





STUDY MATERIAL FOR BTECH EXAMS BY BITS PILANI FOR WORKING PROFESSIONALS UNDER WILP*

- WORK INTEGRATED LEARNING PROGRAM

-  **Study Kit:** Course is divided into several modules as per syllabus
-  **Faculty:** Guided by scholars and retired faculty members from IITR
-  **Effectiveness:** 100% exam oriented with dynamic updates
-  **Support:** Contact us on WhatsApp | Call | Email *anytime*

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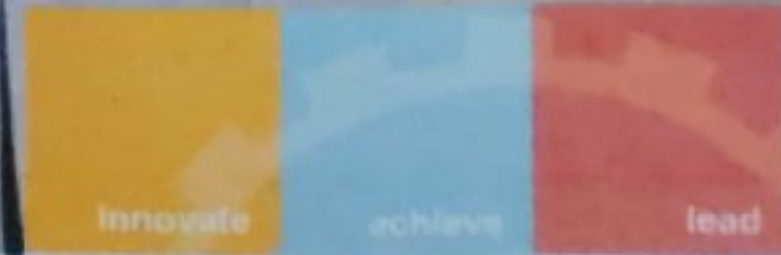
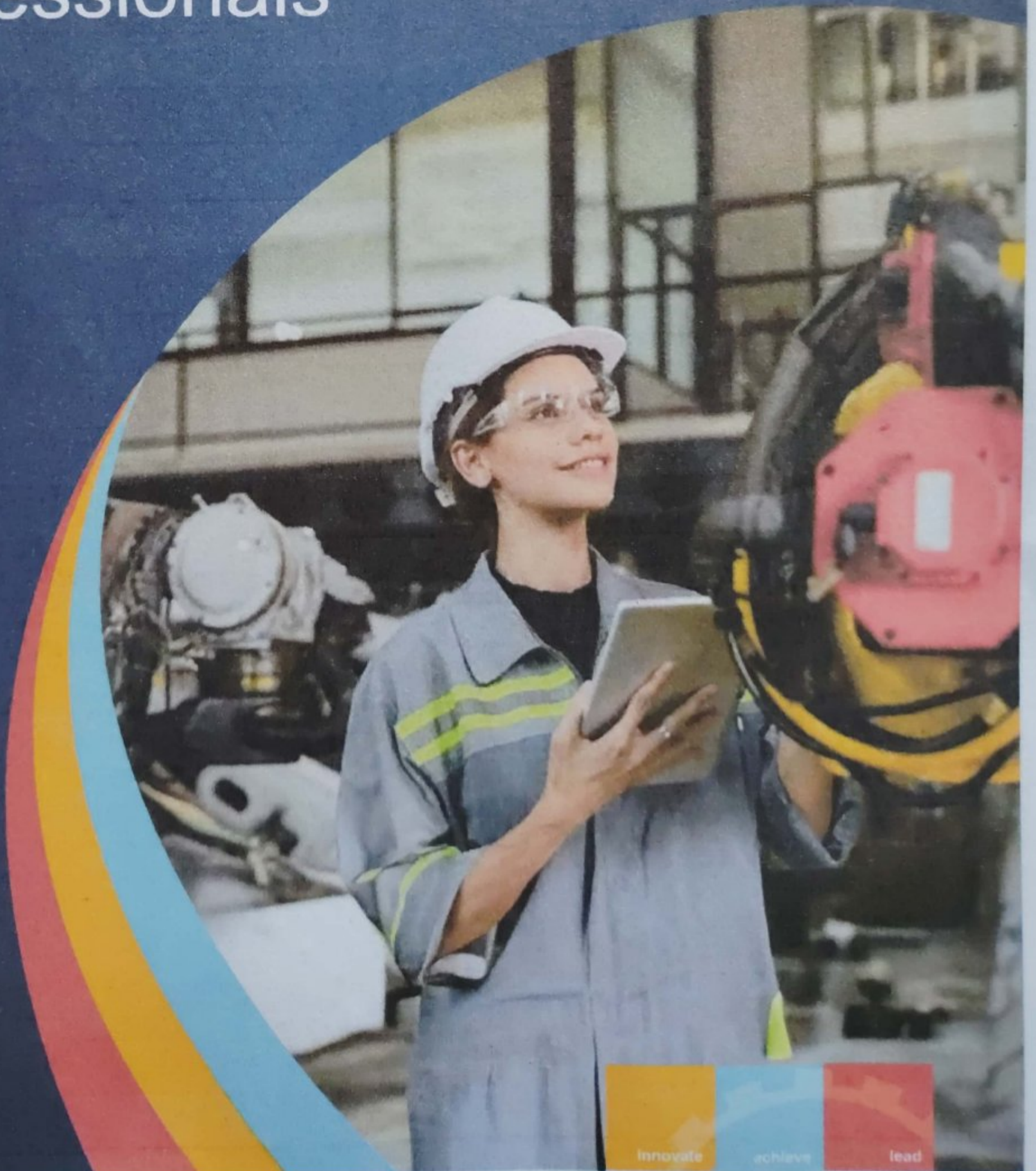
 CIVIL LINES, NEAR IIT, ROORKEE





BITS Pilani
Pilani · Dubai · Goa · Hyderabad · Mumbai
WORK INTEGRATED
LEARNING PROGRAMMES

B.Tech. in Smart Manufacturing for Working Professionals



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Programme Introduction

To nurture professionals in the emerging area of smart manufacturing and industry 4.0, reinforced with data science and analytic techniques enabling them to contribute and innovate in the area of smart factories across different industry verticals.

The global smart manufacturing market size is calculated at **US\$ 353.23 bn** in **2025** and is expected to reach around **USD 1,343.32 bn** by **2034**, expanding at a **CAGR of 16%** from **2025** to **2034**.



01 B.Tech. in Smart Manufacturing

APPLY NOW



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Who Should Apply?



Employed professionals holding a Technical Diploma or B.Sc. degree.



Programme Highlights



Attend live-lectures from anywhere over an online technology-enabled platform. These live lectures would be conducted by faculty mostly on weekends or after business hours enabling working professionals to pursue the programme along with their jobs



Contribute to the development of smart factories by integrating the concepts of Mechatronics, Internet of things, advanced data analytics, cyber security, AI, ML, etc.



Lectures conducted by BITS Pilani faculty and experienced industry professionals



The Project in the final semester enables participants to apply concepts and techniques learnt during the programme



Leverage insights from digitalization techniques to implement sustainable manufacturing practices.



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



Aim to implement connected factories by applying advanced technologies such as digital twins, extended reality, autonomous robots, and machine vision.



Option to submit fee using easy-EMI with 0% interest and 0 down payment

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Programme Objectives

To nurture professionals in the emerging area of smart manufacturing and industry 4.0, reinforced with data science and analytic techniques enabling them to contribute and innovate in the area of smart factories across different industry verticals.



WILP Presence and Impact



45+

Years of
Educating Working
Professionals



1,36,900+

Working
Professionals
Graduated



46,150+

Working Professionals
Currently Enrolled



1100+

Faculty Members



47

Programmes



Student

Learning Outcomes

At the end of the programme, the students will be able to:



Contribute to the development of smart factories by integrating the concepts of Mechatronics, Internet of Things, Advanced Data Analytics, Cyber Security, AI, ML, etc.



Leverage insights from digitalisation techniques to implement sustainable manufacturing practices.



Establish a safe and connected workforce by integrating wearable sensors, generative AI, collaborative robots, mixed reality, and real-time communication technologies to improve safety, enhance productivity, and foster collaboration across the workplace.



Aim to implement connected factories by applying advanced technologies such as digital twins, extended reality, autonomous robots, and machine vision.



Mode of Learning

The Mode of Learning used in this programme is called - Work Integrated Learning. Internationally, Work Integrated Learning (WIL) is defined as "An educational approach involving three parties - the student, educational institution, and employer organization(s) - consisting of authentic work-focused experiences as an intentional component of the curriculum. Students learn through active engagement in purposeful work tasks, which enable the integration of theory with meaningful practice that is relevant to the students' discipline of study and/or professional development*.

An education model can be considered as WIL if and only if:

1. The programs are designed and developed by the institute in collaboration with industry.
2. Work-focused experiences form an active part of the curriculum.
3. The program structure, pedagogy and assessment enable integration of theory-with relevant practice.

The innovative **Work Integrated Learning Programs (WILP)** of BITS Pilani are quite aligned with the above definition and requirements. The programs are designed in collaboration with its industry partners, subject matter experts from industry and academia that enable the students to remain relevant in their chosen profession, grow in their career and retain the habit of lifelong learning. The continued availability of workplace related experiences along with the weekly instruction sessions promote integration of theory with practice. An active participation of the organization mentor in the learning process of the student plays a key role. Case studies, simulation exercises, labs and projects further strengthen this integration.

The **WILP** of BITS Pilani is comparable to its campus-based programs in terms of structure, rigor, instruction, labs, assessment, faculty profile and learning support. The pervasive adoption of technology in all its academic processes makes the same high-quality education of BITS Pilani available to the aspirants at scale with the required flexibility.





Key Benefits of BITS Pilani WILP

- Can pursue the programme without any career break and along with the job.
- The programme curriculum is highly relevant to sectors, industries and organisations they work for.
- In addition to the institute, the learning experience of working professionals in the programme is also supported by the employer organisation and Industry Mentors.
- Effective use of technology to deliver a range of learning interventions at the location of the working professional such as faculty contact sessions, asynchronous learning materials, remote, virtual and cloud labs, Learner support, peer to peer collaboration etc.
- Contact sessions with faculty take place mostly over weekends or after business hours and are conducted over a technology platform that can be accessed from anywhere.
- Mid semester and End semester examinations for every semester are conducted mostly at designated examination centres distributed across the country (for details refer to link mode of examinations).
- Learners can access engaging learning material which includes recorded lectures from BITS Pilani faculty members, course handouts and recorded lab content where applicable.



Experiential Learning

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

Labs

Experiments
With IIoT Lab



Mechanisms and
Robotic



Cyber Security in
Manufacturing



Additive Manufacturing
Processes Labs



Siemens TIA portal



Tecnomatix

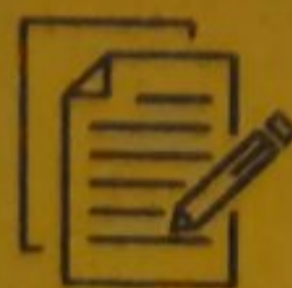


Continuous Assessment

The assessment includes graded assignments/quizzes, mid-semester and comprehensive exam

Case studies & Assignments

Carefully chosen real-world cases & assignments are both discussed and used as problem-solving exercises during the programme



Dissertation / Project Work

The seventh semester offers an opportunity for learners to apply their knowledge gained during the programme to a real-world like complex project. The learner is expected to demonstrate understanding of vital principles learnt across semesters and their ability to successfully apply these concepts



Programme Curriculum

First Semester

- Calculus
- Computer Programming
- Engineering Basics for Manufacturing
- Electrical and Electronics

Third Semester

- IoT in Manufacturing
- Industrial Control Systems
- Data Science and Engineering for Manufacturing
- Elective I

Fifth Semester

- Cyber-Physical Systems and Digital Twins in Manufacturing
- Cybersecurity in Smart Manufacturing
- Predictive Maintenance and Sustainability
- Elective III
- Project Work

Seventh Semester

- Project Work

Second Semester

- Manufacturing Processes and Systems
- Linear Algebra and Optimization
- Sensors, Actuators, and Signal Conditioning
- Computer Aided Design and Manufacturing

Fourth Semester

- Fundamentals of AI/ML
- Robotics in Manufacturing
- Cloud Computing for Manufacturing
- Elective II

Sixth Semester

- Connected Factories and Workforce
- Prompt Engineering & Generative AI in Manufacturing
- Lean-Agile Project Management
- Elective IV



Programme Curriculum

Pool of Electives for Concentration 1: IoT

- Communication & Networking Technologies for IoT #
- Introduction to Edge Computing #
- Blockchain Technology
- Mobile and Web App development for Smart Manufacturing
- Machine Learning for Edge

Note: 3 courses are to be chosen from the designated pool of electives for this concentration

indicates mandatory electives for this concentration

Pool of Electives for Concentration 3: Extended Reality

- Human Computer Interaction
- UX Design for Virtual Reality #
- Foundations of VR, AR and MR #
- Mobile and Web App development for Smart Manufacturing
- Multimedia Computing

Note: 3 courses are to be chosen from the designated pool of electives for this concentration

indicates mandatory electives for this concentration

Pool of Electives for Concentration 2: Machine Vision

- Digital Image Processing #
- Computer Vision for Manufacturing #
- UX Design for Virtual Reality
- Foundations of VR, AR and MR
- Robotics Vision

Note: 3 courses are to be chosen from the designated pool of electives for this concentration

indicates mandatory electives for this concentration

General Pool of Electives

- Green Steel Manufacturing and Advanced Metallurgy (Steel)
- Continuous Manufacturing (Pharma)
- EV Manufacturing Technology (Automotive)
- Advanced Composites and Materials (Aerospace)
- MEMS & Microfluidics (Semiconductors)
- Generative Design
- Additive Manufacturing

Notes: 1 course is to be chosen from the above list of other electives

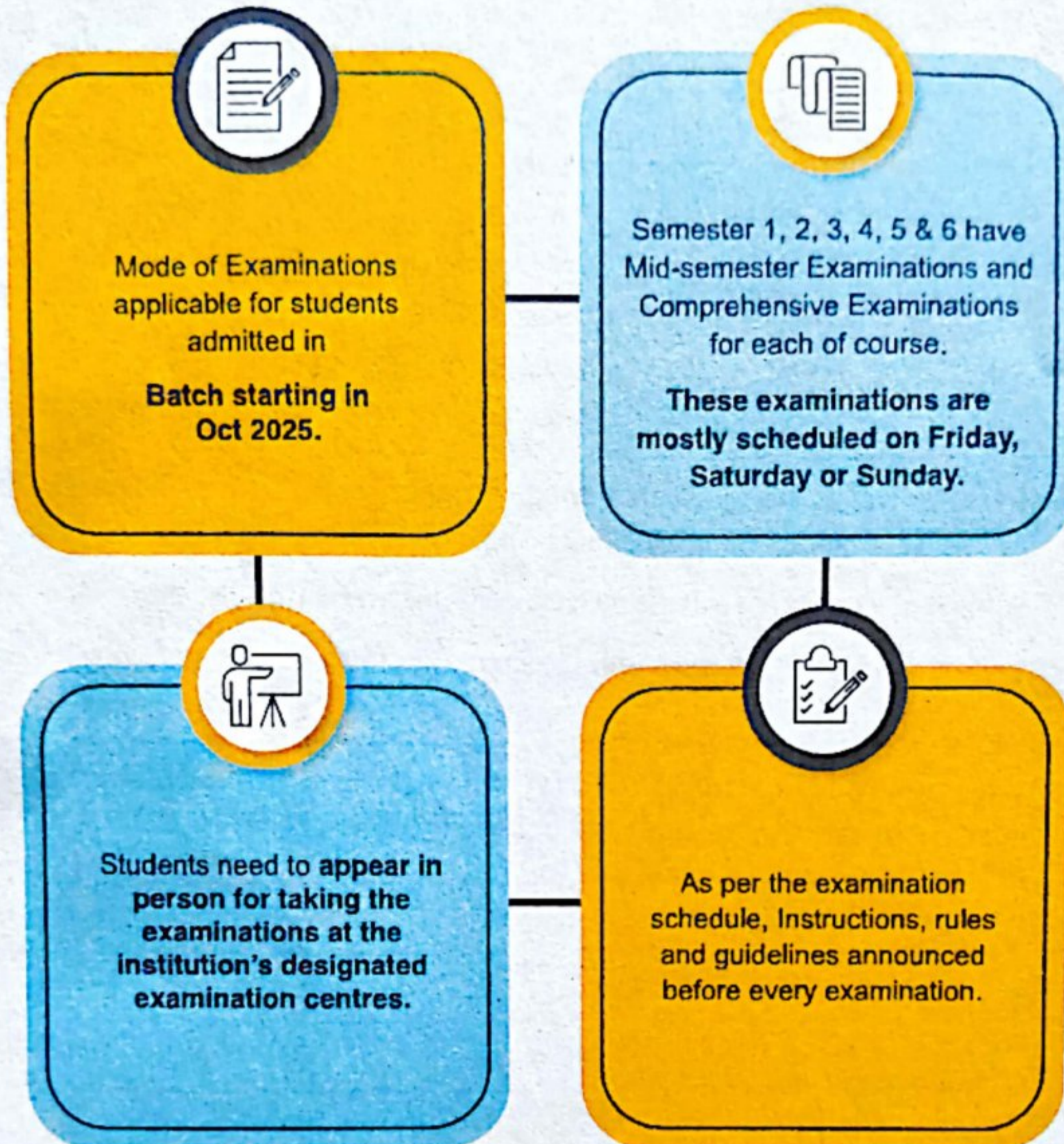
Note: Choice of Electives is made available to enrolled students at the beginning of each semester. Students' choice will be taken as one of the factors while deciding on the Electives offered. However, Electives finally offered will be at the discretion of the Institute.

Eligibility Criteria

Employed professionals holding a Technical Diploma or B.Sc. degree with adequate preparation in Mathematics and having a minimum of two years of work experience in manufacturing or related domains.



Mode of Examination



Students can take their examination at any of our **27 designated examination centres in India** at the following locations:

- **South Zone:** Bangalore, Chennai, Hyderabad, Vijayawada, Visakhapatnam, Kochi, Thiruvananthapuram, Coimbatore.
 - **North Zone:** Delhi NCR, Gurugram, Noida, Faridabad, Jaipur, Chandigarh, Lucknow, Udaipur, Pilani.
 - **West Zone:** Mumbai, Pune, Ahilya Nagar, Goa, Ahmedabad, Indore, Nagpur.
 - **East Zone:** Kolkata, Guwahati, Bhubaneswar.
- In addition to these locations, the Institution also has a designated examination centre in **Dubai**.



During these semesters, in addition to the above mentioned Mid-Semester and Comprehensive examinations, there will also be Quizzes/Assignments conducted online on the Learning Management System (LMS) as per the course plan in which the students need to participate.

In Semester 7 (Final Semester), the student will be doing Dissertation/Project Work as per the Institution's guidelines.

For International Students:

- In addition to the above locations, the institution also has a designated international examination centre, located in **Dubai**.
- To facilitate the learning of international students, applying from any other location except India and Dubai, the mode of examinations will be online, which can be availed by meeting the requirements of the institute.
 - a). Scanned copy of the visa for the country in which you are currently residing. The visa should be currently valid. No expired visas shall be considered,
 - b). Scanned copy of government-issued ID from the residing country
 - c). HR recommendation or endorsement letter from the employer, stating the location of your work.
- Indian students, who are temporarily based out of India, can also avail of online examinations **on request** by meeting the above-mentioned requirements of the institute.



How to Apply

Login to our Application Centre to apply for the program [Click Here](#).

Points to Note

- a) Make photocopies of the documents mentioned in the Checklist.
- b) Applicants are required to self-attest all academic mark sheets and certificates.
- c) On page no. 3 a section called the Employer Consent Form. This form needs to be authorized by your organisation's HR or any other authorised signatory of the company.
- d) On page no. 4 is a section called the Mentor Consent Form. The Mentor Consent Form needs to be signed by the Mentor.

Who is a mentor:

- Candidates applying to Work Integrated Learning Programmes must choose a Mentor, who will monitor the academic progress of the candidate, and act as an advisor & coach for successful completion of the programme.
- Candidates should ideally choose the immediate supervisor or another senior person from the same organisation. In case a suitable mentor is not available in the same organisation, a candidate could approach a senior person in another organisation who has the required qualifications. Wherever the proposed Mentor is not from the same employing organization as that of the candidate, a supporting document giving justification for the same should be provided by the candidate's employer.
- Candidates applying to B.Tech. programmes should choose a Mentor who is an employed professional with B.E./ B.S./ B.Tech./ M.Sc./ A.M.I.E./ Integrated First Degree of BITS or equivalent. Candidates applying to M.Tech., M.Sc., MBA, M.Phil programme should choose a Mentor who is an employed professional with:
- B.E./ M.Sc./ M.B.A./ M.C.A./ M.B.B.S. etc. and with a minimum of five years of relevant work experience.

OR

- M.E./ M.S./ M.Tech./ M.Phil./ M.D./ Higher Degree of BITS or equivalent.

Page 5 of the downloaded Application Form includes a Checklist of Enclosures/Attachments.

Photocopies of these documents should be made, and applicants need to self-attest academic mark sheets and certificates.

In the final step (Step 4), upload your printed Application Form, Mentor Consent Form, Employer Consent Form, and mandatory documents one by one.

Accepted file formats for uploads include .DOC, .DOCX, .PDF, .ZIP, and .JPEG.

The Admissions Cell will review your application for completeness, accuracy, and eligibility.

Selected candidates will receive email notifications within two weeks of submitting their application with all required documents.

You can also check your selection status by logging in to the Online Application Centre.

