innovate   achieve   lead

M.Tech.

VLSI DESIGN AND MICROELECTRONICS

BITS Pilani
Pilani | Dubai | Goa | Hyderabad | Mumbai

**WORK INTEGRATED
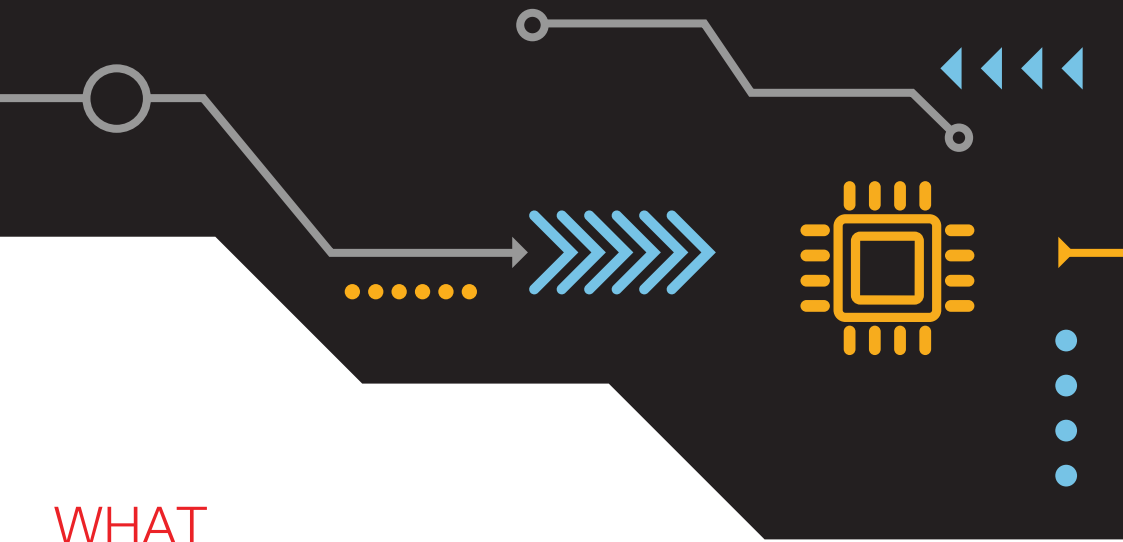LEARNING PROGRAMMES**

HCL

M.Tech. VLSI Design and Microelectronics, a four-semester Work Integrated Learning Programme, is tailored to empower electronics engineers with specialized expertise for designing, fabricating, and testing micro and Nano-scale devices, circuits, and systems.

WHO SHOULD APPLY?

▶ Ambitious engineers in the Semiconductor industry seeking expertise in system on Chip design, Processor design, IC fabrication, and VLSI CAD. Electronics industry professionals, Micro-Architects, EDA Tool Engineers, and Analog/Digital/Mixed Signal Chip Designers.

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WHAT ARE THE MAIN HIGHLIGHTS OF THE PROGRAMME?

▶ The programme will also enable working professionals to attend contact classes from anywhere over a technology-enabled platform. The contact classes will be conducted mostly on weekends or after business hours.

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

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

▶ The programme offers courses covering back-end and front-end microelectronics, including Processor & SoC Design, Chip Design, VLSI CAD Tool Development, and Semiconductor Fabrication.

▶ Participants can access Remote Labs for hardware and software tools used in designing and testing embedded and VLSI systems on platforms like Keil, Multicore STM32, Cadence EDA tools, Vivado, and Xilinx FPGA.

▶ Employs Continuous Evaluation to provide ongoing feedback and support.

▶ Become a part of elite and global BITS Pilani Alumni community.

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WHAT ARE THE PROGRAMME OBJECTIVES?

▶ To design and analyze analog, digital and RF CMOS integrated circuits fundamentals and new paradigms that practicing engineers need to master as a working professional employed in the VLSI domain.

▶ To develop both a solid foundation and methods of designing, analyzing and optimizing circuits using EDA tools.

▶ To combine theoretical rigor with practical hands-on labs, real-world problem-solving capabilities, lead and innovate in the landscape of semiconductor devices, fabrication technologies, and VLSI design.

▶ To emphasize on the intricacies of smart technologies, high speed and low power design technologies using industry standard EDA tools to master design and analysis of complex integrated circuits.

▶ Equip participants with the knowledge, skills, and aptitude needed for long-term career growth and increased workplace.
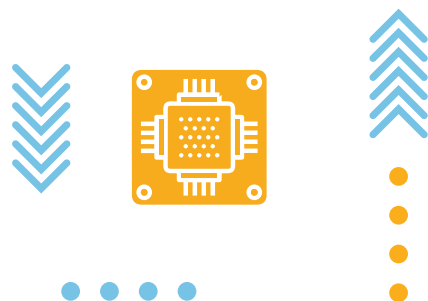
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WHAT ARE THE STUDENT LEARNING OUTCOMES?

Upon completing the programme, learners will be able to:

- ▶ Mastery of fundamental scientific principles governing the operation, design, and fabrication of integrated circuits, covering CPUs, GPUs, and SoCs.

- ▶ Deep understanding of relevant technologies, including integrated circuit process integration and manufacturing.

- ▶ Expertise in both basic and advanced circuit and system design techniques across digital, analog, and RF domains.

- ▶ Proficiency in the application of modern CAD tools and techniques.

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LEARNING METHODOLOGY

ATTEND ONLINE LECTURES OVER WEEKENDS

Lectures are conducted live via online classes. These lectures can be attended via the internet using a computer from any location. These online 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.

DIGITAL LEARNING

Learners can access engaging learning material at their own pace which includes recorded lectures from BITS Pilani faculty members, course handouts and recorded lab content where applicable.

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.

EXPERIENTIAL LEARNING

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, Vivado, Xilinx FPGA.

CONTINUOUS ASSESSMENT

Continuous Assessment includes graded Assignments/ Quizzes, Mid-semester exam, and Comprehensive Exam.

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WHAT IS THE ELIGIBILITY CRITERIA?

▶ Minimum eligibility to apply: Employed professionals holding BE/ B.Tech./ M.Sc. or equivalent in relevant disciplines, 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 2024-2025:

Application Fees (one time)	:INR 1,500
Admission Fees (one time)	:INR 16,500
Semester Fees (per semester)	:INR 66,750

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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 - 1st Year

- MOS Devices and Microfabrication Technology
- Analog IC Design
- CAD for VLSI Design Flow
- VLSI Design

Second Semester - 1st Year

- VLSI Architecting, the RTL Way
- Elective 1
- Elective 2
- Elective 3

Third Semester - 2nd Year

- Elective 4
- Elective 5
- Elective 6
- Elective 7

Fourth Semester - 2nd Year

- Dissertation

Choice of Electives is made available to enrolled students at the beginning of each semester. A limited selection of Electives will be offered at the discretion of the Institute.

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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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D ISCLAIMER

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.