SYLLABUS

DR VISHWANATH KARAD

MIT - WORLD PEACE UNIVERSITY

FACULTY OF ENGINEERING AND TECHNOLOGY

INTEGRATED B. TECH.

(COMPUTER SCIENCE AND ENGINEERING)

BATCH 2021-2027 AND ONWARDS

Prof. Dr. R. S. Kale
Associate Dean

PROGRAMME STRUCTURE

Preamble:

There are several ways to present the canonical core of computing science. Over the years we have developed a distinctive style and method that bridges the theory-practice divide while remaining grounded in the core. Technology changes rapidly, especially in the field of computing, whereas the science, if it changes at all, does so much more gradually. Those who are clear and thorough about the fundamentals can adapt to rapid changes in technology relatively easily. We want the education imparted to our students to be the basis of a lifetime of learning.

The faculty of Computer Science and Engineering Department is working with a sense of responsibility and dedication to excel and achieve success in this era of Computer technology. The department of Computer Science and Engineering offers a comprehensive curriculum from introductory level courses to graduate seminars and projects focusing on critical research areas. Students find a unique set of opportunities available to study. Apart from imparting conventional technical education and rich learning environment, emphasis is laid on co-curricular activities such as webinars, seminars, workshops, debates and quizzes to prepare students for highly competitive job market.

Prof. Mrs. Jyoti Mante (Khurpade)
Programme Head
Computer Science & Engineering

Prof. Dr. Rohini Kale
Associate Dean
School of Polytechnic & Skill Development

Prof. Dr. R. S. Kale
Associate Dean

Vision and Mission of the Programme

VISION

To impart quality education to enrich the technical skills of the students with a focus on lifelong learning attitude in the field of Computer Engineering.

MISSION

- To provide staff and students with an academic environment that nurtures technical skills in field of computer engineering.
- Provide opportunities to promote organizational and leadership skills among the students through various extra- curricular and co-curricular events.

Programme Educational Objectives

The Department of Computer Engineering has articulated the Program Education Objectives (PEOs) as follows:

PEO 1. Provide socially responsible, environment friendly broad-based solutions to Computer engineering related problems adapting professional ethics.

PEO 2. Adapt state-of-the-art Computer engineering broad-based technologies to work in multi-disciplinary work environments.

PEO 3. Solve broad-based problems individually and as a team member communicating effectively in the world of work.

Prof. Dr. R. S. Kale
Associate Dean

Programme Outcomes (POs)

Computer Science & Engineering Graduates will be able to:

PO1 **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2 **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3 **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4 **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5 **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6 **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7 **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8 **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9 **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10 **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11 **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12 **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Prof. Dr. R. S. Kale
Associate Dean

Programme Specific Outcomes

Computer Science & Engineering Graduate will be able to:

PSO1 Computer Software and Hardware Usage: Use state-of-the-art technologies for operation and application of computer software and hardware.

PSO2 Computer Engineering Maintenance: Maintain computer engineering related software and hardware systems.

PSO3 Testing of Developed Software's / Programs Test, Debug and Troubleshoot developed programs to given problems.

Prof. Dr. R. S. Kale
Associate Dean

Programme Structure*:*

(a) Programme duration: Six Years

(b) System followed: Trimester

(c) Credits System:

The outcome based education, trimester based credit and grading system is introduced to ensure quality of engineering education. Trimester based credit and grading system enables a much-required shift in focus from teacher centric to learner-centric education since the workload estimated is based on the investment of time in learning and not in teaching. It also focuses on continuous evaluation which will enhance the quality of education.

(i) Per term or per year : Credits are given per trimester
(ii) Total in the programme : 125 Credits (For First Three Years)

(d) Credits for activities other than academics:

In the curriculum, some credits are given to other activities such as Industry internship/projects/MOOC

(e) Internship:

The program has rural immersion module as a part of social internship in the first year of study. The student would also have to undergo two full trimester Internship in Industry along with their project work during the final year. These internships have credits and mandatory for all the students.

(f) Assessment Criteria:

There will be continuous as well as end trimester assessment of a student's performance and grades will be awarded by the Subject Teacher. Various assessment tools such as tests, quizzes, assignments, project, group activities, presentations, etc would be used to evaluate the performance of the students.

(g) Branches or Specialisations: NA

(h) Mandatory Attendance to appear for examination:

As per the Examination Ordinance, 2020 of MIT-WPU, the student should have minimum 75% attendance in a trimester considering all concessions such as attendance concession given for sport, sick leave etc. to appear for external examination for that trimester.

(i) Medium of Instruction & Examination: *English*

As per Section 14(a), Academic Ordinance: 2018 of MIT-WPU, in all the Academic Programs, the medium of instruction and examination shall be English.

Prof. Dr. R. S. Kale
Associate Dean

(j) Eligibility criteria for admission to the programme:

The eligibility criteria for First Year Integrated B. Tech. admission is as below:

1. 10^{th} with 60% in SSC course of state of Maharashtra or equivalent board. Reservations as per AICTE rules published from time to time.

Eligibility Criteria for Integrated B.Tech. (Lateral Entry)

1. Lateral entry as per prevailing rules of DTE and Government of Maharashtra.

Prof. Dr. R. S. Kale
Associate Dean

Integrated B. Tech Courses in Computer Science and Engineering

A. Definition of Credit:

1 Credit (Theory/Tutorial)	15 Hrs
1 Credit (Laboratory/Project or similar activity)	30 Hrs

B. Credits:

Total number of credits for Three-year ***Integrated B.Tech. Computer Science and Engineering*** Programme would be 125. (For First Three Years)

C. Structure of Credits for three years Integrated B.Tech. Computer Science & Engineering Programme:

S. No.	Category	Suggested Breakup of Credits(Total 125)(For First Three Years)
1	Humanities and Social Sciences and Peace Programmes including Management courses	07
2	Basic Science courses	19
3	Engineering Science courses including workshop, drawing, basics of electrical/mechanical/computer etc	18
4	Professional core courses	52
5	Professional Elective courses relevant to chosen specialization/branch	09
6	Open subjects – Electives from other technical and /or emerging subjects	04
7	Project work, seminar and internship in industry or elsewhere	16
	Tota	**125**

D. Course code and definition:

Course code	Definitions
L	Lecture
T	Tutorial
ES	Engineering Science Courses
WPC	Humanities and Social Sciences and Peace Programs including Management courses
ME	Mechanical Engineering Courses
EC	Electronics and Communication
EE	Electrical Engineering
CH	Chemical Engineering
CS	Computer Science and Engineering
PO	Polymer Engineering

Prof. Dr. R. S. Kale
Associate Dean

CE	Civil Engineering
PE	Petroleum Engineering

E. Grading Scheme:

The credit based system provides flexibility in designing curriculum and assigning credits based on the course content and hours of teaching. The University shall follow a 10-point grading system with the following letter grades as given below:

Marks Out of 100	Grade	Grade Point
80-100	O: Outstanding	10
70-79	A+: Excellent	9
60-69	A: Very Good	8
55-59	B+: Good	7
50-54	B: Above Average	6
45-49	C: Average	5
40-44	Pass	4
0-39	Fail	0
Ab	Absent	NA

Prof. Dr. R. S. Kale
Associate Dean

Integrated B. Tech. Computer Science and Engineering (First Year)
(Batch 2021-2027)
Trimester I

				Total Hours			Credits		Assessment Marks**			
S.No.	**Course Code**	**Name of course**	**Type**	**Theory**	**Tutorial**	**Lab**	**Theory**	**Lab**	**CCA***	**LCA***	**ESE**	**Total**
1		Basic Mathematics	BS	30	20	0	3	0	50	50	50	150
2		Basic Physics	BS	30	0	30	2	1	50	50	50	150
3		Fundamentals of Computer Systems	ES	30	0	30	2	1	50	50	50	150
4		Engineering Graphics	ES	30	0	30	2	1	50	50	50	150
5		World Famous Philosophers Sages/Saints & Great Kings	HS	30	0	0	2	0	70	0	30	100
6		Workshop Practices	ES	0	0	30	0	1	0	50	0	50
7		Yoga for Winning Personality	WP	-	-	-	-	-	-	-	-	-
		Total		**150**	**20**	**120**	**10**	**5**	**270**	**250**	**230**	**750**

**Assessment Marks are valid only if Attendance criteria are met

Trimester Teaching Hours: 290
Total Credits: First Year Integrated B. Tech Trimester I: 15

* CCA : Class Continuous Assessment
* LCA : Laboratory Continuous Assessment

Prof. Dr. R. S. Kale
Associate Dean

Dr. Vishwanath Karad
MIT WORLD PEACE UNIVERSITY | PUNE
TECHNOLOGY, RESEARCH, SOCIAL INNOVATION & PARTNERSHIPS

ntegrated B. Tech. Computer Science and Engineering (First Year)
(Batch 2021-2027)
Trimester II

				Total Hours			Credits		Assessment Marks**			
S.No.	**Course Code**	**Name of course**	**Type**	**Theory**	**Tutorial**	**Lab**	**Theory**	**Lab**	**CCA***	**LCA***	**ESE**	**Total**
1		Basic Chemistry	BS	30	0	30	2	1	50	50	50	150
2		Basics of Mechanical Engineering	ES	30	0	30	2	1	50	50	50	150
3		Course Basics of Electronics and Electrical Engineering.	ES	30	0	30	2	1	50	50	50	150
4		Fundamentals of Biology for Engineers	BS	30	0	0	2	0	50	0	50	100
5		Problem Solving & Program Design	PC	0	0	60	0	2	0	100	0	100
6		Web Page Designing	PC	0	0	60	0	2	0	100	0	100
7		Yoga for Winning Personality	WP	-	-	-	-	-	-	-	-	-
		Total		**120**	**0**	**210**	**8**	**7**	**200**	**350**	**200**	**750**

****Assessment Marks are valid only if Attendance criteria are me**

Trimester Teaching Hours: 330
Total Credits: First Year Integrated B. Tech Trimester II: 15

*** CCA : Class Continuous Assessment**
*** LCA : Laboratory Continuous Assessment**

Prof. Dr. R. S. Kale
Associate Dean

Integrated B. Tech. Computer Science and Engineering (First Year)
(Batch 2021-2027)
Trimester – III

				Total Hours			Credits		Assessment Marks**			
S.No.	**Course Code**	**Name of course**	**Type**	**Theory**	**Tutorial**	**Lab**	**Theory**	**Lab**	**CCA***	**LCA***	**ESE**	**Total**
1		Communication Skills	HS	30	0	0	2	0	50	0	50	100
2		Basics of Civil Engineering	ES	30	0	30	2	1	50	50	50	150
3		Engineering Mechanics-Statics	ES	30	0	30	2	1	50	50	50	150
4		Material Science	PC	30	0	0	2	0	50	0	50	100
5		Fundamentals of Computer Network	PC	0	0	60	0	2	0	100	0	100
6		Programming in C	PC	0	0	60	0	2	0	100	0	100
7		Fundamentals of Linux	PC	0	0	30	0	1	0	50	0	50
8		Yoga for Winning Personality	WP	-	-	-	-	-	-	-	-	-
		Total		**120**	**0**	**210**	**8**	**7**	**200**	**350**	**200**	**750**

**Assessment Marks are valid only if Attendance criteria are met

Trimester Teaching Hours: 330
Total Credits: First Year Integrated B. Tech Trimester III: 15

* CCA : Class Continuous Assessment
* LCA : Laboratory Continuous Assessment

Prof. Dr. R. S. Kale
Associate Dean

Integrated B. Tech. Computer Science and Engineering (Second Year)
(Batch 2021-2027)
Trimester – IV

				Total Hours			Credits		Assessment Marks**			
S.No.	**Course Code**	**Name of course**	**Type**	**Theory**	**Tutorial**	**Lab**	**Theory**	**Lab**	**CCA***	**LCA***	**ESE**	**Total**
1		Engineering Mathematics I	BS	30	0	0	2	0	50	0	50	100
2		Applied Science	BS	30	0	30	2	1	50	50	50	150
3		Algorithms and Data Structures	PC	30	0	30	2	1	50	50	50	150
4		Java Script Programming	PC	0	0	60	0	2	0	100	0	100
5		Object Oriented Programming with C++	PC	0	0	60	0	2	0	100	0	100
6		Data Communications and Computer Network	PC	30	0	30	2	1	50	50	50	150
		Total		**120**	**0**	**210**	**8**	**7**	**200**	**350**	**200**	**750**

**Assessment Marks are valid only if Attendance criteria are met

Trimester Teaching Hours: 330
Total Credits: First Year Integrated B. Tech Trimester IV: 15

* CCA : Class Continuous Assessment
* LCA : Laboratory Continuous Assessment

Prof. Dr. R. S. Kale
Associate Dean

Integrated B. Tech. Computer Science and Engineering (Second Year)
(Batch 2021-2027)
Trimester –V

				Total Hours			Credits		Assessment Marks**			
S.No.	**Course Code**	**Name of course**	**Type**	**Theory**	**Tutorial**	**Lab**	**Theory**	**Lab**	**CCA***	**LCA***	**ESE**	**Total**
1		Data Structures & Files using C	PC	30	0	30	2	1	50	50	50	150
2		Java Programming	PC	0	0	60	0	2	0	100	0	100
3		Database Management System	PC	30	0	30	2	1	50	50	50	150
4		Operating System	PC	30	0	30	2	1	50	50	50	150
5		Programming with Python	PC	30	0	30	2	1	50	50	50	150
6		Know your India	HS	30	0	0	2	0	70	0	30	100
		Total		**150**	**0**	**180**	**10**	**6**	**270**	**300**	**230**	**800**

**Assessment Marks are valid only if Attendance criteria are met

Trimester Teaching Hours: 330
Total Credits: First Year Integrated B. Tech Trimester V: 16

* CCA : Class Continuous Assessment
* LCA : Laboratory Continuous Assessment

Prof. Dr. R. S. Kale
Associate Dean

Integrated B. Tech. Computer Science and Engineering (Second Year)
(Batch 2021-2027)
Trimester – VI

				Total Hours			Credits		Assessment Marks**			
S.No.	**Course Code**	**Name of course**	**Type**	**Theory**	**Tutorial**	**Lab**	**Theory**	**Lab**	**CCA***	**LCA***	**ESE**	**Total**
1		Advanced Java Programming	PC	30	0	30	2	1	50	50	50	150
2		Multimedia and Animation Technologies	PC	0	0	60	0	2	0	100	0	100
3		Mobile Application Development	PC	0	0	60	0	2	0	100	0	100
4		Fundamentals of AI	PC	20	0	0	1	0	25	0	25	50
5		Elective-I	PE	30	0	30	2	1	50	50	50	150
6		Elective-II	PE	30	0	30	2	1	50	50	50	150
7		Entrepreneurship Start-ups & Digital Marketing	HS	0	0	30	0	1	0	50	0	50
		Total		**110**	**0**	**240**	**9**	**6**	**175**	**400**	**175**	**750**

**Assessment Marks are valid only if Attendance criteria are met

Trimester Teaching Hours: 350
Total Credits: First Year Integrated B. Tech Trimester VI: 15

* CCA : Class Continuous Assessment
* LCA : Laboratory Continuous Assessment

Prof. Dr. R. S. Kale
Associate Dean

Integrated B. Tech. Computer Science and Engineering (Third Year)
(Batch 2021-2027)
Trimester – VII

				Total Hours			Credits		Assessment Marks**			
S.No.	**Course Code**	**Name of course**	**Type**	**Theory**	**Tutorial**	**Lab**	**Theory**	**Lab**	**CCA***	**LCA***	**ESE**	**Total**
1		**Internship**	SI	0	0	180	0	6	0	300	0	300
2		MOOC Course (NPTEL/Coursera etc.)	OE	0	0	0	2	0	0	0	0	100
		Total		**0**	**0**	**180**	**2**	**6**	**50**	**300**	**50**	**400**

**Assessment Marks are valid only if Attendance criteria are met

Trimester Teaching Hours: 180
Total Credits: First Year Integrated B. Tech Trimester VII: 08

* CCA : Class Continuous Assessment
* LCA : Laboratory Continuous Assessment

Prof. Dr. R. S. Kale
Associate Dean

Integrated B. Tech. Computer Science and Engineering (Third Year)
(Batch 2021-2027)
Trimester – VIII

				Total Hours			Credits		Assessment Marks**			
S.No.	**Course Code**	**Name of course**	**Sub. Abbr.**	**Theory**	**Tutorial**	**Lab**	**Theory**	**Lab**	**CCA***	**LCA***	**ESE**	**Total**
1		Internship	SI	0	0	180	0	6	0	300	0	300
2		Open Elective	OE	30	0	0	2	0	50	0	50	100
3		Project Stage I Seminar	PR	0	0	60	0	2	0	100	0	100
		Total		**30**	**0**	**240**	**2**	**8**	**50**	**400**	**50**	**500**

**Assessment Marks are valid only if Attendance criteria are met

Trimester Teaching Hours: 270
Total Credits: First Year Integrated B. Tech Trimester VIII: 10

* CCA : Class Continuous Assessment
* LCA : Laboratory Continuous Assessment

Prof. Dr. R. S. Kale
Associate Dean

Integrated B. Tech. Computer Science and Engineering (Third Year)
(Batch 2021-2027)
Trimester – IX

				Total Hours			Credits		Assessment Marks**			
S.No.	**Course Code**	**Name of course**	**Type**	**Theory**	**Tutorial**	**Lab**	**Theory**	**Lab**	**CCA***	**LCA***	**ESE**	**Total**
1		Engineering Mathematics II	BS	30	0	0	2	0	50	0	50	100
2		Fundamentals of IOT	PC	30	0	30	2	1	50	50	50	150
3		Data Science Fundamentals with Python and SQL	PC	30	0	30	2	1	50	50	50	150
4		Principles of Software Engineering	PC	30	0	30	2	1	50	50	50	150
5		Elective III	PE	30	0	30	2	1	50	50	50	150
6		Project Stage II	PR	0	0	60	0	2	0	100	0	100
		Total		**150**	**0**	**180**	**10**	**6**	**250**	**300**	**250**	**800**

**Assessment Marks are valid only if Attendance criteria are met

Trimester Teaching Hours: 330
Total Credits: First Year Integrated B. Tech Trimester IX: 16

* CCA : Class Continuous Assessment
* LCA : Laboratory Continuous Assessment

Total Integrated *B. Tech* Credits: 125 (For First Three Years)

Prof. Dr. R. S. Kale
Associate Dean

Elective Courses:

Track-1	**Networking & Security**	1 Advanced Computer Network
		2 Network Security
		3 Network Forensic & Hacking Techniques
Track-2	**Web Development**	1 Advanced Web Technology (Client side-AJAX/JQuery)
		2 Server side Web Development (Java/Python Technology)
		3 Web Development Framework
Track-3	**Data Science**	1 Basics of Data Science and Data Mining
		2 Basics of Machine Learning
		3 Machine Learning and Applications

Open Electives:

1.Fundamentals of Cloud Computing

2. Information and Communication Technologies in Rural Sector

3. Recent Trends in Computing

4. Information Security

Prof. Dr. R. S. Kale
Associate Dean