

## Course Curriculum

Total credit requirement for the award of M.Tech. in EREM is 50.

### Semester—1

Core courses	2	6 credits
Elective courses	2	5 credits

### Semester—2

Core courses	4	8 credits
Elective courses	2	5 credits
Compulsory Course	2	2 credits

### Semester—3

Masters Thesis	1	12 credits
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### Semester—4

Masters Thesis	1	12 credits
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### Core Courses

1. Introduction and general concepts to waste and waste management
2. E-waste recycling Methods: Physical Metallurgical Processes
3. Hydrometallurgy: Aqueous processing of metals
4. AI and machine learning
5. Instrumentation and characterization
6. Supply chain management & Circular economy
7. Trace Metal Analysis
8. English Communication
9. Industry Lectures

### Elective Courses

#### A. Processes

- A1:Sustainable Recycling for Mitigating Climate Change
- A2: Electrometallurgy
- A3: Separation Processes
- A4: Industrial Waste Treatment
- A5: Engineering Thermodynamics

### B. Project, business & human resources management

- B1: Design concepts of project capacity to a viable scale
- B2: Business calculations & break-even point
- B3: SWOT analysis and risk management
- B4: Updated Govt. policies on E-waste

### C. Plant Design and Instrumentation

- C1:Pilot plant designs, Mechanical engineering designs
- C2: Instrumentation for efficient recycling and automation

### D. Mathematical Modelling

- B1: Queuing Theory
- B2: Numerical Methods
- B3: Detection and Estimation Theory

### Eligibility Criteria

- 1) B.Tech. in Chemical Engg./Materials Sci. & Metallurgical Engg./Civil Engg./Environmental Engg./Electrical Engg./Mechanical Engg./Engg. Sciences/Engg. Physics/Minerals Engg. and affiliated areas with GATE qualification OR M.Sc. in Physics/Chemistry with NET/GATE qualified
- 2) GATE Subjects: CE/CH/CY/EC/EE/IN/ME/MN/MT/PH/PI/XE-C/XE-F/XE-H/XL-P/ES
- 3) NET/GATE qualification is exempted for industry sponsored candidates with a minimum two years' experience OR for IIT Undergraduates with minimum CGPA of 7.0. OR for self-sponsored candidates.

### How to apply and selection criteria?

Eligible candidates may register and apply through COAP portal. Reservations as per the GoI norms will be applicable. MHRD scholarship will be available for GATE qualified selected candidates. MHRD candidates will be selected based on GATE scores. Self-Sponsored candidate will be selected based on written exam and/or interview.

Indian Institute of Technology Hyderabad

(IITH)

&

Centre for Materials for  
Electronics Technology (C-MET)

## Two Years M.Tech. Program in E-waste Resource Engineering & Management (EREM)

(Regular and Self-Sponsored)

Information Brochure



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## About the Program

With rapid change in technology and more digitalization in the world, there is an explosive growth in electronics industry and subsequently that has led to enormous growth in electronic waste (e-waste). E-waste contains many hazardous and toxic substances which have serious health and environmental effects, if not managed properly. Therefore, it becomes essential to learn about various technological interventions to manage, reduce and recycle e-waste for its safe disposal.

M.Tech in E-waste Resource Engineering & Management (EREM) is being offered, from academic year 2020, jointly by IIT Hyderabad and C-MET. This M.Tech. program will catalyse the efforts towards E-waste management in the country and worldwide and will provide a necessary support for several of Government initiatives in this direction such as Skill India, Swachh Bharat, Waste-to-Wealth initiatives.

## Faculty

### IIT Hyderabad

Dr.Chandra Shekhar Sharma (Coordinator)  
Dr. Pritha Chaterjee  
Dr. Suhash Ranjan Dey  
Prof. Ch. Subrahmanyam  
Dr. Bhuvanesh Ramakrishna  
Dr. Abhinav Kumar  
Dr. Kishalay Mitra  
Dr. Surendra Kumar Martha

### CMET

Dr. N.R. Munirathnam, DG  
Dr. R.Ratheesh, Director  
Dr. S.Rajesh Kumar, Scientist E  
Dr. U. Rambabu, Scientist E  
Dr. Ajay Kaushal, Scientists E

## About IIT Hyderabad

IIT Hyderabad is one among the 2nd generation of IITs started by the Govt. of India in 2008. As of date, IITH offers 10 B.Tech programs, 21 M.Tech programs, 3 M.Sc programs, 5 M.Phil programs, 1 M.Des program and Ph.D. programs in all branches of engineering, science, liberal arts and design. The institute has about 220 faculty and 2,500 students. IITH is ranked consistently in Top 10 Engineering Institute in NIRF ranking of MHRD, GoI.

The very foundation of IIT Hyderabad is based on research and innovation. The vibrant research culture is evident from the number of patents and publications that IITH has. IITH is creating a unique holistic educational ecosystem that offers interactive learning, a highly, flexible academic structure, cutting-edge research, strong industry collaboration, and entrepreneurship.

## About CMET

Centre for Materials for Electronics Technology (C-MET) is an autonomous R&D institution under Ministry of Electronics & Information Technology (MeitY), Govt. of India. C-MET envisions attainment of self-sufficiency in all spheres of electronic materials, components and devices to cater to the country's strategic and industrial applications in addition to converting indigenous resources of raw materials into value added technologically suitable materials. CMET's R&D activities have been implemented in three laboratories at Pune, Hyderabad and Thrissur. Centre of Excellence (COE) on E-waste Management at C-MET Hyderabad has excellent state of the art R&D infrastructure including RoHS test facility.

## Research Facilities

COE host incubation facilities to create prototypes for addressing various E-waste recycling issues, viz., dismantling, designing and automation of various process equipment for environmentally friendly recycling of PCBs, recovery of precious metals, separation of rare earth oxides from spent phosphors, recovery of Li & Co from Li-Ion batteries, nurturing of start-ups, and provide training to Indian electronics and electrical industries complying with E-waste (Management) Rules 2016.

