FIRST SEMESTER 2016-2017

Course Handout Part-II

Date: 02/08/2016

In addition to part -I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

Course No. : **CE G549**

Course Title : **RURAL ROAD TECHNOLOGY**

Instructor-in-charge : **NIKHIL SABOO**

1 (a): Scope of the Course:

Rural roads are the key components for the development of rural community. In this regard, The Pradhan Mantri Gram Sadak Yojana (PMGSY), was launched by the Govt. of India to provide connectivity to unconnected Habitations as part of a poverty reduction strategy. Subsequently, the various strategies have been adopted in planning and construction of rural roads with the aid of technologically advanced construction practices. The scope of the course is to know the various aspects rural roads construction and the various processes associated with the construction. In the recent past, special emphasis is on the use of green technology for road construction in many states. Emulsion based cold mix has been used in certain locations as a part of green initiative. Rural road technology is fast evolving at an urban pace. The course aims to cover various technological advancements that have taken place not only in India, but also on the global stage.

1(b): Objectives of the course:

- To understand the basic objectives of PMGSY, roles of NRRDA and the rural road networks in India [**Module - I**]
- To study the rural road planning operations followed in India and abroad [**Module-II**]
- To understand the geometric design of rural roads [**Module-III**]
- To study the various materials and its behavioral characteristics used for the rural road construction [**Module IV**]
- To study the design of rural roads as per the specifications as per Rural Roads Manual and compare with the International standards [**Module V**]
- To understand the various steps associated with the preparation of Detailed Project Report (DPR) [**Module VI**]

- To highlight the various complexities associated with the construction of rural roads and Rural Roads Maintenance Management System [**Module VII**]
- To assess the various modes of failures of rural road networks and remedial measures [**Module VIII**]
- To highlight the new technologies being implemented in rural road construction [**Module IX**]
- To discuss the future ahead for rural roads and the research scope [**Module X**]

2. Text Book:
T1. IRC SP 20 - Rural Roads Manual

3. Reference Books:
R1. Quality Assurance Handbook for Rural Roads - published by NRRDA

4. Course Plan

Mod. No.	Learning Objective	Topics to be covered	No. of Lectures
1	Introduction to PMGSY, NRRDA	Objectives of PMGSY, Roles of NRRDA, Initiatives taken by NRRDA, Rural Road Network in India	2
2	Rural Road Planning	Network planning, Economic & Social considerations; Guidelines for planning; accessibility and mobility.	3
3	Geometric design of rural roads	Road alignment and survey; geometric design: cross-sectional elements, sight distance, horizontal and vertical alignments; Safety aspects.	5
4	Materials for rural road construction	Characteristics of pavement materials including soil and marginal materials; stabilized soils; Locally available materials; Cost and durability aspects; Hard materials and soft materials availability; Materials specification in IRC codes.	3
5	Design of Rural Roads	Design parameters Pavement components; Flexible pavements; Semi-Rigid & Rigid pavements; Drainage and Shoulders; Types & Criteria for Road drainage; System of drainage.	8
6	Detailed Project Report	Need for DPR; List of parameters &necessary base data discussed in DPR; Preparation of DPR; Important aspects of DPR; Surveys and investigation; Representations of Designs & Drawings in DPR; Role of STA/PTA in evaluating the DPR.	5
7	Rural Road Construction	Various aspects of construction of rural roads; Different stages in rural road construction; Cross- Drainage protection works; Road construction in hilly terrains; Quality of workmanship; Best construction practices	4
8	Rural Roads Networks - Distresses & Failures	Various distresses; Identification of distresses; Causes of distresses in rural roads; Damage quantification; Remedial measures; Performance evaluation; Health Monitoring of roads.	4
9	New Technologies	Use of innovative and cost-effective construction materials; Use of geo-textiles and geo membranes; Use of fly ash, waste materials; Plastic wastes; Emulsion based cold mix technology; Less energy intensive technology and materials	3

10	Future of Rural Road Construction	Latest updates; specifications; internationally recognized innovations; research scope & prospects.	3
		Total	**40**

5. Evaluation Scheme:

Component	Duration	Weight	Date & Time	Remarks
Mid Test	90 min	25%	<TEST_1>	CB
Monthly Assignments/Case study presentation/Literature Review		20%	Will be announced every month	OB
End Semester Project		20%		OB
Comprehensive Examination	3 hrs	35%	<TEST_C>	OB

6. Mid Semester Grading [Mid Sem + Assignments] = [35+10 = 40]

7. Chamber Consultation Hour: Thursday 5 pm - 7 pm

8. Reading assignments will be given as and when necessary.

9. Notices: Notices and communication will be sent through your BITS mail only.

Instructor-in-charge