

# Programme Specification



**PG Certificate Signalling Systems & Application Engineering for  
Railways & Metro**

**PG Certificate in Safety & Communication Management for Railways &  
Metro**

**PG Diploma In Signalling and Communications Management for  
Railways and Metro**

**Faculty of Engineering and Technology  
Directorate of Training & Lifelong Learning  
M.S Ramaiah University of Applied Sciences**

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## Programme Specification and Syllabus for award of

Postgraduate Certificate /Diploma in Railway Signaling and Communication Management

### 1. Title of the Awards

- Post Graduate Certificate in Signalling Systems and Application Engineering for Railways and Metro
- Post Graduate Certificate in Safety and Communication Management for Railways and Metro
- Post Graduate Diploma in Signalling and Communication Management for Railways and Metro

### 2. Modes of Study

Blended

### 3. Degree Awarding Institution / Certificate awarding body

M.S. Ramaiah University of Applied Sciences – Bangalore, India

### 4. Teaching Institution / company

Faculty of Engineering and Technology, MSRUAS - Bangalore, India

### 6. Date of course Specification

January 2024

### 7. Date of Course Approval by MSRUAS

### 8. Course Benchmark

### 9. Rationale for the Course

Massive expansion projects going on around the world in railways are creating opportunities for signaling and Telecommunication Engineers in a big way. According to surveys conducted for railway projects many people required in the next five years in Signaling and Telecommunication alone with more than 30 percent of these people to be technical level and above.

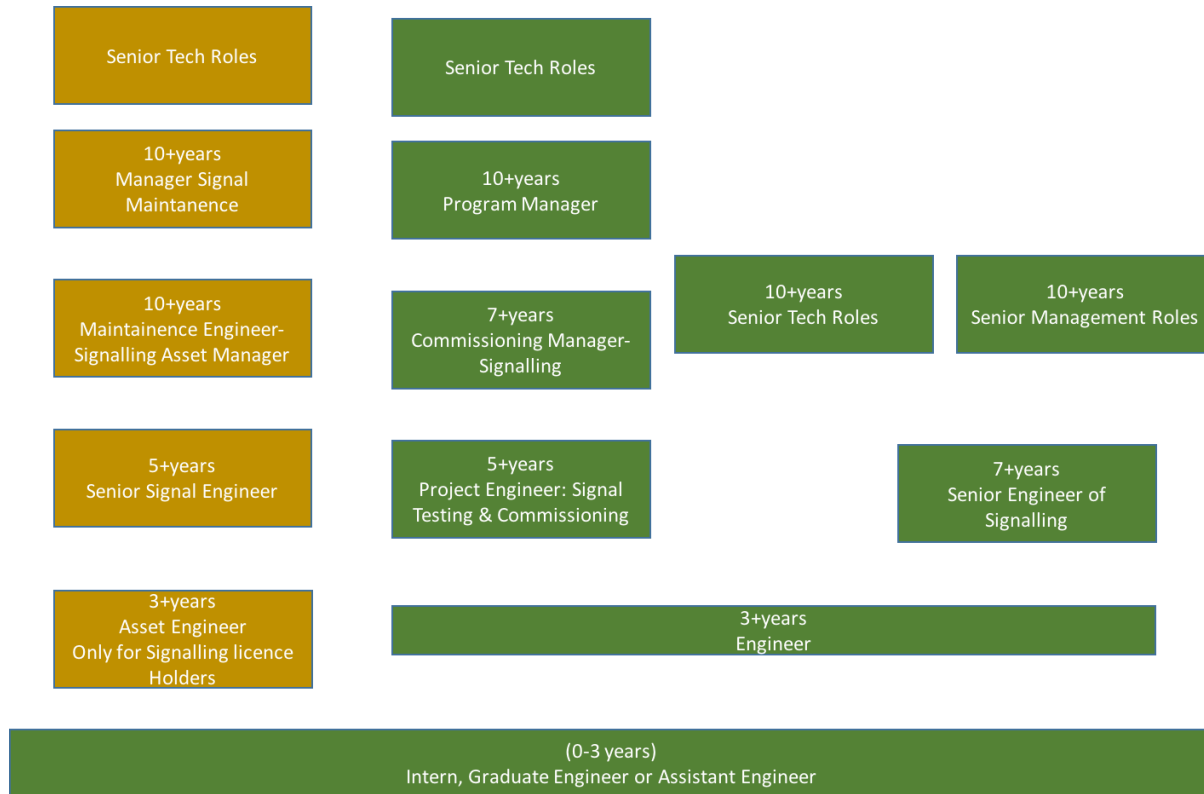
Globally, Qatar Rail, Network Rail (UK), Singapore and Middle East countries are expanding rail networks to improve their infrastructure and economies which are expected to catalyze huge demand for skilled manpower.

Metro industry is moving towards modern digital systems and data driven systems. There are 50+metro rail projects presently running in the country which creates opportunities for S&T Engineers.

This program is mainly aimed to develop competency in railway signaling and telecommunication engineering under the guidance of Rail industry. This program also imparts Knowledge & understanding the skills in the field of business communication, project management and other managerial aspects.

## Career Path

### Typical Career Path of Signaling Engineer



## Who is Eligible

Candidates seeking admission to PG Certificate/PG Diploma program shall be full time graduates from engineering and M.Sc in relevant branch as authenticated by the respective university documents(s).

### 10. Course Aim

The aim of the program in Railway Signaling and Telecommunication is to:

- Develop proficient practitioners in Railway Signaling and Railway Communication Systems
- Meet the requirement for common principles but different applications in each State/Country
- Encourage students to understand current industry trends and issues
- Encourage development of future industry leaders
- Achieve certification from University
- Conform to current direction of professional engineer development framework
- Encourage work-based and work-relevant learning
- Provide challenging and value adding development to students' capabilities and skills
- Develop students' adaptive, cooperative, and reflective learning ability.

## Course Objectives

**11. Intended learning outcomes of the course**

The Intended Learning Outcomes (ILO's) are listed under three headings:

1. Knowledge and Understanding 2. Practical Skills and 3.Capability /Transferable Skills

**11.1 Knowledge and Understanding**

After undergoing this course, the student will be able to:

- Ability to apply safety systems to railway operations in a cost-effective manner which contributes to business objectives
- Employ procedures from the safety and reliability assurance tool kits
- Employ procedures from the risk mitigation and management tool kits
- Multi-disciplinary system thinking that can synthesize across social, economic, technical, environmental and legislative issues.

In addition, graduates will have to demonstrate through their course work that they have developed the following capability (consciously competent):

- Quickly adapt to any system
- Apply principles to different situations
- Manage interfaces with other disciplines and systems
- Manage projects in design, construction, and testing.

Furthermore, graduates will have to accept the Institution of Railway Signal Engineers Code of Professional Conduct and Engineers India Code of Ethics and have demonstrate through the performance of their course work that they have consistently adhered to these Codes.

**11.2 Practical Skills**

After undergoing this course, the student will be able to :

- The current business and legislative environment of the railway industry, including legal requirements and standards in force in the student's own State
- Railway operations, the roles of the engineering disciplines and interface requirements
- Objectives of signaling systems – safety and traffic management efficiency
- History of rail systems and how signaling evolved

**11.3 Capability/Transferable Skills**

After undergoing this course, the student will be able to :

- Guiding the train on correct route
- Controlling the train in between the stations
- Enhancing speed
- Ensuring safety
- Preventing accidents
- Information to passengers
- Reservation by trains
- Suburban train services
- Metro trains services
- Unique system over the globe
- Upcoming technologies

**12. Programme Structure**

A student is required to successfully complete the following courses for the award of the Postgraduate Diploma in Railway Signaling and Communication. The course is delivered as per the Time-Table for every batch

**PG Certificate / Diploma in Signalling and Communications Management for Railways and Metro**

<b>Trimester 1: Foundation Course</b>				
<b>Sl.No</b>	<b>Name of the Course</b>	<b>Credits</b>	<b>Hours</b>	<b>Remarks</b>
<b>1</b>	Statistics for System Engineering & Reliability Assessment	2	30	<b>MSRUAS &amp; ZREPL</b>
<b>2</b>	Train Fundamentals & Operations	2	30	<b>ZREPL</b>
<b>3</b>	Critical Thinking & Writing/OR Models & Linear Programming	2	30	<b>MSRUAS</b>
<b>4</b>	Telecommunications and Software Programming	4	60	<b>MSRUAS &amp; ZREPL</b>
<b>Total</b>		<b>10</b>	150	
<b>Trimester 2: Certificate in Signalling Systems &amp; Application Engineering for Railways &amp; Metro</b>				
<b>1</b>	Systems Engineering	2	30	<b>ZREPL</b>
<b>2</b>	Principles and Interlocking Engineering	2	30	<b>ZREPL</b>
<b>3</b>	Application Engineering and Railway Modernisation	2	30	<b>ZREPL</b>
<b>4</b>	Design thinking/Engineering Visualisation/AUTOCAD/MicroStation	2	30	<b>MSRUAS/ ZREPL</b>
<b>5</b>	Mini Project	3	90	<b>ZREPL</b>
<b>Total</b>		<b>11</b>	210	
<b>Trimester 3: Certificate in Safety &amp; Communication Management for Railways &amp; Metro</b>				
<b>1</b>	RAMS & Functional Safety for Railways & Metro	2	30	<b>ZREPL</b>
<b>2</b>	Telecommunications for Railways	2	30	<b>ZREPL</b>
<b>3</b>	Project Management	2	30	<b>MSRUAS</b>
<b>4</b>	Software Development Lifecycle Management	2	30	<b>MSRUAS</b>
<b>5</b>	Mini Project	3	90	<b>ZREPL</b>
	<b>Total</b>	<b>11</b>	210	
<b>1</b>	Internship/Project	8	240	<b>ZREPL</b>
<b>Grand Total (Trimester 1,2&amp;3)</b>		<b>40</b>	810	

Sl.No	Name of the Course	Remarks
1	PG Certificate in Signalling Systems & Application Engineering for Railways & Metro	After Completion of Trimester 1 & 2
2	PG Certificate Safety & Communication Management for Railways & Metro	After Completion of Trimester 1 & 3
3	PG Diploma in Signalling and Communication Management for Railways and Metro	After Completion of Trimester 1,2 & 3

### 13. Course wise Content

As per Course Specification

### 14. Delivery Structure

The programme is in trimester pattern with an average of 12 hours of interactions per week (Saturday and Sunday) and duration of the programme is 48 weeks.

### 15. Teaching and Learning Methods

The course delivery comprises of a combination of few or all the following:

1. Face to Face Lectures using Audio-Visuals
2. Live online Classes
3. Demonstrations
4. Laboratory/Field work/Workshop
5. Industry Visit
6. Group Exercises
7. Project Exhibitions
8. Technical Festivals

### 16. Assessment and Grading

Each course is assessed for a total of 100 marks. A candidate is required to score a minimum of 40% in each of the courses.

### 17. Failure

If a student fails in a course, he/she is required to take up the make-up examination by payment of a fee as per the university norms.

### 18. Attendance

A student is required to have a minimum attendance of 75% on each of the courses.

### 19. Award of Class

As per the Programme Regulations.

**20. Student Support for Learning**

Students are given the following support:

- a. Course notes
- b. Reference books in the library
- c. Magazines and Journals
- d. Internet facility
- e. Computing facility
- f. Laboratory facility
- g. Workshop facility
- h. Staff support
- i. Lounges for discussions
- j. Any other support that enhances their learning