INTRODUCTION TO MANAGEMENT

Course Code: EE-601

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1. **Course Pre-requisites:**
   NIL

2. **Course Learning Objectives:**
   The course helps the students to know about the historical evolution of the Indian constitution. It tells about the structure and hierarchy of the Indian government the executive, the legislature and judiciary. The students gather knowledge about the President election, powers, jurisdiction, the Prime Minister Election, powers, jurisdiction, Governor Election, powers, jurisdiction, Chief Minister election, powers, jurisdiction. Students also gather knowledge of district and panchayat level administration

3. **Course Name: INTRODUCTION TO MANAGEMENT**
   Course Code: EE-601
   Hours per Week: 4
   Credits: 4

   Course Contents:

Module	Topics	32L
1.	**Fundamentals of Pedagogy -** Psychology of learning – Introduction – Theories of Learning – Memory and Forgetting – Personality and Attitude – student Motivation. **Class room management** - Effective Classroom Communication - Classroom Motivation principles and techniques - Techniques of Class room management. **Student evaluation** - Principles of evaluation - Tools and techniques of evaluation - Statistical analysis of evaluation process. **Student feedback** - Tools and techniques - Evaluation of teacher performance	08
2.	**Research methodology and tools** - Definition of research and research methodology - objectives and types research - criteria of a good research. **Data collection –** primary data (questionnaire, interview, etc.) and secondary data (case study, journals, etc.) – sampling - census and sample survey - need for sampling - characteristics of a good sample - criteria of selecting sampling procedure - different types of sample design **Data analysis -** frequency distribution - measures of central tendency - correlation and regression (concepts only) Research proposal - selection of topic - literature survey - development of hypothesis - hypothesis testing (concepts only) **Report writing -** Interpretation and report writing – techniques of interpretation - significance of report writing - different steps in report writing and format for report writing. **Plagiarism in research.**	06
3.	Intellectual Property Right and Patent Laws in India. What is intellectual property - importance of IPR. Patent -types of patents - patentable inventions - what is not patentable - application and registration of patents - who can apply - rights and duties of patentee - infringement and remedies. Copyright - coverage provided by copyright - Transfer of copyright - Infringement of copyright Trademark - Well-known trademarks and associated trademarks - Service	06

	marks - Certification Trademarks. R & D activities in educational institutes – IPR and patent issues.	
4.	Academic Institution Management - Organisation - Types- structure-Institution as an organisation Institutional process - objectives - purpose – responsibilities Management - fuctions - skills - motivational theories- communication- types- nature- importance-channel richness - how to increase effectiveness of organisational communication. Transparency in academic institutions. Quality- concept-deciphering quality aspect of different products, services as also that of educational system and institutions Quality improvement in institutional activities - identification of potential areas Washington Accords – goal – salient features – implications. Customer – different classes - orientation – satisfaction of stake holders. Basics of project management - concept - types - life - cycle - phases - feasibility - viability - cost benefit analysis – PERT and CPM – SWOT Analysis -dimensions of educational projects – case studies	12

4. Text Books:

T1: Rao and Reddy - Learning & Teaching, Commonwealth Publishers, New Delhi, 1992.
T2: Chauhan S S - Advanced Educational Psychology, Vikas Publishing House Pvt. Ltd, 2002.
T3: Cooper J.M.(Ed) - Classroom Teaching Practice, D.C.Heath and Co.
T4: Romiszwoski A J - Designing Instructional Systems, Kogan Page.
T5: Das N G – Statistical Methods (Vol I and II), M Das and Co.
T6: Gronlund N E - Measurement and Evaluation in Teaching, Macmillan Publishing Co., New York, 1981.

5. References:

R1: Saylor A. and Lewis H - Curriculum Planning for Better Teaching & Learning, Rinehart & Winston, Inc., 1981.
R2: Beard I. J. and Senior I. J. - Motivating Students, Routledge & Kegan Paul Ltd, 1980.
R3: Barnard H C - An Introduction to Teaching, University of London Press Ltd., London, 1965.
R4: Bigge M L - Learning Theories for Teachers, Harper & Row, Publication, New York, Second edition, 1971.

6. Course Outcomes:

Course Outcomes	Details/Statement	Action Verb	Knowledge Level
CO1	Different features of Indian constitution.	Represent, Identify	Understand, Remember
CO2	Power and functioning of Union, state and local self-government.	Analyze, Evaluating	Understand, Apply, Evaluating
CO3	Structure, jurisdiction and function of Indian Judiciary	Understand, Analyze	Understand, Apply
CO4	Basics of PIL and guideline for admission of PIL.	Analyze, Evaluating	Understand, Apply, Analyze
CO5	Functioning of local administration starting from block to Municipal Corporation.	Understand, Remember	Evaluate
CO6	Identify authority to redress a problem in the profession and in the society.	Design	Create

7. Mapping of course outcomes to module/course content:

Module	CO1	CO2	CO3	CO4	CO5	CO6
1	3	2	-	-	-	-
2	2	3	2	-	-	-
3	-	-	3	-	-	-
4	-	-	-	3	2	2

8. Mapping of CO to PO:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	-	-	-	-	-	-	-	-	1
CO2	3	3	1	1	-	2	-	-	-	-	-
CO3	-	3	1	1	-	-	-	-	-	-	-
CO4	-	-	-	2	-	2		2	2	2	-
CO5					-	2	2	2	2	2	-
CO6					-	2	2	2	2	2	-

9. Mapping to PSO:

	PSO1	PSO2	PSO3	PSO4
CO1	3	-	-	2
CO2	-	1	1	1
CO3	3	2	-	-
CO4	3	-	2	1
CO5	3	-	1	2
CO6	3	-	-	2

NON-CONVENTIONAL ENERGY

Course Code: EE-602

1. **Course Pre-requisites:**
   1. Power System-I
   2. Power System-II
   3. Power Plant Engineering

2. **Course Learning Objectives:**

This course is designed to provide brief introduction to non-conventional energy sources. Finite, non-renewable energy sources like coal, oil, and gas are consumed quicker than they are replaced. Long-term energy security, shortages, and price volatility are issues. Greenhouse gasses from fossil fuel burning cause climate change and air pollution. Renewable energy sources like solar, wind, and hydro power produce fewer emissions and are more sustainable. Natural replenishment makes non-conventional energy sources renewable and infinite. For future generations' energy sustainability, this is essential.

3. **Course Name: NON-CONVENTIONAL ENERGY**
   Course Code: EE-602
   Hours per Week: 4
   Credits: 4

Course Contents:

Module	Topics	36L
1.	**Introduction to Energy sources:** Renewable and non-renewable energy sources, energy consumption as a measure of Nation's development; strategy for meeting the future energy requirements Global and National scenarios, Prospects of renewable energy sources. Impact of renewable energy generation on environment, Kyoto Protocol.	02
2.	**Solar Energy:** Solar radiation - beam and diffuse radiation, solar constant, earth sun angles, attenuation and measurement of solar radiation, local solar time, derived solar angles, sunrise, sunset and day length. flat plate collectors, concentrating collectors, Solar air heaters-types, solar driers, storage of solar energy-thermal storage, solar pond, solar water heaters, solar distillation, solar still, solar cooker, solar heating & cooling of buildings, Solar photo voltaic cells: different types of PV Cells, Mono-poly Crystalline and amorphous Silicon solar cells. Equivalent circuit of solar cell, I-V and P-V characteristics, partial shedding effect, efficiency calculation, Design of PV array. cost and rating of PV array for standalone and grid connected systems.	10
3.	**Wind Energy:** Principle of wind energy conversion; Basic components of wind energy conversion systems; wind mill components, various types and their constructional features; design considerations of horizontal and vertical axis wind machines: analysis of aerodynamic forces acting on wind mill blades and estimation of power output; wind data and site selection considerations.	08
4.	**Energy from Biomass:** Biomass conversion technologies, Biogas generation plants, classification, advantages and disadvantages, constructional details, site selection, digester design consideration, filling a digester for starting, maintaining biogas production, Fuel properties of bio	05

	gas, utilization of biogas.	
5.	**Geothermal Energy:** Estimation and nature of geothermal energy, geothermal sources and resources like hydrothermal, geo-pressured hot dry-rock, magma. Advantages, disadvantages and application of geothermal energy, prospects of geothermal energy in India.	05
6.	**Fuel cell and Hydrogen Energy:** Introduction of fuel cell, Design principle and operation of fuel cell, Types, conversion efficiency and application of fuel cell. Hydrogen Production methods, Hydrogen storage, hydrogen transportation, utilization of hydrogen gas.	06

4. Text Books:

T1: Non-conventional Energy sources, G.D. Rai, Khanna Publishers.
T2: Non-conventional Energy Resources, B. H. Khan, Tata McGraw Hill.
T3: Renewable energy sources and conversion technology, Bansal, Keemann and Meliss, Tata McGraw Hill
T4: Energy Technology, O.P. Gupta, Khanna Publishing House
T5: Renewable energy resources and emerging technologies, D.P. Kothari, PHI

5. References:

R1: Non-conventional Energy, Ashok V. Desai, New Age International Publishers Ltd

R2: Non-Conventional Energy Resources, Chandra and Chandra, Khanna Publishing House

6. Course Outcomes:

Course Outcomes	Details/Statement	Action Verb	Knowledge Level
CO1	To understand the difference between Renewable and non-renewable energy sources	Analyze, Identify	Understand, Remember
CO2	To understand methods of conversion of solar energy to other form of energy.	Identify, Select	Understand, Apply, Analyze
CO3	To understand methods of conversion of wind energy.	Identify, Select	Understand, Apply
CO4	To understand methods harnessing energy from Biomass and Geothermal	Analyze	Understand, Apply, Analyze
CO5	To understand the principle and operation of fuel cell and hydrogen energy	Identify	Analyze

7. Mapping of course outcomes to module/course content:

Module	CO1	CO2	CO3	CO4	CO5
1	3	-	-	-	-
2	2	3	-	-	-
3	2	-	3	-	-
4	2	-		3	-
5	2	-	-	3	-
6	2				3

8. Mapping of CO to PO:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	2	-	-	1	1	-	-	-	1
CO2	3	3	3	2	2	1	1	-	-	-	1
CO3	3	3	3	3	2	2	1	-	-	-	1
CO4	3	3	3	3	2	1	1	-	-	-	1
CO5	3	3	3	3	2	1	1	-	-	-	1

9. Mapping to PSO:

	PSO1	PSO2	PSO3	PSO4
CO1	3	2	1	1
CO2	3	3	1	2
CO3	3	2	1	2
CO4	3	2	1	1
CO5	3	2	1	2

ENERGY MANAGEMENT

Course Code: EE-603

1. **Course Pre-requisites:**
   1. Renewable Energy
   2. Power system

2. **Course Learning Objectives:**
   This course is designed to provide brief introduction to non-conventional energy sources. Finite, non-renewable energy sources like coal, oil, and gas are consumed quicker than they are replaced. Long-term energy security, shortages, and price volatility are issues. Greenhouse gasses from fossil fuel burning cause climate change and air pollution. It deals with IGBC Kyoto protocol, Energy policies and design a sustainable framework.

3. **Course Name: ENERGY MANAGEMENT**
   Course Code: EE-603
   Hours per Week: 4
   Credits: 4

   Course Contents:

Module	Topics	36L
1.	**Introduction:** Energy Scenario – global, sub continental and Indian, Energy economy relation, Future energy demand and supply scenario, Integrated energy planning with particular reference to Industrial Sector in India, Captive power units and others – demand v/s supply.	08
2.	**Types of Energy:** Physical Aspects of Energy: Classification of energy – Hydel, Thermal, Nuclear, Wind, & from Waste Products. Efficiency and effectiveness of energy utilization in Industry. Energy and energy analysis. Renewable and non- renewable energy, Conventional and unconventional energy.	10
3.	**Energy Demand Management:** Energy utilization, Instrumentation and data analysis, Financial aspects of energy management, Energy management as a separate function and its place in plant management hierarchy.	10
4.	**Energy Planning:** Energy Staffing, Energy Organization, Energy Requirement. Energy Costing, Energy Budgeting, Energy Monitoring, Energy Consciousness, Energy Conversions, Energy Efficient Equipment, Energy Management Professionals, Environment Pollution due to Energy Use, Components of Pollution, Harmful Effects of Pollution, Measures taken to combat Pollution.	08

4. **Text Books:**
   T1: Non-conventional Energy sources, G.D. Rai, Khanna Publishers.
   T2: Non-conventional Energy Resources, B. H. Khan, Tata McGraw Hill.
   T3: Renewable energy sources and conversion technology, Bansal, Keemann and Meliss, Tata McGraw Hill.
   T4: Energy Technology, O.P. Gupta, Khanna Publishing House.

5. **References:**
   R1: Non-conventional Energy, Ashok V. Desai, New Age International Publishers Ltd.

6. Course Outcomes:

Course Outcomes	Details/Statement	Action Verb	Knowledge Level
CO1	To understand the global energy scenario.& energy sources	Analyze, Identify	Understand, Remember
CO2	To understand methods of Energy planning in India.	Identify, Select	Understand, Apply, Analyze
CO3	To understand methods of conversion of wind energy.	Identify, Select	Understand, Apply
CO4	To understand methods harnessing energy from Biomass, Geothermal and ocean	Analyze	Understand, Apply, Analyze
CO5	To understand the Energy utilization, Instrumentation and data principle and operation and planning	Identify	Analyze
CO6	To Understand, Energy Staffing, Energy Organization, Energy Requirement. Energy Costing, Energy Budgeting, Energy Monitoring, Energy Consciousness	Identify	Analyse

7. Mapping of course outcomes to module/course content:

Module	CO1	CO2	CO3	CO4	CO5
1	3	-	-	1	1
2	2	3	-	1	1
3	2	-	3	1	1
4	2	-		3	1

8. Mapping of CO to PO:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	2	-	-	1	1	-	-	-	-
CO2	3	3	3	2	2	1	1	-	1-	1	-
CO3	3	3	3	3	2	2	1	-	-	1	1
CO4	3	3	3	3	2	1	1	-	-	1	-
CO5	3	3	3	3	2	1	1	-	-	1	1
CO6	3	3	3	2	2	2	2	1	-	1	1

9. Mapping to PSO:

	PSO1	PSO2	PSO3	PSO4
CO1	3	2	1	1
CO2	3	3	1	2
CO3	3	2	1	2
CO4	3	2	1	1
CO5	3	2	1	2