Two year M.Tech Programme
in Railway Engineering at IIT Kharagpur

Commencing from the 2015-2016 academic year, IIT Kharagpur, with grant-in-aid from Indian Railways, is starting a two year M.Tech program in Railway Engineering. The M.Tech program spans across three verticals in Civil, Electrical and Mechanical Engineering. The goal of the programme is:

(i) to impart scholastic training to Indian Railways engineers to develop rigorous analysis capability and in-depth knowledge in Railway Technology domain under the chosen vertical discipline.

(ii) to equip graduate engineers, with little or no exposure to Railway Engineering, with specialized knowledge in Railway Engineering and develop rigorous analysis capability in the chosen vertical discipline.

Students admitted to the programme will take courses in their chosen vertical (Civil, Electrical or Mechanical) as well as across disciplines, thereby enabling them to acquire detailed knowledge in their verticals, as well as a broad perspective on Railway Engineering. Details of the programme are described below.

Eligibility

Indian Railway engineers from the Civil, Electrical and Mechanical specializations with minimum 2 years of experience will be eligible for applying for this programme. In addition graduate engineers with B.Tech/B.E or equivalent degrees in Civil, Electrical or Mechanical Engineering with a qualifying GATE score will be eligible to apply.

Admission Process

The number of seats available in the programme will be thirty (30), of which twenty (20) will be reserved for officers from Indian Railways and the remaining ten (10) will be open to eligible candidates not belonging to Indian Railways, but selected on the basis of their performance in GATE. To attract excellent students in this GATE-qualified category, an additional top-up fellowship will be provided by railways

For railway officers this M.Tech program was advertised on 8 May 2015 in the following website for training circulars for IR Personal

www.indianrailways.gov.in/railwayboard/view_section.jsp?lang=0&id=0,1,304,366,530,566

IR officers should apply according to the above circular from Indian Railways. The shortlisted Railway officers will submit a one page research proposal. The performance in the final interview and quality of the research proposal will play an important role in admission to the MTech program.

Number of Credits

The credit requirements for the course shall comprise:

(i) Course work including theory and laboratory courses --- 48 credits.
(ii) Summer Internship --- 2 credits
(iii) Thesis/Project Work --- 40 credits

Internship

Students of the programme will be required to undergo a compulsory two-credit summer internship during the summer following their first year of studies. The internship will be for eight weeks. It will usually be in an Indian Railway workshop in India or at an equivalent location in a Railway subsidiary or ancillary industry or at a University abroad.

M.Tech Project

The students will pursue an M.Tech project in their vertical discipline in the second year of their studies. The project can be pursed in IIT Kharagpur under the aegis of the Centre of Railway Research (CRR), or in an Indian Railway workshop in India, at an equivalent location in a Railway subsidiary or ancillary industry, or at a University abroad.

Course Curriculum

The course list is attached as annexure.

Rules and Regulations

All students joining under this programme shall be governed by the existing academic, disciplinary and any other relevant rules of IIT Kharagpur during the programme.

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Date: 2015.04.30 15:30:20 IST
Location: CIVIL ENGINEERING, IIT Kharagpur

INDIAN INSTITUTE OF TECHNOLOGY,KHARAGPUR

Revised Course Proposal Structure

Department:-CIVIL ENGINEERING

Course Name:- M.TECH. in RAILWAY ENGINEERING

Sub No	Sub Name	LTP	Crd	Sub type	Sub Group	Comments
Semester- 1						
RR61001	RAILWAY ENGINEERING-I	3-1-0	4	DEPTH	7	
CE60041/EE60035/ME60407	ADVANCED STRUCTURAL ANALYSIS/ELECTRIC DRIVE SYSTEMS/FEM IN ENGINEERING	3-1-0	4	DEPTH	7	Existing courses for three verticals (CE/EE/ME)
CE61003/EE60019/ME60403	BRIDGE ENGINEERING/SWITCHED MODE POWER CONVERSION/VIBRATION ANALYSIS	3-1-0	4	DEPTH	7	Existing courses for three verticals (CE/EE/ME). Bridge Engineering- revised to 4 credits.
	ELECTIVE-I	3-1-0	4	ELECTIVE	7	
	ELECTIVE-II	3-0-0	3	ELECTIVE	7	
RR69091	RAILWAY ENGINEERING LABORATORY-I	0-0-3	2	DEPTH	7	
	ELECTIVE-III	3-0-0	3	ELECTIVE	7	
TOTAL		18-4-3	24			
Semester- 2						
RR61002	RAILWAY ENGINEERING - II	3-1-0	4	DEPTH	7	
CE61004/EE 60004/ME61006	TRACK ENGINEERING/ADVANCED POWER ELECTRONIC CONVERTERS/RAIL VEHICLE DYNAMICS	3-1-0	4	DEPTH	7	New courses for two verticals (CE/ME)
	ELECTIVE -IV	3-0-0	3	ELECTIVE	7	
	ELECTIVE-V	3-0-0	3	ELECTIVE	7	
	ELECTIVE-VI	3-0-0	3	ELECTIVE	7	
RR69092	RAILWAY ENGINEERING LABORATORY-II	0-0-3	2	DEPTH	7	
RR69094	DESIGN PROJECT	0-0-3	2	DEPTH	7	
RR68002	COMPREHENSIVE VIVA	0-0-0	3	DEPTH	7	
TOTAL		15-2-6	24			
Semester- 3						
RR67001	THESIS PART-I	0-0-0	20	DEPTH	7	
RR67003	SUMMER INTERNSHIP	0-0-3	2		7	This is a DEPTH subject for Railway Engineering
TOTAL		0-0-3	22			

Semester- 4						
RR67002	THESIS PART II	0-0-0	20	DEPTH	7	
TOTAL		0-0-0	20			

Elective List

Sub No	Sub Name	LTP	Crd	Sub type
Semester- 1				
EE60011	CONTROL THEORY	3-1-0	4	ELECTIVE-I,II,III
CE60013	URBAN TRANSPORTATION SYSTEMS PLANNING	4-0-0	4	ELECTIVE-I,II,III
CE60035	MECHANICS OF SOILS	3-1-0	4	ELECTIVE-I,II,III
CE60037	STRENGTH AND DEFORMATION CHARACTERISTICS OF SOILS	3-1-0	4	ELECTIVE-I,II,III
CE60043	ADVANCED STRUCTURAL ANALYSIS	4-0-0	4	ELECTIVE-I,II,III
CE60083	STRUCTURAL DYNAMICS AND EARTHQUAKE ENGG.	3-0-0	3	ELECTIVE-I,II,III
CE60101	DESIGN OF PRESTRESSED CONCRETE STRUCTURES	3-0-0	3	ELECTIVE-I,II,III
CE60123	GROUND IMPROVEMENT	3-0-0	3	ELECTIVE-I,II,III
CE60137	APPLIED SOIL MECHANICS	3-0-0	3	ELECTIVE-I,II,III
CE61003	BRIDGE ENGINEERING	3-1-0	4	ELECTIVE-I,II,III
EE60003	MACHINE ANALYSIS	3-1-0	4	ELECTIVE-I,II,III
EE60019	SWITCHED MODE POWER CONVERSION	3-1-0	4	ELECTIVE-I,II,III
EE60031	INDUSTRIAL INSTRUMENTATION	3-1-0	4	ELECTIVE-I,II,III
EE60033	DIGITAL SIGNAL PROCESSING	3-1-0	4	ELECTIVE-I,II,III
EE60035	ELECTRIC DRIVE SYSTEMS	3-1-0	4	ELECTIVE-I,II,III
EE60098	PROGRAMMABLE AND EMBEDDED SYSTEM	3-1-0	4	ELECTIVE-I,II,III
IM60051	PROJECT ENGINEERING AND MANAGEMENT	3-0-0	3	ELECTIVE-I,II,III
ME60023	APPLIED ELASTICITY	3-1-0	4	ELECTIVE-I,II,III
ME60103	MACHINERY FAULT DIAGNOSTICS AND SIGNAL PROCESSING	3-1-0	4	ELECTIVE-I,II,III
ME60403	VIBRATION ANALYSIS	3-1-0	4	ELECTIVE-I,II,III
ME60405	AUTOMATIC CONTROL	3-1-0	4	ELECTIVE-I,II,III
ME60407	FINITE ELEMENT METHODS IN ENGINEERING	3-1-0	4	ELECTIVE-I,II,III
ME60419	MODELING AND SIMULATION OF DYNAMIC SYSTEMS	3-1-0	4	ELECTIVE-I,II,III
RE60001	RELIABILITY ANALYSIS AND PREDICTION	3-1-0	4	ELECTIVE-

				I,II,III
CE60045	DESIGN OF REINFORCED SOIL STRUCTURES	3-0-0	3	ELECTIVE- I,II,III
		Semester- 2		
BM61012	PRODUCTION & OPERATION MANAGEMENT	3-0-0	3	ELECTIVE-- IV,V,VI
CE60042		4-0-0	4	ELECTIVE-- IV,V,VI
CE60044	THEORY OF ELASTIC STABILITY & BEHAVIOUR OF METAL STR.	4-0-0	4	ELECTIVE-- IV,V,VI
CE60112	RISK & RELIABILITY ANALYSIS OF CIVIL INFRASTRUCTURE SYSTEMS	3-0-0	3	ELECTIVE-- IV,V,VI
CE60150	SOIL STRUCTURE INTERACTION	3-0-0	3	ELECTIVE-- IV,V,VI
EC60090	EMI AND EMC TECHNIQUES	3-1-0	4	ELECTIVE-- IV,V,VI
EE60002	ADVANCED MACHINE DRIVES	3-1-0	4	ELECTIVE-- IV,V,VI
EE60004	ADVANCED POWER ELECTRONIC CONVERTERS	3-1-0	4	ELECTIVE-- IV,V,VI
EE60014	NON-LINEAR CONTROL	3-1-0	4	ELECTIVE-- IV,V,VI
ME60404	LUBRICATION AND ROTOR DYNAMICS	3-1-0	4	ELECTIVE-- IV,V,VI
ME60408	MECHANICS OF COMPOSITES	3-1-0	4	ELECTIVE-- IV,V,VI
ME60422	ACOUSTICS AND NOISE CONTROL	3-1-0	4	ELECTIVE-- IV,V,VI
CE60050	ANALYSIS AND EVALUATION OF MASS TRANSPORTATION SYSTEMS	3-0-0	3	ELECTIVE-- IV,V,VI
EE61010	RAILWAY SIGNALLING AND TELECOMMUNICATION	3-1-0	4	ELECTIVE-- IV,V,VI
CE61004	TRACK ENGINEERING	3-1-0	4	ELECTIVE-- IV,V,VI
		Semester-		

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Signature (HOD/HOC/HOS)