



M.Tech.

**SOFTWARE
ENGINEERING**



**WORK
INTEGRATED
LEARNING
PROGRAMMES**

HCL



M.Tech. Software Engineering at BITS WILP is a unique work-integrated learning programme for professionals in the software industry. It equips learners with a full stack of technologies, essential competencies, and specialized knowledge in areas like Full Stack Engineering and Software Product Management.

With a comprehensive curriculum, hands-on experiential learning through remote and cloud labs, and flexible

education methods, this program empowers professionals to excel in the software industry, where career growth demands expertise in various technologies, solution architecture, product design, and effective collaboration across functions.



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WHAT ARE THE HIGHLIGHTS OF THE PROGRAMME?

- ▶ 4 semester M.Tech Software Engineering programme.
- ▶ Pursue the programme without any career break.
- ▶ Lectures by BITS Pilani faculty and industry experts.
- ▶ The program offers core and elective courses for specialization in Full Stack Engineering and Software Product Management.
- ▶ UGC approved programme for Working professionals.
- ▶ Online classes conducted mostly on weekends.
- ▶ Blend of classroom and experiential learning.
- ▶ It extensively uses Cloud-based and Remote labs, providing hands-on access to tools like Jenkins, Docker, GitHub, SonarQube, Selenium, and various programming languages and libraries such as Java, Python, NumPy, SciPy, and more.
- ▶ 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.
- ▶ Fee submission using easy - EMI with 0% interest and 0 down payment.
- ▶ Employs Continuous Evaluation to provide ongoing feedback and support.
- ▶ Become a part of Elite and Global BITS Pilani Alumni community.

Classes are conducted by a pool of faculty members comprising of academicians from BITS Pilani, and guest faculty who are experienced industry professionals

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WHAT ARE THE PROGRAMME OBJECTIVES?

- ▶ Explore customer needs and market insights to identify software product opportunities.
- ▶ Implement robust, maintainable, and scalable software products using contemporary software architectural and design principles.
- ▶ Manage the software product lifecycle using agile methodologies and rapid release cycles.
- ▶ Apply software engineering and product management practices within specific domains.
- ▶ Define product requirements, create a strategy, and establish a roadmap for product rollout.
- ▶ Develop, test, and deploy software while adhering to best practices, including automation with continuous integration and delivery.
- ▶ Continuously evaluate product performance through relevant analytical methods to refine the roadmap and prioritize features.



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WHAT ARE THE STUDENT LEARNING OUTCOMES?

Upon successful completion of the programme, learners will be able to:

- ▶ Proficiency in software architectural models for complex systems.
- ▶ Adaptability in software development processes and tools for various applications, from traditional to modern.
- ▶ Skills in user needs assessment, full-stack solution design, implementation, and release using cutting-edge technologies. Capability to take an idea from concept to market launch using software product management methodologies.
- ▶ Effective individual work and collaboration within software teams to achieve goals and objectives.



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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.



CONTINUOUS ASSESSMENT

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



EXPERIENTIAL LEARNING

The programme emphasizes on Experiential Learning that allows learners to apply concepts learnt in the classroom in simulated, and real work situations. This is achieved through 3 lab setups. Apart from these, AWS is also extensively used for experiments on Scalable Services.



Cloud based virtual lab hosts Dev-Ops tool chain, languages and programming platforms for Full Stack engineering and other simulators:

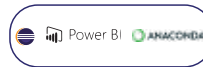
Tools



Languages and Library



Programming Platforms

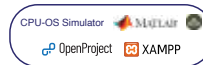


Programming Environments



Simulators: EdgecloudSim and IoTSimEdge

Others



Remote Lab facility caters to the needs of resource intensive requirements of Big Data Analytics applications with the following platforms:

- Apache Hadoop
- CockroachDB
- Apache Kafka
- Apache Spark
- MongoDB
- Apache Storm
- MPI

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WHAT IS THE ELIGIBILITY CRITERIA?

The minimum eligibility to apply: Employed professionals holding B. Tech., B.E, M.Sc., MCA, or equivalent in relevant disciplines with at least 60% aggregate marks and minimum 18 months of relevant work experience within HCL are eligible to apply.

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 1500

Admission Fees
(one time) :INR 16,500

Semester Fees
(per semester) :INR 63,500



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PROGRAMME CURRICULUM

First Semester

- Software Architectures
- Cloud Computing
- Agile Software Processes
- Software Product Management

Third Semester

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

General Pool of Electives

- Data Structures & Algorithms
- Design Data visualization and Interpretation
- Artificial and Computational Intelligence
- Blockchain Technologies & Systems
- Cyber Security

Pool of Electives : Full Stack Engineering (FSE)

- Cross Platform Application Development
- Introduction to DevOps#
- Scalable Services#
- Software Testing Methodologies
- Full-stack Application Development#
- Database Design & Applications
- API-based Products
- User Experience Design
- Design of Conversational Experiences
- API-driven Cloud Native Solutions
- Open Source Software Engineering
- Object Oriented Analysis and Design

Second Semester

- Software Quality Assurance and Testing
- Elective 1
- Elective 2
- Elective 3

Fourth Semester

- Dissertation

- Data Warehousing
- Applied Machine Learning
- Secure Software Engineering
- Middleware Technologies
- Advanced topics in Software Engineering

Pool of Electives : Software Product Management

- Product Discovery and Requirements Engineering#
- Product Strategy and Planning#
- Communication, Estimation and Negotiation#
- Product Analytics
- API-based Products
- User Experience Design
- Marketing
- Software Project Management
- Open Source Software Engineering

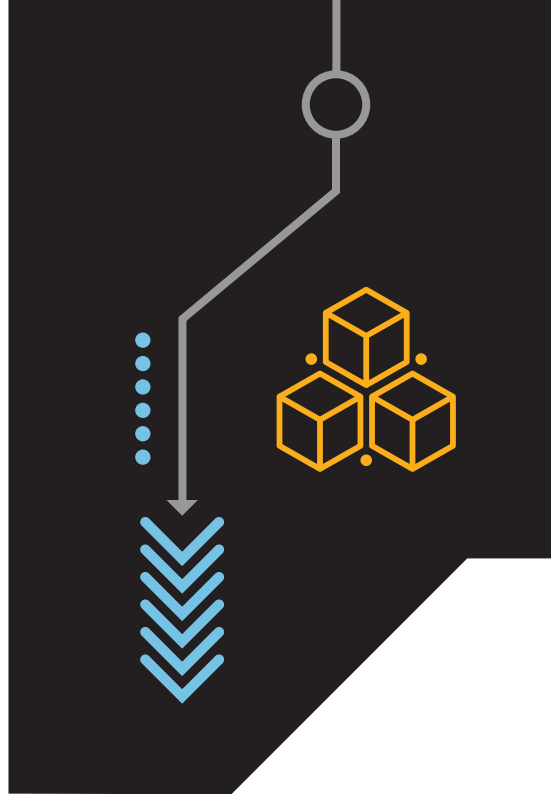
*For any specialization, 4 courses (including mandatory electives marked #) are to be selected for that specialization.
For graduating without a specialization, at least 3 courses from those marked # (from either specialization) to be selected.
Note: Student can also obtain the degree without any specialization.
indicates mandatory elective for this specialization*

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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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.

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