Mandatory Courses (AUC)

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 (IKS)	FC	2			0	100	-	100	-
Total			10			0				

Environmental Science

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

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

Course Outcomes:

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

CO1	Outline the natural resources & their importance for the sustenance of the life
CO2	Explain about the biodiversity of India, threats & its conservation methods
CO3	Illustrate various attributes of the pollution, impacts & measures to control the pollution along with waste management practices
CO4	Describe social issues of both rural & urban environment to combat the challenges & the legislations of India in environmental protection
CO5	Explain the population growth & its implications
CO6:	Summarize the Role of IT on Environment & Human Health

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					3	2				
CO2		1					2	3			
CO3						2	3				
CO4						2	3	1			
CO5						2	3				
CO6:					2	2	3				

UNIT – I

Multidisciplinary Nature of Environmental Studies: Definition, Scope & Importance, Need for Public Awareness.

Natural Resources: Renewable & non-renewable resources – Natural resources & associated problems.

UNIT – II

Ecosystem, Biodiversity & Its Conservation:

Ecosystems: Concept of an ecosystem. – Structure & function of an ecosystem – Producers, consumers, & decomposers. Food chains, food webs & ecological pyramids.

Biodiversity & Its Conservation: Definition: genetic, species & ecosystem diversity – Bio-geographical classification of India – Values of biodiversity. Hot-spots of biodiversity – Threats to biodiversity. Conservation of biodiversity: In-situ & Ex-situ conservation of biodiversity.

UNIT – III

Environmental Pollution & Solid Waste Management:

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

a. Air Pollution.

b. Water Pollution

c. Soil Pollution

d. Marine Pollution

e. Noise Pollution

Solid Waste Management:

Causes, effects & control measures of urban & industrial wastes – Role of an individual in prevention of pollution

UNIT – IV

Social Issues & The Environment:

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

UNIT – V

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

Text Books:

1. Textbook of Environmental Studies for Undergraduate Courses, Erach Bharucha for University Grants Commission, Universities Press. ISBN: 9788173718625
2. Environmental Studies, Palaniswamy – Pearson education ISBN: 978-9332528277

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 by M.Anji Reddy, B.S Publication. ISBN: 9385433385
3. Comprehensive Environmental studies by J.P.Sharma, Laxmi publications ISBN: 978-8170087380

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

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

	L	T	P	C
Course Code:241AC002	**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 & its importance for building a democratic India

CO2 Compare the functioning of three wings of the government i.e.., executive, legislative & judiciary

CO3 Interpret the value of the fundamental rights & duties for becoming good citizen of India

CO4 Compare the decentralization of power between central, state & local self-government

CO5 Extend the knowledge in strengthening of the constitutional institutions like CAG, Election Commission & UPSC for sustaining democracy.

CO6: Underst& the Electoral Process & Amendment procedure.

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	2	1			
CO2						2	3	1			
CO3						3	3	2			
CO4						3	1	2			
CO5						2	3	1			
CO6:						3	2	1			

UNIT – I

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

UNIT – II

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

UNIT – III

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

UNIT – IV

Local Administration: District's Administration Head - Role & Importance, Municipalities - Mayor & role of Elected Representative - CEO of Municipal Corporation .

PanchayatiRaj: Functions PRI: Zila Panchayat, Elected officials & their roles, CEO Zila Panchayat: Block level Organizational Hierarchy – (Different departments), Village level – Role of Elected & Appointed officials – Importance of grass root democracy.

UNIT – V

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

Text Books:

1. Introduction to the Constitution of India, Durga Das Basu, Prentice – Hall of India Pvt. Ltd. New Delhi. ISBN: 978-9388548861
2. Indian Constitution, Subash Kashyap, National Book Trust. ISBN: 9788123707341

Reference Books:

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

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

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

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

Course Outcomes:

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

- **CO1** Explain the characteristics & process of research.
- **CO2** Select the research problem by applying problem identification techniques.
- **CO3** Formulate & 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
- **CO6:** Analyze the results of research using coefficient of variation, correlation & regression

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
CO6:	1			2						2	1

UNIT – I

Meaning of Research: Function of Research - Characteristics of Research – Steps involved in Research – Research in Pure & Applied Sciences - Inter Disciplinary Research. Factors which hinder Research – Significance of Research - Research & 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 & 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 & Report Writing: Meaning & 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 & Tools : Introduction of statistics – Functions – Limitations – Measures of central tendency – Arithmetic mean – Median – Mode – St&ard deviation – Co-efficient of variation (Discrete serious & continuous serious) – Correlation – Regression.

Text Books:

Research Methodology Methods & Techniques, C.R. Kothari – New Age international Publishers, Reprint. ISBN: 9788122415223

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. ISBN: 9788120349469
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://www.youtube.com/watch?v=IZLn9_PA_4s

Intellectual Property Rights & Patents
(CE,EEE, ME, ECE,CSE, IT, AIML, CSE(DS), PT&Min.E)

	L	T	P	C
Course Code: 241AC004	**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 & infer rights on such Intellectual Property owners
CO3: Explain the process of patenting
CO4: Apply for Trade marks & Copyrights.
CO5: Explain the methods to protect Trade secrets
CO6: Interpret the legal issues on Intellectual Property Rights & cyber laws

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
CO6	1					1		3			2

UNIT – I

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

UNIT – II

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

UNIT – III

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

UNIT – IV

Trademarks & Trade secrets: Introduction to Trademarks – Laws Relating to Trademarks – Functions of Trademark – Distinction between Trademark & 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 & 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 & Cyber Crime : Introduction to Cyber Law – Information Technology Act 2000 - Protection of Online & Computer Transactions - E-commerce - Data Security – Authentication & Confidentiality - Privacy - Digital Signatures – Certifying Authorities - Cyber Crimes - Prevention & 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: 9788178002774
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. ISBN: 979-8886848229
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