

BIJUPATNAIKUNIVERSITY OF TECHNOLOGY, ODISHA
ROURKELA



Curriculum and Syllabus


B. Tech (*MechanicalEngineering*)from the Admission Batch
2018-19

Semester (7th)

Principal
Radhakrishna Institute of Technology
and Engineering, Shubaneswar

Seventh Semester							
Theory							
Sl No	Category	Course Code	Course Title	L-T-P	Credit	University Marks	Internal Evaluation
1	HS	RED7E001	Entrepreneurship Development	3-0-0	3	100	50
2	PE	RME7D001	Power Plant Engineering	3-0-0	3	100	50
		RME7D002	Product Design and Production Tooling (PDPT)				
		RME7D003	Design of Machine Components				
3	PE	RME7D004	Mechanical Vibration	3-0-0	3	100	50
		RME7D005	Refrigeration and Air Conditioning				
		RME7D006	Micro and Nano Machining				
4	OE	REI6D001	Micro Electronic Mechanical Systems	3-0-0	3	100	50
		REC5D006	Digital VLSI Design				
		REC7D002	Embedded Systems				
5	OE	REV5D004	Disaster Management	3-0-0	3	100	50
		RIP7E002	Intellectual Property Right				
		RGT6A003	Green Technology				
6	OE	RIT7D001	Internet of Things	3-0-0	3	100	50
		RIS7B001	Industrial Safety Engineering				
		RCS7D007	Soft Computing				
7	MC*	RIK7F001	Essence of Indian Knowledge Tradition - II	3-0-0	0		100 (Pass Mark is 37)
Total Credit (Theory)					18		
Total Marks						600	300
Practical							
1	PSI	RMP7H201	Minor Project	0-0-6	3		200
2	PSI	RSM7H202	Seminar - II	0-0-3	1		100
3	PSI	RCV7H203	Comprehensive Viva	0-0-3	1		100
Total Credit (Practical)					5		
Total Semester Credit					23		
Total Marks							400

***Mandatory Non-Credit Courses (MC) result will be reflected with Pass (P) / Fail (F) grade. Thus, the grade obtained will not be affecting the grade point average. However, it shall appear on the grade sheet as per AICTE rule.**


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7 th Semester	RME7D002	Production Design and Power Plant Engineering Production Tooling	L-T-P 3-0-0	3 Credits
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Module I:**(12 Hours)**

Product Design-Product design considerations, product planning, product development, value analysis, product specification. Role of computer in product design.

Process Planning – selection of processes, machines and tools. Design of sequence of operations, Time & cost estimation

Module II:**(12 Hours)**

Forging design- allowances, die design for drop forging, design of flash and gutter, upset forging die design.

Sheet metal working- Design consideration for shearing, blanking piercing, deep drawing operation, Die design for sheet metal operations, progressive and compound die, strippers, stops, strip layout.

Module III:**(12 Hours)**

Design of jigs and fixtures, principle of location and clamping, clamping methods, locating methods, Drill Jig bushing, Indexing type drilling Jig.

Design of single point cutting tool, broach and form tool. Tooling design for turret lathe and automats. Design of limit gauges.

Books:

- [1] Product Design & Manufacturing, A K Chitale, R C Gupta, Eastern Economy Edition, PHI.
- [2] Product Design & Development, Karl T Ulrich, Steven D Eppinger, Anita Goyal, McGraw Hill.
- [3] A Textbook of Production Engineering, P.C. Sharma, S. Chand & Co
- [4] Fundamentals of Tool Engineering design, S.K. Basu, S.N. Mukherjee, R. Mishra, Oxford & IBH Publishing Co.
- [5] Technology of Machine Tools, Krar, Gill, Smid, Tata Mc Graw Hill
- [6] Jigs & Fixture Design, Edward G Hoffman, Cengage Learning.


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7 th Semester	REV5D004	Disaster Management	L-T-P 3-0-0	3 CREDITS
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Module I (12 hr)

Understanding Disaster: Concept of Disaster - Different approaches- Concept of Risk - Levels of Disasters - Disaster Phenomena and Events (Global, national and regional) Hazards and Vulnerabilities: Natural and man-made hazards; response time, frequency and forewarning levels of different hazards - Characteristics and damage potential or natural hazards; hazard assessment - Dimensions of vulnerability factors; vulnerability assessment - Vulnerability and disaster risk - Vulnerabilities to flood and earthquake hazards

Module II (6 hr)

Disaster Management Mechanism: Concepts of risk management and crisis managements - Disaster Management Cycle - Response and Recovery - Development, Prevention, Mitigation and Preparedness - Planning for Relief

Module III (6 hr)

Capacity Building: Capacity Building: Concept - Structural and Nonstructural Measures Capacity Assessment; Strengthening Capacity for Reducing Risk - Counter-Disaster Resources and their utility in Disaster Management - Legislative Support at the state and national levels

Module IV (12 hr)

Coping with Disaster: Coping Strategies; alternative adjustment processes - Changing Concepts of disaster management - Industrial Safety Plan; Safety norms and survival kits - Mass media and disaster management

Planning for disaster management: Strategies for disaster management planning - Steps for formulating a disaster risk reduction plan - Disaster management Act and Policy in India - Organizational structure for disaster management in India - Preparation of state and district disaster management plans

Books

1. Manual on Disaster Management, National Disaster Management, Agency Govt of India.
2. Disaster Management by Mrinalini Pandey Wiley 2014.
3. Disaster Science and Management by T. Bhattacharya, McGraw Hill Education (India) Pvt Ltd Wiley 2015
1. Earth and Atmospheric Disasters Management, N. Pandharinath, CK Rajan, BS Publications 2009.
2. National Disaster Management Plan, Ministry of Home affairs, Government of India
<http://www.ndma.gov.in/images/policyplan/dmplan/draftndmp.pdf>


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7 th Semester	RIP7E002	Intellectual Property Right	L-T-P 3-0-0	3 CREDITS
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MODULE-I (12 Hours)
Introduction: Intellectual property: meaning, nature and significance, need for intellectual property Right (IPR), IPR in India – Genesis and development, IPR in abroad, Examples: - Biotechnology Research and Intellectual Property Rights Management. What is a patent, what can be protected by a patent, why should I apply for a patent? Patent Law, Patentability requirements, non-Patentable subject matters, Layout of the Patents. Procedure for domestic and international filing of applications, Restoration, Surrender and Revocations of Patents, Rights of Patentee and Working of Patent, Licensing and Enforcing Intellectual Property.

MODULE-II (10 Hours)
Copyrights: Copyright: meaning, scope; What is covered by copyright? How long does copyright last? Why protects copyright? Related rights, Rights covered by copyright. Ownership: Duration, Division, Transfer and Termination of Transfers.

MODULE-III (10 Hours)
Infringement and Remedies: Literal and non-literal infringement, Role of claims, Doctrines on infringement: Equivalent doctrine, Pith and Marrow doctrine, Comparative test. Defences: Gillette Defence, General grounds, Patents granted with conditions, Parallel import. Remedies: Civil, Administrative.

MODULE-IV (08 Hours)
State Law: Trade Secret, Contract, Misappropriation, Right of Publicity Trademarks, Trade Secret - Overview, Requirements, Misappropriation of Trade Secret, Departing Employees, Remedies, Criminal Liability, Misappropriation, Clickwrap Agreements, Idea Submissions; Right of Publicity, Federal Pre-emption, Review.

Books:

- [1] W. R. Cornish and D. Llewellyn, Intellectual Property: Patents, Copyrights, Trade Marks and Allied Rights, Sweet & Maxwell.
- [2] Lionel Bently and Brad Sherman, Intellectual Property Law, Oxford University Press.
- [3] P. Narayanan, Intellectual Property Law, Eastern Law House
- [4] B. L. Wadehra, Law Relating to Intellectual Property, Universal Law Publishing Co.
- [5] V. K. Ahuja, Law Relating to Intellectual Property Rights, LexisNexis
- [6] AjitParulekar and Sarita D'Souza, Indian Patents Law – Legal & Business Implications; Macmillan India Ltd, 2006
- [7] P. Narayanan; Law of Copyright and Industrial Designs; Eastern law House, Delhi, 2010.

Reference:

- [1] The Copyright Act, 1957
- [2] The Patent Act, 1970
- [3] The Trade Marks Act, 1999
- [4] The Designs Act, 2000
- [5] The Geographical Indication of Goods Act, 1999
- [6] The Protection of Plant Varieties and Farmers' Rights Act, 2001
- [7] The Semiconductor Integrated Circuits Layout Design Act, 2000

Digital Learning Resources:

Course Name: Intellectual Property
Course Link: <https://nptel.ac.in/courses/109/106/109106137/>
Course Instructor: Prof. Feroze Ali, IIT Madras


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7 th Semester	RGT6A003	Green Technology	L-T-P 3-0-0	3 CREDITS
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Module I: (12 Hrs)

Global Warming and its effect:- Introduction and physical definition of global warming, the New Carbon Problem: Accumulation, Long Half-Life, Heating Potential, Carbon Emission Factors, Carbon Absorption in Nature, The Global Emission Situation and its effect in India, The Kyoto and Other Protocols and its view in India, Effect of climate change and its impact. Planning for the Future to reduce global warming:- Steps taken to Control Carbon Emissions universally, Use of Promotional and Punitive Mechanisms for Reducing Carbon in Atmosphere, The General Approach in Planning for the Future, Developing Countrywide Adaptive Measures for Safety of Local People, Developing Mitigative Measures for Global Reduction of Carbon, India's National Action Plan on Climate Change (NAPCC) till date, National Mission for a Green India, The MRV Debate.

Module II: (8 Hrs)

Opportunities in Control of Carbon Emissions and Accumulation:- Essential Steps for Control of Carbon Emissions and Accumulation, Procedure to develop own Priorities and Business Opportunities in India for control of carbon emissions and accumulation, Needs a Mix of Green and Traditional Power Sources in India, A Logical Approach for Carbon Reduction, Need in India —More Forests, Less Deforestation and payment rates procedure for controlling carbon emissions and its Promotional Mechanisms at India. Green Technologies for Energy Production: - Various Technologies Available for Energy Production, Cost Comparison of a Few Typical Systems for Power Generation, Sources of Energy Production Already in Use, Alternative Methods Ready for Use, Green Technologies Needing some Prior R&D Work.

Module III: (10 Hrs)

Green Technologies for Personal and Citywide Application: - Measures to be taken for Green city, Carbon Emission Reduction at Personal Level, Carbon Emission Reduction at Local Authority and Citywide Level, Carbon Emissions from Imports. Green Technologies for Specific Applications:- Promotion of 'Green' Buildings, Guidelines, The Energy Conservation Building Code (ECBC), Green Hotels and Hospitals, Green Technologies for Transport, Green Roads, Ports and Harbours, Industries, Carbon, Carbon Emissions from a Few Selected Industries in India, The Changing Scenario in Cities, Need for Wider Application to Town Planning and Area Re-Development Projects, 'Green' Infrastructure for Municipal Services, Bringing up Indian Villages, Green Services for Crematoria, Spreading Message to all Stakeholders.

Module IV: (10 Hrs)

Some High-tech Measures for Reducing Carbon Emissions: - Use of Solar Power with Satellite-Based Systems, Use of Carbon Capture and Storage (Sequestration), Microorganisms, A Quick SWOT Analysis. Recommended Plan of Action: - India's National Action Plan Take Us to a Low-Carbon Path, The Missions Help Develop Awareness, few case studies on Projects undertaken by Various Countries, Adaptive Measures Essential for Indian People to Cope with Climate Change

Books

- [1] Green Technologies, Soli J. Arceivala, McGraw Hill Education
- [2] Green Technologies and Environmental Sustainability edited by Ritu Singh, Sanjeev

Kumar

Digital Learning Resources:

Course Name: Sustainable Materials and Green Buildings

Course Link: <https://nptel.ac.in/courses/105/102/105102195/>

Course Instructor: Dr. B. Bhattacharjee, IIT Delhi


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7 th Semester		Essence of Indian Knowledge Tradition - II	L-T-P 3-0-0	3 CREDITS
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Course Objectives:

1. To facilitate the students with the concepts of Indian traditional knowledge and to make them understand the Importance of roots of knowledge system.
2. To make the students understand the traditional knowledge and analyse it and apply it to their day to day life

Course Outcomes :

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

1. Identify the concept of Traditional knowledge and its importance.
2. Explain the need and importance of protecting traditional knowledge.
3. Illustrate the various enactments related to the protection of traditional knowledge.
4. Interpret the concepts of Intellectual property to protect the traditional knowledge.
5. Explain the importance of Traditional knowledge in Agriculture and Medicine.

Module-1:

Introduction to traditional knowledge: Define traditional knowledge, nature and characteristics, scope and importance, kinds of traditional knowledge, Indigenous Knowledge (IK), characteristics, traditional knowledge vis-a-vis indigenous knowledge, traditional knowledge Vs western knowledge traditional knowledge

Module-2:

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.

Module-3:

Legal framework and TK: The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, Plant Varieties Protection and Farmer's Rights Act, 2001 (PPVFR Act); The Biological Diversity Act 2002 and Rules 2004, the protection of traditional knowledge bill, 2016.

Module-4:

Traditional knowledge and intellectual property: Systems of traditional knowledge protection, Legal concepts for the protection of traditional knowledge, Patents and traditional knowledge, Strategies to increase protection of traditional knowledge

Module-5:

Traditional Knowledge in Different Sectors: Traditional knowledge and engineering, Traditional medicine system, TK in agriculture, Traditional societies depend on it for their

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food and healthcare needs, Importance of conservation and sustainable development of environment, Management of biodiversity, Food security of the country and protection of TK

Books:

1. Traditional Knowledge System in India, by Amit Jha, 2009.
2. Traditional Knowledge System in India by Amit Jha Atlantic publishers, 2002.
3. "Knowledge Traditions and Practices of India" Kapil Kapoor, Michel Danino.

Digital Learning Resources:

Course Name: Ayurvedic Inheritance of India
Course Link: <https://nptel.ac.in/courses/121/106/121106003/>
Course Instructor: Dr M. S. Valiathan, IIT, Madras

<https://www.youtube.com/watch?v=LZP1StpYEPM>


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