



NRI INSTITUTE OF TECHNOLOGY

(AUTONOMOUS)

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Accredited by NAAC with "A" GRADE, Accredited by NBA (CSE, ECE&EEE)
An ISO 9001:2015 Certified Institution
Pothavarappadu (V), Agiripalli (M), Eluru District, A.P., India, Pin: 521 212
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7.1.8 Institutional efforts / initiatives in providing an inclusive environment i.e., tolerance and harmony towards cultural, regional, linguistic, communal socio-economic and other diversities

S. No	Description (Academic Activities)			
	Regulation	Subject Name	Subject Code	Semester
1	NRIA18	Professional Ethics & Human Values	18A2100801	2-1
			18A2200801	2-2
IPR & P		18A2200802	2-2	
		18A3104802	3-1	
		18A3200801	3-2	
		18A4100802	4-1	
3		Sanskrit	18A2100603	2-1
4		Biology for Engineers/ Enterprising and Startup/ NSS / YOGA / Social service/ sports /games	18A3200791	3-2
5		Environmental Studies	18A1100801	1-1
6		Essence of Indian knowledge and traditions	18A3200801	3-2
7		NRIA20	Environmental Sciences	20A1100801
	20A1200801			1-2
	Professional Ethics & Human Values		20A2100802	2-1
			20A3200803	3-2
	Essence of Indian knowledge and traditions		20A2200801	2-2
20A3100801		3-1		
10	IPR&P	20A3100803	3-1	
11	Research methodologies & IPRP	20A3200802	3-2	


IQAC

I.Q.A.C. Coordinator

NRI INSTITUTE OF TECHNOLOGY
POTHAVARAPPADU (V), Agiripalli (M)
Eluru Dist., Vijayawada Rural - 521 212


PRINCIPAL
PRINCIPAL

NRI Institute of Technology
Pothavarappadu (V), Agiripalli (M)

18A2100802- PROFESSIONAL ETHICS AND HUMAN VALUES

Lecture – Tutorial- Practical:	0-2-0	Internal Marks:	40
Credits:	0	External Marks:	60*

Prerequisites:

Basic understanding about Engineering profession

Course Objectives:

- To create awareness on engineering ethics and human values.
- To understand social responsibility of an engineer.

To instill moral and social values and loyalty.

Course Outcomes:

Upon successful completion of the course, the student will be able to:

C01	Grooms themselves as ethical, responsible and societal beings.
C02	Discuss ethics in society and apply the ethical issues related to engineering.
C03	Exhibit the understanding of ethical theories in professional environment.
C04	Recognize their role as social experimenters (engineers) and comprehend codes of ethics.
C05	Identify the risks likely to come across in the professional world, analyzing them and find solutions.
C06	Realize the responsibilities and rights of engineers in the society.

Contribution of Course Outcomes towards achievement of Program Outcomes (1 – Low, 2- Medium, 3 – High)

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
C01.	-	-	-	-	-	1	1	2	-	-	-	1
C02	-	-	-	-	-	1	1	2	-	-	-	1
C03	-	-	-	-	-	1	1	2	-	-	-	1
C04	-	-	-	-	-	1	1	2	-	-	-	1
C05	-	-	-	-	-	1	1	2	-	-	-	1
C06	-	-	-	-	-	1	1	2	-	-	-	1

UNIT I

Human Values: Objectives, Morals, Values, Ethics, Integrity, Work ethics, Service learning, Virtues, Respect for others, Living peacefully, Caring, Sharing, Honesty, Courage, Valuing time, Cooperation, Commitment, Empathy, Self-confidence, Challenges in the work place.

UNIT II

Engineering

ethics

Senses of 'Engineering Ethics' – Variety of moral issues – Types of inquiry – Moral dilemmas – Moral Autonomy – Kohlberg's theory – Gilligan's theory – Consensus and Controversy – Models of professional roles – Theories about right action – Self-interest – Customs and Religion – Uses of Ethical Theories.

UNIT III

Engineering as Social Experimentation: Engineering as experimentation, Engineers as responsible experimenters, Codes of ethics, Industrial standards, A balanced outlook on law, Case study: The challenger.

UNIT IV

Safety, Responsibilities and Rights: Safety and risk, types of risks, Assessment of safety and risk, Safe exit, Risk-benefit analysis, safety lessons from 'the challenger', Case study: Power plants, Collegiality and loyalty, Collective bargaining, Confidentiality, Conflict of interests, Occupational crime, whistle blowing, Intellectual property rights, professional rights.

TEXT BOOKS:

- A Text book on Professional Ethics and Human Values by R.S Naagarazan- New Age International Publishers.
- " Engineering Ethics includes Human Values" by M. Govindarajan, S. Natarajan and V. S. Senthil Kumar- PHI Learning Pvt. Ltd-2009

REFERENCE BOOKS:

"Professional Ethics and Human Values" by A. Alavudeen, R. Kalil Rahman and M. Jayakumaran- Laxmi Publications.

E-RESOURCES:

- www.onlineethics.org
- www.nspe.org
- www.globalethics.org
- www.ethics.org


PRINCIPAL
NRI Institute of Technology
Pothaverrappadu (V), Aglripalli (M)

18A2200801-IPR & Patents

Lecture – Tutorial: 2-0 Hours

Internal Marks: 40

Credits: 0

External Marks: 00

Prerequisites: Professional Ethics

Course Objectives:

- 1) To impart knowledge on innovations and creations.
- 2) To encourage students on developing Entrepreneurship Skills
- 3) To teach procedure for registrations of various intellectual property rights.
- 4) To bring awareness on cybercrimes.

Course Outcomes:

Upon successful completion of the course, the student will be able to:

CO1	Understand the need for Intellectual Property Rights and its importance
CO2	Study of Information Technology Act 2000 and classification of Cybercrimes
CO3	Study of Copyrights Act and its registrations process
CO4	Study of Patents Act and it's infringement
CO5	Study of Trademarks Act and it's registration formalities
CO6	Understand the importance of Trade secrets and maintaining trade secrets

Contribution of Course Outcomes towards achievement of Program Outcomes (1 – Low, 2- Medium, 3 – High)

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO1	2	2	-	-	-	-	-	3	-	-	-	-
CO2	3	-	-	-	-	-	-	3	-	2	-	-
CO3	2	-	2	-	-	-	-	3	-	-	-	-
CO4	2	-	-	2	-	-	-	3	-	-	-	-
CO5	2	-	2	-	-	-	-	3	-	-	-	-
CO6	2	-	-	-	-	-	-	3	2	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.

LO: 1. Classify intellectual property rights

2. Understand the importance of IPR

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.

LO: 1. Classification of cyber crimes

2. Awareness and preventive measures of cyber crimes

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.

- LO. 1. Categorize subject matters of copyrights*
2. Understand the registration process of copyrights
3. Study effect of Infringement under Copyright 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.

- LO. 1. Analyze Patent requirements and its registration formalities*
2. Study the effect of Infringement under Patent Act

UNIT IV

Trademarks: 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.

- LO. 1. Analyze functions of Trademark and its registration formalities*
2. Study the effect of Infringement under Trademark Act

Trade Secrets

Introduction to Trade Secrets – General Principles - Laws Relating to Trade Secrets - Maintaining Trade Secret – Physical Security – Employee Access Limitation – Employee Confidentiality Agreements – Breach of Contract – Law of Unfair Competition – Trade Secret Litigation – Applying State Law.

- LO. 1. Understand the importance of Tradesecrets*
2. Understand how to maintain Tradesecrets

TEXT BOOKS:

1. Deborah E. Bouchoux: Intellectual Property, Cengage Learning, New Delhi.
2. Prabhuddha Ganguli: Intellectual Property Rights, Tata Mc-Graw –Hill, New Delhi

REFERENCE BOOKS:

- 1 Intellectual Property Rights (Patents & Cyber Law), Dr. A. Srinivas. Oxford University Press, New Delhi.
- 2 R. Radha Krishnan, S. Balasubramanian: Intellectual Property Rights, Excel Books. New Delhi.
- 3 M. Ashok Kumar and Mohd Iqbal Ali: Intellectual Property Rights, Serials Pub.

E-RESOURCES:

- https://www.wipo.int/edocs/pubdocs/en/intproperty/450/wipo_pub_450.pdf
- <https://www.icsi.edu/media/webmodules/publications/9.4%20Intellectual%20Property%20Rights.pdf>
- <https://lecturenotes.in/notes/20883-note-for-intellectual-property-rights-ipr-by-gyan-prakash>


PRINCIPAL

18A2100603- Sanskrit

Lecture - Tutorial- 2-0-0	Internal Marks:	40
Practical:		
Credits: 1	External Marks:	60

Prerequisites:

Basic understanding of languages

Course Objectives:

1. Reading, Writing, understanding and conversational skills of Sanskrit language will be imparted (through lecture method, Questions and Answers, Test, Open text book study, Role play, Discussion, Debate or collaboration assignment or case study).

2. (As Sanskrit enriched all most all Indian Languages through it's rich vocabulary) proper understanding of one's mother tongue and usage are expected.

3. To enable the students for the proper understanding of the culture, Heritage, Traditions, Thinking, ethics and values of our country Bharath.

Course Outcomes:

Upon successful completion of the course, the student will be able to:

CO1 Reading, Writing, understanding and conversational skills are developed.

CO2 Unity in diversity of our country is well understood.

CO3 The origin and development of Indian Languages is well understood

CO4 Proper usage of Language is achieved.

CO5 Sanskrit words that are familiar to us which we are using in our languages are identified.

CO6

The great Indian culture roots are well observed.

UNIT	TOPIC NAME	POEMS
I	विदुरानीति: (Vidhuraneethi)	1 - 16
II	भर्तृहरि नीतिशतकम् (Bhartruhari - Neetisatakam)	1-16
III	संभाषणसंस्कृतम् (Prescribed Text by NRIIT)	1-16 Lesson From
IV	संस्कृतभाषा कौरालम् (Prescribed Text by NRIIT)	17-32 Lessons From संस्कृतमनोरम

Reference Books:

- विदुरनीति: from श्रीमन्महाभारतम् of वेदव्यासः
- नीतिशतकम् of भर्तृहरिः
- "TEACH YOURSELF SANSKRIT" (Graded Text Books) published by Rashtriya Sanskrit Sansthan, MHRD, Govt. of India, New Delhi.


PRINCIPAL

NRI Institute of Technology
Bothavaraipadu (O), Agiripalli (M)

Course Code-BIOLOGY FOR ENGINEERS

Type of Course : Audit course

Lecture – Tutorial- Practical:: Credits:	0-2-0 (Audit Course) 0	Internal Marks: External Marks:	40 60*
Prerequisites:			
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Course Objectives:The objective of this course is to provide basic knowledge in biology for the engineers and to analyze biological process in computational tools.

Course Outcomes:

Upon successful completion of the course, the student will be able to:

CO1	Describe the fundamental Principles and methods of engineering
CO2	Identify the functions of different types in bio-molecules
CO3	Describe mechanisms underlying the working of molecular biological processes including enzyme catalysis, metabolic pathways, gene expression.
CO4	Use Excel, MATLAB and other computational tools to quantitatively analyze biological processes.
CO5	
CO6	

Contribution of Course Outcomes towards achievement of Program Outcomes (1 – Low, 2-Medium, 3 – High)

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO1	-	3	-	2	-	-	-	-	-	-	-	-
CO2	-	3	-	-	-	-	-	-	-	-	-	-
CO3	-	2	-	3	-	-	-	-	-	-	-	-
CO4	-	1	-	2	3	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-

UNIT I :

UNIT I:Introduction and Classification of Living organisms. Introduction: Fundamental differences between science and engineering by drawing a comparison between eye and camera, Bird flying and aircraft. Biology as an independent scientific discipline. Discuss how biological observations of 18th Century that lead to major discoveries. Examples from Brownian motion and the origin of thermodynamics by referring to the original observation of Robert Brown and Julius Mayor.**Classification:**Classification of living organisms based on (a) Cellularity-Unicellular or multicellular (b) Ultrastructure-prokaryotes or eukaryotes. (c) Energy and Carbon utilization - Autotrophs, heterotrophs, lithotrophs (d) Ammonia excretion –aminotelic, uricotelic, ureotelic (e) Habitat-aquatic, terrestrial (e) Molecular taxonomy-three major kingdoms of life.

UNIT II:

Biomolecules and EnzymesBiomolecules:Biomolecules: Structures of sugars(Glucose and Fructose), starch and cellulose. Nucleotides and DNA/RNA. Amino acids and lipids. Proteins-structure and functions-as enzymes, transporters, receptors and structural elements**Enzymes:** Enzyme classification, Mechanism of enzyme action.Enzymekinetics and kinetic parameters.

UNIT III:

“Genetics is to biology what Newton’s laws are to Physical Sciences” Mendel’s laws, Concept of segregation and independent assortment. Concept of allele. Concepts of recessiveness and dominance. Gene interaction, Epistasis. Meiosis and Mitosis be taught as a part of genetics. Emphasis to be given not to the mechanics of cell division nor the phases but how genetic material passes from parent to offspring. Information Transfer: DNA as a genetic material. Hierarchy of DNA structure-from single stranded to double helix to nucleosomes. Concept of genetic code. Universality and degeneracy of genetic code. Define gene in terms of complementation and recombination.

UNIT IV:

Metabolism :Exothermic and endothermic versus endergonic and exergonic reactions. Concept of K_{eq} and its relation to standard free energy. ATP as an energy currency. Breakdown of glucose to $CO_2 + H_2O$ (Glycolysis and Krebs cycle) and synthesis of glucose from CO_2 and H_2O (Photosynthesis). Energy yielding and energy consuming reactions. Microbiology: Concept of single celled organisms. Concept of species and strains. Identification and classification of microorganisms. Growth kinetics. Ecological aspects of single celled organisms. Microscopy.

TEXT BOOKS:

Reference Books:

- [1] Biology: A global approach: Campbell, N. A.; Reece, J. B.; Urry, Lisa; Cain, M, L.; Wasserman, S. A.; Minorsky, P. V.; Jackson, R. B. Pearson Education Ltd
- [2] Outlines of Biochemistry, Conn, E.E; Stumpf, P.K; Bruening, G; Doi, R.H., John Wiley and Sons

REFERENCE BOOKS:

- [1] Principles of Biochemistry (V Edition), By Nelson, D. L.; and Cox, M. M.W.H. Freeman and Company
- [2] Molecular Genetics (Second edition), Stent, G. S.; and Calender, R.W.H. Freeman and company, Distributed by Satish Kumar Jain for CBS Publisher Microbiology, Prescott, L.M J.P. Harley and C.A. Klein 1995. 2nd edition Wm, C. Brown Publishers

E-RESOURCES:

- [1]. https://bee.cals.cornell.edu/sites/bee.cals.cornell.edu/files/shared/documents/Career_BEE_Final-for-eb.pdf
- [2]. <https://www.teachengineering.org/subjectareas>



PRINCIPAL
NRI Institute of Technology
Pothavarappadu (V), Agiripalli (M)

ENVIRONMENTAL STUDIES
(Common to CE,EEE,ME,CSE and IT)

Lecture – Tutorial: 2-1
Credits: --

Internal Marks: 40
External Marks: 60

Prerequisites:

Course Objectives:

- Basic understanding of ecosystem and to know the importance of biodiversity.
- Understanding of natural resources.
- To understand different types of pollutants effecting the environment.
- To know global environmental problems, problems associated with over population and burden on environment.

COURSE OUTCOMES:

Upon successful completion of the course, the student will be able to:

- CO1 Realize the importance of ecosystem and biodiversity for maintaining ecological balance.
- CO2 Understand the role of natural resources for the sustenance of life on earth and recognize the need to conserve them.
- CO3 Identify the environmental pollutants and abatement devices.
- CO4 Gain the importance of sustainability.

Contribution of Course Outcomes towards achievement of Program Outcomes

(1 - Low, 2- Medium, 3 - High)

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO1	2		3			2	3	2			2	1
CO2	2		3			2	3	2			2	1
CO3	2		3			2	3	2			2	1
CO4	2		3			2	3	2			2	1

UNIT I

Ecosystems: Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Ecological succession. - Food chains, food webs and ecological pyramids, flow of energy, biogeochemical cycles.

Biodiversity and its conservation: Definition: genetic, species and ecosystem diversity- classification - Value of biodiversity, India as a mega-diversity nation - Hot-spots of biodiversity - Threats to biodiversity: habitat loss, man-wildlife conflicts - Endangered and endemic species of India - Conservation of biodiversity.

UNIT II

Natural Resources: Natural resources and associated problems

Forest resources - Use and over - exploitation, deforestation - Timber extraction - Mining, dams and other effects on forest and tribal people.

Water resources - Use and over utilization of surface and ground water -

Floods, drought, conflicts over water, dams – benefits and problems.
Mineral resources: use and exploitation, environmental effects of extracting and using mineral resources. Case studies.
Energy resources: Growing energy needs, renewable and non-renewable energy sources use of alternate energy sources Vs Oil and Natural Gas Extraction.
Land resources: land as a resource, land degradation, wasteland reclamation, man induced landslides, soil erosion and desertification.
Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.

UNIT III

Environmental Pollution: Definition, Cause, effects and control measures of Air pollution, Water pollution, Soil pollution, Noise pollution, Nuclear hazards, Technological solutions for pollution control, Role of an individual in prevention of pollution with case studies.

Solid Waste Management: Sources, Classification, effects and control measures of urban and industrial solid wastes. Biomedical, Hazardous and E-waste management, carbon credits.

Disaster management: floods, droughts, earthquakes, cyclones.

UNIT IV

Social issues and the environment: Global environmental challenges- global warming and climate change, acid rains, ozone layer depletion.

Towards sustainable future: From unsustainable to sustainable development, population and its explosion, urban problems related to energy, rain water harvesting, consumerism and waste products, role of IT in environment and human health, HIV/ AIDS, environmental ethics.

Environmental management and acts: Impact assessment and significance, various stages of EIA, environmental management plan (EMP), green belt development. Environmental Law (Air, Water, Wildlife, Forest, Environment protection act).

The student should visit an industry/ Ecosystem and submit a report individually on any issues related to environmental studies course and make a power point presentation.

TEXT BOOKS:

1. Environment Studies, Anubha Kaushik, C P Kaushik, New Age International Publishers, 2018
2. Environmental Studies, R. Rajagopalan, 2nd Edition, 2011, Oxford University Press.
3. Environmental Studies, P. N. Palanisamy, P. Manikandan, A. Geetha, and K. Manjula Rani; Pearson Education, Chennai

REFERENCE BOOKS:

1. Text Book of Environmental Studies, Deeshita Dave & P. Udaya Bhaskar, Cengage Learning.
2. Environmental Studies, K. V. S. G. Murali Krishna, VGS Publishers, Vijayawada.
3. Erach Bharucha, 2010 “ Text Book of Environmental Studies” , University Grants Commission, University Press (India) Pvt. Ltd., Hyderabad.
4. Text book of Environmental Science and Engineering by G. Tyler Miller Jr, 2006 Cengage learning.

E-RESOURCES:

1. <http://nptel.ac.in/courses.php>.
2. <http://jntuk-coerd.in/>


PRINCIPAL

NRI Institute of Technology
Pathayampadu (V), Agidipalli (M)

18A3200801-ESSENCE OF INDIAN KNOWLEDGE AND TRADITIONS

Lecture – Tutorial:	2-0 Hours	Internal Marks:	40
Credits:	0	External Marks:	60

Prerequisites: -----

Course Objectives:

6. To develop knowledge of fundamental management concepts, skills and tools, to aid in problem solving and decision making.
7. To develop and understanding about the organizational structure and relationship between authority and responsibility in various structures.
8. To discuss the evolution of principles that make it possible to design facilities, processes, and control systems with a degree of predictability as to their performance.
9. To develop comprehensive skills in planning, selecting, motivating, and developing the human resources for organisational effectiveness.
10. To understand the broad scope of marketing, societal, ethical and other diverse aspects of marketing.

Course Outcomes:

Upon successful completion of the course, the student will be able to:

C01	Understand the concept of Traditional knowledge and its importance
C02	Know the need and importance of protecting traditional knowledge
C03	Know the various enactments related to the protection of traditional knowledge
C04	Understand the concepts of Intellectual property to protect the traditional knowledge
C05	Develop comprehensive skills in planning, selecting, motivating, and developing the human resources for organisational effectiveness.
C06	Understand the broad scope of marketing, societal, ethical and other diverse aspects of marketing

Contribution of Course Outcomes towards achievement of Program Outcomes (1 - Low, 2- Medium, 3 - High)

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
C01	2	-	-	-	-	-	-	2		-	-	-
C02	2	-	-	-	-	-	-	2		-	-	-
C03	2	-	-	-	-	-	-	2		-	-	-
C04	2	-	-	-	-	-	-	2		-	-	-
C05	2	-	-	-	-	-	-	2		-	-	-
C06	2	-	-	-	-	-	-	2		-	-	-

UNIT I

Introduction to traditional knowledge: Define traditional knowledge, nature and characteristics, scope and importance, kinds of traditional knowledge, the physical and social contexts in which traditional knowledge develop, the historical impact of social change on traditional knowledge systems. Indigenous Knowledge (IK), characteristics, traditional knowledge vis-à-vis indigenous knowledge, traditional knowledge Vs western knowledge traditional knowledge vis-à-vis formal knowledge

UNIT II

Protection of traditional knowledge: the need for protecting traditional knowledge
Significance of TK Protection, value of TK in global economy, Role of Government to harness TK.

Legal framework and TK: A: The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, Plant Varieties Protection and Farmers Rights Act, 2001 (PPVFR Act); B: The Biological Diversity Act 2002 and Rules 2004, the protection of traditional knowledge bill, 2016. Geographical indications act 2003.

UNIT III

Traditional knowledge and intellectual property: Systems of traditional knowledge protection, Legal concepts for the protection of traditional knowledge, Certain non IPR mechanisms of traditional knowledge protection, Patents and traditional knowledge, Strategies to increase protection of traditional knowledge, global legal FORA for increasing protection of Indian Traditional Knowledge.

UNIT IV

Traditional knowledge in different sectors: Traditional knowledge and engineering, Traditional medicine system, TK and biotechnology, TK in agriculture, Traditional societies depend on it for their food and healthcare needs, Importance of conservation and sustainable development of environment, Management of biodiversity, Food security of the country and protection of TK.

TEXT BOOKS:

1. Traditional Knowledge System in India, by Amit Jha, 2009.
2. Traditional Knowledge System and Technology in India by Basanta Kumar Mohanta and Vipin Kumar Singh, PratibhaPrakashan 2012.

REFERENCE BOOKS:

1. Traditional Knowledge System in India by Amit Jha Atlantic publishers, 2002
2. "Knowledge Traditions and Practices of India" Kapil Kapoor, Michel Danino


PRINCIPAL
NRI Institute of Technology
Pothavarappadu (V), Agiripalli (M)

**20A1100801: ENVIRONMENTAL SCIENCES
(Common to CSE,IT,AI ML and Ds)**

Lecture – Tutorial:	2-0	Internal Marks:	30
Credits:	0	External Marks:	70*

Prerequisites:

Course Objectives:

The objectives of the course are to impart:

- ❖ Overall understanding of the natural resources.
- ❖ Basic understanding of the ecosystem and its diversity.
- ❖ Acquaintance on various environmental challenges induced due to unplanned anthropogenic activities.
- ❖ An understanding of the environmental impact of developmental activities.
- ❖ Awareness on the social issues, environmental legislation and global treaties.

Course Outcomes:

CO1	➤ Illustrate the importance of sustainability in the progress of a nation. (L2)
CO2	➤ Infer the existence of ecosystems in maintaining ecological balance. (L2)
CO3	➤ Recall the importance of biodiversity and its conservation. (L1)
CO4	➤ Summarize the role of natural resources for the sustenance of life on earth and recognize the need to conserve them. (L2)
CO5	➤ Identify the environmental pollutants and the abatement devices to be used. (L3)
CO6	➤ Interpret environmental related acts and social issues. (L2)

Contribution of Course Outcomes towards achievement of Program Outcomes (1 – Low, 2- Medium, 3 – High)

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO1	3	2	2	-	-	2	3	2	-	-	2	2
CO2	3	2	2	-	-	2	3	2	-	-	2	2
CO3	3	2	2	-	-	2	3	2	-	-	2	2
CO4	3	2	2	-	-	2	3	2	-	-	2	2
CO5	3	2	2	-	-	2	3	2	-	-	2	2
CO6	3	2	2	-	-	2	3	2	-	-	2	2

UNIT I

(6hrs)

Sustainability: Stockholm and Rio Summit–Global Environmental Challenges: Global warming and climate change, acid rains, ozone layer depletion, population growth and explosion, effects. Role of information technology in environment and human health.

Ecosystems: Concept of an ecosystem. - Structure and function of an ecosystem; Producers, consumers and decomposers. - Energy flow in the ecosystem - Food chains, food webs and ecological pyramids- Ecological succession.

UNIT II

(4hrs)

Biodiversity and its conservation: Definition: genetic, species and ecosystem diversity- classification - Value of biodiversity: consumptive use, productive use, social value. India as a mega diversity nation - Hot-spots of biodiversity - Threats to biodiversity: habitat loss, man-wildlife conflicts. Endangered and endemic species of India – Conservation of biodiversity.

UNIT III**(7hrs)****Natural Resources:** Natural resources and associated problems.

Forest resources: Use and over – exploitation, deforestation – Timber extraction – Mining, dams and other effects on forest and tribal people.

Water resources: Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems.

Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources.

Energy resources: Growing energy needs, renewable and non-renewable energy sources use of alternate energy sources.

Role of an individual in conservation of natural resources; Equitable use of resources for sustainable lifestyles.

UNIT IV**(5hrs)****Environmental Pollution:** Definition, Cause, effects and control measures of Air pollution, Water pollution, Soil pollution, Noise pollution, Nuclear hazards. Role of an individual in prevention of pollution. - Pollution case studies, Sustainable Life Studies. Impact of Fire Crackers on Men and his well being.**Solid Waste Management:** Sources, Classification, effects and control measures of urban and industrial solid wastes. Consumerism and waste products, Biomedical, Hazardous and e – waste management.**UNIT V****(6hrs)****Social Issues and the Environment:** Urban problems related to energy, rain water harvesting. Environmental ethics: Issues and possible solutions. Environmental Protection Act -Air (Prevention and Control of Pollution) Act. -Water (Prevention and control of Pollution) Act - Wildlife Protection Act -Forest Conservation Act. Environmental Management: Impact Assessment and its significance various stages of EIA, preparation of EMP and EIS. Ecotourism, Green Campus – Green business and Green politics.**TEXT BOOKS:**

- 1) Perspectives in Environment Studies, Anubha Kaushik, C P Kaushik, New Age International Publishers, 2014
- 2) Environmental Studies, K. V. S. G. Murali Krishna, VGS Publishers, Vijayawada
- 3) Environmental Studies, R. Rajagopalan, 2nd Edition, 2011, Oxford University Press.
- 4) Environmental Studies, P. N. Palanisamy, P. Manikandan, A. Geetha, and K. Manjula Rani; Pearson Education, Chennai

REFERENCE BOOKS:

- 1) Text Book of Environmental Studies, Deeshita Dave & P. Udaya Bhaskar, Cengage Learning.
- 2) A Textbook of Environmental Studies, Shaashi Chawla, TMH, New Delhi
- 3) Environmental Studies, Benny Joseph, Tata McGraw Hill Co, New Delhi

E-RESOURCES: 1. <http://nptel.ac.in/courses.php>.2. <http://jntuk-coeerd.in/>

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PROFESSIONAL ETHICS & HUMAN VALUES

Lecture - Tutorial:	2-0 Hours	Internal Marks:	30
Credits:	0	External Marks:	70

- Course Objectives:**
- To create an awareness on Engineering Ethics and Human Values.
 - To instill Moral and Social Values and Loyalty.
 - To appreciate the rights of others.
 - To create awareness on assessment of safety and risk.

UNIT I

Human Values:
 Morals, Values and Ethics: Integrity, Work Ethic, Service Learning, Civic Virtue - Respect for others - Living Peacefully - Caring - Sharing - Honesty - Courage - Cooperation - Commitment - Empathy - Self Confidence Character - Spirituality. Learning outcomes:
 1. Learn about morals, values & work ethics.
 2. Learn to respect others and develop civic virtue.
 3. Develop commitment.
 4. Learn how to live peacefully.

UNIT II

Engineering Ethics:
 Sources of Engineering Ethics - Variety of moral issues - Types of inquiry - Moral dilemmas - Moral autonomy - Kohlberg's theory - Gilligan's Theory - Consensus and controversy - Models of professional roles - Theories about right action - Self-interest - Customs and religion - Uses of Ethical theories - Voluntary Ethics - Cooperation - Commitment. Learning outcomes:
 1. Learn about the ethical responsibilities of the engineers.
 2. Create awareness about the customs and religions.

- 3. Learn time management.
- 4. Learn about the different professional roles.

UNIT III

Engineering as Social Experimentation:
 Engineering As Social Experimentation - Framing the problem - Determining the facts - Codes of Ethics - Clarifying Concepts - Application Issues - Common Ground - General Principles - Utilitarian thinking respect for persons. Learning outcomes:
 1. Demonstrate knowledge to become a social experimenter.
 2. Provide depth knowledge on framing of the problem and determining the facts.
 3. Provide depth knowledge on codes of ethics.
 4. Develop utilitarian thinking.

UNIT IV

Engineers Responsibility for Safety and Risk:
 Safety and risk - Assessment of safety and risk - Risk benefit analysis and reducing risk - Safety and the Engineer - Designing for the safety - Intellectual Property rights (IPR). Learning outcomes:
 1. Create awareness about safety, risk & risk benefit analysis.
 2. Engineer's design practices for providing safety.
 3. Provide knowledge on intellectual property rights.

UNIT V

Global Issues:
 Globalization - Cross-culture issues - Environmental Ethics - Computer Ethics - Computers as the instrument of Unethical behavior - Computers as the object of Unethical acts - Autonomous Computers - Computer codes of Ethics - Weapons Development - Ethics and Research - Analyzing Ethical Problems in research. Learning outcomes:
 1. Develop knowledge about global issues.
 2. Create awareness on computer and environmental ethics.
 3. Analyze ethical problems in research.
 4. Give a picture on weapons development.

TEXT BOOKS:

- 1) "Engineering Ethics includes Human Values" by M.Govindarajan, S.Natarajan and V.S.Senthil Kumar-PHI Learning Pvt. Ltd-2009
- 2) "Engineering Ethics" by Harris, Prichard and Rabins, CENGAGE Learning, India Edition, 2009.
- 3) "Ethics in Engineering" by Mike W. Martin and Roland Schinzinger -Tata, McGraw-Hill-2003.
- 4) "Professional Ethics and Morals" by Prof.A.R.Ayyasri, DharamketaSuyodhana-Maruthi Publications.
- 5) "Professional Ethics and Human Values" by A.Ahmed, R.Kalidhassan and M. Jayakumarah, Laxmi Publications.
- 6) "Professional Ethics and Human Values" by Prof.D.R.Kiran -Indian Culture, Values and Professional Ethics" by P&R Murti's SS Publication

Handwritten Signature
 Head, MBA Department
NRI Institute of Technology
POTHAVARAPPADU (VIII)
 Pothavaram, Krishna Dist

II B. Tech II Semester

20A2200801: ESSENCE OF INDIAN TRADITIONAL KNOWLEDGE

Lecture – Tutorial:	2	Internal Marks:	30
Credits:	0	External Marks:	70

Prerequisites:

- Students are expected to have knowledge on
1. Reasoning and inference sustainability is at the course of Indian traditional knowledge system
 2. legal framework and traditional knowledge and biological diversity and geographical indication act
 3. Mechanism of traditional knowledge and protection
 4. Traditional knowledge in different sector

Course Objectives:

1. The course aim of the importing basic principle of third process reasoning and inference sustainability is at the course of Indian traditional knowledge system
2. To understand the legal framework and traditional knowledge and biological diversity act 2002 and geographical indication act2003
3. The courses focus on traditional knowledge and intellectual property mechanism of traditional knowledge and protection
4. To know the student traditional knowledge in different sector

Course Outcomes:

Upon successful completion of the course, the student will be able to:

- CO1 Understand the concept of Traditional knowledge and its importance
- CO2 Know the need and importance of protecting traditional knowledge
- CO3 Know the various enactments related to the protection of traditional knowledge
- CO4 Understand the concepts of Intellectual property to protect the traditional knowledge
- CO5 Understand the Traditional knowledge and engineering, Traditional medicine system, TK and biotechnology, TK in agriculture
- CO6 Know the importance of TK and biotechnology, TK in agriculture

Contribution of Course Outcomes towards achievement of Program Outcomes (1 - Low, 2- Medium, 3 - High)

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO1	-	-	-	-	-	1	2	1	1	2	-	1
CO2	-	-	-	-	-	1	1	1	2	1	-	1
CO3	-	-	-	-	-	1	2	1	1	1	-	1
CO4	-	-	-	-	-	2	1	1	1	1	-	1
CO5	-	-	-	-	-	2	2	2	1	2	-	1
CO6	-	-	-	-	-	1	2	2	2	2	-	-

UNIT I

Introduction to traditional knowledge: Define traditional knowledge, nature and characteristics, scope and importance, kinds of traditional knowledge, the physical and

social contexts in which traditional knowledge develop, the historical impact of social change on traditional knowledge systems. Indigenous Knowledge (IK), characteristics, traditional knowledge vis-à-vis indigenous knowledge, traditional knowledge Vs western knowledge traditional knowledge vis-à-vis formal knowledge

UNIT II

Protection of traditional knowledge: the need for protecting traditional knowledge Significance of TK Protection, value of TK in global economy, Role of Government to harness TK.

UNIT III

Legal framework and TK: A: The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, Plant Varieties Protection and Farmers Rights Act, 2001 (PPVFR Act); B: The Biological Diversity Act 2002 and Rules 2004, the protection of traditional knowledge bill, 2016. Geographical indications act 2003.

UNIT IV

Traditional knowledge and intellectual property: Systems of traditional knowledge protection, Legal concepts for the protection of traditional knowledge, Certain non IPR mechanisms of traditional knowledge protection, Patents and traditional knowledge, Strategies to increase protection of traditional knowledge, global legal FORA for increasing protection of Indian Traditional Knowledge.

UNIT V


Traditional knowledge in different sectors: Traditional knowledge and engineering, Traditional medicine system, TK and biotechnology, TK in agriculture, Traditional societies depend on it for their food and healthcare needs, Importance of conservation and sustainable development of environment, Management of biodiversity, Food security of the country and protection of TK.

REFERENCE BOOKS:

1. Traditional Knowledge System in India, by Amit Jha, 2009.
2. Traditional Knowledge System and Technology in India by Basanta Kumar Mohanta and Vipin Kumar Singh, Pratibha Prakashan 2012.
3. Traditional Knowledge System in India by Amit Jha Atlantic publishers, 2002
4. "Knowledge Traditions and Practices of India" Kapil Kapoor, Michel Danino

e-Resources:

- 1) <https://www.youtube.com/watch?v=LZP1StpYEPM>
- 2) <http://nptel.ac.in/courses/121106003/>


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 POTHAVARAPPADU (V), (VIA) NUNNA, AGIRIPALLI (M), PIN – 521 212

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

III Year - I Semester

L T P C
2 0 0 0

INTELLECTUAL PROPERTY RIGHTS and PATENTS

Lecture – Tutorial:	2-0 Hours	Internal Marks:	30
Credits:0		External Marks:	70
Prerequisites: -			
Course Objectives:			
<ul style="list-style-type: none"> • The main objective of IPR is to make the students aware of their rights for the protection of their invention done in their project work. • To get registration in our country and foreign countries of their invention, designs and theory written by the students during their project work and for this they must have knowledge of patents, copyrights, trademarks, designs and information Technology Act. • To introduce fundamental aspects of IPR to students who are going to play a major role in development and management of innovative projects in industries. • To disseminate knowledge on patents, patent regime in India and abroad and registration aspects. 			
Course Outcomes:			
Upon successful completion of the course, the student will be able to:			
CO1	Classify intellectual property rights, cybercrimes and understand the importance of ipr.		
CO2	Categorize subject matters of copyrights, understand the registration process of copyrights and effect of Infringement .		
CO3	Analyze Patent requirements and its registration formalities and effect of Infringement .		
CO4	Analyze functions of Trademark and its registration formalities and effect of Infringement under Trademark Act.		
CO5	Understand the importance of Trade secrets and how to maintain Trade secrets.		
CO6	Pave the way for the students to catch up Intellectual Property as a career option		
Course Content(Syllabus)			
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.			
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.			



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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

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 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.

UNIT V

Trade Secrets Introduction to Trade Secrets – General Principles - Laws Relating to Trade Secrets - Maintaining Trade Secret – Physical Security – Employee Access Limitation – Employee Confidentiality Agreements – Breach of Contract – Law of Unfair Competition – Trade Secret Litigation – Applying State Law.

TEXT BOOKS:

- 1) Deborah E.Bouchoux: Intellectual Property, Cengage Learning, New Delhi.
- 2) PrabhuddhaGanguli: Intellectual Property Rights, Tata Mc-Graw –Hill, New Delhi

REFERENCES:

1. Cyber Law - Texts & Cases, South-Western's Special Topics Collections.
2. R.Radha Krishnan, S.Balasubramanian: Intellectual Property Rights, Excel Books. New Delhi.
3. M.Ashok Kumar and MohdIqbal Ali: Intellectual Property Rights, Serials Pub.

Contribution of Course Outcomes towards achievement of Program Outcomes (PO) and Program Specific outcomes (PSO) (1 – Low, 2- Medium, 3 – High)

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PSO 2
CO1	2	-	-	-	-	-	-	3	-	-	-	-	-	-
CO2	-	2	-	-	-	-	-	-	2	-	-	-	-	-
CO3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	-	2	-	-	-	-	-	-	2	-	-	-	2	-


 PRINCIPAL

NRI Institute of Technology
 Pothavarappadu (V), Agiripalli (M)

MECH B.TECH. III YEAR NRA20 REGULATIONS SYLLABUS

III B.TECH I SEMESTER

Course Code: 20A3200802
Research Methodology & IPR

Lecture – Practical:	2-0 Hours	Internal Marks:	30
Credits	0	External Marks:	70

Prerequisites: None

Course Objectives

- 1) To understand the objectives and characteristics of a research problem.
- 2) To analyze research related information and to follow research ethics
- 3) To understand the types of intellectual property rights.
- 4) To learn about the scope of patent rights.
- 5) To understand the new developments in IPR.

Course Outcomes

Upon successful completion of the course, the student will be able to:

CO1 Judge the characteristics of a research problem

CO2 Justify research related information

CO3 Interpret intellectual property rights

CO4 Utilize scope of patent rights

CO5 Develop New IPR's

Contribution of Course Outcomes towards achievement of Program Outcomes (1 – Low, 2- Medium, 3 – High)

	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	PO 9	PO 10	PO 11	PO 12
CO1						√	√	√	√			√
CO2						√	√	√	√			√
CO3						√	√	√	√			√
CO4						√	√	√	√			√
CO5						√	√	√	√			√

UNIT I

Research problem: Meaning of research problem, Sources of research problem, Criteria Characteristics of a good research problem, Errors in selecting a research problem, Scope and objectives of research problem. Approaches of investigation of solutions for research problem, data collection, analysis, interpretation, Necessary instrumentations

UNIT II

Literature study: Effective literature studies approaches, analysis Plagiarism, Research ethics, Technical writing: Effective technical writing, how to write report, Paper Developing a Research Proposal, Format of research proposal, a presentation and assessment by a review committee

UNIT III

Nature of Intellectual Property: Patents, Designs, Trade and Copyright.

Process of Patenting and Development: technological research, innovation, patenting,

MECH B.TECH. III YEAR NRA20 REGULATIONS SYLLABUS

development. International Scenario: International cooperation on Intellectual Property. Procedure for grants of patents, Patenting under PCT.

UNIT IV

Patent Rights: Scope of Patent Rights. Licensing and transfer of technology. Patent information and databases. Geographical Indications

UNIT V


New Developments in IPR: Administration of Patent System. New developments in IPR; IPR of Biological Systems, Computer Software etc, Traditional knowledge Case Studies, IPR and IITs.

Text Book:

- 1) Stuart Melville and Wayne Goddard, "Research methodology: an introduction for science & engineering students"
- 2) Wayne Goddard and Stuart Melville, "Research Methodology: An Introduction"
- 3) Ranjit Kumar, 2nd Edition, "Research Methodology: A Step by Step Guide for beginners"

REFERENCE BOOKS:

- 1) Halbert, "Resisting Intellectual Property", Taylor & Francis Ltd , 2007.
- 2) Mayall, "Industrial Design", McGraw Hill, 1992.
- 3) Niebel, "Product Design", McGraw Hill, 1974.
- 4) Asimov, "Introduction to Design", Prentice Hall, 1962.


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