

SHRI VENKATESHWARA UNIVERSITY



Syllabus

B.TECH
Civil Engineering
VIIIth SEMESTER
(Four Years Degree Programme)

(w.e.f. 2019-20)

**SCHOOL OF ENGINEERING &
TECHNOLOGY**

Civil Engineering

SEMESTER-VIII

| Sl. No | Subject Codes | Subject | Periods | | | Evaluation Scheme | | | | End Semester | | Total | Credit |
|--------|---------------|--|---------|---|----|-------------------|----|-------|-----|--------------|-----|-------|--------|
| | | | L | T | P | CT | TA | Total | PS | TE | PE | | |
| 1 | SCE-701 | Ground Water Management | 3 | 0 | 0 | 20 | 10 | 30 | | 70 | | 100 | 3 |
| 2 | SCE-702 | Industrial Pollution Control & Environmental Audit | 2 | 0 | 0 | 20 | 10 | 30 | | 70 | | 100 | 2 |
| 3 | SOE-081 | Renewable Energy | 3 | 0 | 0 | 20 | 10 | 30 | | 70 | | 100 | 3 |
| 4 | SOE-082 | Operation Research | 3 | 0 | 0 | 20 | 10 | 30 | | 70 | | 100 | 3 |
| 5 | SCE-811 | Project-II | 0 | 0 | 12 | | | | 100 | | 100 | 200 | 6 |
| 6 | SCE- 888 | Seminar | | | | | | | 100 | | | 100 | 3 |
| | | Total | | | | | | | | | | 700 | 20 |

SCE-701 GROUNDWATER MANAGEMENT

Introduction, Occurrence of ground water, Hydrological Cycle, Ground water movement, Well Hydraulics and Water Wells, Ground Water quality, Ground Water Modeling Techniques, Surface and Subsurface Investigations of Ground water, Artificial discharge and Recharge of Ground Water, Ground Water Management Techniques.

SCE-702

Industrial Pollution Control & Environmental Audit

Objectives: To understand the important issues and their abatement principles of industrial pollution

Outcomes:

The students will be able to:

1. Quantify and analyze the pollution load.
2. Analyze/design of suitable treatment for wastewater
3. Model the atmospheric dispersion of air pollutants.
4. Selection and design of air pollution control devices.
5. Analyze the characteristics of solid waste and its handling & management..

| S.N. | Unit number | Topics | Sub Topics |
|------|-------------|---|---|
| 1 | 1 | Industrial wastes | Industrial wastes & their sources: various industrial processes, sources and types of wastes- solid, liquid, gaseous, noise & radiation emissions. Sources for industrial water usages and various industrial processes requiring water use and water quality. |
| 2 | 2 | Control and removal of specific pollutants in industrial | Processes responsible for deterioration in water quality, Various waste water streams, Control and removal of specific pollutants in industrial wastewaters, e.g., oil and grease, bio-degradable organics, chemicals such as cyanide, fluoride, toxic organics, heavy metals, radioactivity etc. Wastewater re-uses & recycling, concept of zero discharge effluent. |
| 3 | 3 | Control of gaseous emissions: | hood and ducts, tall stacks, particulate and gaseous pollutant control; Solid waste generation and disposal management; Hazardous wastes: definitions, concepts and management aspects; Noise & radiation: generation, control and management. |
| 4 | 4 | Recent trends in industrial waste management | Recent trends in industrial waste management, cradle to grave concept, life cycle analysis, clean technologies; Case studies of various industries, e.g., dairy, fertilizer, distillery, sugar, pulp and paper, iron and steel, metal plating, thermal power plants, etc. |
| 5 | 5 | Environmental audit: | Environmental audit: definitions and concepts, environmental audit versus accounts audit, compliance audit, relevant methodologies, various pollution regulations, Introduction to ISO and ISO 14000. |

Recommended References:

1. Industrial Wastewater Management Handbook, Azad, Hardom Singh, Editor-in-Chief, McGraw Hill, New York.
2. Wastewater Reuse and Recycling Technology-Pollution Technology Review-72, Culp, Gordan, George Wasner, Robert Williams and Mark , V.Hughes Jr., Noyes Data Corporation, New Jersey.

3. The Treatment of Industrial wastes. Edmund, B. Besselieve P.E., McGraw Hill, New York.
4. Industrial Pollution Control –Issues and Techniques. Nancy, J. Sell, Van Nostrand Reinhold Co, NY.
5. Wastewater Engineering: Treatment & Re-use. Metcalf & Eddy, Tata Mc Graw-Hill.
6. Industrial Pollution Prevention Handbook. Shen, T.T., Springer-Verlag, Berlin.
7. Environmental Engineering. Pandey, G.N. and Corney, G.C., Tata McGraw Hill, New Delhi
8. Environment (protection) Act- 1986. Any authorized & recent publication on Government Act

SOE-081

Renewable Energy

Objectives: To impart the knowledge of basics of different non conventional types of power generation & power plants in detail so that it helps them in understanding the need and role of Non-Conventional Energy sources particularly when the conventional sources are scarce in nature.

Outcomes:

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

1. Study various non-conventional sources of energy like wind, biomass etc and its applications in remote areas of the country.
2. Understand the working criteria of various direct energy conversion systems and study its applications.
3. Understand the importance of non energy scenario.
4. Understand and pursue further research work behind the development of non conventional energy sources as a part of their research work.
5. Understand other direct energy conversion systems like m thermoelectric and fuel cells.
6. Evaluate methods for generation of hydrogen power and production of hydrogen.

| S.N. | Unit number | Topics | Sub Topics |
|------|-------------|---|--|
| 1 | 1 | Introduction | Introduction Various non -conventional energy resources - Introduction, availability, classification, relative merits and demerits. 3 Solar Cells: Theory of solar cells. solar cell materials, solar cell array, solar cell power plant, limitations. 4 |
| 2 | 2 | Solar Thermal Energy | Solar radiation, flat plate collectors and their materials, applications and performance, focusing of collectors and their materials, applications and performance; solar thermal power plants, thermal energy storage for solar heating and cooling, limitations. 9 |
| 3 | 3 | Geothermal Energy | Resources of geothermal energy, thermodynamics of geo -thermal energy conversion -electrical conversion, non -electrical conversion, environmental considerations. 4 Magneto -hydrodynamics (MHD): Principle of working of MHD Power plant, performance and limitations. 2 Fuel Cells: Principle of working of various types of fuel cells and their working, performance and limitations. 3 |
| 4 | 4 | Thermo -electrical and thermionic Conversions: | Principle of working, performance and limitations. Wind Energy: Wind power and its sources, site selection, criterion, momentum theory, classification of rotors, concentrations and augments, wind characteristics. performance and limitations of energy conversion systems. 6 |
| 5 | 5 | Bio -mass | |

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|--|--|--|---|
| | | | Availability of bio -mass and its conversion theory. Ocean Thermal Energy Conversion (OTEC): Availability, theory and working principle, performance and limitations. Wave and Tidal Wave: Principle of working, performance and limitations. Waste Recycling Plants. 3 |
|--|--|--|---|

Text/References Books:

1. Raja etal, "Introduction to Non -Conventional Energy Resources" Scitech Publications.
2. John Twideu and Tony Weir, "Renewal Energy Resources" BSP Publications, 2006.
3. M.V.R. Koteswara Rao, " Energy Resources: Conventional & Non -Conventional " BSP Publications,2006.
4. D.S. Chauhan,"Non -conventional Energy Resources" New Age International.

SOE-082

OPERATION RESEARCH

Objectives:

| S.N. | Unit number | Topics | Sub Topics |
|------|-------------|--------|------------|
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|---|---|---------------------------------|---|
| 1 | 1 | Introduction: | Definition and scope of operations research (OR), OR model, solving the OR model, art of modeling, phases of OR study. Linear Programming: Two variable Linear Programming model and Graphical method of solution, Simplex method, Dual Simplex method, special cases of Linear Programming, duality, sensitivity analysis. |
| 2 | 2 | Transportation Problems: | Types of transportation problems, mathematical models , transportation algorithms, Assignment: Allocation and assignment problems and models, processing of job through machines. |
| 3 | 3 | Network Techniques: | |
| 4 | 4 | Theory of Games : | Shortest path model, minimum spanning Tree Problem, Max -Flow problem and Min -cost problem. Project Management: Phases of project management, guidelines for network construction, CPM and PERT. |
| 5 | 5 | Inventory Control: | Rectangular games, Minimax theorem, graphical solution of $2 \times n$ or $m \times 2$ games, game with mixed strategies, reduction to linear programming model. Quality Systems: Elements of Queuing model, generalized poisson queuing model, single server models. Models of inventory, operation of inventory system, quantity discount. Replacement: Replacement models: Equipment's that deteriorate with time, equipment's that fail with time. |

Reference Books:

1. Wayne L. Winston, "Operations Research" Thomson Learning,2003.
2. Hamdy H. Taha, "Operations Research-An Introduction" Pearson Education,2003.
3. R. Panneer Seevam, "Operations Research" PHI Learning, 2008.
4. V.K.Khanna, "Total Quality Management" New Age International, 2008.