

Date: 26/06/2019

SU/BOS/Sci. & Tech/6497

To,

The Principal/ Director,
 All affiliated Engineering Colleges/ Institute,
 Shivaji University, Kolhapur.

Subject : Regarding Syllabi and equivalence of CBCS Second Year B.Tech. Part - II
 (Sem III & IV) Program under Faculty of Science and Technology.

Sir/Madam,

With reference to the subject mentioned above, I am directed to inform you that the University Authorities have accepted and granted approval to structure and Syllabus of CBCS Second Year B.Tech. Part - II (semIII & IV) syllabi and equivalence under the Faculty of Science & Technology.

B. Tech. Programme (Branch)

1.	Civil Engineering & Technology
2.	Mechanical Engineering & Technology
3.	Electrical Engineering & Technology
4.	Chemical Engineering & Technology
5.	Electronics Engineering & Technology
6.	Electronics and Telecommunication Engineering & Technology
7.	Computer Science Engineering & Technology
8.	Information Technology Engineering & Technology
9.	Mathematics

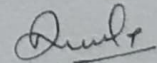
This syllabus and equivalence shall be implemented from the academic year 2019-2020 (i.e. from June 2019) onwards. A soft copy containing syllabus is attached herewith and it is available on university website www.unishivaji.ac.in.

The question papers on the pre-revised syllabi of above mentioned course will be set for the examinations to be held in October /November 2019 & March/April 2020. These chances are available for repeater students, if any.

You are, therefore, requested to bring this to the notice of all students and teachers concerned.

Thanking you,

Yours faithfully,



Dy. Registrar

Copy to:

1	The I/c Dean and Associal Dean, Faculty of Science & Technology	7	Computer Centre
2	The Chairman, Respective Board of Studies	8	Affiliation Section (T.1)
3	Director, Examination and Evaluation	9	Affiliation Section (T.2)
4	Eligibility Section	10	P.G.Admission Section
5	O.E. - 4	11	P.G Seminar Section



SHIVAJI UNIVERSITY, KOLHAPUR-416 004. MAHARASHTRA
PHONE : EPABX-2609000 website- www.unishivaji.ac.in
FAX 0091-0231-2691533 & 0091-0231-2692333 – BOS - 2609094
शिवाजी विद्यापीठ, कोल्हापूर – 416004.

दुरध्वनी (हॉपीएबीएक्स) २६०९००० (अभ्यास मंडळे विभाग- २६०९०९४)
फॅक्स : ००९१-०२३१-२६९१५३३ व २६९२३३३. e-mail: bos@unishivaji.ac.in

SU/BOS/Sci. & Tech/

Date: 16/07/2020

To,

16 JUL 2020

No 183111

The Principal/ Director,
All affiliated Engineering Colleges/ Institute,
Shivaji University, Kolhapur.

Subject : Regarding Syllabi and Equivalence of CBCS Third Year B.Tech. Part - III
(Sem V & VI) Dgree Program under Faculty of Science and Technology.

Sir/Madam,

With reference to the subject mentioned above, I am directed to inform you that the university authorities have accepted and granted approval to structure and Syllabus of CBCS Third Year B.Tech. Part - III (sem V & VI) under the Faculty of Science & Technology.

B. Tech. Programme (Branch)

1.	Civil Engineering & Technology
2.	Mechanical Engineering & Technology
3.	Electrical Engineering & Technology
4.	Chemical Engineering & Technology
5.	Electronics Engineering & Technology
6.	Electronics and Telecommunication Engineering & Technology
7.	Computer Science Engineering & Technology
8.	Information Technology Engineering & Technology
9.	Production

This syllabus and equivalence shall be implemented from the academic year 2020-2021 onwards. A soft copy containing syllabus is attached herewith and it is available on university website www.unishivaji.ac.in.

The question papers on the pre-revised syllabi of above mentioned course will be set for the examinations to be held in October /November 2020 & March/April 2021. These chances are available for repeater students, if any.

You are, therefore, requested to bring this to the notice of all students and teachers concerned.

Thanking you,

Yours faithfully,

Dy. Registrar

Copy to:

1	The I/c Dean, Faculty of Science & Technology	7	Computer Centre
2	The Chairman, Respective Board of Studies	8	Affiliation Section (T.1) T.2
3	Director, Examination and Evaluation	9	Dy.Registrar Exam
4	Eligibility Section	10	P.G.Admission Section
5	O.E. – 4	11	P.G Seminar Section



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फॅक्स : ००९१-०२३१-२६९१५३३ व २६९२३३३. e-mail: bos@unishivaji.ac.in

SU/BOS/Sci. & Tech/ No 0 0 3 5 8

Date: 15/09/2021

17 SEP 2021

To,

The Principal/ Director,
All affiliated Engineering Colleges/ Institute,
Shivaji University, Kolhapur.

Subject : Regarding revised Syllabus and equivalence of CBCS Final Year B.Tech.
Part-IV Sem-VII-VIII Program under Faculty of Science and Technology.

Sir/Madam,

With reference to the subject mentioned above, I am directed to inform you that the University Authorities have accepted and granted approval to structure and Syllabus of CBCS Final Year B.Tech. Part-IV Sem-VII-VIII under the Faculty of Science & Technology.

B. Tech. Programme (Branch)

1.	Civil Engineering & Technology
2.	Mechanical Engineering & Technology
3.	Electrical Engineering & Technology
4.	Chemical Engineering & Technology
5.	Electronics Engineering & Technology
6.	Electronics and Telecommunication Engineering & Technology
7.	Computer Science Engineering & Technology
8.	Information Technology Engineering & Technology
9.	Production

This revised syllabus and equivalence shall be implemented with effect from the academic year 2021-2022 (i.e. from June 2021) onwards. A soft copy containing syllabus is attached herewith and it is available on university website www.unishivaji.ac.in.

The question papers on the pre-revised syllabi of above mentioned course will be set for the examinations to be held in October /November 2021 & March/April 2022. These chances are available for repeater students, if any.

You are, therefore, requested to bring this to the notice of all students and teachers concerned.

Thanking you,

Yours faithfully,

Dy. Registrar

Copy to:

1	The I/c Dean, Faculty of Science & Technology	7	Computer Centre
2	The Chairman, Respective Board of Studies	8	Affiliation Section (T.1)
3	Director, Examination and Evaluation	9	Affiliation Section (T.2)
4	Eligibility Section	10	P.G. Admission Section
5	O.E. - 4	11	P.G Seminar Section



Estd. 1962
NAAC 'A' Grade
MHRD-NIRF- 28th Rank

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फॅक्स : ००९१-०२३१-२६९१५३३ व २६९२३३३.e-mail:bos@unishivaji.ac.in

Ref.No. SU/BOS/Sci & Tech/

No 0881

Date: 29/10/2020

29 OCT 2020

To,

The Principal,
All affiliated Engineering College,
Shivaji University,
Kolhapur.

Subject:-Regarding minor changes in syllabus open Elective papers of Third Year B. Tech. (Sem V & VI) Program under Faculty of Science & Technology.

Ref.:- SU/BOS/Sci & Tech/1831 dt. 16/07/2020

Sir/Madam,

With reference to subject mentioned above, I am directed to inform you that University Authorities has accepted and granted approval to the minor changes in syllabus open Elective papers of Third Year B. Tech. (Sem V & VI) under Faculty of Science & Technology.

The corrected syllabus will be implemented from the academic year 2020-2021 (i.e. from July 2020) onwards. The corrected syllabus soft copy is enclosed herewith and as well as it is also made available on website www.unishivaji.ac.in (Online syllabus)

You are therefore, requested to bring this to the notice of all students and teachers concerned.

Thanking you,

Yours faithfully,

Deputy Registrar

Encl:- As above

Copy to:

1	The Dean, Faculty of Science & Technology	7	Computer Centre
2	The Chairman, Respective Board of Studies	8	Affiliation Section (T.1)
3	Director, Examination and Evaluation	9	Affiliation Section (T.2)
4	Eligibility Section	10	P.G.Admission Section
5	O.E. – 4	11	P.G Seminar Section
6	Appointment Section	12	Meeting Section

Semester VII

Sr. No.	Code No.	Subject	Semester	Credits
1	PCC-ETC701	Satellite Communication	7	4
2	PCC-ETC702	Embedded Systems	7	5
3	PCC-ETC703	Computer Networks	7	5
4	PCC-ETC704	Image Processing	7	5
5	PCE-ETC701	Elective-I	7	4
6	PW-ETC701	Project Phase-I	7	2
Total				25

Semester VIII

Sr. No.	Code No.	Subject	Semester	Credits
1	PCC-ETC801	Microwave Engineering	8	5
2	PCC-ETC802	Wireless Communication	8	5
3	PCC-ETC803	Video Engineering	8	5
4	PCE-ETC801	Elective-II	8	4
5	PW-ETC801	Project Phase-II	8	6
Total				25

Elective-I	Elective-II
Speech Processing	High Performance Communication Network
Radar and Navigation	Advance Network Security
Java Script	Electrical Automobile
Information Theory And Coding Techniques	Big Data Analytics

*****For Theory CIE 30 Marks,**

Two tests of 30 marks at college should be conducted and best of two marks should be communicated to university.

*****Guidelines to paper setter:**

In theory ESE examination of 70 marks following points should be considered,

1. First question of 10 marks should be allotted to Objective type questions.
2. In Remaining 60 marks, four questions of 15 marks should be considered.

Semester V

Sr. No	Code No.	Subject	Semester	Credits
1.	PCC-ETC501	Signal and Systems	5	5
2.	PCC-ETC502	Electromagnetic Engineering	5	4
3.	PCC-ETC503	Digital and VLSI Design	5	5
4.	PCC-ETC504	Optical Communication	5	5
5.	OEC-ETC501	Open Elective – I	5	4
6.	PCC-ETC505	Simulation and Modeling	5	2
		Total		25

Semester VI

Sr. No	Code No.	Subject	Semester	Credits
1.	PCC-ETC601	Digital Signal Processing	6	5
2.	PCC-ETC602	Microprocessor and Microcontrollers	6	5
3.	PCC-ETC603	Power Electronics	6	5
4.	PCC-ETC604	Antenna and Wave Propagation	6	5
5.	OEC-ETC601	Open Elective – II	6	4
6.	PCC-ETC605	Mini Project	6	1
		Total		25

- **For Theory CIE 30 marks,**
Two tests of 30 marks at college should be conducted and best of two marks should be communicated to university.
- **Guidelines to paper setter:**
In theory ESE examination of 70 marks following points should be considered,
 - Q.1 MCQ's based on complete syllabus. (Carries 14 Marks)
 - Q.2 based on unit no 1, 2, 3 (Carries 14 Marks)
 - Q.3 based on unit no 1, 2, 3 (Carries 14 Marks)
 - Q.4 based on unit no 4, 5, 6 (Carries 14 Marks)
 - Q.5 based on unit no 4, 5, 6 (Carries 14 Marks)

Open Elective –I

Sr. No.	Name of Subject /Elective	Name of the Concern Branch
1.	Energy And Environment	Civil Engineering
	Waste Management	
2.	Enterprise Resource Planning	Mechanical Engineering
	Optimization Techniques	
3.	Electrical Appliances And Luminaries	Electrical Engineering
	Domestic /Industrial Electrical Installation, Estimation And Costing	
4.	Industrial Automation	Electronics Engineering
	Biomedical Instrumentation	
5.	Computer Graphics & Multimedia	Computer Science & Engineering
	Internet of Things	
6.	Additive Manufacturing	Production Engineering
	Human Resource Management	
7.	Computational Techniques in Chemical Engineering	Chemical Engineering
	Applications of MATLAB in Chemical Engineering	
8.	Human Computer Interaction	Information Technology
	Internet of Things	
9.	Industrial Automation	Electronics & Telecommunication Engineering
	Biomedical Instrumentation	

Open Elective –II

Sr. No.	Name of Subject /Elective	Name of the Concern Branch
1.	Soil And Water Conservation Techniques	Civil Engineering
	Disaster Risk Management	
2.	Computer Aided Design And Manufacturing	Mechanical Engineering
	Electric Vehicle	
3.	Electrical Energy Audit And Conservation	Electrical Engineering
	PLC & SCADA	
4.	Robotics Engineering	Electronics Engineering
	Mobile Technology	
5.	E-Commerce & Digital Marketing	Computer Science & Engineering
	Cyber Security	
6.	Entrepreneurship Development	Production Engineering
	Supply Chain Management	
8.	Industrial Economics, Management And Entrepreneurship	Chemical Engineering
	Project Management And Smart Technology	
10.	Cyber Security	Information Technology
	E-Commerce & Digital Marketing	
11.	Robotics Engineering	Electronics & Telecommunication Engineering
	Mobile Technology	

Shivaji University, Kolhapur
 Revised Syllabus Structure of Final Year Engineering (BE) (w. e. f. July 2016)
 Electronics and Telecommunication Engineering Course
 Scheme of Teaching and Examination
 Semester-VII

Sr. No.	Subject	Teaching Scheme (Hrs.)				Examination Scheme (Marks)				
		L	T	P	Total	Theory	TW	POE	OE	Total
1	Satellite Communication	3	1	--	4	100	25	--	--	125
2	Embedded System	4	--	2	6	100	25	50	--	175
3	Computer Communication Networks	4	--	2	6	100	25	--	25	150
4	RF & Microwave Engineering	4	-	2	6	100	25	--	--	125
5	Elective-I	3	1	--	4	100	25	--	--	125
6	Industrial Training	--	--	--	---	--	25*	--	--	25
7	Project Phase-I	--	--	2	2	--	25	--	50	75
		18	2	08	28	500	175	50	75	800

* Assessment will be carried out with Project Phase – I By Internal Guide.

Semester-VIII

Sr. No.	Subject	Teaching Scheme(Hrs.)				Examination Scheme(Marks)				
		L	T	P	Total	Theory	TW	POE	OE	Total
1	Video Engineering	4	--	2	6	100	25	50	--	175
2	Wireless Mobile Communication	4	--	2	6	100	25	--	--	125
3	Digital Image Processing	4	--	2	6	100	25	--	50	175
4	Elective-II	3	1	--	4	100	25	--	--	125
5	Project Phase – II	--	--	4	4	--	100	--	100	200
		15	01	10	26	400	200	50	150	800

BE Part-I (Elective-I)	BE Part-II (Elective-II)
1. Robotics	1. Mechatronics
2. Speech processing	2. Artificial Neural Network
3. MEMS	3. Remote Sensing & GPS
4. Radar & Navigation Aids	4. Operating System

Elective I

Sr.No.	Name of Subjects
1.	Advanced Traffic Engineering
2.	Open Channel Hydraulics
3.	Remote Sensing and GIS Application in Civil Engineering
4.	Solid Waste Management
5.	Optimization Techniques
6.	Town Planning

ELECTIVE-II (STRUCTURE GROUP)

Sr.No.	Name of Elective
1.	Design of bridges
2.	Maintenance, Retrofitting, Rehabilitation Of Structure
3.	Advance Foundation Engineering
4.	Advanced Pre-stressed Concrete Design
5.	Structural Design of Foundation & Retaining Structures
6.	Advanced Design of Concrete Structures
7.	Dynamics of Structure
8.	Finite Element Method

6	6	11
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ELECTIVE-III

Sr.No.	Name of Elective
1.	Hydrology And Watershed Management
2.	Site Investigation Methods And Practices
3.	Industrial Waste Treatment
4.	AdvancedConstructionTechniques
5.	Engineering Geology
6.	Valuation Of Real Properties
7.	Air Pollution And Control
8.	Construction Practices
9.	Water Power Engineering



SHIVAJI UNIVERSITY, KOLHAPUR

REVISED SYLLABUS AND STRUCTURE
THIRD YEAR (C.B.C.S.) BACHELOR OF TECHNOLOGY
IN
**Computer Science and
Engineering**

To be introduced from the academic year 2020-21
(w. e. f. June 2020) onwards

THIRD YEAR COMPUTER SCIENCE AND ENGINEERING - CBCS PATTERN																
SEMESTER - V																
Sr. No.	Course Subject / Title	TEACHING SCHEME							EXAMINATION SCHEME							
		THEORY			TUTORIAL		PRACTICAL		THEORY				ORAL / PRACTICAL		TERMWORK	
		Credits	No. Of Lectures	Hours	Credits	No. of Hours	Credits	No. of Hours	mode	marks	Total Marks	MIN.	MAX	MIN.	MAX	MIN.
1	PCC-CS501 Information Security	3	3	3			1	2	CIE	30	100	40			50	20
									ESE	70						
2	PCC- CS502 System Programming	3	3	3			1	2	CIE	30	100	40	25	10	50	20
									ESE	70						
3	PCC- CS503 Object-Oriented Modeling & Design	3	3	3					CIE	30	100	40				
									ESE	70						
4	PCC- CS504 Computer Algorithms	4	4	4	1	1			CIE	30	100	40			25	10
									ESE	70						
5	OEC- CS505 Computer Graphics & Multimedia OEC-CS506 Internet of Things	3	3	3					CIE	30	100	40				
									ESE	70						
6	PCC- CS507 Java Programming	3	3	3			2	4					50	20	50	20
7	HM- CS508 Business English				1	2							25	10	25	10
Total (SEM -V)		19	19	19	2	3	4	8			500		100		200	

T. Y. B. Tech (Computer Science and Engineering) Sem – V

5. Open Elective Course - I (OEC - CS506)

Internet of Things (OEC - CS506)

TEACHING SCHEME	EXAMINATION SCHEME
Theory : 3 Hrs./Week	Theory : ESE 70 Marks CIE 30 Marks
Tutorial : ----	Term work : ----
Practical : ----	Practical : ----

Pre-requisites: Fundamentals of Computer Network and Internet, basics of C / C++ programming language.

Course Objectives

1. To learn Internet of Things Technology
2. To know the basics of RFID, Sensor technologies.
3. To know the basics of IoT systems like Raspberry Pi, Arduino, and Banana Pi.
4. To aware students about wireless communication technologies and IoT applications.
- 5.

Course Outcome

1. Students will understand basic concepts of IoT
2. students will be able to learn and implement RFID technology in various applications.
3. Students will be able to write programs for basic applications
4. Student will understand and implement different communication technologies in IoT systems.

UNIT NO.	UNIT NAME & DETAILS	NO. OF LECTURES
1.	Introduction: IoT, Objects / Things, IoT definitions, IoT frame work, Identification technologies, Internet in IoTs.	4
2.	Fundamental of IoT mechanisms: Identification of IoT objects and services, Traffic characteristics, scalability and inter-operability, security and privacy, Communication capabilities, Mobility support and device power, Sensor technology, RFID technology and satellite technology.	6
3.	Radio Frequency Identification Technology: RFID, IoT objects and services, principles of RFID, Components of an RFID system, RFID reader, Tags, middleware, Sensor nodes, connecting nodes, networking nodes.	6
4.	IoT systems: Hardware and Software: Introduction to Raspberry Pi, Familiar with Raspberry Pi hardware, study of I/O ports, Programming with Raspberry Pi: Study of operating system, simple programs in C / C++, Introduction with Python programming.	8

5.	Communication Technologies: WPAN Technologies: Introduction to IEEE 802.15.4 standard, Bluetooth, Zigbee, IEEE 802.15.6; WBANS, NFC, IEEE 802.11 WLAN, Cellular and mobile technologies.	6
6.	IoT Application Examples: Smart Metering, advanced metering infrastructure, e-health / Body Area Network, City Automation (Smart City), Automotive Application, Environmental Applications, Home Automation, Control Applications.	6

Text Books

Sr. No.	Title	Author(s) Name	Publication & Edition
1	The Internet of Things - Connecting objects to the web	Hakima Chaouchi	Wiley Publications
2	Building the Internet of Things	Daniel Minoli	Wiley Publications
3	Raspberi Pi Beginner's Guide	Gareth Halfacree	Raspberi Press
4	Introduction to Wireless Telecommunications systems and Networks	Gary J. Mulett.	Cengage Learning (India Edition).

Reference Books

Sr. No.	Title	Author(s) Name	Publication & Edition
1	Raspberry Pi for Dummies	Sean McManus, Mike Cook	A Wiley Brand
2	Architecting the Internet of Things	Bernd Scholz, Reiter	Springer

T. Y. B. Tech (Computer Science and Engineering) Sem – V

5. Open Elective Course - I (OEC - CS505)

Computer Graphics and Multimedia (OEC - CS505)

TEACHING SCHEME	EXAMINATION SCHEME
Theory : 3 Hrs./Week	Theory : ESE 70 Marks CIE 30 Marks
Tutorial : ----	Term work : ----
Practical : ----	Practical : ----

Course Objectives

1. To provide knowledge to the students about basics of computer graphics and different display devices.
2. To expose students to the various 2D & 3D transformation & projection techniques.
3. To provide knowledge to the students about basics of Illumination models, surface rendering methods.
4. To make the students aware of multimedia system & Multimedia Authoring, Compression techniques.

Course Outcomes

Upon successful completion of this course, the student will be able to -

1. Express basic ideas of computer graphics and different display devices.
2. Understand & apply various transformation, projection and rendering techniques on graphical objects.
3. Identify & apply the intensity of light on graphical objects using different illumination models.
4. Understand multimedia system & use of Multimedia Authoring & Compression techniques on graphical objects.

Unit No.	Unit Name and Contents	No. of Lectures
1	Basic of Computer Graphics Basic of Computer Graphics, Applications of computer graphics, Display devices: Random and Raster scan systems, Input devices, Scan Conversion techniques: RLE, Frame Buffer, Graphics software and standards.	5
2	Transformations – Basic 2D & 3D transformations - Translation, Scaling, Rotation, Reflection, Shearing, Multiple Transformations, Rotation about an axis parallel to a coordinate axis, Rotation about an arbitrary axis in space, Affine and Perspective Geometry, Orthographic projections and Axonometric projections.	8
3	Illumination models and surface rendering methods Light sources, Basic illumination models. Displaying light intensities, Polygon Rendering methods, Ray tracing methods, Radiosity lighting.	5

4	Introduction to Multimedia Multimedia: Historical perspective, multimedia data and multimedia systems, a multimedia system today. Analog and Digital Signals, Analog-to-Digital Conversion, Media Representation and Media Formats - Digital Images. Digital Video, Digital Audio.	6
5	Multimedia Authoring & Compression Examples of Multimedia, Requirements for Multimedia Authoring Tools, Intramedia Processing, Intermedia Processing, Media Compression - The Need for Graphics Compression, Graphics compression in relation to other media compression, Mesh compression using connectivity encoding.	7
6	Computer Animation Introduction: Types, Key frame animation, Procedural animation, Construction of an animation sequence, Motion control methods, VFX, SFX, Introduction to Morphing, Wrapping techniques, Defining virtual & Augmented reality.	5

Text Books:

1. Procedural elements for Computer Graphics - David F. Rogers (MGH International) (For Units 1)
2. Mathematical elements for Computer Graphics - David F. Rogers, J. Alan Adams (MGH Int.) (Unit 2)
3. Computer Graphics C Version second edition -Donald D. Hearn, M. Pauline Baker (Pearson) (Unit 3)
4. Multimedia systems: Algorithms, Standards & Industry Practice-Parag Havaldar & Gerard Medioni, Cengage Learning (Unit 4, 5)
5. Computer Graphics- Rajesh Maurya (WILEY India) (Unit 6)
6. Virtual & Augmented reality - Paul Mealy (Kindle Edition) (Unit 6)

Some assignments on following topics can be given and its evaluation should be considered for CIE

1. Introduction to computer graphics, OPEN GL, GLUT, GLU
2. Design 2D & 3D objects by using graphics primitives
3. Apply the different transformation techniques on 2D & 3D graphical objects
4. Create graphics design using any software(Picasa, Autodesk Maya, Sketch Up, Solid works)
5. Perform rendering using Blender or Lux Core Render Software
6. Create 2D & 3D animated object using Synfig or Blender Software.

Date: 11/8/23

To,
The HOD,
CSE Department,
AGTI's DACOE,
Karad.

Subject: Regarding application for selection of OEC-I subject.

Respected Sir,

With due respect and humble submission to say that we are the students of class T.Y B. TECH CSE of your college. We choose Internet of Thing as our OEC-I subject. We request you to provide the faculty incharge for the same.

Therefore, we hope that you will be kind enough to permit us to select this subject and oblige thereby.

Yours Faithfully,



Roll no	Name of Students	Sign
15	Shraddha Anandrao Gurav	<u>Sagurav</u>
16	Sakshi Shivaji Ingavale	<u>S.S. Ingavale.</u>
18	Jadhav Manali Ramesh	<u>Jadhav</u>
4	Chavan Nilam Bhaskar	<u>Chavan</u>
12	Gaikwad Narmata Babu	<u>Narmata</u>
10	Dhebe Rutuja Bajrang	<u>Dhebe</u>
30	Lade vidya dipak	<u>Vade</u>
51	Pawar Aarti Uttam	<u>Aarti</u>
53	Pawar Nisha Baluram	<u>Nisha</u>
40	Nalgure Shrutika Dhananjay	<u>N.B. Pawar</u>
35	Mane Vaibhavi Umesh	<u>Nalgure</u>
44	Patil Gayatri Prakash	<u>V.V. Mane</u>
71	Babar Amruta Sadanand	<u>Patil</u>
54	Pawar Sakshi Bajirao	<u>B. Babar</u>
64	Sonawale Bhavana Bhimrao	<u>Sonawale</u>
50	Pawar Aarati Chandrakant	<u>A. Pawar</u>
01	Abdas Divya Ganman	<u>Abdas</u>
32	Mahadik Shreyas Rahulkumar	<u>Mahadik</u>
03	Bhosale Samika Dattatray	<u>Bhosale</u>
29	Tegswini Vijay Kalekar	<u>Tegswini</u>
31	Lokare Prajakta Prakash	<u>Lokare</u>
23	Kachare Rohini Sakharan	<u>Kachare</u>
24	Kodam Nondini Prashant	<u>Kodam</u>
49	Patil Vishakha Sanjay	<u>Patil</u>
39	Mohite Sakshi Ashok	<u>Mohite</u>
60 27	Satpute Sakshi Ramchandrag	<u>Satpute</u>
62	Shinde Ashlesha Deepak	<u>Shinde</u>
35	Pawar Shivani Pralhad	<u>Pawar</u>
41	Patel Aarju Samir	<u>A.S. Patel.</u>
75	Shinde Vaishnavi Shashikant	<u>Shinde</u>
70	Kashid Shraddha Shekhar	<u>S.S. Kashid</u>
77	Patil Vaishnavi Vishnu	<u>Patil</u>
72	Patil Vaishnavi Pravin	<u>Patil</u>

Roll No

47

38

22

06

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02

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68

56

09

19

79

Name of Student

Sign

Patil Sakshi Satish

Satish

More Sayaji Tukaram

Sayaji

Junjwadkar Yogita Narayan

Yogita

Dange Jyoti Shrikant

Jyoti

Ghonge Harish Vijay

Harish

Dange Tejas Amar

Tejas

Bagwan Muraaj Sajid

Sajid

Mali Abhishek Bhanu

Abhishek

Yelave Omkar Dattatray

Omkar

Pise / Prothamesh Anil

Anil

Deshmukh Jagadish Sunil

Jagadish


Tadhar Rohit Raja

Rohit

Ghutekale Swapnil Sada

Swapnil



	G.K. Gujar Memorial Charitable Trust's Dr. Ashok Gujar Technical Institute's, Dr. Daulatrao Aher College of Engineering, Karad. Vidyanagar Ext. Banawadi, Tal. Karad 415124, Dist. Satara, Maharashtra INDIA	
	Year: 2023-24	Date: 11/08/2023
Department: COMPUTER SCIENCE & ENGINEERING		DACOE/ACAD/EL/FRM- 01 EL-FRM-01- Rev. No: 0

Date: 11/08/2023

Elective Choice Form (For T.Y. B.Tech)

Academic Year: 2023-24

Semester-V

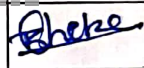

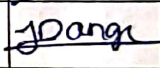

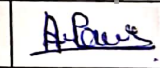
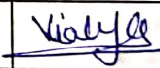
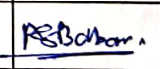

Class: T.Y. B.Tech

Terms and Conditions:


- 1) Once selected, the elective will be Final
- 2) Under any circumstances this elective will not be changed.

Open Elective Choice I (Subjects)

- 1) Computer Graphics & Multimedia
- 2) Internet of Things

Roll No	Name of Student	Open Elective Choice		Sign
		Choice 1 CG & M	Choice 2 IOT	
23010	Dhebe Rutuja Bajrang.		✓	
23012	Gaikwad Namrata Babu		✓	
23006	Dange Jyoti Shrikant		✓	
23027	Kolekar Tejaswini Vijay		✓	
23049	Pawar Aarti Uttam		✓	
23028	Lade Vidya Dipak		✓	
23067	Babar Anurata Sadanand		✓	
23052	Power Sakshi Bajirao		✓	

Roll No	Name of Student	Open Elective Choice		Sign
		Choice 1 CG	Choice 2 IOT	
23048	Pawar Aarati Chandrakant		✓	A. Pawar
23033	Mane Vaibhavi Umesh		✓	V. V. Mane
23042	Patil Gayatri Prakash		✓	G. Patil
23071	Shinde Vaishnavi Shashikant		✓	V. Shinde
23066	Kashid Shroddha Shekhar		✓	S. Kashid
23057	Satpute Sakshi Ramchandra		✓	S. Satpute
23059	Shinde Ashlesha Deepak		✓	A. Shinde
23051	Pawar Nisha Baluram		✓	N. Pawar
23053	Pawar Shivani Pralhad		✓	S. Pawar
23025	Kale Vishwajeet vijay		✓	V. Kale
23020	Jadhav Shivaaji Rajendra		✓	S. Jadhav
23064	Yelave omkar Dattatray		✓	O. Yelave
23075	Ghulukade Swapnil D.		✓	S. Ghulukade
23018	Jadhav Manali Ramesh		✓	M. Jadhav
23004	chavan Nilam bhaskar		✓	N. Chavan
23060	Sonawale Bhavana Bhimrao		✓	B. Sonawale
23074	Lochanade Swastika Thakurakumar		✓	S. Lochanade
23070	Girigosavi prasanna sumit		✓	P. Girigosavi
23078	Shinde Neha Dilip		✓	N. Shinde
23073	Patil Vaishnavi Vishnu		✓	V. Patil


Sign of Class Teacher:.

HOD

Roll No	Name of Student	Open Elective Choice		Sign
		Choice 1 CG	Choice 2 IOT	
23015	Gurav Shraddha Anandrao		✓	<u>S. Gurav</u>
23016	Ingavale Sakshi Shivaji		✓	<u>S.S. Ingavale</u>
23022	Tunjwadkar Yogita Narayan		✓	<u>Yogita</u>
23024	Jangam varadraj somnath		✓	<u>Varadraj</u>
23019	Jadhav Rohit Raju		✓	<u>Rohit Jadhav</u>
23026	Khedkar Utkarsh Sudhir		✓	<u>Utkarsh</u>
23062	velhal chinmay Jagdish		✓	<u>Chinmay</u>
23037	Mulla Rihan Jakir		✓	<u>Rihan</u>
23009	Deshmukh Jagadish S.		✓	<u>Jagadish</u>
23032	Mane Shubham Ravindra		✓	<u>Shubham</u>
23044	Patil Rohan Digambar		✓	<u>Rohan</u>
23043	Patil omkar krushnat		✓	<u>Omkar</u>
23008	Desai Rohan Ramkrishna		✓	<u>Rohan</u>
23005	Chavan Prathmesh Rajendra.		✓	<u>Prathmesh</u>
23076	Kotaktalware Ritesh Anand		✓	<u>Ritesh</u>
23050	Pawar Nikhil Rajesh		✓	<u>Nikhil</u>
23039	Patil Ajinkya Jaywant		✓	<u>Ajinkya</u>
23010	Patil Aditya Jaydeep		✓	<u>Aditya</u>
23051	Pise Prathamesh Anil		✓	<u>Prathamesh</u>
23046	Patil Sumit Sudhir		✓	<u>Sumit</u>
23069	Molone digvijay Somnath		✓	<u>Digvijay</u>

Ashe

Sign of Class Teacher:

Prathamesh

HOD

Roll No	Name	OEC	Sign
		CG	IOT
230301	Mali Abhishek Bharat	✓	✓
23002	Begwan Mueoj Sajid	✓	✓
23013	Gharge Harsh Vijay	✓	✓
23086	sathe Atharv sunil	✓	✓



SHIVAJI UNIVERSITY KOLHAPUR

**REVISED SYLLABUS AND STRUCTURE
FINAL YEAR (FINAL YEAR B. Tech) BACHELOR OF
TECHNOLOGY**

IN

Computer Science and Engineering

**To be introduced from the academic year 2021-22
(w.e.f. June 2021) onwards**

FINAL YEAR COMPUTER SCIENCE AND ENGINEERING - CBCS PATTERN																
SEMESTER - VII																
Sr. No.	Course Subject / Title	TEACHING SCHEME						EXAMINATION SCHEME								
		THEORY			TUTORIAL		PRACTICAL		THEORY				ORAL / PRACTICAL		TERMWORK	
		Credits	No Of Lectures	Hours	Credits	No of Hours	Credits	No of Hours	mode	marks	Total Marks	MIN	MAX	MIN	MAX	MIN
1	PCC-CS701 Advanced Computer Architecture	4	4	4	1	1			CIE	30	100	40			25	10
									ESE	70						
2	PCC- CS702 Cloud Computing	3	3	3			1	2	CIE	30	100	40			25	10
									ESE	70						
3	PCC- CS703 Advanced Database Systems	3	3	3			1	2	CIE	30	100	40	50	20	25	10
									ESE	70						
4	PCE- CS704 Elective-I	3	3	3	1	1			CIE	30	100	40			25	10
									ESE	70						
5	PCC- CS705 Web Technologies	3	3	3			2	4					50	20	50	20
6	PW- CS706 Project – I						2	4					50	20	50	20
7	SI-CS707 Internship						1								50	20
Total (SEM –VII)		16	16	16	2	2	7	12			400		150		250	

• Candidate contact hours per week : 30 Hours (Minimum)	• Total Marks for Final Yr. Sem VII & VIII : $800 + 800 = 1600$
• Theory and Practical Lectures : 60 Minutes Each	• Total Credits for Final Yr. Sem VII & VIII: 50 (SEM-VII: 25 + SEM-VIII: 25)
• In theory examination there will be a passing based on separate head of passing for examination of CIE and ESE.	
• There shall be separate passing for theory and practical (term work) courses.	

Note:

1. PCC-CS: Professional Core Course – Computer Science and Engineering are compulsory.
2. PCE-CS: Professional Core Elective – Computer Science and Engineering are compulsory.
3. HM-CS: Humanities and Management- Computer Science and Engineering are compulsory.
4. PW-CS: Domain Specific Mini Project – Computer Science and Engineering are compulsory.
5. SI-CS: Internship-Computer Science and Engineering are compulsory.

Professional Core Elective – I

1. Artificial Intelligence
2. Software Testing & Quality Assurance
3. Image Processing

Professional Core Elective – II

1. Project Management
2. Natural Language Processing
3. Ad-Hoc Wireless Sensor Networks

Professional Core Elective – III

1. High Performance Computing
2. Blockchain Technologies
3. Human computer Interaction

Final Year B. Tech (Computer Science and Engineering) Sem- VII

4. Artificial Intelligence (PCE- CS704) Elective-I

TEACHING SCHEME	EXAMINATION SCHEME
Theory : 3 Hrs./Week (3 Credits)	Theory : ESE 70 Marks CIE 30 Marks
Tutorial : 1 Hr. /Week (1 Credit)	Term work: 25 Marks
Practical :	Practical :-

Pre-requisites: Basic Programming in Python.

Course Objectives

1. To impart artificial intelligence principles, techniques, and its history.
2. To assess the applicability, strengths, and weaknesses of the basic knowledge representation, problem solving, and learning methods in solving engineering problems.
3. To develop intelligent systems by assembling solutions to concrete computational problems.

Course Outcomes

Upon successful completion of this course, the students will be able to:

1. Evaluate Artificial Intelligence (AI) methods and describe their foundations.
2. Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation and learning.
3. Demonstrate knowledge of reasoning and knowledge representation for solving real world problems.
4. Analyze and illustrate how search algorithms play vital role in problem solving.
5. Illustrate the construction of learning and expert system.
6. Discuss current scope and limitations of AI and societal implications.

UNIT NO.	UNIT NAME & DETAILS	NO. OF LECTURES
1.	Artificial Intelligence and Its Issues: Definitions - Importance of AI, Evolution of AI - Applications of AI, Classification of AI systems with respect to environment, Knowledge Inferring systems and Planning, Uncertainty and towards Learning Systems.	5
2.	Overview to Problem Solving & Heuristic Search: Problem solving by Search, Problem space - State space, Blind Search - Types, Performance measurement. Types, Game playing mini-max algorithm, Alpha-Beta Pruning	6
3.	Probabilistic Reasoning & Markov Decision process: Probability, conditional probability, Bayes Rule, Bayesian Networks- representation, construction and inference, temporal model, hidden Markov model. MDP formulation, utility theory, utility functions, value iteration, policy iteration and partially observable MDPs.	7
4.	Learning Systems & Expert Systems: Forms of Learning Types - Supervised, Unsupervised, Reinforcement Learning, Learning Decision Trees. Expert Systems - Stages in the development of an Expert System - Probability based Expert Systems - Expert System Tools - Difficulties in Developing Expert Systems - Applications of Expert Systems.	7
5.	Reinforcement Learning: Passive reinforcement learning, direct utility estimation, adaptive dynamic programming, temporal difference learning, active reinforcement learning- Q learning.	5
6.	AI with Python: Study of important inbuilt libraries of Python like NumPy, SciPy, matplotlib, nltk, SimpleAI. Installing Python. Setting up PATH. Running Python. Study of real time applications of AI with Python, Case Studies: AI Platforms-Azure ML, Google AI, Swift AI, Tensorflow.	6

Term Work

- Minimum 8 tutorials to be performed from the list given below.
- Practical should include the implementation and use of the above mechanisms/Algorithms/Tools /Techniques.
- Implementation can be in Python Programming Language.

Tutorial List

1. Write a program to conduct uninformed and informed search.
2. Write a program to conduct game search.
3. Write a program to construct a Bayesian network from given data.
4. Write a program to infer from the Bayesian network.
5. Write a program to run value and policy iteration in a grid world.
6. Write a program to do reinforcement learning in a grid world.
7. Develop small AI based Mini Project like:
 - i) Predicting user's next location
 - ii) Detecting YouTube comment spam
 - iii) Identifying the genre of a song
 - iv) Shock front classification
8. Case Study on any one real time AI application.

Final Year B. Tech (Computer Science and Engineering) Sem–VII

5. Software Testing and Quality Assurance (PCE- CS704) Elective-I

TEACHING SCHEME	EXAMINATION SCHEME
Theory : 3 Hrs./Week	Theory : ESE 70 Marks CIE 30 Marks
Tutorial : 1 Hrs./Week	Term work: 25 Marks
Practical : --	Practical : --

Pre-requisites: Software Engineering, SDLC and STLC.

Course Objectives

1. To understand software testing and quality assurance as a fundamental component of software life cycle
2. To understand the fundamentals of software verification
3. To efficiently perform Testing & QA activities using modern software tools
4. To understand and compare testing web applications and desktop applications

Course Outcomes

Upon successful completion of this course, the students will be able to:

1. Understand fundamental component of software life cycle
2. Apply and use the modern software testing tools
3. Compare and analyze the web and desktop application testing
4. Explore newer software project assessment methods

UNIT NO.	UNIT NAME & DETAILS	NO. OF LECTURES
1.	Introduction : Some Software Failures, Testing Process, Some Terminologies, Limitations of Testing, The V Shaped software life cycle model	4
2.	Software Verification: Verification Methods, SRS document verification, SDD document verification, Source code reviews, User documentation verification, Software project audit Creating test cases from SRS and Use cases: Use Case Diagram and Use Cases, Generation of test cases from use cases, Guidelines for generating validity checks,	8

	strategies for data validity, Database testing	
3.	Regression Testing: What is regression testing?, Regression Test cases selection, Reducing the number of test cases, Risk analysis, Code coverage prioritization techniques Object oriented testing: What is Object orientation?, What is object oriented testing?, Path testing, State based testing, Class testing	7
4.	Software Testing Tools: Selecting and Installing Software Testing tools, Automation and Testing Tools, Load Runner, Win runner and Rational Testing Tools, Silk test, Java Testing Tools,	6
5.	Testing Process : Seven Step Testing Process – I: Overview of the Software Testing Process, Organizing of Testing, Developing the Test Plan, Verification Testing, Validation Testing.	5
6.	Testing Web applications What is web testing? functional testing, UI testing, Usability testing, configurations and compatibility testing, security testing, performance testing, database testing, post deployment testing, web metrics. Automated Test data generation: Automated Test Data generation, Approaches to test data generation, Test data generation tools	6

Term Work

- Minimum of 10 Tutorials to be done from the list given below.
- It should include the demonstration and use of the Tools /Techniques

Guidelines for tutorials:

It should consist of 8-10 assignments based on the following topics:

1. Software Testing Process, its need and limitations
2. Verification at different phases of SDLC for particular case study (SRS document verification, SDD document verification, Source code reviews, User documentation verification, Software project audit etc.)
3. Creating test cases from SRS and Use cases for particular case study
4. Generation of validity checks for particular case study
5. Regression testing with Test cases selection / Regression testing with reducing the number of test cases / Regression testing with code coverage prioritization techniques
6. Generation of test cases using Path testing/ State based testing/Class testing for particular case Study
7. Measurement in Software Engineering
8. Software Metrics: Object oriented Metrics used in testing
9. Calculation of Software Quality attributes using different prediction models
10. Measurement of Internal / External Product Attributes

11. Generation of test cases in different key areas of Web application testing

12. Automated test data generation

Text Books

Sr. No.	Title	Author(s) Name	Publication & Edition	Units Covered
1	Software testing:	Yogesh Singh,	Cambridge University Press, First Edition	Unit-I,II,III,VI
2	Effective Methods for Software Testing (Chapter 4, 6, 7, 8, 9, 10)	William E. Perry,	Third edition, Wiley India, 2009	Unit –IV,V
3	Software Testing – Principles and Practices (Chapter 12)	Naresh Chauhan,	Oxford University Press, 2010	Unit –IV

Reference Books

Sr. No.	Title	Author(s) Name	Publication & Edition
1	Foundations of Software testing:	Aditya P. Mathur,	Pearson, Second Edition
2	Software Testing:	Ron Patton,	Pearson (SAMS), Second Edition
3	Software Quality, Mordechai	Ben Menachem, Garry S. Marliss,	BS Publications

Final Year B. Tech (Computer Science and Engineering) Sem- VII

6. Image Processing (PCE – CS704) Elective-I

TEACHING SCHEME	EXAMINATION SCHEME
Theory : 3 Hrs./Week	Theory : ESE 70 Marks
Tutorial : 1 Hrs./Week	CIE 30 Marks
Practical :	Term work: 25 Marks
	Practical : –

Pre-requisites:

Course Objectives

1. To learn the fundamental concepts of Digital Image Processing
2. To study basic image processing operations.
3. To cover the basic analytical methods which are widely used in image processing.

Course Outcomes

Upon successful completion of this course, the students will be able to:

1. Describe the basic issues and the scope of image processing, and the roles of image processing and systems in a variety of applications.
2. Explore different techniques in image acquisition and color transformation
3. Understand how digital images are represented
4. Evaluate the mathematical principles of digital image enhancement
5. Explore and apply the concepts of Edge detection, segmentation and object recognition

UNIT NO.	UNIT NAME & DETAILS	NO. OF LECTURES
1.	Introduction Concept of Digital Image Processing, Steps in Image Processing, Components of Image Processing System, Applications areas, Image representation, Grey scale and color images.	6
2.	Image Enhancement and Processing : Basic Grey level transformation, Histogram Processing techniques, Color Fundamentals, color models, Pseudo color image processing.	7
3.	Image Restoring and Reconstruction: Noise models, Noise Reduction, Inverse filtering, MMSE filtering.	5
4.	Image Compression : Fundamental of Redundancies, Basic Compression Methods, Huffman coding, Arithmetic coding, LZW coding, JPEG	5

	compression, Standard.	
5.	Image Segmentation: Detection of Discontinuities, Point, Line and Edge detection, Thresholding, Region based Segmentation.	6
6.	Image Processing Applications: Biometric Pattern Recognition, Face Recognition, Preprocessing of Signature Patterns, Lung Disease Identification.	7

Term Work


- It should consist of minimum 8 – 10 assignments based on the above topics.

Text Books

Sr. No.	Title	Author(s) Name	Publication & Edition	Units Covered
1	Digital Image Processing	R.C.Gonzalez and R.E.Woods	Pearson Edition	1 to 6

Reference Books

Sr. No.	Title	Author(s) Name	Publication & Edition
1	Digital Image Processing	A.K.Jain	PHL
2	Image processing, Analysis and Machine vision	M.Sonka, V.Hlavac, and R.Boyle	Thomson Asia pvt. Ltd

	G.K. Gujar Memorial Charitable Trust's Dr. Ashok Gujar Technical Institute's, Dr. Daulatrao Aher College of Engineering, Karad. Vidyanagar Ext. Banawadi, Tal. Karad 415124, Dist. Satara, Maharashtra INDIA	
	Year: 2023-24	Date: 17/08/23
	Department: COMPUTER SCIENCE & ENGINEERING	
		DACOE/ACAD/EL/FRM- 01 EL-FRM-01- Rev. No: 0

Date: 17/08/23

Elective Choice Form (For B.Tech)

Academic Year: 2023-24

Semester-VII

Class: B.Tech

Terms and Conditions:

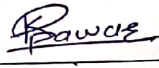
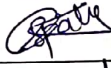
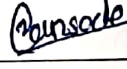
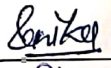
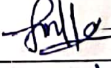

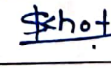
- 1) Once selected, the elective will be Final
- 2) Under any circumstances this elective will not be changed.

Elective I (Subjects)

- 1) Artificial Intelligence
- 2) Software Testing & Quality

Assurance

- 3) Image Processing

Roll Number	Name of Student	Elective Choice-I			Sign
		Choice 1 AI	Choice 2 STQA	Choice 3 IP	
24055	Pawar Kajal Krishnat	✓			
24042	Patil Saylee Sanjay	✓			
24002	Bansode Vidya Pravin	✓			
24064	Shinde Banika Sanjay	✓			
24036	Mulla Suhan Jameez	✓			
24049	Patole Shravani Mahesh	✓			
24024	Khot Shruti Sharad	✓			

Roll Number	Name of Student	Elective Choice-I			Sign
		Choice 1 AI	Choice 2 STQA	Choice 3 IP	
24059	Shedage Gauri Dhanaji	✓			<u>Gauri</u>
24069	Tandale Pradnya Mahesh	✓			<u>Pradnya</u>
24057	Salunkhe Rucha Sanderh	✓			<u>Rucha</u>
24052	Pawar Harshali Madan	✓			<u>Harshali</u>
24016	Kadam Sakshi Milind	✓			<u>Sakshi</u>
24038	Nalawade Sanika Anil	✓			<u>Sanika</u>
24030	Mahajan Mukti Premchand	✓			<u>Mukti</u>
24021	Kale Asmita Yuvraj	✓			<u>Asmita</u>
24015	Jadhav Snehal Sanjay	✓			<u>Snehal</u>
24013	Inamdar Diya Ramjan	✓			<u>Diya</u>
24060	Shejwal Archana Raju	✓			<u>Archana</u>
24051	Pawar Dhanashri Nitin	✓			<u>Dhanashri</u>
24010	Gadale Snehal Krishna	✓			<u>Snehal</u>
24066	Shirsat Salinee Pravin	✓			<u>Salinee</u>
24043	Patil Vaishnavi Ashok	✓			<u>Vaishnavi</u>
24031	Mane Sanket Sinabhou	✓			<u>Sanket</u>
24050	Pawar Mayur Pratap	✓			<u>Mayur</u>
24026	Kumbhar Prathmesh Popat	✓			<u>Prathmesh</u>
24048	Patil Suyash Jivan	✓			<u>Suyash</u>
24001	Bagwan Kamil M. Rafique	✓			<u>Kamil</u>
24006	Chorage Pratik Ajeun	✓			<u>Pratik</u>
24025	Kodulkar Omkar Arun	✓			<u>Omkar</u>

Sign of Class Teacher:

HOD

Roll Number	Name of Student	Elective Choice-I			Sign
		Choice 1 AI	Choice 2 STQA	Choice 3 IP	
24039	Pakhale Omkar Santosh	✓			<u>Pakhale</u>
24020	Karande Neha Ganesh	✓			<u>Nes</u>
24011	Gawade Komal Kiran	✓			<u>Gawade</u>
24012	Gurav Aishwarya Rajendra	✓			<u>Gurav</u>
24008	Chavan Tejaswini Dilip	✓			<u>Chavan</u>
24005	Chorage Ankita Chandrakant	✓			<u>Chorage</u>
24004	Chavan Shubham Sanjay	✓			<u>Shubham</u>
24017	Kalaskar Abhishek Pandit	✓			<u>Kalaskar</u>
24063	Sanika Sandeep Shinde	✓			<u>Sanika</u>
24045	Patil Pranjali Pradip	✓			<u>Patil</u>
24009	Desai Rohan Ramesh	✓			<u>Desai</u>
24050	Patil Sakshi Mohan	✓			<u>Patil</u>
24065	Shinde Tanmay Balkrishna	✓			<u>Shinde</u>
24053	Pawar Pratik Shankar	✓			<u>Pawar</u>
24062	Shikhar Javed Kamruddin	✓			<u>Shikhar</u>
24072	Christipin Shine Jayan	✓			<u>Christipin</u>
24067	Sonawale Sakshi Baburao	✓			<u>Sonawale</u>
24054	Pogary Varsha Vasantha	✓			<u>Varsha</u>
24071	Yadav Pratiksha Balasahab	✓			<u>Yadav</u>
24029	Mahadik Viraj Nitin	✓			<u>Viraj</u>
24034	Mujawar Rizwan Abid	✓			<u>R. Mujawar</u>
24036	Mujawar Sayama Dilawar	✓			<u>Mujawar</u>
24028	Lohar Poojekta Prakash	✓			<u>Lohar</u>