlife and Habitats*, 5th edition. The Wildlife Society, Allen Press.
- Sutherland, W.J. (2000). *The Conservation Handbook: Research, Management and Policy*. Blackwell Sciences
- Hunter M.L., Gibbs, J.B. and Sterling, E.J. (2008). *Problem-Solving in Conservation Biology and Wildlife Management: Exercises for Class, Field, and Laboratory*. Blackwell Publishing.

**Wildlife Photography and
Ecotourism**

**CREDITS 4
Credit-1**

Unit-I Tools and Technique of Photography

- Introduction to Photography
- Still && Video Photography
- To develop expertise in Photography
- Field trips for photography in different periods (Light and Dark), seasons and places (Wetlands, Wildlife sanctuaries, National parks, Industrial sites)
- Methods of documentation

Practical

- Submission of Photography
- Preparation of Poster and Calendar

Unit-2 Eco-tourism

- Introduction of Eco-tourism
- Scope of Eco-tourism with special reference to North East region of India
- Management of Eco-tourism & hospitality
- Development of Eco-tourism with innovative Eco-restoration ideas.

Practical

- Field visit to Wildlife sanctuaries, Eco-park, Historical and religious places, Cultural museum etc.
- Preparation of report and seminar presentation

- Alan Sinfield, 'Literature and Cultural Production', in *Literature, Politics, and Culture in Postwar Britain* (Berkeley and Los Angeles: University of California Press, 1989) pp. 23–38.
- Seamus Heaney, 'The Redress of Poetry', in *The Redress of Poetry* (London: Faber, 1995) pp. 1–16.
- Patricia Waugh, 'Culture and Change: 1960-1990', in *The Harvest of The Sixties: English Literature and Its Background, 1960-1990* (Oxford: OUP, 1997).

Paper 12: ENG-HC-5026 Women's Writing

Credits: 5 (Theory) + 1 (Tutorial)

Marks: 80 (End-Semester Examination) + 20 (Internal Assessment)

This paper seeks to direct the students' attention to nineteenth and twentieth century writings by women living in different geographical and socio cultural settings. Students will get acquainted with the situationally distinct experiences of women articulated in a variety of genres-poetry, novels, short stories, and autobiography, while the selections from Mary Wollstonecraft-the only 18th century text prescribed, will acquaint students with the ideas contained in one of the earliest feminist treatises of the western world. Apart from an examination of the themes and styles in the prescribed texts, students will be required to engage themselves with the specificities of the contexts from which the texts emerged and also analyze the women writers' handling of the different genres to articulate their women-centric experiences.

Themes: Gender, sexual/textual politics, feminism, body, identity, class, location, voice, space, gender and narrative.

Texts:

- Mary Wollstonecraft: *A Vindication of the Rights of Woman* (New York: Norton, 1988) chap. 1, pp. 11–19; chap. 2, pp. 19–38.
- Rassundari Debi: Excerpts from *Amar Jiban* in Susie Tharu and K. Lalita, eds., *Women's Writing in India*, vol. 1 (New Delhi: OUP, 1989) pp. 191–2.
- Katherine Mansfield: 'Bliss'
- Sylvia Plath: 'Daddy'; 'Lady Lazarus'
- Alice Walker: *The Color Purple*
- Mahashweta Devi: 'Draupadi', tr. Gayatri Chakravorty Spivak (Calcutta: Seagull, 2002)
- Nirupama Bargohain: 'Celebration'
- Adrienne Rich: 'Orion'
- Eunice De Souza: 'Advice to Women'; 'Bequest'

Suggested Topics and Background Prose Readings for Class Presentations

Topics

- The Confessional Mode in Women's Writing

Semester IV
PHI-HC-4036
Political & Social Philosophy

Unit I

Rights and Duties
Justice
Equality & Liberty

Unit II

Anarchism
Socialism
Marxism

Unit III

Monarchy
Theocracy
Democracy

Unit IV

Humanism
Secularism
Multiculturalism

Books Recommended:

Benjamin, M. (ed):

*Science and Sensibility, Gender and Scientific Enquiry,
1780-1945*

Durkheim, E.:

Sociology and Philosophy

Joshi, N. V.:

Social and Political Philosophy

Mackenzie, J.S.:

Outlines of Social Philosophy

Raphael, D. D.:

Problems of Political Philosophy

Rout, B. C.:

Political Theory and Ideology

Roy & Bhattacharya.:

Political Theory

Sinhha, A. K.:

Outlines of Social Philosophy