



**M.Tech**

# COMPUTING SYSTEMS & INFRASTRUCTURE



**BITS Pilani**  
Pilani | Dubai | Goa | Hyderabad

Work Integrated Learning Programmes

**HCL**



According to Gartner, the worldwide public cloud services market is expected to grow from \$182b in 2018 to about \$331b in 2022. The Indian market will grow at a CAGR of 33.9% during 2017-22, to reach \$6.3b by 2022. Owing to this, technology professionals with skills in domains such as DevOps, SaaS, IaaS, Automation, Agile, and software-defined networks are going to be in high demand.

M.Tech. Computing Systems is a four-semester Work Integrated Learning Programme designed to help technology professionals build skills required to remain competitive in the rapidly evolving workplace, and enable rapid career progression in the area of IT Infrastructure Operations & Management.

## WHO SHOULD APPLY?

- ▶ Highly driven and ambitious engineers and managers who work in the areas such as Infrastructure Management, Data Center Operations, Cloud Deployment, and Networked Embedded Systems
- ▶ IT professionals in technical roles such as DevOps Engineer, Systems Engineer, Network Administrators, Cloud Services Engineer or techno-managerial roles such as Infrastructure Lead/ Infrastructure Manager





## WHAT ARE THE MAIN HIGHLIGHTS OF THE PROGRAMME?

- ▶ Learn without a career break with online classes conducted mostly on weekends or after business hours.
- ▶ The programme offers a set of courses that allow learners to gain expertise in designing and managing hardware, software, storage & networking systems, and Infrastructure Services management.
- ▶ The programme makes use of Simulation Software, and Deployment Environments. These include CloudSim, NS2, Net-SNMP, CPU-OS Simulator, Amazon's Compute and Storage platforms, Apache cloud suite, and other open-source tools/frameworks.
- ▶ The Dissertation (Project Work) in the final semester enables students to apply concepts and techniques learnt during the programme.
- ▶ The programme uses a Continuous Evaluation System that assesses the learners over convenient and regular intervals. Such a system provides timely and frequent feedback and helps busy working professionals stay on course with the programme.
- ▶ The education delivery methodology is a blend of classroom and experiential learning. Experiential learning consists of lab exercises, assignments, case studies and work-integrated activities.
- ▶ Participants who successfully complete the programme will become members of an elite & global community of BITS Pilani Alumni.



## WHAT ARE THE PROGRAMME OBJECTIVES?

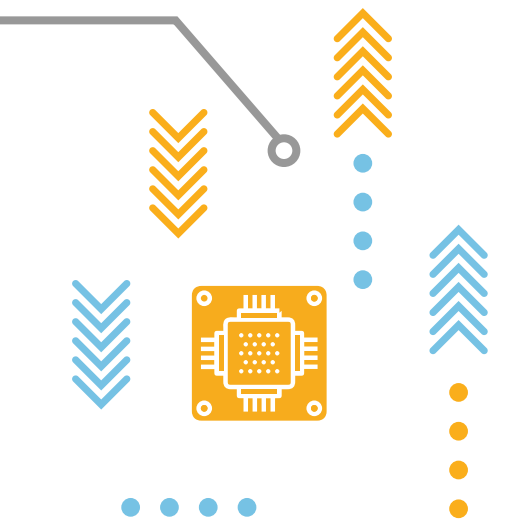
Studies have shown that senior positions in technology industry require holistic understanding and capabilities that span multiple technologies, critical thinking & problem solving situations and cross-functional collaboration. This programme aims to:

- ▶ Enable learners to take up leadership roles in managing IT infrastructure, or grow as a specialist in an Infrastructure Engineering/ Consulting role
- ▶ Build and nurture the knowledge, skills and aptitude required to realise long-term career growth and enables participants to undertake higher responsibilities at the workplace
- ▶ Provide requisite conceptual foundation, and contextual understanding of real-world applications that enable a learner to enhance workplace performance and stand out among peers for growth opportunities



## WHAT ARE THE STUDENT LEARNING OUTCOMES?

Upon successful completion of the programme, learners will:

- 
- ▶ Acquire a better understanding of the working of systems & infrastructure, including hardware, software & networking
  - ▶ Gain an appreciation of industry best-practices, and successfully apply them to various projects
  - ▶ Be able to monitor and manage the performance of IT Systems
  - ▶ Design Data centres, manage operations and enhance performance

# WHAT IS THE EDUCATION DELIVERY METHODOLOGY?



## CLASSROOM SESSIONS

- ▶ Classroom sessions in this programme will be conducted through live online sessions which can be accessed by the learners from any location using a computer and a high-speed internet connection.
- ▶ Classes will be conducted by BITS Pilani faculty over weekends. A typical weekend classroom session per subject is of 1.5-2 hours duration. Since students typically pursue 4 courses in a semester, they will be expected to attend approximately 4 classroom sessions over a weekend. These classroom sessions will be typically scheduled over 16 weekends per semester.

The schedule of the classroom sessions, will be announced at the beginning of each semester.beginning of each semester.



## EXPERIENTIAL LEARNING & LABS

The programme emphasises on Experiential Learning that allows learners to apply concepts learnt in classroom in simulated and real work situations. This is achieved through Simulations, Online Labs, Case Studies, Group Discussions, and Assignments, etc.

Some or all of the following would be utilised across the programme

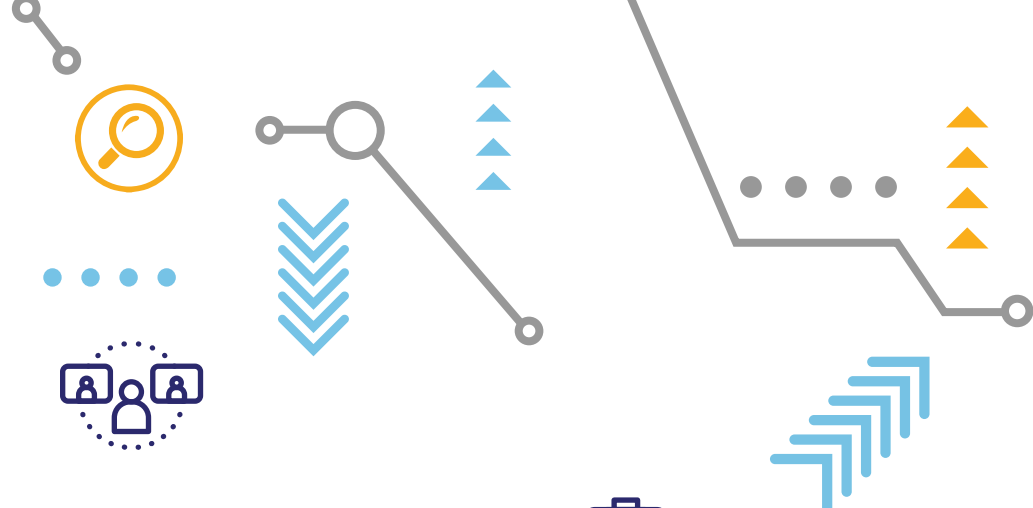


Simulation Software like CloudSim, NS2, Net-SNMP, CPU-OS Simulator Deployment Environments including Amazon's Compute and Storage platforms, Apache cloud suite, and other open source tools / frameworks



## 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.



## 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.







## WHAT IS THE ELIGIBILITY CRITERIA?

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

## FEE STRUCTURE

The following fees schedule is applicable for candidates seeking new admission during the academic year 2021-22

Application Fees (one time)	:INR 1,500
Admission Fees (one time)	:INR 16,500
Semester Fees (per semester)	:INR 57,750



# 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

- Network Security
- Cloud Computing
- Elective 2
- Elective 1

## Second Semester

- Design and Operation of Data Centers
- Advanced Computer Networks
- Elective 3
- Elective 4

## Third Semester

- Middleware Technologies
- Infrastructure Management
- Elective 5
- Elective 6

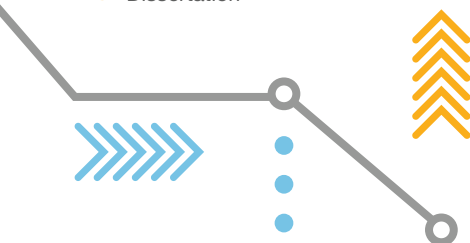
## Fourth Semester

- Dissertation



## Electives

- Cryptography
- Cyber-Physical Systems
- Data Warehousing
- Introduction to DevOps
- Network Programming
- Networked Embedded Applications
- Service-Oriented Computing
- Software Development for Portable Devices
- Telecom Network Management
- Web Technologies
- Wireless & Mobile Communication
- Data Storage Technologies & Networks
- IT Infrastructure Projects & Process
- Introduction to Data science
- Database Design and Applications



*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

- ▶ 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





## 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.

HCL\_11/09/2021