Course title: Renewable energy project management			
Course code: ENR 156	**No. of credits: 3**	**L-T-P**: 34-08-00	**Learning hours:** 42
Pre-requisite course code and title (if any):			
Department: Department of Energy and Environment			
Course coordinator: Dr. Atul Kumar		**Course instructor(s):** Dr. Atul Kumar	
Contact details: atulk@teri.res.in			
Course type: Core		**Course offered in:** Semester 2	

Course description

The course is designed for the students to prepare them for the working in various renewable energy projects right from conceptualization to delivery of energy services/electricity. Students will discover the renewable energy project life cycle and learn how to build a successful project from pre-implementation to completion. It will introduce project management topics such as resources, costs, time constraints and project scopes.

Course objectives

- Understand and articulate the importance of Project Management in any renewable energy project
- Develop a manageable project schedule
- Use tools and techniques to manage a project during execution

Course content

Module	Topic	L	T	P
1	**Introduction** Definition, need/benefits, projects versus routine production, project life cycle, investigative approach, process group.	2	0	0
2	**Planning** Project planning matrix, aim oriented project planning, generation and screening of project ideas, capital budgeting, criteria and models for resource allocation	6	2	0
3	**Analysis** Market and demand analysis, technical analysis, financial estimates and projections, investment appraisal criteria, cost benefit analysis, risk analysis	8	4	0
4	**Financing** Project financing, elements and parties of financing, multilateral and bilateral financing of renewable energy project, case studies	4	0	0
5	**Contract Management** Contract selection, tendering, negotiation, contract preparation, Power Purchase Agreements (PPAs) contract, Engineering, Procurement, Construction (EPC) contract.	4	0	0
6	**Implementation** Project management, network analysis for project management-PERT, CPM and CERT, Fuzzy logic, project material management, evaluation & analysis, implementation & monitoring, performance indices, supply chain management, customer relation management	8	2	0
7	**Review**	2	0	0

	Control of In-Progress projects, post completion audits, abandonment analysis			
		34	**8**	**0**

Evaluation criteria

- Minor test 1: 15%
- Minor test 2: 15%
- Assignment/Tutorials: 20%
- Major test: 50%

Learning outcomes

After completing this course, students would be able to:

- Describe a renewable energy project life cycle, and can skillfully map each stage in the cycle
- Identify the resources needed for each stage, including tools and supplementary materials
- Describe the time needed to successfully complete a renewable energy project, considering factors such as task dependencies and task lengths
- Demonstrate effective project execution and control techniques that result in successful projects.

Pedagogical approach

The course will be delivered through class room lectures. Relevant case studies shall be discussed in class so that students are introduced to the latest stage of development in the subject.

Materials

Textbooks

Prasanna, C. (2008). *Projects, Planning, Analysis, Selection, Financing, Implementation and Review.* Tata McGraw-Hill Publishing Company Limited.
Finnerty, J. D. (2013). *Project financing: Asset-based financial engineering.* John Wiley & Sons.
Frigenti, E., & Comninos, D. (2002). *The Practice of Project Management: a guide to the business-focused approach*. Kogan Page Publishers.
Lewis, J. P. (2002). *Fundamentals of project management: developing core competencies to help outperform the competition*. AMACOM Div American Mgmt Assn.
Scott, B. (2005). The Art of Project Management. *California USA. O'Relly Media Inc.*

Suggested readings

Andrew S. and Jennifer G. (2005) *Applied Software Project Management,* Cambridge, MA, O'Reilly Media.
Gary H. (2001) *Project Management (The Briefcase Book Series),* McGraw-Hill.
Harold K. (2003) *Project Management: A Systems Approach to Planning, Scheduling and Controlling, 8th Ed.,* Wiley.
Jack R.M. and Samuel J.M. (2002) *Project Management: A Managerial Approach,* 5th ed., Wiley.
James L. (2002) *Fundamentals of Project Management, 2nd ed.,* American Management Association.
Project Management Institute (2003) *A Guide To The Project Management Body of Knowledge, 3rd ed.,* Project Management Institute.

Journals

Project Management Journal
International Journal of Project Management

Other
Flyvbjerg, B. (2006). From Nobel Prize to project management: getting risks right. *Project Management Journal*, 37(3): 5–15.
Additional information (if any)
Student responsibilities The students are expected to submit assignments in time and come prepared with readings when provided.

Course reviewers

1. Professor Jyotirmay Mathur, Centre for Energy & Environment Malaviya National Institute of Technology Jaipur
2. Professor Vijay Prakash Ojha, Institute of Management Technology (IMT), Ghaziabad