Mandatory Course (MC)

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
241AC001	Environmental Science	FC	2			0	100	-	100	-
241AC002	Constitution of India	FC	2			0	100	-	100	-
241AC003	Research Methodology	FC	2			0	100	-	100	-
241AC004	Intellectual Property Rights & Patents	FC	2			0	100	-	100	-
241AC005	Indian Knowledge Systems	FC	2			0	100	-	100	-
	Total		**10**			**0**				

Environmental Science

(Common to CE, EEE, ME, ECE, CSE, IT, AIML, CSE(DS), PT, Min.E)

Course Code: 241AC001	**L**	**T**	**P**	**C**
	2	**0**	**0**	**0**

Course Outcomes: At the end of the course, student will be able to:

- **CO1:** Outline the natural resources and their importance for the sustenance of the life
- **CO2:** Explain about the biodiversity of India, threats and its conservation methods
- **CO3:** Illustrate various attributes of the pollution, impacts and measures to control the pollution along with waste management practices
- **CO4:** Describe social issues of both rural and urban environment to combat the challenges and the legislations of India in environmental protection
- **CO5:** Explain the population growth and its implications

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11
CO1	1				1	2					
CO2	1					3					
CO3					2	3					1
CO4					1	3	1				1
CO5						3					

UNIT – I

Multidisciplinary Nature of Environmental Studies: Definition, Scope and Importance, Need for Public Awareness.Natural Resources: Renewable and non-renewable resources – Natural resources and associated problems

UNIT – II

Ecosystem, Biodiversity and Its Conservation:

Ecosystems: Concept of an ecosystem–Structure and function of an ecosystem–Producers, consumers, and decomposers. Food chains, food webs and ecological pyramids.Biodiversity And Its Conservation: Definition: genetic, species and ecosystem diversity– Bio-geographical classification of India – Values of biodiversity. Hot-spots of biodiversity – Threats to biodiversity. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity

UNIT – III

Environmental Pollution and Solid Waste Management:

Environmental Pollution: Definition, Cause, effects, and control measures of:

a. Air Pollution.
b. Water Pollution
c. Soil Pollution
d. Marine Pollution
e. Noise Pollution

Solid Waste Management: Causes, effects and control measures of urban and industrial wastes – Role of an individual in prevention of pollution

UNIT – IV

Social Issues and The Environment:

Social Issues and the Environment: From Unsustainable to Sustainable development – Urban problems related to Energy &Water. Resettlement and rehabilitation of people, Environmental ethics, Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents, and holocaust. Environment Protection Act – Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act-Wildlife Protection Act – Forest Conservation Act – Issues involved in enforcement of environmental legislation – Public awareness.

UNIT – V

Human Population and The Environment: Population growth, variation among nations. Environment and human health, Human Rights, Value Education. Role of Information Technology in Environment and human health.

Text Books:

1. Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha for University Grants Commission, Universities Press, ISBN 788173718625
2. Environmental Studies, Palaniswamy – Pearson education, ISBN 978-9332528277
3. Environmental Studies, Dr.S.Azeem Unnisa, Academic Publishing Company, ISBN 978-1926895246

Reference Books:

1. Textbook of Environmental Science, Deeksha Dave and E.Sai Baba Reddy, Cengage Publications, ISBN 978-8131517604
2. Textbook of Environmental Sciences and Technology, M.Anji Reddy, B.S Publication, ISBN 978-8178002347
3. Comprehensive Environmental studies, J.P.Sharma, Laxmi publications, ISBN 978-8170087380
4. Environmental sciences and engineering, J. Glynn Henry and Gary W. Heinke – Prentice Hall of India Private limited, ISBN 978-0132831772
5. A Textbook of Environmental Studies, G.R.Chatwal, Himalaya Publishing House, ISBN 978-9350245781

Web Links:

1. https://www.youtube.com/watch?v=mOwyPENHhbc
2. https://www.youtube.com/watch?v=_mgvsPnCYj4
3. https://www.youtube.com/watch?v=L5B-JMnBIyQ

Constitution of India

(Common to CE, EEE, ME, ECE, CSE, IT, AIML, CSE(DS), PT, Min.E)

Course Code: 241AC002	**L**	**T**	**P**	**C**
	2	**0**	**0**	**0**

Course Outcomes: At the end of the course, student will be able to:

- **CO1:** Explain historical background of the constitution making and its importance for building a democratic India
- **CO2:** Compare the functioning of three wings of the government i.e.., executive, legislative and judiciary
- **CO3:** Interpret the value of the fundamental rights and duties for becoming good citizen of India
- **CO4:** Compare the decentralization of power between central, state and local self-government
- **CO5:** Extend the knowledge in strengthening of the constitutional institutions like CAG, Election Commission and UPSC for sustaining democracy

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11
CO1					3			1	2		
CO2					2			1	3		
CO3					3			2	3		
CO4					3			2	1		
CO5					2			1	3		

UNIT – I

Introduction to Indian Constitution: Constitution' meaning of the term, Indian Constitution - Sources and constitutional history, Features - Citizenship, Preamble, Fundamental Rights and Duties, Directive Principles of State Policy.

UNIT – II

Union Government and its Administration Structure of the Indian Union: Federalism, Centre- State relationship, President: Role, power and position, PM and Council of ministers, Cabinet and Central Secretariat, Lok Sabha, Rajya Sabha, The Supreme Court and High Court: Powers and Functions

UNIT – III

State Government and its Administration Governor: Role and Position - CM and Council of ministers, State Secretariat: Organization, Structure and Functions

UNIT – IV

Local Administration: District's Administration Head - Role and Importance, Municipalities - Mayor and role of Elected Representative - CEO of Municipal Corporation PanchayatiRaj: Functions PRI: Zila Panchayat, Elected officials and their roles, CEO Zila Panchayat: Block level Organizational Hierarchy - (Different departments), Village level - Role of Elected and Appointed officials - Importance of grass root democracy

UNIT – V

Election Commission: Election Commission- Role of Chief Election Commissioner and Election Commissionerate State Election Commission:, Functions of Commissions for the welfare of SC/ST/OBC and women

Text Books:

1. Durga Das Basu, Introduction to the Constitution of India, Prentice – Hall of India Pvt. Ltd. New Delhi
2. Subash Kashyap, Indian Constitution, National Book Trust.

Reference Books:

1. J.A. Siwach, Dynamics of Indian Government & Politics, ISBN 9788120709768
2. D.C. Gupta, Indian Government and Politics, ISBN 9780706987782
3. H.M.Sreevai, Constitutional Law of India, 4th edition in 3 volumes (Universal Law Publication), ISBN 9788194776529
4. J.C. Johari, Indian Government and Politics Hans, ISBN 978-9351676065

Web Links:

1. nptel.ac.in/courses/109104074/8
2. nptel.ac.in/courses/109104045/
3. nptel.ac.in/courses/101104065/
4. www.hss.iitb.ac.in/en/lecture-details
5. www.iitb.ac.in/en/event/2nd-lecture-institute-lecture-series-indian-constitution

Research Methodology
(Common to CE, EEE, ME, ECE, CSE, IT, AIML, CSE(DS), PT, Min.E)

Course Code: 241AC003	L	T	P	C
	2	0	0	0

Course Outcomes: At the end of the course, student will be able to:

CO1: Explain the characteristics and process of research
CO2: Select the research problem by applying problem identification techniques.
CO3: Formulate and execute research design process.
CO4: Report the results of research process adhering to professional ethics.
CO5: Analyze the results of research using statistical measures of central tendancy

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11
CO1	1			2					2		1
CO2	1			2					2		1
CO3	1			2					2		1
CO4	1			2			3		2		1
CO5	1			2	2				2		1

UNIT – I

Meaning of Research:

Meaning of Research - Function of Research - Characteristics of Research – Steps involved in Research – Research in Pure and Applied Sciences - Inter Disciplinary Research. Factors which hinder Research – Significance of Research - Research and scientific methods – Research Process– Criteria of good Research – Problems encountered by Researchers – Literature review.

UNIT – II

Identification of Research Problem : Selecting the Research problem – Necessity of defining the problem – Goals and Criteria for identifying problems for research. Perception of Research problem – Techniques involved in defining the problem

UNIT – III

Research Design : Formulation of Research design – Need for Research design – Features of a good design – Important concepts related to Research design.

UNIT – IV

Interpretation and Report Writing: Meaning and Technique of interpretation – Precautions in interpretation – Significance of report writing – Different steps in writing a report – Layout of a Research report.

UNIT – V

Statistical Techniques and Tools : Introduction of statistics – Functions – Limitations – Measures of central tendency - Arithmetic mean – Median – Mode – Standard deviation – Co-efficient of variation (Discrete serious and continuous serious) – Correlation – Regression.

Text Books:

1. Research Methodology Methods & Techniques, C.R. Kothari – New Age international Publishers, Reprint 2008, ISBN 9788122415223
2. A Hand Book of Methodology of Research, Rajammall, P. Devadoss and K. Kulandaivel, RMM Vidyalaya press, ISBn 9780367135720

Reference Books:

1. Thesis and Assignment Writing, J. Anderson, Wiley Eastern Ltd, ISBN 978-8126530755
2. Research Methodology, Mukul Gupta, Deepa Gupta – PHI Learning Private Ltd., New Delhi, 2011, ISBN 9788120343818
3. Fundamentals of Mathematical statistics, S.C. Gupta and V.K. Kapoor, Sultan Chand & Sons, New Delhi, ISBN 978-8180545283

Web Links:

1. https://nptel.ac.in/courses/127106227
2. https://archive.nptel.ac.in/courses/121/106/121106007/

Intellectual Property Rights & Patents

(Common to CE, EEE, ME, ECE, CSE, IT, AIML, CSE(DS), PT, Min.E)

Course Code: 241AC004	**L**	**T**	**P**	**C**
	2	**0**	**0**	**0**

Course Outcomes: At the end of the Course, Student will be able to:

- **CO1:** Compare various types of Intellectual Property rights.
- **CO2:** Discuss Intellectual Property and infer rights on such Intellectual Property owners
- **CO3:** Explain the process of patenting
- **CO4:** Apply for Trade marks and Copyrights.
- **CO5:** Explain the methods to protect Trade secrets

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11
CO1	1					1	3				2
CO2	1					1	3				2
CO3	1					1	3				2
CO4	1					1	3				2
CO5	1					1	3				2

UNIT – I

Introduction to Intellectual Property Rights (IPR): Concept of Property - Introduction to IPR – International Instruments and IPR - WIPO - TRIPS – WTO –Laws Relating to IPR - IPR Tool Kit - Protection and Regulation - Copyrights and Neighboring Rights – Industrial Property – Patents - Agencies for IPR Registration – Traditional Knowledge –Emerging Areas of IPR – Layout Designs and Integrated Circuits – Use and Misuse of Intellectual Property Rights.

UNIT – II

Copyrights and Neighboring Rights: Introduction to Copyrights – Principles of Copyright Protection – Law Relating to Copyrights - Subject Matters of Copyright – Copyright Ownership – Transfer and Duration – Right to Prepare Derivative Works –Rights of Distribution – Rights of Performers – Copyright Registration – Limitations – Infringement of Copyright – Relief and Remedy – Case Law - Semiconductor Chip Protection Act.

UNIT – III

Patents: Introduction to Patents - Laws Relating to Patents in India – Patent Requirements – Product Patent and Process Patent - Patent Search - Patent Registration and Granting of Patent - Exclusive Rights – Limitations - Ownership and Transfer — Revocation of Patent – Patent Appellate Board - Infringement of Patent – Double Patenting — Patent Cooperation Treaty – New developments in Patents – Software Protection and Computer related Innovations.

UNIT – IV

Trademarks and Trade secrets: Introduction to Trademarks – Laws Relating to Trademarks – Functions of Trademark – Distinction between Trademark and Property Mark – Marks Covered under Trademark Law - Trade Mark Registration – Trade Mark Maintenance – Transfer of rights - Deceptive Similarities - Likelihood of Confusion - Dilution of Ownership – Trademarks Claims and Infringement – Remedies – Passing off Action - Introduction to

Trade Secrets – General Principles - Maintaining Trade Secret – Physical Security – Employee Access Limitation – Employee Confidentiality Agreements.

UNIT – V

Cyber Law and Cyber Crime : Introduction to Cyber Law – Information Technology Act 2000 - Protection of Online and Computer Transactions - E-commerce - Data Security – Authentication and Confidentiality - Privacy - Digital Signatures – Certifying Authorities - Cyber Crimes - Prevention and Punishment – Liability of Network Providers. Relevant Cases Shall be dealt where ever necessary.

Text Books:

1. Fundamentals of IPR for Engineers- Kompal Bansal & Parishit Bansal, B. S.Publications (Press), ISBN 978-8178002774
2. Intellectual Property -Deborah E.Bouchoux, Third Edition, Cengage Learning, New Delhi, ISBN: 0 340 67786 4.

Reference Books:

1. Intellectual property rights- Prabuddha Ganuli, Tata Mcgraw hill, ISBN 978-0070077171
2. Intellectual property rights M.Ashok kumar and Mohd.Iqbal Ali:, Serials Publications, ISBN 9788183871648
3. Intellectual Property Rights (Patents & Cyber Law), Dr. A. Srinivas. Oxford University Press, New Delhi.
4. Intellectual Property- Richard Stim, Cengage Learning, New Delhi, ISBN 978-0766826656

Web Links:

1. http://www.wipo.int/portal/en/index.html
2. https://indiankanoon.org/
3. http://www.ipindia.nic.in/patents.htm
4. http://www.ipindia.nic.in/trade-marks.htm
5. http://copyright.gov.in

Indian Knowledge Systems (IKS)
(CE, EEE, ME, ECE, CSE, IT, AIML, CSE(DS), PT, Min. E)

	L	T	P	C
Course Code: 241AC005	**2**	**0**	**0**	**0**

Course Outcomes:

At the end of the course, students will be able to:

- **CO1:** Describe the foundations and scope of Indian Knowledge Systems.
- **CO2:** Recognize major Indian contributions to knowledge, science, and culture.
- **CO3:** Appreciate ethical values and sustainability rooted in Indian traditions.
- **CO4:** Relate traditional knowledge to contemporary societal and technological needs.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11
CO1	-	-	-	-	-	3	1	1	-	-	-
CO2	-	-	-	-	-	3	1	1	-	-	-
CO3	-	-	-	-	-	3	1	1	-	-	-
CO4	-	-	-	-	-	3	1	1	-	-	-
CO5	-	-	-	-	-	3	1	1	-	-	-

UNIT – I
Foundations of Indian Knowledge Systems

Meaning, scope, and importance of IKS. Sources of IKS: Vedas, Upanishads, Itihasas, Puranas, Shastras. Traditional Knowledge, Indigenous Knowledge, and Western Knowledge – comparison. Gurukula system and knowledge transmission traditions

UNIT – II
Indian Civilization and Philosophical Traditions

Overview of ancient Indian civilization (Indus Valley, Maurya, Gupta). Indian philosophical schools and ethical values. Epics: Ramayana and Mahabharata – cultural and moral significance. Religious traditions: Hinduism, Buddhism, Jainism, Sikhism

UNIT – III
Arts, Architecture and Cultural Expressions

Temple architecture: Nagara, Dravidian, Vesara. Mughal architecture and monuments. Indian classical dance forms and music traditions. Handicrafts, sculpture, painting, and iconography

UNIT – IV
Traditional Knowledge in Health, Environment and Sustainability

Ayurveda and Yoga – holistic health systems. Traditional agriculture and food practices. Water conservation methods and environmental ethics. Biodiversity conservation and sustainable living

UNIT – V
Traditional Knowledge and Contemporary Relevance

Protection of Traditional Knowledge.Traditional Knowledge (TK) and Intellectual Property Rights (overview). Role of government and national initiatives. Relevance of IKS to engineering, innovation, and entrepreneurship

Text Books:

1. **Indian Knowledge Systems**, Kapil Kapoor & Avadhesh Kumar Singh, D.K. Printworld (India) Pvt. Ltd., New Delhi. ISBN: 9788124608177.
2. **Indian Philosophy – Volume I & II**, S. Radhakrishnan, Oxford University Press, New Delhi. ISBN: 9780195698418.
3. **Science and Technology in Ancient India**, O.P. Jaggi, Atma Ram & Sons, Delhi. ISBN: 9788185694085.
4. **Indian Heritage and Culture,** Madhukar K. Bhagat, McGraw Hill Education (India). ISBN: 9789332901476.
5. **Traditional Knowledge System in India,** Yogendra K. Malik, Pearson Education India. ISBN: 9788131762219.

Reference Books:

1. **Ancient Indian Science and Technology**, Debiprasad Chattopadhyaya, History of Science, Philosophy and Culture in Indian Civilization Series. ISBN: 9788187586098.
2. **Indian Culture and Heritage**, Nitin Singhania, McGraw Hill Education. ISBN: 9789353161132.
3. **Knowledge Traditions of India**, Bhu Dev Sharma, Indian Council of Philosophical Research (ICPR). ISBN: 9788185636306.

Web Links:

1. https://iks.aicte-india.org/
2. https://www.education.gov.in/iks