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M.Tech.
EMBEDDED SYSTEMS

BITS Pilani
Pilani | Dubai | Goa | Hyderabad | Mumbai
An Institution of Eminence

**WORK
INTEGRATED
LEARNING
PROGRAMMES**

HCL

WHO SHOULD APPLY?

M.Tech. Embedded Systems, a four-semester Work Integrated Learning Programme, is tailored for engineers in the embedded systems industry, encompassing automotive, avionics, consumer electronics, medical devices, defense, and processor design.

This programme equips professionals with cutting-edge tools and theories, covering key areas such as embedded control, real-time systems, model-based design and verification, Processor Architecture, and Chip Design for embedded systems. It is offered through BITS Pilani's Work Integrated Learning Programme (WILP), which is UGC approved.

▶ Ambitious engineers aiming to advance their careers in fast-growing sectors like Consumer Electronics, Automotive, Semiconductors, Medical Equipment, and Process industries within Embedded Systems.

▶ Technical professionals in roles such as Software Development & Testing (System or Applications), Hardware Design & Validation, Product Design, Tech Support, Communications, and Network Engineering.

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WHAT
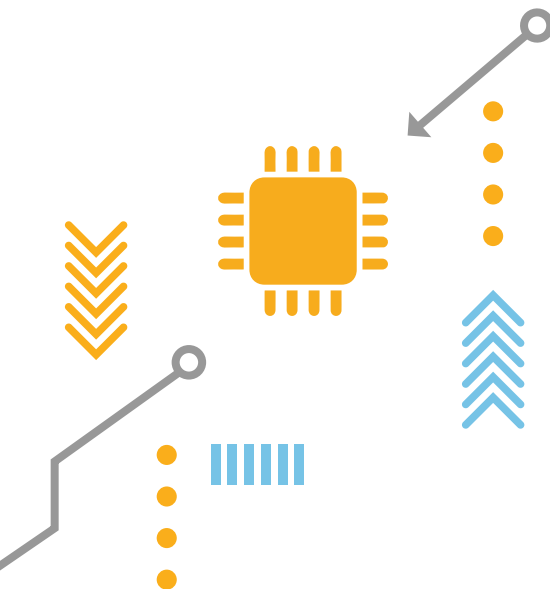# ARE THE MAIN
HIGHLIGHTS OF
THE PROGRAMME?

- ▶ 4 Semester M.Tech. Embedded Systems programme

- ▶ UGC approved programme for Working professionals

- ▶ Online classes conducted mostly on weekends

- ▶ Pursue the programme without any career break

- ▶ Emphasizes experiential learning with lab exercises, assignments, case studies, and work-integrated activities

- ▶ Blend of classroom and experiential learning

- ▶ Employ VLSI Architecture, Simulation, and Mathematical Modeling tools like GEM5, Tossim, Cheddar, Keil, CCS Studio, and MATLAB in the programme

- ▶ Utilize Remote Labs for designing and testing embedded systems on platforms like MultiCore STM32, Raspberry Pi, and Xilinx FPGA

- ▶ The final semester includes a practical Dissertation (Project Work) for real-world application

- ▶ Employs Continuous Evaluation to provide ongoing feedback and support

- ▶ Become members of an elite & global community of BITS Pilani Alumni

- ▶ Fee submission using easy- EMI with 0% interest and 0 down payment

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WHAT ARE THE PROGRAMME OBJECTIVES?

Develop knowledge, skills, and aptitude for long-term career growth and greater workplace responsibilities

- ▶ Provide a strong conceptual foundation and real-world understanding to enhance workplace performance and excel among peers
- ▶ Offer expertise in rapidly growing domains like IoT, Instrumentation, Automotive Engineering, Aeronautics, Telecommunication, and Defense

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WHAT ARE THE STUDENT LEARNING OUTCOMES?

Upon programme completion, learners will be able to:

▶ Design, validate, and optimize embedded electronic systems for diverse industrial applications

▶ Define communication and control requirements, bridging the gap between hardware and software design in industrial production contexts

▶ To use tools for the development and debugging on a variety of platform

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WHAT IS THE EDUCATION DELIVERY METHODOLOGY?

ATTEND ONLINE LECTURES OVER WEEKENDS

▶ Lectures are conducted live via online classeso nline classrooms offer similar levels of interactivity as regular classrooms at the BITS Pilani campus.

▶ The class schedule is announced within 1 week of completion of the admission process.

▶ The online lectures are conducted usually over weekends for a total of 7-8 hours per week. If you miss a lecture, you can also access the recorded lecture on the internet.

EXPERIENTIAL LEARNING & LABS

The programme prioritizes experiential learning, enabling learners to apply classroom concepts in simulated and real work scenarios through remote and virtual lab exercises.

▶ Virtual & Remote Labs: The remote labs provide you with remote access to hardware and software tools that are used for designing and testing embedded systems on various platforms such as MultiCore STM32, Raspberry Pi, Arduino, Xilinx FPGA

▶ Simulation-based Lab components: Some or all of the following would be utilised across the programmeo

▶ VLSI Architecture tools like GEM5

▶ Simulation tools like KEIL Tools for ARM

▶ Mathematical Modelling tools such as MATLAB

PROJECT WORK

During the final semester participants carryout a semester-long intensive project work applying the various concepts learnt throughout the program guided by the organisation mentor and supervisor. Participants are provided access to virtual labs where applicable, and faculty expertise to support the project work.

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DIGITAL LEARNING

Learners can access engaging learning material at their own pace which lecture videos, student notes, curated content etc. for select courses, through a learning management platform that is engaging and mobile-friendly.

EXAMINATIONS & CONTINUOUS ASSESSMENT

The learners' performance is assessed continuously throughout the semester using various tools such as quiz, assignments, mid-semester and comprehensive exams. The assessment results are shared with the learners to improve their performance.

Each course will entail a minimum of 1 Assignment/ Quiz, a Mid-semester exam and a final Comprehensive exam. Your semester calendar will clearly indicate the dates of the Mid-semester and Comprehensive exam. Typically, a Mid-semester or Comprehensive examination for a course is for 2-3 hours duration. The examinations are typically conducted over a weekend, i.e. Saturday and Sunday. These exams will be conducted either at the learners' office premises, or at another suitable location. Details regarding the exam location will be communicated at the beginning of the semester.

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What is the Eligibility Criteria?

Minimum eligibility to apply: Employed professionals holding Bachelor of Engineering in EEE/ECE/ENI/ Computer Science or equivalent with at least 60% aggregate marks and minimum 18 months of work experience within HCL in relevant domains.

The above are only the minimum criteria to apply. The final decision to offer admission to an applicant rests with BITS Pilani which will be made based on an overall review of your application information.

FEE STRUCTURE

The following fees schedule is applicable for candidates seeking new admission during the academic year 2023-24:

Application Fees (one time)	:INR 1,500
Admission Fees (one time)	:INR 16,500
Semester Fees (per semester)	:INR 63,500

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Programme Curriculum

Participants need to take at least 12 courses towards coursework, and complete one Project/ Dissertation. The coursework requirement for the programme would consist of a set of core courses and electives. Core courses are compulsory for all participants, while electives can be chosen based on individual learning preferences.

First Semester

- Embedded System Design
- Real Time Systems
- Software for Embedded System
- Hardware Software Co-Design

Second Semester

- Elective 1
- Elective 2
- Elective 3
- Elective 4

Third Semester

- Elective 5
- Elective 6
- Elective 7
- Elective 8

Fourth Semester

- Dissertation

Electives

- Computer Networks
- Network Security
- Wireless & Mobile Communication
- Project Management
- Real-Time Operating Systems
- Pervasive Computing
- Reconfigurable Computing
- Digital Signal Processing
- Fault-Tolerant System Design
- VLSI Architecture
- Networked Embedded Applications
- Advanced digital signal processing
- VLSI Design
- Testability for VLSI
- Advanced Computer networks
- Optical Communication
- Mechatronics
- Mechanism & Robotics
- Data Storage Technology & Networks

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Electives finally offered will be at the discretion of the BITS Pilani, and will be decided in consultation with HCL. Offered electives will be made available to enrolled students at the beginning of each semester.

HOW
TO APPLY

▶ Click here to visit the Online Application Center. Create your login at the Online Application Center by entering your official HCL Email ID only and create a password of your choice. Once your login has been created, you can anytime access the Online Application Center using your official email ID and password

▶ Begin by clicking on Step 1 - 'Fill/ Edit and Submit Application Form'. This will enable you to select the programme of your choice. After you have chosen your programme, you will be asked to fill your details in an online form. You must fill all details and press 'Submit' button given at the bottom of the form

▶ Now, click on 'Pay Application Fee' to pay INR 1,500/- using Netbanking/ Debit Card/ Credit Card

▶ Finally, click on 'Upload & Submit All Required Documents'. This will allow you to upload one-by-one all the mandatory supporting documents such academic certificates and transcripts, photograph, etc. and complete the application process. Acceptable file formats for uploading these documents are .DOC, .DOCX, .PDF, .ZIP and .JPEG

▶ Upon receipt of your Application Form and all other enclosures, the Admissions Cell will scrutinise them for completeness, accuracy and eligibility

▶ Admission Cell will intimate selected candidates by email within two weeks of submission of application with all supporting documents. The selection status can also be checked by logging in to the Online Application Centre

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DISCLAIMER

Ever since it was declared as a Deemed to be University in 1964, BITS Pilani has been offering higher education programmes in science and technology, and has earned an enviable reputation for its innovations in this sphere. The Work Integrated Learning Programmes (WILP) of BITS Pilani constitutes a unique set of educational offerings for working professionals. These programmes, which BITS began to offer in 1979, have, over the years, evolved along the lines envisaged in the National Policy on Education, 1986.

The WILP are rigorous higher education programmes in technology areas, designed keeping the evolving needs of industry in view, and meant for working professionals in their respective domains. The very intent is to deliver the education at the workplace, in order that the greatest degree of work integration of the education is achieved, and thus the WILP are very distinct in philosophy and pedagogy from open, distance learning programmes. Though it is incorrect and improper, at times the WILP are compared to ODL programmes. Accordingly, it has been our constant endeavor to engage with the regulator, and provide all necessary information about these programmes.

The WILP have been well received, and accepted by industry, because of the high quality of the programmes in terms of the curriculum and the instruction, and also because of the high degree of work integration, which results not only in up gradation of knowledge, but also in up skilling, and productivity increase.