INSTITUTE OF INFRASTRUCTURE TECHNOLOGY RESEARCH AND MANAGEMENT (IITRAM)

POST GRADUATE PROGRAMS (2016-17)

Introduction

The growth of any economy hinges largely on the creation of sustainable infrastructure. NITI Aayog-the policy think tank of Government of India has laid a roadmap to help Asia's third largest economy cross the $10 trillion mark by 2032. In the light of such lofty goals, India needs to invest heavily in upgrading Infrastructure that would be expected to provide unprecedented avenues for Infrastructure related jobs.

Institute of Infrastructure Technology Research and Management (IITRAM) Ahmedabad through its departments of Civil, Electrical and Mechanical Engineering offers post-graduate programs leading to M.Tech. degree with specialization in areas pertaining to infrastructure and its management.

Applications are invited for the M.Tech. programs in following disciplines commencing from academic session 2016-17.

1. Civil Engineering (with specialization in Urban Infrastructure)
2. Electrical Engineering (with specialization in Electrical Infrastructure)
3. Mechanical Engineering (with specialization in Industrial Infrastructure)

The M.Tech. programs are designed to offer a fine balance of course work and research. Course work constitutes nearly 60% credits and thesis work constitutes 40% credits of the total minimum 60 credits required for successful completion of the program.

Course structure includes compulsory institute level courses, specialization centric core courses, and elective courses designed to offer flexibility to suit research requirements and changing industry demand from time to time. During first year (i.e. semesters I and II), students are expected to earn a minimum of 32 credits by successfully clearing 8-10 courses offered by individual departments. The second year (i.e. semesters III and IV) is largely devoted to thesis work. The thesis work shall aim to accomplish an original and quality research work making a significant contribution to the selected field of knowledge and should be suitable for publication in reputed academic conferences/journals. The individual department may offer an additional elective course/seminar in second year.

A brief introduction to each discipline is as under:

1. M.Tech. in Civil Engineering (with specialization in Urban Infrastructure)

The Government of India is emphasizing on up-gradation of infrastructure by focusing on development of Smart Cities, AMRUT (Atal Mission for Rejuvenation and Urban Transformation), NHDP, Sethu Bharatam etc… The proposed M.Tech. program in Civil Engineering (Urban Infrastructure) offered by Civil Engineering Department, IITRAM bridges the gap between theoretical concepts and its ground level implementation for efficient utilization of resources. The department aims to achieve this objective by tailoring courses to directly address the issues and look for technical solutions. The program would also create a platform for major urban bodies to exchange difficulties and innovative solutions developed. The aim of this program would be to enable research and development for addressing problems faced by rapid urbanization like development of multi-modal transport networks, water conservation, sewage disposal, waste management and so on.

The graduates of this program would be highly employable for Government projects as project engineers, consultants, project managers and so on. The students would also be encouraged to undertake research in state-of-the-art laboratories under highly qualified faculty members.

Courses would be offered from the following list not limited to it at Post Graduate program:

➢ Research Methodology ➢ Optimization Methods in Engineering ➢ Advanced Construction Practices ➢ Advanced Foundation Systems ➢ Air Quality and Control ➢ Civil Engineering Applications of Remote Sensing and GIS ➢ Disaster Management ➢ Ground Improvement Techniques	➢ Infrastructure Design ➢ Microeconomics of Infrastructure ➢ Municipal Waste Management ➢ Pavement Construction and Maintenance ➢ Public Infrastructure -Planning and Design ➢ Reinforced Earth Structures ➢ Structural Health Monitoring ➢ Transportation Systems Management ➢ Urban Planning ➢ Water Resources Planning and Management

2. M.Tech. in Electrical Engineering (with specialization in Electrical Infrastructure)

The industrial scenario is quite encouraging for the existing power producers and so the demand of the post graduate students having the domain knowledge shall be in demand from Govt. Organization as well private industries for their expansion. It is expected that the graduates with specialization in electrical infrastructure shall be well employed in the power sector that includes generation, transmission, distribution, smart grid and renewable engineering industries.

Proposed M.Tech. program in Electrical Engineering (Electrical Infrastructure) provides an opportunity for engineering students to mold themselves to meet the needs, requirements and challenges of infrastructure development in the power industries. The aim of this PG degree is to obtain research and developments on the most advanced technologies for analyzing, predicting and optimizing Electrical infrastructure like Transmission and Distribution, Renewable Energy Sources, Smart Grid, Communication Engineering etc... The main gaps to be filled are those between researchers and practitioners in electrical infrastructure developers.

Courses would be offered from the following list not limited to it at Post Graduate program:

➢ Research Methodology ➢ Optimization Methods in Engineering ➢ Linear Algebra ➢ Power Transmission Infrastructure ➢ Renewable Energy Infrastructure ➢ Energy Audit ➢ Smart Grid ➢ Machine Learning ➢ Artificial Intelligence ➢ Telecommunication Infrastructure ➢ Advanced Power Electronics	➢ Robust Control ➢ Adaptive and Nonlinear Control ➢ Antenna Design and Analysis ➢ Biomedical instrumentation ➢ Chaos and Bifurcation ➢ Microwave Integrated Circuits ➢ Multi-rate Signal processing ➢ Remote Sensing and Satellite Communication ➢ Speech Processing ➢ VLSI and Embedded Systems ➢ Advanced Electrical Drives

3. M.Tech. in Mechanical Engineering (with specialization in Industrial Infrastructure)

Mechanical Engineers have a vital role to play in the development of infrastructural facilities related to power generation, manufacturing, and industrial refrigeration, to name a few. With the unprecedented growth currently happening in India, and the resultant increase in societal needs of power and demand for manufactured goods, there is a huge requirement for mechanical engineering graduates equipped with knowledge of state-of-the-art in these areas. To meet this requirement, the Department of Mechanical Engineering at IITRAM is offering a two-year postgraduate program leading to an M.Tech. degree in Mechanical Engineering (Industrial Infrastructure).

This program builds on traditional Mechanical Engineering undergraduate education and equips students with the latest technical know-how in a wide range of topics related to industrial infrastructure. The curriculum has been designed with a focus on infrastructure and management of infrastructure, in line with the institute objectives. Students graduating from this program will be well placed for a career of their choice – whether in the industry or for further research leading to a doctoral degree and subsequent industry/academia career.

Courses would be offered from the following list not limited to it at Post Graduate program:

➢ Research Methodology ➢ Optimization Methods in Engineering ➢ Advanced Engineering Mathematics ➢ Advanced Machine Design ➢ Advanced Manufacturing Techniques ➢ Advanced Refrigeration & Air-Conditioning Systems ➢ Advanced Thermodynamics ➢ Advanced Welding Processes ➢ Computational Methods in Fluid Dynamics and Heat Transfer	➢ Design-of-Experiments in Engineering ➢ Earth-Moving Equipment ➢ Energy Economics and Management ➢ Finite Element Method ➢ Manufacturing Metrology ➢ Power Generation ➢ Risk Management ➢ Servo-Hydraulics ➢ Smart Materials and Structures