Department of Environmental Science

Effective from Session: 2025-2026							
Course Code	**B150701T/ ES413**	**Title of the Course**	**Advanced Studies in Environment and Ecology**	**L**	**T**	**P**	**C**
Year	**4th**	**Semester**	**VII**	**5**	**1**	**0**	**4**
Pre-Requisite	**Basic in Science**	**Co-requisite**					
Course Objectives	The course is designed to develop the basics of environment, its functioning and interactions that influences the globe positively and negatively. Students from different disciplines of science need the basis to understand the further advanced courses and researches being carried out in this area.						

Course Outcomes	
CO1	Develop knowledge about the basics of Environmental Sciences, interactions among biotic and abiotic factors of environment and environment in terms of socioeconomic benefits.
CO2	An insight into anthropogenic activities that lead to imbalance in ecosystem natural disasters, and climate change.
CO3	Develop concept of ecology and Ecosystem. Critically acclaimed the interactions between living-non-living and living – living component of ecosystem. Acquire knowledge of some basic type of ecosystems.
CO4	Develop knowledge about origin and evaluation of species, Structure of population and establishment of community in ecosystem.
CO5	Understand the concept of industrial development in synergy with environment

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**Introduction**	Environmental Science - Definition, Scope and Importance - Components of the environment: Atmosphere, Hydrosphere, Lithosphere and Biosphere – Structure and composition - History and scope of Ecology - Terminologies in ecology. Strategies for preservation and conversation of environment.	8	CO1
2	**Fundamentals of Ecosystem**	Eco-System: Concept, Components, Types, Structure, Functions and Stability. Characteristics and Components of Aquatic, Terrestrial and Marine ecosystem. Flow of energy and matter. Coexistence in communities-food webs.	8	CO2&CO3
3	**Functional Aspects of Ecology**	Ecology: Definition, Principles, Objectives & Scope. Concept of carrying capacity, Assimilative capacity and ecological foot prints. Food chain & Food web. Ecological pyramids. Ecological niche. Keystone species. Ecotypes. Plant Indicators. Ecological Adaptation.	7	CO3
4	**Geochemical Cycles & Energy System**	Bio-Geochemical Cycles: Gases and sedimentation cycles - Carbon cycle, Nitrogen cycle, Sulphur cycle, Phosphorus cycle and their interaction. Earth Energy Flow System: Energy Cycles and Energy Budget. Nutrient budgets (terrestrial, aquatic). Green House gasses. Green House Effect. Energy pyramid.	8	CO3
5	**Public Participation in Restoration**	Role of public participation, government agencies and NGOs in conservation and restoration, environmental education and its role in conservation and restoration.	7	CO4
6	**Population Ecology**	Population ecology - Levels of Organization, population characteristics - density, natality, mortality, survivorship curves, age distribution, growth curves and models - Population interactions - Co-evolution, Neutralism, symbiosis, commensalism, mutualism, antagonism, antibiosis, parasitism, predation; competition- inter and intra specific.	8	CO4
7	**Industrial Ecology**	Concept of Industrial Ecology. Eco-product design, Development and Eco labelling. Ecological industrial model. Eco-industrial parks, Industrial symbiosis, Life cycle assessment of Eco-products.	6	CO5
8	**Global Environmental Issues in Present Scenario**	Interaction between Earth, Man and Environment, Water crisis; Soil fertility; Forest cover changes; Natural and anthropogenic disasters, Urbanization and Industrialization; Biodiversity loss; Public health issues; Population and Society, Natural resources degradation, land degradation, deforestation, ecological and social impact of resource depletion.	8	CO5

Reference Books:

1. Odum EP (1996) Fundamentals of Ecology. W.B. Saunders, USA. Indian Reprint 1996, Natraj Publishers, Dehradun, India.
2. Rana SVS (2005) Essentials of Ecology and Environmental Sciences, Prentice-Hall of India Private Limited, New Delhi, India.
3. Sharma PD (2000) Ecology and Environment. Rastogi Publications, Meerut, India.
4. P. D. Sharma; Ecology and Environment; Volume 22 of Popular Biology Text Books Rastogi Publications, 2007
5. D.D. Mishra-Fundamental of Environmental Studies, S Chand & Co Ltd (1 December 2010).
6. E.D. Enger, B. E. Smith; Environmental Sciences-A study of Inter relationships, WCB Publication
7. M.C.Mollesh Jr. (1999) Ecology-Concepts and Aplication, McGraw Hill, New Delhi
8. Chapman, J.L. and Reiss M.J. (2005) Ecology Principles And Applications, Cambridge University Press, London.
9. V.Rana (2005) Essential of Ecology and Environmental Sciences, Prentice Hall of India, New Delhi.
10. Environment And Ecology-EAS105/EAS 205-R. Radagopalan.

e-Learning Source:

1. SWAYAM, MOOC, e-Skill India

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	-	-	-	-	-	2	3	-	-	-	-
CO2	3	-	-	-	-	-	2	3	2	2	-	-
CO3	3	-	-	-	-	-	2	3	-	-	-	-
CO4	2	-	-	-	-	-	3	3	-	-	-	-
CO5	2	-	-	-	-	-	3	3	2	-	2	-

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

INTEGRAL UNIVERSITY

Department of Environmental Science

Effective from Session: 2025-2026							
Course Code	**B150702T/ ES414**	**Title of the Course**	**Atmospheric Sciences and Global Climate Change**	**L**	**T**	**P**	**C**
Year	**4th**	**Semester**	**VII**	**5**	**1**	**0**	**4**
Pre-Requisite	**Basic in Science**	**Co-requisite**	-				
Course Objectives	The purpose of this course is to impart basic and key knowledge of atmosphere and global climate change. This will help in enhancing knowledge of influence of meteorological parameters and atmospheric circulation on Climate, atmospheric stability, energy balance, global warming, climate change and its impacts, policies and ozone layer depletion. After successfully completion of course, the student will able to explore subject into their respective dimensions.						

Course Outcomes	
CO1	Students will be able to analyse impact of atmospheric circulation on world climate and influence of meteorological parameters & atmospheric stability in shaping of Climate.
CO2	Students will be able to evaluate about energy balance and relationship of global warming with climate change.
CO3	Students will be able to evaluate various policies related to climate change mitigation strategies and create a knowledge base for global and national action plans to combat climate change issues.
CO4	Students will be able to analyze impact of climate change on human, environment and species.
CO5	Students will analyze the role of ozone depleting substances in ozone layer depletion and efforts for mitigation of ozone hole problem.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**MappedCO**
1	**Atmospheric Circulation**	Movement of air masses; atmosphere and climate; air and sea interaction; southern oscillation; western disturbances; El Nino and La Nina; tropical cyclone; Indian monsoon and its development, changing monsoon in Holocene in the Indian subcontinent, its impact on agriculture and Indus valley civilization; effect of urbanization on micro climate; Asian brown clouds.	8	CO1
2	**Meteorological Parameters**	Meteorological parameters (temperature, relative humidity, wind speed and direction, precipitation)	8	CO1
3	**Atmospheric Stability**	Atmospheric stability and mixing heights; temperature inversion; plume behavior; Gaussian plume model	6	CO1
4	**Energy Balance**	Earth's energy balance; energy transfers in atmosphere; Earth's radiation budget; greenhouse gases (GHGs); greenhouse effect; global conveyor belt, Milankovitch cycles.	6	CO2
5	**Global Warmingand Climate Change**	Earth's climate through ages; Global Warming; Climate Change; Relationship of Global warming with Climate Change, Trends of global warming and climate change; drivers of global warming and the potential of different greenhouse gases (GHGs) causing the climate change; atmospheric windows.	8	CO2
6	**Climate Changeand Policy**	Environmental policy debate; International agreements; Montreal protocol 1987; Kyoto protocol 1997; Convention on Climate Change; carbon credit and carbon trading; clean development mechanism.	8	CO3
7	**Climate Change and Impact**	Impact of climate change on atmosphere, weather patterns, sea level rise, agricultural productivity and Biological responses - range shift of species, CO_2 fertilization and agriculture; impact on economy and spread of human diseases.	8	CO4
8	**Ozone Layer Depletion**	Ozone layer or ozone shield; importance of ozone layer; ozone layer depletion and causes; Chapman cycle; Process of spring time ozone depletion over Antarctica; ozone depleting substances (ODS); effects of ozone depletion; mitigation measures.	8	CO5

Reference Books:

1. Barry, R. G. 2003. Atmosphere, Weather and Climate. Routledge Press, UK.
2. Hardy, J.T. 2003. Climate Change: Causes, Effects and Solutions. John Wiley & Sons.
3. Harvey, D. 2000. Climate and Global Climate Change. Prentice Hall
4. Mitra, A.P., Sharma, S., Bhattacharya, S., Garg, A., Devotta, S. & Sen, K. 2004. Climate Change and India. Universities Press, India

e-Learning Source:

1. https://www.edx.org/learn/climate-change
2. https://www.coursera.org/learn/global-warming#syllabus

Course Articulation Matrix: (Mapping of COs with POs and PSOs)

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	-	-	-	-	-	3	-	2	3	-	-	-
CO2	2	-	-	-	-	-	3	-	2	3	-	-	-
CO3	2	-	-	-	-	-	3	-	2	3	-	-	-
CO4	2	-	-	-	-	-	3	-	2	3	-	-	-
CO5	2	-	-	-	-	-	3	-	2	3	-	-	-

1. Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of**

Department of Environmental Science

Effective from Session: 2025-2026							
Course Code	**B150703T/ ES415**	**Title of the Course**	**Global Resources and Wildlife Management**	**L**	**T**	**P**	**C**
Year	**4th**	**Semester**	**VII**	**5**	**1**	**0**	**4**
Pre-Requisite	**Basic in Science**	**Co-requisite**					

Course Objectives	The course aims to introduce students to the concepts of global natural resources and their sustainable management. It will helps students to explore patterns and practices in wildlife conservation across different regions of the world, examine human-wildlife interactions, transboundary conservation challenges, develop an understanding of international frameworks, species management plans, and ecosystem-level conservation strategies.
Course Outcomes	
CO1	To identify different resources, their classification and distribution.
CO2	To know the interaction between resources and people's livelihood and the challenges associated with their exploitation and conservation.
CO3	To analyze the different methods used for management of species, its health and habitat.
CO4	To evaluate the effectiveness of in-situ conservation approaches and legal approach in it.
CO5	To develop mitigation approach to reduce human wildlife interface.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**Introduction to Resources**	Concept of resource: classification of natural resources. Factors influencing resource availability, distribution and uses. Interrelationships among different types of natural resources. Concern on Productivity issues. Ecological, social and economic dimension of resource management. Indian Biodiversity: Vegetational Zones, Zones of Faunal distribution, Major protected areas & their importance, Global Biodiversity, Major Biodiversity areas of the world, Biodiversity Hot Spots Global Biodiversity, major Biodiversity areas of the world, Biodiversity Hot Spots	6	CO1
2	**Livelihoods and Resources**	Concepts and scope of livelihood, indigenous communities and traditional livelihoods, forms of natural resources and dependencies of local people, natural resource crisis impacts on the livelihood of people, Non-Timber Forest Products (NTFP) types, classification and distributions. Joint Forest Management in India, scope of livelihood generation under JFM, JFM Linking scope of Rural Development with livelihoods, Different governmental schemes (MNREGA, NRM, RD, SGSY, DRDP, WFP, Integrated Rural Development Programme, Rural Livelihood Programmes) and Projects, National Afforestation Programme, DPIP, Man and Biosphere Programme, Bamboo Mission, Medicinal Plant Conservation and Cultivation Projects (NMPB).	10	CO2
3	**Overview of Policies in Resource Management**	National Forest Policy of 1988, National Environment Policy of 2004, National Conservation Policy, National Action Plan on Climate Change of 2008, Coastal Protection Act. Wildlife Protection Act of 1972, Forest Protection Act of 1980, Environment Protection Act of 1986, ICZM-Indian Coastal Zone Management, Water Act, 1981. Biological Diversity Act of 2002 and Rule 2004, Forest Rights Act of 2006. Green Tribunal Act, 2009. The precautionary principle and common responsibilities. PESA 1996, FRA 2006), sustainable harvesting rules in India	8	CO2
4	**Wild Species and Habitat Management**	Population Viability Analysis (PVA) and Minimum Viable Population (MVP), Translocation, Conservation Breeding, Surplus Hunting, Culling, Species management for man-wildlife conflict resolution and mitigation. Habitat Management Habitat Mapping and Suitability Analysis, Fire as a management tool in grass land management; Livestock grazing and its impact on wildlife habitats; Weed infestation and its adverse impacts; Canopy opening and its beneficial and negative impacts; Introduction and spread of exotic and invasive species in India and world; Waterhole management; Invasive Control (biological agents, chemical), Creation of Habitat Mosaics, Natural disaster Management (mounds to protect from floods).	8	CO3
5	**Wildlife Health Management**	Capture and handling of animals - purpose, restraint techniques, different capture methods and animal barriers. Drug immobilization - drug delivery equipment and accessories. Immobilization drugs - action, dosage, response and side effects, safety measures, complications. Handling and transport of wild animals, designing sledge, crate and holding enclosures. Management and identification of animals in conflict, identification by natural marking, individual damage; behavioural idiosyncrasies etc, managing problem animals using passive marking collars, tags, branding, rings etc. Dynamic marking-beta light, radio-tracking-harnesses, collars; tele-metering of physiological parameters.	8	CO3
6	**Law, Management Planning and Enforcement**	Interface between forest and wildlife management in India. Legal instruments for managing wildlife in India, Analysis of wildlife management problems in plantations and exploited forests; Indian and global scenario. In-situ conservation approach, Species conservation projects; tiger, lion, rhino, crocodile, etc. Role of Biology in management.	8	CO4
7	**Human Dimension in Wildlife Management**	Human Dimensions of Wildlife Management, Use of Technology for Human-Wildlife Conflict Mitigation, Dogs, Drones, Spy, Cameras, and Other Surveillance Tools for Poaching Control, Mobile Apps and Citizen Science	6	CO5
8	**Case Studies and Field Work**	Case studies and field work related to Natural resource management, species, health and habitat management.	6	CO5

Reference Books:

1. Knight, Richard L., editor, et al. 1995. A New Century for Natural Resources Management. Island Press.
2. Francois Ramade 1984. Ecology of Natural Resources. John Wiley & Sons Ltd.
3. Vitousek, P.M. 1994. Global Change and Natural Resource Management.
4. Odum, E.P. 1971. Fundamentals of Ecology. W.B. Saunders Co. USA
5. Heal, Geoffrey. 2000. Nature and the Marketplace: Capturing The Value Of Ecosystem Services. Island Press.
6. Kumar Arvind. 2005. Biodiversity and Conservation, Today & Tomorrow's Printers and Publishers New Delhi.
7. Kareiva, Peter, and Michelle Marview. 2010. Conservation Science: Balancing the Needs of People and Nature. Roberts and Company.
8. Johnsingh, A.J.T. (ed.). 2009. The Mammals of South Asia: Ecology, Behaviour and Conservation. Permanent Black
9. Prater, S.H. 1971. The Book of Indian Animals. Oxford University press, Bombay.
10. Ali, S. and Ripley, D.S. 1987. A compact Handbook of Birds of Indian Subcontinent. OUP, Bombay.

11.	Grimmet R, Inskipp C and Inskipp T. 1999. Handbook of birds of Indian subcontinent
12.	Daniel JC. 1980. Book of Indian reptiles. OUP
13.	Edmunds, D and Wollenberg, E 2003. Local Forest Management, Earthscan Publications, London
14.	Kerr JM, Marothia DK, Singh K, Ramaswamy C and Beritley WR . 1997. Natural Resource Economics: Theory and Applications in India. Oxford & IBH.
15.	Kathiresan, 1986. Essentials of Forest Management, Natraj Publishers, Dehra Dun.
16.	Coetzee, K. (2016). Practical Techniques for Habitat & Wildlife Management: A Guide for Game Ranches, Conservation Areas and Farmland. New Voices Publishing Services.
e-Learning Source:	
1.	www.apgweb
2.	http://envis.nic.in/

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5	PSO 6
CO1	2	2	2	2	2	3	1	-	-	-	-	-	2	2	2	2	2	-
CO2	2	2	3	2	2	3	1	-	-	-	-	-	1	1	2	1	2	-
CO3	1	3	2	2	2	3	2	-	-	-	-	-	3	1	3	1	3	-
CO4	2	3	3	2	3	3	2	-	-	-	-	-	3	1	3	3	3	-
CO5	2	3	2	2	3	3	2	-	-	-	-	-	2	1	3	3	3	-

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

Department of Environmental Science

Effective from Session: 2025-2026							
Course Code	**B150704P/ ES416**	**Title of the Course**	**Environmental Lab 1**	**L**	**T**	**P**	**C**
Year	**4th**	**Semester**	**VII**	**0**	**0**	**2**	**4**
Pre-Requisite	**Basic in Science**	**Co-requisite**					
Course Objectives	The objectives of this course are (a) Develop skills about analyzing Greenhouse gases emissions, causing global climate change. (b) Study the vegetation and species distribution in an area along with developing technical know-how of Physico-chemical analysis methods. (c) To develop interest in wild life, Forest resources, Biodiversity conservation, spread awareness towards Human-wildlife conflict and creating innovative mitigating strategies						

Course Outcomes	
CO1	Gain in-depth knowledge of global climate change and develop technical skills for determining their parameters and indicators.
CO2	Understand the species and community distribution patterns. Analysis of surface water parameters
CO3	To study the biological resources, wildlife capture techniques and invasive species mapping
CO4	Aware students about Human-wildlife Techniques and Mitigation Strategies.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**Atmospheric Sciences and Global Climate Change"**	1. To study about weather conditions of a particular region. 2. To Study about the sequence of events that lead to climate change. 3. To Study about trends of rise in Green- house gases concentration from Pre- Industrial times. 4. To study about the Impact of Climate Change on Species. 5. To study climatic classification of India based on Koppens System of classification of climate.	15	CO1
2	**Advanced Studies in Environment and Ecology**	1. To determine the minimum size of the quadrat by the species-area-curve method. 2. To study the community by quadrat method by determining the frequency, density, and abundance of different species present in the community. 3. To study the vegetation by line transects method, determining the frequency of individual species. 4. To record the abiotic components i.e. pH, turbidity, DO, temperature, salt and conductivity of water in a pond ecosystem. 5. To study the ecological adaptations of a hydrophyte and a xerophyte.	30	CO2
3	**Global Resources and Wildlife Management**	1. Biodiversity Assessment and Vegetational Zonation 2. Resource Mapping and Dependency Analysis 3. Non-Timber Forest Products (NTFP) Survey and Livelihood Evaluation 4. Habitat Suitability and Invasive Species Mapping 5. Wildlife Capture Techniques and Health Management 6. Human-Wildlife Conflict Mapping and Mitigation Strategies	15	CO3, CO4

Reference Books:

1. Agarwal, K.C. 2001 Environmental; Biology, Nidi Pub. Ltd.Bikaner.
2. Urban Wildlife Conservation Theory and Practice, Christopher E. Moorman, Robert A. McCleery, M. Nils Peterson, Springer International Publishing
3. Experimental Agrometeorology: A Practical Manual By Latief Ahmad, Raihana Habib Kanth, Sabah Parvaze, Syed Sheraz Mahdi · 2017, Springer International Publishing
4. Ecology The Experimental Analysis of Distribution and Abundance By Charles J. Krebs · 2001, Publisher Benjamin Cummings
5. Learning Landscape Ecology A Practical Guide to Concepts and Techniques By Monica G. Turner · 2006, Springer Newyork

e-Learning Source:

1. https://www.divulgameteo.es/Userfiles/Pdfs/Libro%20de%20Aberron/FitzRoy-III.pdf
2. https://library.uniq.edu.iq/storage/books/file/Perlman%20-%20Practical%20Ecology%20for%20Planners,%20Developers%20and%20Citizens%20(Island,%202004)/1671261289Perlman%20-%20Practical%20Ecology%20for%20Planners,%20Developers%20and%20Citizens%20(Island,%202004).pdf
3. https://www.conserve-energy-future.com/environmental-ethics.php

Course Articulation Matrix: (Mapping of COs with POs and PSOs)

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	1	1	1	1	2	3	-	-	-	-	-	2	2	3	1	1	-
CO2	3	1	1	1	1	2	3	-	-	-	-	-	2	2	3	1	1	-
CO3	3	1	1	1	1	2	3	-	-	-	-	-	2	2	3	1	1	-
CO4	3	1	1	1	1	2	3	-	-	-	-	-	2	2	3	1	1	-

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

Department of Environmental Science

Effective from Session:2025-2026							
Course Code	**B150705P/ ES417**	**Title of the Course**	**Field Project/ Educational Tour/ Industry Visit**	**L**	**T**	**P**	**C**
Year	**4th**	**Semester**	**VII**	**0**	**0**	**0**	**4**
Pre-Requisite	**Basic in Science**	**Co-requisite**					
Course Objectives	Upon finishing the course students will be able to come up with a gain of professional work in industry and research project experience.						

Course Outcomes	
CO1	To apply theoretical concepts learned in degree course work to a practical situation
CO2	To obtain experience with relevant materials and methodologies.
CO3	Achieve/complete assigned target(s)/ task(s) given by the person to whom the intern or apprentice is reporting (Supervisor)

Unit No.	**Title of the Unit**	**Content of unit**	**Mapped CO**
1	**Field Project/ Educational Tour/ Industry Visit**	Students are encouraged to undergo summer/winter plant training in a suitable industry, consultancy, research laboratory, institute, Protected Area etc. to get firsthand experience of corporate environmental management and of natural habitat. Candidates will write a field project report on issues related to Environmental Science under the guidance of their respective guides. Each student will work independently on the topic. The field project must consist of a review of the literature and produce a deep insight of the subject based on personal research. Field project work will be initiated at the start of the Semester. The students will undertake fieldwork in terms of the collection of data and surveys. The field project will have to be submitted for appraisal and acceptance by the University. The students should submit their field project report in the following format: Chapter I: Introduction with Aims and Objectives: A background with historical information and a review of existing material or data on the subject along with the aims and objectives of the study. Chapter II: Methodology with Material and Methods: Description of the issue, and methodology adopted for the study. Chapter III: Experimental: Presentation of data collected and detailed analysis of results. Chapter IV: Result and Discussion: Discussion on the data and results obtained and Presentation of the method suggested to solve the problem. Chapter V: Summary and Conclusions: A summary of the dissertation and important conclusions drawn at the end of the investigation. Bibliography or References: A list of references cited in the text. The Field Project Report should be typed on A4 size bond paper with 1.5 line spacing. Illustrations and photographs should be of high quality. The report should be flawless without any spelling mistakes or grammatical errors. Students will have to submit their field project report one month Before the practical examination at the end of Semester. The field work report will carry 100 marks (Internal marks 20 and External marks 80). Assessment of the report will be done at the end of the year. Students have to present a Power Point Presentation. Assessment of the field work shall be done by the external examiner appointed by HOD, Integral University.	CO1,2,3,

Course Articulation Matrix: (Mapping of COs with POs and PSOs)

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	2	1			1						1	2			
CO2	3	2	1	1									1	1			
CO3	3	2	2	2	2	2							1	1	1		

1-Correlation Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of HOD**

Department of Environmental Science

Effective from Session:2025-2026							
Course Code	**B150705R/ ES417**	**Title of the Course**	**Internship/Research Project (Research Project IV)**	**L**	**T**	**P**	**C**
Year	**4th**	**Semester**	**VII**	**0**	**0**	**0**	**4**
Pre-Requisite	**Basic in Science**	**Co-requisite**	**Nil**				
Course Objectives	Upon finishing the course students will be able to come up with a gain of professional work in industry and research project experience.						

Course Outcomes	
CO1	To apply theoretical concepts learned in degree course work to a practical situation
CO2	To obtain experience with relevant materials and methodologies.
CO3	Achieve/complete assigned target(s)/ task(s) given by the person to whom the intern or apprentice is reporting (Supervisor)

Unit No.	**Title of the Unit**	**Content of unit**	**Mapped CO**
1	**Internship/ (Research Project IV)**	Students are encouraged to undergo summer/winter in plant training in a suitable industry, consultancy, research laboratory, institute, Protected Areas etc. So as to get firsthand experience of corporate environmental management and of natural habitat. Candidates will write a field project report on issues related to Environmental Science under the guidance of their respective guides. Each student will work independently on the topic. The field project must consist of a review of the literature and produce a deep insight of the subject based on personal research. Field project work will be initiated at the start of Semester. The students will undertake fieldwork in terms of the collection of data and surveys. The field project will have to be submitted for appraisal and acceptance by the University. The students should submit their field project report in the following format: Chapter I: Introduction with Aims and Objectives: A background with historical information and a review of existing material or data on the subject along with the aims and objectives of the study. Chapter II: Methodology with Material and Methods: Description of the issue, methodology adopted for the study. Chapter III: Experimental: Presentation of data collected and detailed analysis of results. Chapter IV: Result and Discussion: Discussion on the data and results obtained and Presentation of method suggested to solve the problem. Chapter V: Summary and Conclusions: A summary of the dissertation and important conclusions drawn at the end of the investigation. Bibliography or References: A list of references cited in the text. The Field Project Report should be typed on A4 size bond paper with 1.5 line spacing. Illustrations and photographs should be of high quality. The report should be flawless without any spelling mistakes or grammatical errors. Students will have to submit their field project report one month Before the practical examination at the end of Semester. The field work report will carry 100 marks (Internal marks 20 and External marks 80). Assessment of the report will be done at the end of the year. Students have to present a Power Point Presentation. Assessment of the field work shall be done by the external examiner appointed by HOD, Integral University.	CO1,2,3,

Course Articulation Matrix: (Mapping of COs with POs and PSOs)

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	2	2	1		2	3						3	2	2	3	3	
CO2	3	2	1	1		3	3						3	1	2	3	3	
CO3	3	2	2	2	2	2	2						2	2	2	3	3	

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of HOD**