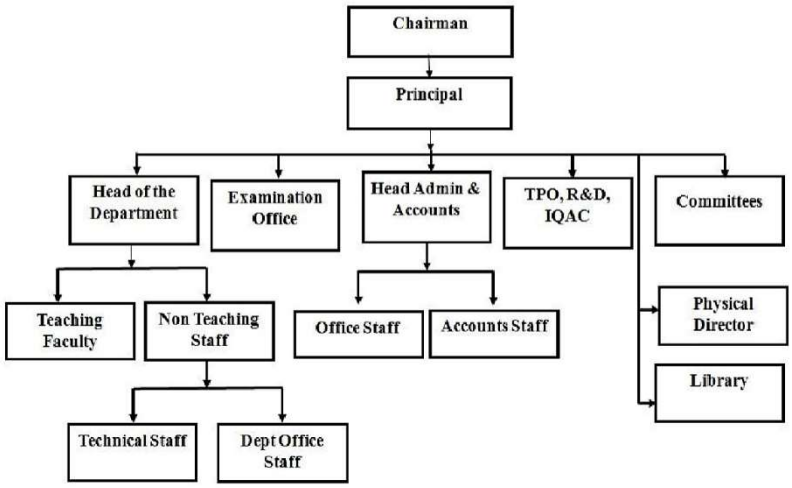
Mandatory Disclosure

1	Name of the Institution	**Dr. A. D. Shinde College of Engineering, Bhadgaon Gadhinglaj.**
2	Name and address of the Trust	Dinkarrao K. Shinde Smarak Trust, Kadgaon road Gadhinglaj Dist.-Kolhapur Maharashtra 416502.
3	Name & Address of the Principal	Dr. D. V. Ghewade Dr. A. D. Shinde College of Engineering, Bhadgaon Gadhinglaj Dist.-Kolhapur Maharashtra - 416502.
4	Name of the affiliating University	Shivaji University, Kolhapur.
5	Governance	
	Members of The Governing Board	Annexure 1
	Members of Academic Advisory Body	Annexure 2
	Frequency of the Board Meeting and Academic Advisory Body	Once in Year
	Organizational chart	
	Nature and Extent of involvement of Faculty and students in academic	Our institute is implementing Shivaji University Kolhapur curriculum.
	Mechanism/ Norms and Procedure for democratic/ good Governance	Being the Private Un- Aided Institute, Trust's Management norms/procedures are followed.
	Student Feedback on Institutional Governance/ Faculty performance	Students feedback is taken once in every semester for quality improvement. Faculty appraisal mechanism is set by Govt. and it is followed by the institute.
	Grievance Redressal mechanism for Faculty, staff and students	Respective committee if formed.
	Establishment of Anti Ragging Committee	Annexure 3
	Establishment of	-

<table>
<tr><td>5</td><td>Online Grievance Redressal Mechanism</td><td></td></tr>
<tr><td></td><td>Establishment of Grievance Redressal Committee in the Institution and Appointment of OMBUDSMAN by the University</td><td>Annexure 3</td></tr>
<tr><td></td><td>Establishment of Internal Complaint Committee (ICC)</td><td>Annexure 3</td></tr>
<tr><td></td><td>Establishment of Committee for SC/ST</td><td>Annexure 3</td></tr>
<tr><td></td><td>Internal Quality Assurance Cell</td><td>Annexure 3</td></tr>
<tr><td>6</td><td>Programmes approved by AICTE</td><td><table><tr><th>Name of Course</th><th>Intake 2023-24</th></tr><tr><td>Civil Engineering</td><td>60</td></tr><tr><td>Electrical Engineering</td><td>60</td></tr><tr><td>Mechanical Engineering</td><td>60</td></tr><tr><td>Electronics and Computer Science</td><td>60</td></tr><tr><td>Computer Science and Engineering</td><td>60</td></tr></table></td></tr>
<tr><td></td><td>NBA Accreditation Status</td><td>Not Applied</td></tr>
<tr><td>7</td><td>Faculty Branch wise list faculty member</td><td>Annexure 4<table><tr><td>Academic Year</td><td>2021-22</td><td>2022-23</td><td>2023-24</td></tr><tr><td>Faculty Count</td><td>59</td><td>60</td><td>60</td></tr></table></td></tr>
<tr><td>8</td><td>Profile of Principal/ Faculty with qualification total experience, age and duration of employment at the institute concerned</td><td>Annexure 5</td></tr>
<tr><td>9</td><td>Fees</td><td>As per decided by Shikshan Shulk Samiti, Maharashtra State.</td></tr>
<tr><td>10</td><td>Admission</td><td><table><tr><td>Course</td><td>Sanctioned Intake</td><td>2022-23</td><td>2023-24</td></tr><tr><td>Civil Engineering</td><td>60</td><td>1</td><td>0</td></tr><tr><td>Electrical Engineering</td><td>60</td><td>1</td><td>1</td></tr><tr><td>Mechanical Engineering</td><td>60</td><td>0</td><td>2</td></tr><tr><td>Electronics and Computer Science</td><td>60</td><td>13</td><td>12</td></tr><tr><td>Computer Science and Engineering</td><td>60</td><td>24</td><td>31</td></tr></table></td></tr>
<tr><td>11</td><td>Admission Procedure</td><td>Admission schedule and procedure is decided by state government which is centralized allotment process (CAP)
https://cetcell.mahacet.org/</td></tr>
<tr><td>12</td><td>Criteria and weightages for Admission</td><td>As per given by DTE Maharashtra
https://cetcell.mahacet.org/</td></tr>
<tr><td>13</td><td>List of Applicants</td><td>All Seats are filled through CAP.</td></tr>
<tr><td>14</td><td>Results of Admission Under Management seats</td><td>No management quota available</td></tr>
<tr><td>15</td><td>Information of Infrastructure and Other Resources Available</td><td>Annexure 6</td></tr>
</table>

	Occupancy Certificate					
15	Library					
	List of Major Equipment/Facilities in each Laboratory/ Workshop					
	Hostel Facilities	Private hostel nearby the institute is available				
	Internet Bandwidth	300MBPS				
	List of facilities Available	Games and sports facilities: Playground, indoor games, facility, tie up with IDSSA Sport Organization Zonal, Inter-Zonal, games/sports conducted every year, participation state level girl's sport.				
	Teaching Learning Process	Annexure 7				
16	Enrollment of students in the last 3 years	Course	Sanctioned Intake	2021-22	2022-23	2023-24
		Civil Engineering	60	1	1	0
		Electrical Engineering	60	1	1	1
		Mechanical Engineering	60	0	0	2
		Electronics and Computer Science	60	-	13	12
		Computer Science and Engineering	60	-	24	31
17	Lists of Research Projects / Consultancy Works MOUs with Industries	Courses	List of MOUs			
		Civil Engineering	1. Takdir stone Crusher Khamletti Gadhinglaj 2. Nirmiti Construction Gadhinglaj. 3. Samarth ready mix Concrete Gadhinglaj.List of MOUs			
		Electrical Engineering	1. Appasaheb Nalawade sugar factory Harali Gadhinglaj. 2. Vignahartha Enterprises			
		Mechanical Engineering	1. Appasaheb Nalawade sugar factory Harali Gadhinglaj. 2. Kalbhairav food Pvt. Ltd. 3. Annabhau Soot Girani Ltd Ajra.			
18	EOA	Annexure 8				
19	Accounted audited statements for the last three years	Annexure 9				
20	Best Practices adopted, if Any	Annexure 10				

Date: 12/04/2024

Annexure 1
Members of the Governing Board

Dinkarrao K. Shinde Smarak Trust's

DR. A. D. SHINDE
COLLEGE OF ENGINEERING
Guddai, A/P: Bhadgaon, Tal: Gadhinglaj, Dist: Kolhapur.
Approved by AICTE, Delhi, DTE Mumbai and Govt of Maharashtra. Affiliated to Shivaji University, kolhapur.,E-mail: principal@adshindecoe.edu.in Ph.No. : 02327-250650, 08380049000.

Ref- DADSCOE/office/23-24/04(c) Date- 03/08/2023

The following members are working on Governing Council of Dr.A.D.Shinde College of Engineering, Bhadgaon. To meet the vision & mission and council is guiding and mentoring to the management, staff and the stakeholders.

Governing Council

Sr. No.	Name	Designation
1	Mr.Ganpatrao A. Patil (Industralist) (Chairman,,Datta Shirol Sahkari Sakahra Karkana)	President
2	Smt. Urmila S. Shinde (President, DKSST)	Member
3	Dr.Vijay Ghorapade (Shivaji University, Nominee) (Principal,Bharati Vidypeeth College of Engineering, Kolhapur)	Member
4	Mrs.Swati M.Kori (Secretary,DKSST)	Member
5	Dr.Ranjit A. Shinde (Educationalist) (Trustee,CSIBER Kolhapur)	Member
6	Dr. Rachna Thorat (Trustee,DKSST)	Member
7	Dr.Mallapa S.Belgudri (Trustee,DKSST)	Member
8	Mrs. Tanuja N. Shipurkar (Social Worker) (Social Activist)	Member
9	Dr..Dinkar V. Ghewade (Principal,DADSCOE)	Secretary

Dr.A.D.Shinde College of Engineering Bhadgaon Tal.Gadhinglaj

PRINCIPAL
Dr.A.D.Shinde College of Engineering
Bhadgaon,Tal.Gadhinglaj,Dist.Kolhapur

Annexure 2
Members of Academic Advisory Body

Dinkarrao K.Shinde Smarak Trusts

DR. A. D. SHINDE COLLEGE OF ENGINEERING,

Bhadgaon, Gadhinglaj. Dist.: Kolhapur Pin: 416502

Department of Computer Science & Engineering

DEPARTMENT ADVISORY BOARD (DAB)

To bring continuous improvement, Department Advisory Board (DAB) has been formed. The committee develops and recommends new or revised goals and objectives of the program. The committee also reviews and analyzes the gap between curriculum and Industry requirement and gives necessary feedback or advice actions.

The DAB consists of faculty members of the department, academicians from other institution, resource persons fromIndustry, alumni, and parents.

Following are the Members of the DAB:

Sr.No	Name of Faculty	Role/ Designation
1	Dr.D.V. Ghewade	Principal, DADSCOE
2	Dr. M.S. Kalas	Academic Expert
3	Mr.Shivshankar Charanthimath	Industrial Expert
4	Mr.M.K.Hasabe	Head of the Department
5	Mr.S.V.A. Aryan	Asst.Professor
6	Miss.R.A.Utturkar	Lecturer
7	Mr. Shivaji B. Chothe	Parent representative
8	Miss. Prachi.S Chothe	Student representative

Dr. A. D. Shinde College of Engineering, Bhadgaon, Tal. Gadhinglaj

HOD
Computer Science & Engineering
Dr.A.D.Shinde College of Engineering
A/P.Bhadgaon,Tal.Gadhinglaj

Dinkarrao K. Shinde Smarak Trust's

DR. A.D. SHINDE

COLLEGE OF ENGINEERING

Approved by AICTE, Delhi, DTE Mumbai and Govt of Maharashtra. Affiliated to Shivaji University, Kolhapur.

Secretary
Mrs. Swati Mahesh Kori

President
Adv. Shripatrao D. Shinde Ex. MLA

DR. A.D. SHINDE COLLEGE OF ENGINEERING

DADS COE

Ref. DADSCOE/6878/22-23/207

Date 15/11/2022

OFFICE ORDER

The following members are nominated on the **Department Advisory Board** for **Electrical Department** of **Dr. A. D. Shinde College of Engineering, Bhadgaon** as per the Rules and conditions of Shivaji University, Kolhapur from the academic year 2022-23.

Department Advisory Board

S.N.	Name	Role	Designation
1	Mr. K. S. Joshi	Chairman	I/C Principal
2	Mr. A.M.Desai	Member	HOD
3	Mr. K.S.Patil	Member	Asst Prof. Electrical
4	Mr. S.B.Desai	Member	Asst Prof. Electrical
5	Mr.V.M.Alavekar	Member	Industrialist
6	Mr. Dheeraj Satvekar	Member	Industrialist

Dr.A.D.Shinde College of Engineering Bhadgaon Tal.Gadhinglaj

PRINCIPAL
Dr.A.D.Shinde College of Engineering
Bhadgaon, Tal.Gadhinglaj,Dist.Kolhapur

C. C.:-

1. Principal
Dr. A. D. Shinde College Of Engineering, Bhadgaon

2. All Committee Members

At- Post Guddai, Bhadgaon, Gadhinglaj.
Tal Gadhinglaj. **Dist** Kolhapur. Pin 416502

Office Ph. No.: + 91 8308830656
Email principal.dadscoe@gmail.com

Annexure 3
Establishment of Committee's

Dinkarrao K. Shinde Smarak Trust's

DR. A.D. SHINDE

COLLEGE OF ENGINEERING

Approved by AICTE, Delhi, DTE Mumbai and Govt of Maharashtra. Affiliated to Shivaji University, Kolhapur.

Secretary
Mrs. Swati Mahesh Kori

President
Adv. Shripatrao D. Shinde Ex. MLA

DR. A.D. SHINDE COLLEGE OF ENGINEERING

DADSCOE

Ref. DADSCOE/6878/2022-23/120-K Date 04/08/2022

OFFICE ORDER

The following members are nominated on **Anti-Ragging Cell** of **Dr. A. D. Shinde College of Engineering, Bhadgaon** as per the Rules and conditions of Shivaji University, Kolhapur from the academic year 2022-23.

Anti-Ragging Cell

S.N.	Name	Role	Designation	Remark
1	Mrs. Swati Kori	Chairman	Secretary	Chairman Of Sanstha/ Nominee of Chairman
2	Mr. K. S. Joshi	Member	Incharge Principal	Incharge Principal
3	Dr. M. S. Belgudri	Member	Doctor	Psychologist
4	Mr. G. M. Kumbar	Member	HOD	(teaching staff including One Women)
5	Mr. A. M. Desai	Member	HOD	
6	Miss. P. D. Sagare	Member	Asst Prof. Civil	
7	Mr. R. R. Savant	Member	Student	Student Co-ordinator
8	Mr. Mahesh Kori	Member	Social Worker	Local Leader (social Worker)

Anti-Ragging Squad

S.N.	Name	Role	Designation	Remark
1	Mr. G. M. Kumbar	Coordinator	HOD Mech	HOD Mech
2	Mr. P. M. Kokitakar	Member	Asst. Prof. Mech	3 Staff Members (1Ladies)
3	Miss. T. C. Kamble	Member	Asst. Prof. Ele	
4	Mr. R. V. Savyanawar	Member	Asst. Prof. Civil	
5	Mr. H. S. Karigar	Member	Registrar	Office
6	Mr. Rahul Jangali	Member	Security	Security

C. C.:-
1. Principal
Dr. A. D. Shinde College of Engineering, Bhadgaon

2. All Committee Members

Dr.A.D.Shinde College of Engineering • Tal.Gadhinglaj

PRINCIPAL
Dr.A.D.Shinde College of Engineering
Bhadgaon, Tal.Gadhinglaj, Dist.Kolhapur

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Secretary
Mrs. Swati Mahesh Kori

President
Adv. Shripatrao D. Shinde Ex. MLA

DR. A.D. SHINDE COLLEGE OF ENGINEERING

DADS COE

Ref. DADSCOE/6878/2022-23/20-I

Date 04/08/2022

OFFICE ORDER

The following members are nominated on **Counseling Cell / Vivek Vahini** of **Dr. A. D. Shinde College of Engineering, Bhadgaon** as per the Rules and conditions of Shivaji University, Kolhapur from the academic year 2022-23.

Counseling Cell

S.N.	Name	Role	Designation	Remark
1	Mr. K. S. Joshi	Chairman	Incharge Principal	Incharge Principal
2	Mr. P. M. Kokitakar	Member	Asst. Prof. Mechanical	(3 teaching staff + one Non-Teaching including two Women)
3	Miss. P. S. Shirgave	Member	Asst. Prof. Civil	
4	Miss. T. C. Kamble	Member	Asst. Prof. Electrical	
5	Mr. R. B. Kamble	Member	Librarian	
6	Dr. M. S. Belgudri	Member	Doctor	Medical/Psychologist Social worker

C. C.:-

1. Principal
Dr. A. D. Shinde College Of Engineering, Bhadgaon

2. All Committee Members

Dr.A.D.Shinde College of Engineering Bhadgaon Tal.Gadhinglaj

PRINCIPAL
Dr.A.D.Shinde College of Engineering
Bhadgaon,Tal.Gadhinglaj,Dist.Kolhapur

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Dinkarrao K. Shinde Smarak Trust's

DR. A.D. SHINDE

COLLEGE OF ENGINEERING

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Secretary
Mrs. Swati Mahesh Kori

President
Adv. Shripatrao D. Shinde Ex. MLA

DR. A.D. SHINDE COLLEGE OF ENGINEERING

DADS COE

Ref. DADSCOE/6878/2022-23/120-J

Date 06/08/2022

OFFICE ORDER

The following members are nominated on **Gymkhana Committee** of **Dr. A. D. Shinde College of Engineering, Bhadgaon** as per the Rules and conditions of Shivaji University, Kolhapur from the academic year 2022-23.

College Gymkhana Committee

S.N.	Name	Role	Designation	Remark
1	Mr. S. D. Shinde	Chairman	Gymkhana Coordinator	Gymkhana Co-ordinator
2	Mr. S. D. Ingale	Member	Asst. Prof. Mechanical	3 teaching and one non-teaching staff
3	Mr. S. B. Desai	Member	Asst. Prof. Electrical	
4	Mr. D. S. Khorate	Member	Asst. Prof. Civil	
5	Mr. S. C. Powar	Member	Lab Assistant (Electrical)	
6	Mr. Vikas Ambi	Member	Student coordinator	Student coordinator

C. C.:-
1. Principal
Dr. A. D. Shinde College Of Engineering, Bhadgaon

2. All Committee Members

Dr.A.D.Shinde College of Engineering Bhadgaon • Tal.Gadhinglaj •

PRINCIPAL
Dr.A.D.Shinde College of Engineering
Bhadgaon, Tal.Gadhinglaj, Dist.Kolhapur

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DR. A.D. SHINDE COLLEGE OF ENGINEERING

DADS COE

Secretary
Mrs. Swati Mahesh Kori

President
Adv. Shripatrao D. Shinde Ex. MLA

Ref. DADSCOE/6878/2022-23/120-Q

Date 04/08/2022

OFFICE ORDER

The following members are nominated on **Industrial Institute Interaction Cell** of **Dr. A. D. Shinde College of Engineering, Bhadgaon** as per the Rules and conditions of Shivaji University, Kolhapur from the academic year 2022-23.

Industrial Institute Interaction Cell

S.N.	Name	Role	Designation
1	Mr. K. S. Joshi	Chairman	Incharge Principal
2	Mr. S. H. Pednekar	Member	Industrialist
3	Mr. R. K. Hanji	Member	Industrialist
4	Mr. B. S. Khangave	Member	Industrialist
5	Mr. P. I. More	Member	Industrialist
6	Mr. S. D. Ingale	Member	TPO
7	Miss. P. D. Sagare	Member	IQAC
8	Mr. G. M. Kumbar	Member	HOD Mechanical
9	Mr. A. M. Desai	Member	HOD Electrical
10	Mr. S. R. Wadagule	Member	HOD Civil

C. C.:-

1. Principal
Dr. A. D. Shinde College Of Engineering, Bhadgaon

2. All Committee Members

Dr.A.D.Shinde College of Engineering Bhadgaon • Tal.Gadhinglaj • Dist.Kolhapur

PRINCIPAL
Dr.A.D.Shinde College of Engineering
Bhadgaon,Tal.Gadhinglaj,Dist.Kolhapur

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Dinkarrao K. Shinde Smarak Trust's

DR. A.D. SHINDE

COLLEGE OF ENGINEERING

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Secretary
Mrs. Swati Mahesh Kori

President
Adv. Shripatrao D. Shinde Ex. MLA

DR. A.D. SHINDE COLLEGE OF ENGINEERING

DADS COE

Ref. DADSCOE/6878/2022-23/120-H

Date 04/08/2022

OFFICE ORDER

The following members are nominated on **Internal Grievance Cell** of **Dr. A. D. Shinde College of Engineering, Bhadgaon** as per the Rules and conditions of Shivaji University, Kolhapur from the academic year 2022-23.

Internal Grievance Cell

S.N.	Name	Role	Designation
1	Mr. K. S. Joshi	Chairman	Incharge Principal
2	Mr. H. S. Karigar	Member	Registrar
3	Mr. G. M. Kumbar	Member	HOD Mechanical
4	Mr. S. R. Wadagule	Member	HOD Civil
5	Mr. A. M. Desai	Member	HOD Electrical
6	Mr. R. B. Kamble	Member	1 Non-teaching and 1 Ladies staff
7	Miss. H. R. Patil	Member	

C. C.:-

1. Principal
Dr. A. D. Shinde College Of Engineering, Bhadgaon

2. All Committee Members

Dr.A.D.Shinde College of Engineering Bhadgaon • Tal.Gadhinglaj •

PRINCIPAL
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COLLEGE OF ENGINEERING

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DR. A.D. SHINDE COLLEGE OF ENGINEERING

DADSCOE

Secretary
Mrs. Swati Mahesh Kori

President
Adv. Shripatrao D. Shinde Ex. MLA

Ref. DADSCOE/6878/2022-23/120-E

Date 04/08/2022

OFFICE ORDER

The following members are nominated on **Special Cell / Standing Committee** of **Dr. A. D. Shinde College of Engineering, Bhadgaon** as per the Rules and conditions of Shivaji University, Kolhapur for the period of three years from the academic year 2022-23.

SPECIAL STANDING COMMITTEE

Sr. No.	Name	Role	Designation	Remark
1	Adv. Shripatrao D. Shinde	Chairman	Chairman Of Sanstha	Chairman of Sanstha or his Nominee
2	Mr. K. S. Joshi	Member	Incharge Principal	Incharge Principal
3	Mr. G. M. Kumbar	Member	HOD Mechanical	(teaching staff including One Women and one HOD)
4	Mr. S. R. Wadagule	Member	HOD Civil	
5	Miss. S. T. Barge	Member	Asst. Prof.	
6	Mr. R. B. Kamble	Member	Asst. librarian	Two Non-Teaching(including One Women)
7	Mr. S. T. Kurale	Member		
8	Mr. H. S. Karigar	Member	Registrar	Registrar/O.S. / Head Clerk

C. C.:-

1. Principal
Dr. A. D. Shinde College Of Engineering, Bhadgaon

2. All Committee Members

Dr.A.D.Shinde College of Engineering Bhadgaon • Tal.Gadhinglaj •

PRINCIPAL
Dr.A.D.Shinde College of Engineering
Bhadgaon,Tal.Gadhinglaj,Dist.Kolhapur

At- Post Guddai, Bhadgaon, Gadhinglaj.
Tal Gadhinglaj. **Dist** Kolhapur. Pin 416502

Office Ph. No.: + 91 8308830656
Email principal.dadscoe@gmail.com

Annexure 4
Faculty Branch wise list faculty member

Faculty Unique ID	Title	Middle Name	First Name	Last Name	PAN	Email Address	Designation	Appointme	Department	Date of Joinin	Dipl	UG	PG	Doct	Gender	FY/Commo	Date of Birth
1-2308495832	Mr.	MARUTI	RAJESH	PATIL	BBPPP0488J	techlogic2020@gmail.com	ASST PROFESSOR	Regular	COMPUTER SCEINCE & ENGINEERIN	1/6/2014	N	Y	N	N	Male		13/12/1984
1-2308495933	Miss	sudhakar	SNEHAL	YADAVADE	AZRPR7055G	snehalrandive@gmail.com	ASST PROFESSOR	Regular	FIRST YEAR/OTHER	1/6/2014	N	Y	N	N	Female	MATHS	5/5/1987
1-2657832596	Mr.	MANOHAR	AMRUT	NADGOUDA	AJNPN2296B	nadgoudaamrut@gmail.com	ASST PROFESSOR	Regular	ELECTRICAL ENGINEERING	1/6/2014	N	Y	N	N	Male		28/8/1986
1-2702334423	Miss	SAMBHAJI	AMITA	DESAI	BDTPD5143G	desai.amita92@gmail.com	LECTURER	Regular	ELECTRICAL ENGINEERING	12/8/2015	N	Y	N	N	Female		20/9/1992
1-3551411743	Dr.	VISHNU	DINKAR	GHEWADE	AHBPG4106B	dvghewade@pvpitsangli.edu.in	PRINCIPAL/DIRECTOR	Regular	MECHANICAL ENGINEERING	1/8/2023	N	Y	Y	Y	Male		25/4/1966
1-3558201198	Mrs.	TUKARAM	SHYAMALA	BARGE	BYBPB6099Q	shamal.barge@gmail.com	ASST PROFESSOR	Regular	MECHANICAL ENGINEERING	1/7/2017	N	Y	N	N	Female	MATHS	1/1/1987
1-3601740815	Mr.	NANGONDA	SHIVAGOUDA	PATIL	CNPPP5582G	patilsn@gmail.com	ASST PROFESSOR	Regular	MECHANICAL ENGINEERING	1/6/2016	N	Y	N	N	Male		10/9/1990
1-3610038503	Mr.	SURESH	ROHIT	DESAI	CNPPD5296P	desairohits@gmail.com	LECTURER	Regular	CIVIL ENGINEERING	1/8/2017	N	Y	N	N	Male		28/7/1994
1-3610142947	Mr.	SHAMRAO	SUHAS	DESAI	BBHPD1419D	suhasdesai1458@gmail.com	LECTURER	Regular	CIVIL ENGINEERING	1/8/2017	N	Y	N	N	Male		13/8/1989
1-3664753153	Miss	SHEKNNA	EDAMMA	SHALINI	GFPPS1825P	shaliniesshalu9@gmail.com	ASST PROFESSOR	Regular	CIVIL ENGINEERING	8/1/2018	N	Y	N	N	Female		24/1/1990
1-3665089399	Mr.	HARUNRASHID	AFTABAHAMAD	DESAI	BKDPD1799P	aftab.desai3@gmail.com	LECTURER	Regular	CIVIL ENGINEERING	8/1/2018	N	Y	N	N	Male		1/6/1994
1-4766062234	Mr.	TIPPANNA	NAGARAJ	KAMBAR	FJPPK7161H	nagarajkambar625@gmail.com	ASSOCIATE PROFESSOR	Regular	MECHANICAL ENGINEERING	3/9/2018	N	Y	N	N	Male		15/7/1993
1-4770713944	Miss	APPAYYA	SHEELA	PUJARI	DCWPP6648Q	sheela@gmail.com	LECTURER	Regular	CIVIL ENGINEERING	1/1/2019	N	Y	N	N	Female		11/12/1992
1-4776360384	Mr.	MARUTI	AMIT	GADKARI	AVFPG8466Q	amitgadkari.mag@gmail.com	LECTURER	Regular	ELECTRICAL ENGINEERING	1/1/2019	N	Y	N	N	Male		11/1/1992
1-7450366850	Mr.		GURUPRASAD	JOSHI	AHOPJ1261H	guruprasadjoshi@gmail.com	ASST PROFESSOR	Regular	MECHANICAL ENGINEERING	10/7/2019	N	Y	N	N	Male		19/11/1982
1-7450759321	Mr.		DIGAMBAR	KHORATE	GRFPK5568D	digambarkhorate1997@gmail.com	ASST PROFESSOR	Regular	CIVIL ENGINEERING	26/9/2019	N	Y	N	N	Male		22/8/1997
1-7450759327	Miss		POOJA	SHIRAGAVI	AHRPH1983R	poojashiragavi1924@gmail.com	ASST PROFESSOR	Regular	CIVIL ENGINEERING	30/9/2019	N	Y	N	N	Female		19/4/1993
1-7450759337	Miss		PRACHI	KUMBHAR	ENGPK6552L	prachikhumbhar12@gmail.com	ASST PROFESSOR	Regular	CIVIL ENGINEERING	15/7/2019	N	Y	N	N	Female		12/7/1995
1-7451013085	Miss		PRACHI	GOSAVI	CJKPG4925K	prachigosavi93@gmail.com	ASST PROFESSOR	Regular	ELECTRONICS & COMPUTER SCIEN(	18/7/2019	N	Y	N	N	Female		16/10/1993
1-7502231605	Mr.		SIDDALINGAPPA	GANDH	AVLPG9482G	gandh.siddu@gmail.com	ASSOCIATE PROFESSOR	Regular	ELECTRICAL AND ELECTRONICS ENG	1/8/2023	Y	N	N	N	Male		16/7/1991
1-7511884593	Mr.		GURURAJ	KUMBAR	EICPK0031H	gururaj.143kumbar@gmail.com	ASSOCIATE PROFESSOR	Regular	MECHANICAL ENGINEERING	1/7/2020	Y	Y	N	N	Male		15/3/1989
1-7512806537	Mr.		SHIVANAND	VANTAMURE	AZHPV6007C	shivavantamure007@gmail.com	ASSOCIATE PROFESSOR	Regular	FIRST YEAR/OTHER	1/7/2023	N	Y	N	N	Male	BUSINESS (	7/1/1993
1-7519038133	Mr.	ANNASAHEB	ABHISHEKH	MAGADUM	BKQPM7077L	abhimagadum01@gmail.com	ASSOCIATE PROFESSOR	Regular	ELECTRONICS & COMPUTER SCIEN(	1/8/2023	N	Y	N	N	Male		31/1/1986
1-9315414199	Mr.	KAKASO	MAHESH	HASABE	AHLPH7109R	maheshhasabe1989@gmail.com	ASSOCIATE PROFESSOR	Regular	COMPUTER ENGINEERING	1/5/2022	Y	N	N	N	Male		25/4/1989
1-9319564471	Mr.	MARUTI	DEEPAK	KALAI	DGKPK0929R	deepakkalai55@gmail.com	ASST PROFESSOR	Regular	MECHANICAL ENGINEERING	9/7/2020	N	Y	N	N	Male		29/4/1989
1-9319564478	Miss	RAGHUNATH	HEMLATA	PATIL	EZEPP2820N	hemlatapatil5462@gmail.com	ASST PROFESSOR	Regular	FIRST YEAR/OTHER	9/7/2020	N	Y	N	N	Female	Engineerin	15/8/1997
1-9324919651	Mr.	VIJAY	ROHIT	SAVYANAVAR	MECPS7774D	rohitsavyanavar1@gmail.com	ASST PROFESSOR	Regular	CIVIL ENGINEERING	21/7/2020	N	Y	N	N	Male		24/2/1997
1-9536597824	Miss	chandrakant	AMRUTA	KOLI	DDHPK5981B	amruta7.koli@gmail.com	LECTURER	Regular	ELECTRONICS & COMPUTER SCIEN(	1/7/2023	N	Y	N	N	Female		6/11/1993
1-9558396392	Mr.	MANOHAR	MANOJ	PATIL	DFQPP6225C	manojp1572@gmail.com	ASST PROFESSOR	Regular	MECHANICAL ENGINEERING	15/10/2020	N	Y	N	N	Male	ENGLISH	31/7/1992
1-10649043558	Mrs.	RAKESH	BHAGYASHRI	BHOSALE	BDPPD1099B	bhagyasgridesai06@gmail.com	ASST PROFESSOR	Regular	COMPUTER ENGINEERING	1/7/2023	N	Y	N	N	Female	ICT	6/10/1992
1-10650359641	Mrs.	SANJAY	ARATI	GAIKWAD	CZOPG3913K	aartigaikwad210207@gmail.com	LECTURER	Regular	CIVIL ENGINEERING	1/7/2021	N	Y	N	N	Female		6/11/1996
1-11316271918	Mr.	vidya arjun	SWAPNIL	ARYAN	BOCPK7871L	mrswapnilaryan@gmail.com	ASST PROFESSOR	Regular	COMPUTER SCIENCE & ENGINEERIN	1/8/2023	N	Y	N	N	Male		9/6/1991
1-11321615740	Miss	VITTAL	VAIBHAVI	CHOUGULE	CGJPC4470R	vaibhavichougule123@gmail.com	ASST PROFESSOR	Regular	CIVIL ENGINEERING	2/8/2021	N	Y	N	N	Female	Communic	25/11/1998
1-467647599	Mr.	SUBHASH	VINAYAK	BURUD	AVNPB8108J	vinayak.burud07@gmail.com	ASSOCIATE PROFESSOR	Regular	ELECTRONICS & COMPUTER SCIEN(	1/7/2023	Y	N	N	N	Male		3/7/1988
1-467647677	Mr.	TAYYABALI	IMRAN	PATEL	BIZPP5646R	patelitbe@gmail.com	ASSOCIATE PROFESSOR	Regular	MECHANICAL ENGINEERING	1/8/2023	Y	N	N	N	Male		27/2/1988
1-751523680	Mr.	APPASAHEB	MAHADEV	BANDI	AYGPB1633A	bandimahadev4@gmail.com	ASSOCIATE PROFESSOR	Regular	ELECTRONICS & COMPUTER SCIEN(	3/3/2023	Y	N	N	N	Male		9/7/1986
1-27901659361	Mr.	SADASHIV	KISHOR	JOSHI	ARFPJ9352E	kishorjoshinds@gmail.com	PRINCIPAL/DIRECTOR	Regular	MECHANICAL ENGINEERING	2/6/2014	N	Y	N	N	Male		12/12/1989
1-43364860241	Miss	VISHNU	SAPANA	GHORPADE	CKEPG7418L	sapnag1998@gmail.com	ASST PROFESSOR	Regular	CIVIL ENGINEERING	1/8/2022	N	Y	N	N	Female		11/8/1998
1-43364957180	Miss	RAVAN	PRIYANKA	TELVEKAR	BLTPT6906P	priyankatelvekar9067@gmail.com	ASST PROFESSOR	Regular	CIVIL ENGINEERING	1/8/2022	N	Y	N	N	Female	AMP	2/10/1999
1-43365118455	Miss	SADASHIV	SUNAYANA	SAWANT	IQCPS0653F	ssunayana16@gmail.com	ASST PROFESSOR	Regular	ELECTRICAL ENGINEERING	1/8/2022	N	Y	N	N	Female		15/5/1998
1-43365118494	Mr.		ASHISH	KAMBLE	KJKPK3868P	kambleashish138@gmail.com	ASST PROFESSOR	Regular	ELECTRICAL ENGINEERING	1/8/2022	N	Y	N	N	Male		22/2/1998
1-43365771041	Mr.	SUBHASHRAO	ANIRUDDHA	BHOI	BZUPB6018D	aniruddhabhoi1000@gmail.com	ASST PROFESSOR	Regular	MECHANICAL ENGINEERING	1/8/2022	N	Y	N	N	Male		4/6/1994
1-43366530751	Mr.	MADHUKAR	ABHAYSINGH	DESAI	BMKPD1068A	yashodhan96@gmail.com	ASST PROFESSOR	Regular	ELECTRICAL ENGINEERING	1/8/2022	N	Y	N	N	Male		24/3/1991
1-43366530794	Mr.	BALIRAM	SUMIT	DESAI	CHWPD2044L	sumit.d7081@gmail.com	ASST PROFESSOR	Regular	ELECTRICAL ENGINEERING	1/8/2022	N	Y	N	N	Male		6/6/1997
1-43366711055	Miss	Yashwant	YOGITA	MALAGEKAR	EYKPM7004J	yogitamalgekar2018@gmail.com	ASST PROFESSOR	Regular	ELECTRICAL ENGINEERING	1/8/2022	N	Y	N	N	Female		29/6/1996
1-43366798211	Miss	TUKARAM	SHRADHA	DUNDAGE	ICXPD2632C	shradhadundage@gmail.com	ASST PROFESSOR	Regular	CIVIL ENGINEERING	1/8/2022	N	Y	N	N	Female	ENGINEERI	11/10/1999
1-43366798264	Mr.		SHARAD	MULIK KILLEDA	APKPK0082R	sharadkilledar75@gmail.com	ASST PROFESSOR	Regular	MECHANICAL ENGINEERING	1/8/2022	N	Y	N	N	Male	COMMUNI	29/8/1976
1-43386480511	Mr.		BASAVARAJ	ANGADI	BEMPA5954A	klepolymlp@gmail.com	ASSOCIATE PROFESSOR	Regular	ELECTRICAL AND ELECTRONICS ENG	1/8/2023	Y	N	N	N	Male		31/7/1991
1-43474470427	Mr.	SHIVGONDA	VINAYAK	PATIL	BABPP3518E	pvinay28@gmail.com	ASSOCIATE PROFESSOR	Regular	CIVIL ENGINEERING	1/8/2023	Y	N	N	N	Male		28/10/1985
1-43510873527	Miss	Tukaram	SUPRIYA	SHINGATE	QBPPS7673H	supriya12.j.s@gmail.com	ASST PROFESSOR	Regular	ELECTRICAL ENGINEERING	3/4/2023	Y	Y	N	N	Female		12/5/2000
1-43529529026	Mr.		SHRIPAD	BAGADI	ARGPB1070L	spbagadi@gmail.com	ASST PROFESSOR	Regular	MECHANICAL ENGINEERING	1/8/2015	N	Y	Y	N	Male		31/1/1983
1-43531691227	Mr.		SURAJ	MURUKATE	EOTPM0494B	surajmurukate@gmail.com	ASST PROFESSOR	Regular	MECHANICAL ENGINEERING	1/4/2022	N	Y	N	N	Male		26/3/1997
1-43531691318	Miss	IRAPPA	SUDHA	PATIL	EGZPD0121G	sudhadarekar@gmail.com	ASST PROFESSOR	Regular	CIVIL ENGINEERING	1/4/2022	N	Y	N	N	Female		5/3/1993
1-43531691379	Mr.		NAMDEV	THOMBARE	BONPT2642M	thombarenamdev@gmail.com	ASST PROFESSOR	Regular	CIVIL ENGINEERING	1/4/2022	N	Y	N	N	Male		28/10/1993
1-43531691450	Mr.		PRAVIN	SAWANT	EUOPS9333G	pravin2022@gmail.com	ASST PROFESSOR	Regular	CIVIL ENGINEERING	1/4/2022	N	Y	N	N	Male		4/12/1988
1-43531691511	Mr.		DATTATRAY	PATIL	ENPPP3954Q	dattapatil@gmail.com	ASST PROFESSOR	Regular	CIVIL ENGINEERING	1/4/2022	N	Y	N	N	Male		27/4/1999
1-43531691572	Mr.		SOURABH	MURUKATE	FPEPM7902F	murukatesourabh@gmail.com	ASST PROFESSOR	Regular	COMPUTER SCIENCE & ENGINEERIN	1/4/2022	N	Y	N	N	Male		13/6/2000
1-43531691643	Mr.		VISHAL	CHOUGULE	AJCPC7797D	ads.civil2021@gmail.com	ASST PROFESSOR	Regular	CIVIL ENGINEERING	1/4/2022	N	Y	N	N	Male		19/3/1979
1-43855068779	Mr.	SATISH	AMIT	MADAKARI	AYZPM4449G	amit.madakari85@gmail.com	HOD	Regular	CIVIL ENGINEERING	1/8/2023	N	Y	N	N	Male		23/8/1985
1-43861913115	Miss	SUNIL	SNEHA	KUPEKAR	EPAPB9850N	sneha.bagave2000@gmail.com	ASST PROFESSOR	Regular	ELECTRICAL ENGINEERING	1/8/2023	N	Y	N	N	Female		2/11/2000
1-43862245170	Miss	ABDULMUNAF	RASHIDA	UTTURKAR	AKWPU4844Q	rashidautturkar@gmail.com	ASST PROFESSOR	Regular	COMPUTER SCIENCE AND ENGINEE	1/8/2023	N	Y	N	N	Female		21/6/2000

1-44128955415	Mr.	DARSHAN	DIWANI	CGQPD6658H	drashandiwani3@gmail.com	LECTURER	Regular	COMPUTER SCIENCE & ENGINEERIN	1/6/2023	Y	N	N	N	Female	29/12/1995

Annexure 5
Profile of Faculty

Dinkarrao K. Shinde Smarak Trust's

Dr. A. D. Shinde College of Engineering

Guddai, A/P: Bhadgaon, Tal: Gadhinglaj Dist: Kolhapur. PIN-416502

FACULTY PROFILE

Name	Prof.Rajesh.Maruti.Patil
Email	techlogic2020@gmail.com
Designation	Assistant Professor
Educational Qualification	MTech in computer science & engineering
Area of Interest/ Specialization	Machine Learning, Python C-programming, PHP, HTML, CSS etc.
Proposed Project Titles	

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FACULTY PROFILE

Name	Prof.Sourabh Murkate
Email	murukatesourabh@gmail.com
Designation	Assistant Professor
Educational Qualification	MTech in computer science & engineering
Area of Interest/ Specialization	Artificial Intelligence, Machine Learning, Python, C-programming, PHP, HTML, CSS etc.
Proposed Project Titles	

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Dr. A. D. Shinde College of Engineering

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FACULTY PROFILE

Name	Prof.Darshan A. Diwani	
Email	drashandiwani3@gmail.com	
Designation	Lecturer	
Educational Qualification	MTech in computer science & engineering	
Area of Interest/ Specialization	C-programming, PHP, HTML, CSS, Operating System etc.	
Proposed Project Titles		

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Guddai, A/P: Bhadgaon, Tal: Gadhinglaj Dist: Kolhapur. PIN-416502

FACULTY PROFILE

Name	Prof.Swapnil V.A. Aryan	
Email	Swapnilaryan.dadscoe@gmail.com	
Designation	Assistant Professor	
Educational Qualification	M.Tech Computer Science & IT	
Area of Interest/ Specialization	Web Development, Mobile Cloud Security, C-programming, PHP, HTML, CSS etc.	
Proposed Project Titles	An Efficient and Secure Real Time Location Proof Updating System.	

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FACULTY PROFILE

Name	Mr. Abhishek A. Magadum
Email	abhimagadum01@gmail.com
Designation	Assistant Professor
Educational Qualification	M. Tech
Area of Interest/ Specialization	Microcontroller & Microprocessor Internet of Things, Digital Electronics
Proposed Project Titles	1. Agriculture based projects using Arduino. 2. IOT based home automation.

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FACULTY PROFILE

Name	Mr. Mahadev A. Bandi
Email	bandimahadev4@gmail.com
Designation	Assistant Professor
Educational Qualification	ME Electronics
Area of Interest/ Specialization	Control System, Measurement, Automation, Instrumentation
Proposed Project Titles	1. Face Detection Project using Matlab. 2. Matlab Projects based on Fingerprint Recognition. 3. A Prototype for Blood Typing Based on Image Processing.

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FACULTY PROFILE

Name	Mr. Subhash Vinayak Burud
Email	Vinayak.burud07@gmail.com
Designation	Assistant Professor
Educational Qualification	ME Digital Communication
Area of Interest/ Specialization	Communication, Microcontroller
Proposed Project Titles	1. Embedded system-based projects. 2. Cloud based projects.

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FACULTY PROFILE

Name	Ms. Prachi Gosavi
Email	Prachigosavi93@gmail.com
Designation	Assistant Professor
Educational Qualification	M. Tech
Area of Interest/ Specialization	Microcontroller & Microprocessor Internet of Things, Digital Electronics
Proposed Project Titles	IOT based automation

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FACULTY PROFILE

Name	Ms. Amruta C. Koli	
Email	Amruta7.koli@gmail.com	
Designation	Assistant Professor	
Educational Qualification	M. Tech	
Area of Interest/ Specialization	Embedded system	
Proposed Project Titles	1. House monitoring embedded system 2. Wi Fi embedded webcam.	

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FACULTY PROFILE

Name	Mr.A.M.Desai
Email	Yashodhan96@gmail.com
Designation	Head Of Department
Educational Qualification	M.E. Electrical (Power System)
Area of Interest/ Specialization	Power System

Proposed Project Titles

1.Energy-Dissipating Hybrid Control for Power System Stabilization

2. Meshed Multiterminal HVDC Networks: Dynamics and Stability

3.Voltage Regulation in Distribution Networks with Fast Distributed Reactive Power Control

4.Recent trends in solar power system.

5.Prevention against electric theft in power system using three phase contactors.

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FACULTY PROFILE

Name	Mr.Sumit B. Desai	
Email	Sumit2gmail.com	
Designation	Asst. prof.	
Educational Qualification	M-tech(Energy)	
Area of Interest/ Specialization	Energy System Engineering	
Proposed Project Titles	1.Understanding Battery Performance in Solar System 2.Modelling the Impact of energy efficiency on energy demand	

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FACULTY PROFILE

Name	Mr.A.G.Kamble
Email	Kambleashish20@gmail.com
Designation	Asst.Prof
Educational Qualification	M-tech
Area of Interest/ Specialization	Power System
Proposed Project Titles	1.Current Source Inverter with Multiple Level 2.Multilevel Current Source Inverter for Balanced Unbalanced PV sources 3.Optimal Placement and Parameters Based on Multi-Objective Predictability

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FACULTY PROFILE

Name	Mr.B.A.Angadi
Email	basu853@gmail.com
Designation	Asst.Prof
Educational Qualification	M-tech
Area of Interest/ Specialization	Energy system engineering.
Proposed Project Titles	1.Implementation of Scaled Model of an HVDC System 2.Power Flow Analysis with Distributed Generation 3.Low Cost Electric Power Quality Monitoring System

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FACULTY PROFILE

Name	Miss.S.S.Bagave
Email	sneha.bagave2000@gmail.com
Designation	Asst.Prof
Educational Qualification	M-tech
Area of Interest/ Specialization	Power system
Proposed Project Titles	1. Modelling and Control of an Open-Loop Stepper Motor in Matlab/Simulink 2. Energy Storage Sharing Between the transmission and distribution of information

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FACULTY PROFILE

Name	Mr.S.C.Gandh
Email	Gandh.siddu@gmail.com
Designation	Asst.Prof
Educational Qualification	M-tech(Digital Electronics)
Area of Interest/ Specialization	Digital electronics
Proposed Project Titles	1.Microprocessor based scheme for measurement and display of speed of a motor 2.Microcontroller-based battery management system 3.Industrial Production Target Counter Display System

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FACULTY PROFILE

Name	Mr. Nadgouda A.M.
Email	nadgoudaamrut@gmail.com
Designation	Asst.Prof
Educational Qualification	ME Electronics
Area of Interest/ Specialization	Electronics
Proposed Project Titles	1.FIR Filter Investigation for Improving Delay Reduction & Power Efficiency 2. Health Monitoring System in Emergency using IoT.

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Guddai, A/P: Bhadgaon, Tal: Gadhinglaj Dist: Kolhapur. PIN-416502

FACULTY PROFILE

Name	Miss.A.S.Desai
Email	desai.amita92@gmail.com
Designation	Asst.Prof
Educational Qualification	M-Tech (power system)
Area of Interest/ Specialization	power system
Proposed Project Titles	1. Energy Storage Sharing Between the transmission and distribution of information 2. Optimal Placement and Parameters Based on Multi-Objective Predictability

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Guddai, A/P: Bhadgaon, Tal: Gadhinglaj Dist: Kolhapur. PIN-416502

FACULTY PROFILE

Name	Mr.A.M.Gadkari
Email	amitgadkari.mag@gmail.com
Designation	Asst.Prof
Educational Qualification	M-Tech (power system)
Area of Interest/ Specialization	power system
Proposed Project Titles	1.Implementation of Scaled Model of an HVDC System 2.Power Flow Analysis with Distributed Generation 3.Low Cost Electric Power Quality Monitoring System

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Dr. A. D. Shinde College of Engineering

Guddai, A/P: Bhadgaon, Tal: Gadhinglaj Dist: Kolhapur. PIN-416502

FACULTY PROFILE

Name	Miss.S.J.Shingate	
Email	supriya12.j.s@gmail.com	
Designation	Asst.Prof	
Educational Qualification	M-Tech (power system)	
Area of Interest/ Specialization	power system	
Proposed Project Titles	1. Energy Storage Sharing Between the transmission and distribution of information 2. Optimal Placement and Parameters Based on Multi-Objective Predictability	

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Dr. A. D. Shinde College of Engineering

Guddai, A/P: Bhadgaon, Tal: Gadhinglaj Dist: Kolhapur. PIN-416502

FACULTY PROFILE

Name	Miss.S.S.Sawant	
Email	ssunayana16@gmail.com	
Designation	Asst.Prof	
Educational Qualification	M-Tech (power system)	
Area of Interest/ Specialization	power system	
Proposed Project Titles	1.Understanding Battery Performance in Solar System 2.Modelling the Impact of energy efficiency on energy demand	

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FACULTY PROFILE

Name	Mrs.Y.Y.Malagekar
Email	yogitamalgekar2018@gmail.com
Designation	Asst.Prof
Educational Qualification	M-Tech (power system)
Area of Interest/ Specialization	power system
Proposed Project Titles	1. Modelling and Control of an Open-Loop Stepper Motor in Matlab/Simulink 2. Energy Storage Sharing Between the transmission and distribution of information

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FACULTY PROFILE

Name	Asst.Prof.S.T. Barge
Email	Shamal.barge@gmail.com
Designation	Asst.Prof. (H.O.D)
Educational Qualification	M.Sc (Mathematics) B.Ed
Area of Interest/ Specialization	Mathematics

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FACULTY PROFILE

Name	Mr.Sharad Anandrao Killedar
Email	Sharadkilledar75@gmail.com
Designation	Professor
Educational Qualification	M.A.,B.Ed. and M.B.A.(HRM)
Area of Interest/ Specialization	Teaching, Reading, Travelling and compering cultural programme
Proposed Project Titles	Working on script writing for various travelogues and proposed to publish in upcoming time.

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Dr. A. D. Shinde College of Engineering

Guddai, A/P: Bhadgaon, Tal: Gadhinglaj Dist: Kolhapur. PIN-416502

FACULTY PROFILE

Name	Prof. Miss. Hemlata Raghunath Patil
Email	hemlatapatil5462@gmail.com
Designation	Assistant Professor
Educational Qualification	M.Sc (Physics)
Area of Interest/ Specialization	Material Science
Proposed Project Titles	Synthesis and Characterization of Nickel Oxide Thin Film Electrode for supercapacitor Applications

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Dr. A. D. Shinde College of Engineering

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FACULTY PROFILE

Name	Prof Miss. S. T. Dundage
Email	shradhadundage@gmail.com
Designation	Asst.Prof.
Educational Qualification	M.Sc (Chemistry)
Area of Interest/ Specialization	Organic Chemistry
Proposed Project Titles	

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FACULTY PROFILE

Name	Prof . Shivanand S. Vantamure
Email	shivavantamure007@gmail.com
Designation	Assistant Professor
Educational Qualification	M.A. (English)
Area of Interest/ Specialization	English

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FACULTY PROFILE

Name	Asst. Prof. Snehal Sudhakar Yadavade
Email	snehalrandive@gmail.com
Designation	ASST. PROFESSOR
Educational Qualification	M. Sc. (Mathematics)
Area of Interest/ Specialization	Mathematics

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FACULTY PROFILE

Name	Prof. Aftbahamad Harunrashid Desai	
Email	Aftab.desai3@gmail.com	
Designation	Assistant Professor	
Educational Qualification	B.E.Civil	
Area of Interest/ Specialization	-	
Proposed Project Titles	1. Effect of Admixtures GGBS and Fly Ash on OMC and MDD of Black Cotton Soil.	

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FACULTY PROFILE

Name	Prof. Amit S. Madakari
Email	hodcivilads@gmail.com
Designation	Asst. Prof.
Educational Qualification	M. Tech (Structural Engg.)
Area of Interest/ Specialization	Optimization of Steel and Concrete Non Elastic Analysis of RCC Structures

Proposed Project Titles	• Investigating the use of machine learning (ML) in Civil Engineering • Investigating the use of artificial intelligence (AI) in Civil Engineering • Investigating the use of big data in Civil Engineering • Performance-based design of structures • Optimization of Steel Structures using Property Modifiers

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FACULTY PROFILE

Name	Prof. Dattatray Ashok Patil	
Email	patildatta1999@gmail.com	
Designation	Assistant Professor	
Educational Qualification	B.E.Civil	
Area of Interest/ Specialization	-	
Proposed Project Titles	1. Effect of Admixtures GGBS and Fly Ash on OMC and MDD of Black Cotton Soil.	

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Dr. A. D. Shinde College of Engineering

Guddai, A/P: Bhadgaon, Tal: Gadhinglaj Dist: Kolhapur. PIN-416502

FACULTY PROFILE

Name	**MISS.PRIYANKA RAVAN TELVEKAR**	
Email	**Priyankatelvekar9067@gmail.com**	
Designation	**ASSISTANT PROFESSOR**	
Educational Qualification	**DCE, BE CIVIL,M.Tech Pursuing**	
Area of Interest/ Specialization	**Construction Management**	
Proposed Project Titles	**I have presented the paper named as "Flow Analysis of River Using HEC-Ras Software." in international Journal IJRAR which is UGC approved of ISSN-2349-5138** **I have presented the paper named as "Low Cost Waste Water Treatment By Using Constructed Wetland" in international Journal IJRAR which is UGC approved of ISSN-2349-5138.**	

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FACULTY PROFILE

Name	Prof. Miss. Vaibhavee V. Chougule	
Email	vaibhavichougule123@gmail.com	
Designation	Asst. Prof.	
Educational Qualification	M. Tech	
Area of Interest/ Specialization	Construction Management	
Proposed Project Titles	1. Development of AI Based App for Construction Planning Management System. 2. Comparative Study on Strength Enhancement of Concrete Using Rubber Crumb, Magnetized and Normal Water. 3. Line of Balance Scheduling for Residential Building.	

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FACULTY PROFILE

Name	Prof. Digambar S. Khorate	
Email	digambarkhorate1997@gmail.com	
Designation	Asst. Professor	
Educational Qualification	M. Tech	
Area of Interest/ Specialization	Structural Engineering	
Proposed Project Titles	• Analysis and design of rotating bridge to provide easy access for roadway and water way • Experimental study on bubble deck beam using hdpe ball • A study of seismic behavior of tube structure	

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FACULTY PROFILE

Name	Prof. Mr. Rohit V. Savyanavar	
Email	rohitsavyanavar1@gmail.com	
Designation	Assistant Professor	
Educational Qualification	M. Tech	
Area of Interest/ Specialization	Construction Management	
Proposed Project Titles	1. Comparative Study on strength of concrete using rubber cum magnetic & magnetic water. 2. Experimental Study of tiles composed with waste plastic and carbon powder. 3. Automated highway system.	

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FACULTY PROFILE

Name	Prof. Prachi Kumbhar	
Email	prachikhumbhar12@gmail.com	
Designation	Asst. Professor	
Educational Qualification	M. Tech	
Area of Interest/ Specialization	Environmental Engineering	
Proposed Project Titles	• Effect of waste on soil quality. • Utilization of electromigration in civil and environmental engineering • Impact of sugar industry effluent on quality of groundwater at Rasulwadi-sambarwadi , Maharashtra india	

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FACULTY PROFILE

Name	Prof. Pooja Sanjay Shiragavi	
Email	Poojashiragavi1924@gmail.com	
Designation	Assistant Professor	
Educational Qualification	M. Tech	
Area of Interest/ Specialization	Structural Engineering	
Proposed Project Titles	1. "Experimental study of bubbled beam using HDPE balls" 2. "Seismal response of RCC structure with tunned Liquid damper"	

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FACULTY PROFILE

Name	Prof. Sapana Vishnu Ghorpade
Email	Sapanag1998@gmail.com
Designation	Asst. Professor
Educational Qualification	B. E.
Area of Interest/ Specialization	Civil Engineering
Proposed Project Titles	• Design of Sewage Treatment Plant for Gadhinglaj City.

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FACULTY PROFILE

Name	Mr. Suraj R. Wadagule
Email	surajdadscoe@gmail.com
Designation	Assistant Professor
Educational Qualification	Master of Technology
Area of Interest/ Specialization	Structural Engineering

Proposed Project Titles	• Seismic Analysis of Tube Structure Using Staad Pro. • Comparative Study of Seismic Behavior of Framed Tube Structure & Tube in Tube Structure. • Earthquake Resistant Building Design by Base Isolation Method. • Partial Replacement of Fine Aggregate by Using Glass Powder. • Refuse of Plastic Waste in Tiles.

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FACULTY PROFILE

Name	Prof. Vishal C. Chougule	
Email	arunachougule20@gmail.com	
Designation	Asst. Professor	
Educational Qualification	B. E.	
Area of Interest/ Specialization	Civil Engineering	
Proposed Project Titles		

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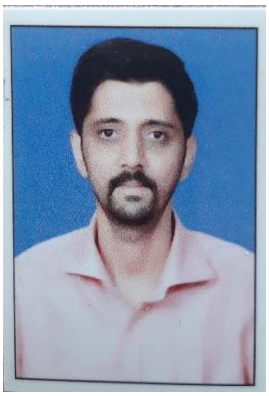
Dr. A. D. Shinde College of Engineering

Guddai, A/P: Bhadgaon, Tal: Gadhinglaj, Dist: Kolhapur. PIN-416502

FACULTY PROFILE

Name	Prof. Mr. Vinayak Shivgonda Patil
Email	pvinay28@gmail.com
Designation	Assistant Professor
Educational Qualification	DCRE, B.E. CIVIL, M.E. CIVIL
Area of Interest/ Specialization	Construction Management
Proposed Project Titles	• Low cost housing • Traffic volume study for Gadhinglaj municipal council • Waste marble chips as coarse aggregate in concrete • Construction of concrete road by using waste material



Annexure 6
Information of Infrastructure and Other Resources Available, Occupancy Certificate, Library\List of Major Equipment/Facilities in Each Laboratory/Workshop

Dinkarrao K. Shinde Smarak Trusts

DR. A. D. SHINDE COLLEGE OF ENGINEERING.

Bhadgaon, Gadhinglaj. Dist: Kolhapur Pin:416502

Academic Year 2023-24

Department of Computer Science and Engineering

Computer Science and Engineering Laboratory

Class	Semester	Name of Laboratory	Total Cost
SY B.Tech	III	Programming Lab- I	3,30,000
		Networking Lab	3,16,000
	IV	Programming Lab- I	3,30,000
		Networking Lab	3,16,000

HOD
Computer Science & Engineering
Dr.A.D.Shinde College of Engineering
A/P.Bhadgaon,Tal.Gadhinglaj

Dinkarrao K. Shinde Smarak Trusts

DR. A. D. SHINDE COLLEGE OF ENGINEERING.

Bhadgaon, Gadhinglaj. Dist: Kolhapur Pin:416502

Academic Year 2023-24

Department of Computer Science and Engineering

Computer Science and Engineering Laboratory

Class	Semester	Name of Laboratory	Name of Equipment	Quantity	Rate	Total Cost
SY B.Tech	III	Programming Lab-I	Desktop with Core i5,6th generation RAM: 8 GB DDR IV RAM, HDD: 512 GB SSD HP keyboard, Mouse Monitor: 18.6" 24 Port Switch	22 01	16000 8000	3,60,000
		Networking Lab	Desktop with Core i5,6th generation RAM: 8 GB DDR IV RAM, HDD: 512 GB SSD HP keyboard, Mouse Monitor: 18.6" 24 Port Switch	22 01	14000 8000	3,16,000
	IV	Programming Lab-I	Desktop with Core i5,6th generation RAM: 8 GB DDR IV RAM, HDD: 512 GB SSD HP keyboard, Mouse Monitor: 18.6" 24 Port Switch	22 01	16000 8000	3,60,000
		Networking Lab	Desktop with Processor: Intel Core i5,6th generation RAM: 8 GB DDR IV RAM, HDD: 512 GB SSD HP keyboard, Mouse Monitor: 18.6" 24 Port Switch	22 01	14000 8000	3,16,000

Dr. A. D. Shinde College of Engineering, A/P. Bhadgaon, Tal. Gadhinglaj

HOD
Computer Science & Engineering
Dr.A.D.Shinde College of Engineering
A/P.Bhadgaon,Tal.Gadhinglaj

Dinkarrao K. Shinde Smarak Trusts

DR. A. D. SHINDE COLLEGE OF ENGINEERING.

Bhadgaon, Gadhinglaj. Dist: Kolhapur Pin:416502

Academic Year 2023-24

Department of Computer Science and Engineering

Computer Science and Engineering Laboratory

Class	Semester	Name of Laboratory	Name of Equipment	Quantity	Rate	Total Cost
SY B.Tech	III	Programming Lab-I	Desktop with Core i5,6th generation RAM: 8 GB DDR IV RAM, HDD: 512 GB SSD HP keyboard, Mouse Monitor: 18.6" 24 Port Switch	22 01	16000 8000	3,60,000
		Networking Lab	Desktop with Core i5,6th generation RAM: 8 GB DDR IV RAM, HDD: 512 GB SSD HP keyboard, Mouse Monitor: 18.6" 24 Port Switch	22 01	14000 8000	3,16,000
	IV	Programming Lab-I	Desktop with Core i5,6th generation RAM: 8 GB DDR IV RAM, HDD: 512 GB SSD HP keyboard, Mouse Monitor: 18.6" 24 Port Switch	22 01	16000 8000	3,60,000
		Networking Lab	Desktop with Processor: Intel Core i5,6th generation RAM: 8 GB DDR IV RAM, HDD: 512 GB SSD HP keyboard, Mouse Monitor: 18.6" 24 Port Switch	22 01	14000 8000	3,16,000

Dr. A. D. Shinde College of Engineering, Bhadgaon, Tal. Gadhinglaj

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A/P.Bhadgaon,Tal.Gadhinglaj

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Bhadgaon, Gadhinglaj. Dist: Kolhapur Pin:416502

Department of Civil Engineering

Academic Year 2023-24

Sr. No.	Name of Laboratory	Cost
1	Applied Mechanics	1,35,898/-
2	Concrete Technology	64,460/-
3	Fluid Mechanics	1,84,854/-
4	Geo-Technical Engineering	92,985/-
5	Strength of Material	5,03,256/-
6	Surveying	7,06,232/-
7	Transportation Engineering	1,46,825/-
8	Environment Engineering	**2,13,683/-**
	Total amount in Rs. – 20,48,193/- In Words – Twenty Lacs Forty Eight Thousand Six Hundred & Ninety Three Only.	

Name of Lab: TRANSPORTATION ENGINEERING LABORATORY			
Sr. No.	**Name of Equipment**	**Quantity**	**Total Price**
1	Aggregate Impact Testing Machine	01	11,000
2	IS Sieves Set	09	8,325
3	Tamping Rod	01	300
4	Weighing Machine	01	9,900
5	Ring And Ball Apparatus	01	2,200
6	Flash And Fire Point	01	8,000
7	Briquette Mould	01	7,000
8	Metal Tray	02	2,200
9	Ductility Testing Machine	01	5,900
10	Loss Angeles Machine	01	84,000
11	Standard Penetrometer	01	8,000
	Total amount in Rs.		**1,46,825/-**

Name of Lab: SURVEYING LABORATORY			
Sr. No.	**Name of Equipment**	**Quantity**	**Total Price**
1	Ranging Rod (Length 2m)	20	7,000
2	Stand For Ranging Rod	02	4,300
3	Line Rangers Fitted With Double Prisms	02	2,000
4	Metric Chain (length 20m)	05	6,000
5	Metric Chain (length 30m)	05	8,250
6	Fiber Glass Tape (length 15m)	10	4,500
7	Fiber Glass Tape (length 30m)	10	8,500
8	Prismatic Compass With Tripod:100 mm Dia	05	22,500
9	Survey Compass With Stand	05	17,500
10	Dumpy Level with Stand (size 300mm)	05	40,000
11	Mechanical Planimeter	01	1,650
12	Digital Planimeter	01	54,000
13	Auto level With Telescopic Aluminium Stand(SUN)	04	54,000
14	Auto level With Telescopic Aluminium Stand(JOGGER 24)	04	70,000
15	Abeny Level:5”	01	1,500
16	Clinometer Compass (75mmDia)	01	1,350
17	Box Sextant	01	2,500

18	Survey Umbrella	01	12,000
19	Cross staff :Open Cross Staff With Steel Pole	05	2,750
20	Aluminium Levelling Staff with Canvas cover	05	13,500
21	Spirit Level:6” Bubble Tube	05	1,000
22	Plane Table Complete With Wooden Tripod Stand	04	26,000
23	Telescopic Alidade 175 mm,Internal Focusing	02	15,000
24	Theodolite With Tripod Stand	02	24,300
25	Dumpy Level With Tripod Stand	02	10,000
26	Ghat Tracer	02	2,016
27	Notical Sextant	01	4,190
28	Cross Staff With Aluminium Pole	02	856
29	Optical Square Type Prism type	02	1,175
30	Line Ranger	02	1,175
31	Notical Sextant	02	13,965
32	Cross Staff With Aluminium Pole	02	855
33	Theodolite	01	4,300
34	Total Station	01	3,15,000
35	Substance Bar	01	1,800
36	Fiber Tape(15m) Lenght	04	2,200
37	Fiber Tape(30m) Lenght	04	2,600
	Total amount in Rs.		**7,06,232/-**

Name of lab : Strength of Material			
Sr. No.	**Name of Equipment**	**Quantity**	**Total Price**
1	Rockwell Cum Brinell Hardness Tester	01	18,900.00
2	Torsion Testing Machine	01	70,875.00
3	Impact Testing Machine	01	38,475.00
4	Universal Testing Machine(1000KN)	01	3,75,006.00
	Total amount in Rs.		**5,03,256.00/-**

Name of Lab: GEOTECHNICAL ENGINEERING LABORATORY			
Sr. No.	**Name of Equipment**	**Quantity**	**Total Price**
1	Desiccator	01	2900
2	Non-Corrodible Air	06	210
3	Is Sieve Set	09	8325
4	Weighing Balance	01	9900
5	Liquid Limit Device	01	12000
6	Grooving Tools	02	200
7	Mixing Dishes	02	400
8	Spatula	02	1000
9	Glass Plate	02	300
10	Cylindrical Core Cutter	01	1500
11	Steel Rammer	01	150
12	Steel Dolly	01	150
13	Sand Pouring	01	1500
14	Micrometer Dial Gauge	01	1500
15	Glass Measuring	01	750
16	Evaporating Dish	01	100
17	Conical Flask	02	100
18	Direct Shear Box	01	52000
	Total amount in Rs.		**92,985/-**

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Bhadgaon, Gadhinglaj. Dist: Kolhapur Pin:416502

Department of Civil Engineering

Academic Year 2023-24

Name of Lab: FLUID MECHANICS			
Sr. No.	**Name of Equipment**	**Quantity**	**Total Price(Rs)**
1	Bernoulli's Theorem Apparatus	01	22642/-
2	Losses in Pipe Friction	01	20032/-
3	Losses in Fitting	01	21337/-
4	Notches & weir Apparatus	01	24599/-
5	Orifice & Orifice Apparatus	01	19379/-
6	Venturimeter & Orifice Apparatus	01	25252/-
7	Pressure Measurement Device	01	23294/-
8	Reynolds Apparatus	01	16117/-
9	Metacentre height of Ship Model	01	12202/-
	Total amount in Rs.		**1,84,854/-**

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Department of Civil Engineering

Academic Year 2023-24

Name of lab : **APPLIED MECHANICS LABORATORY**			
Sr. No.	**Name of Equipment**	**Quantity**	**Total Price**
1	Law of Polygon Force Apparatus	02	16000
2	Bell Crank Lever Apparatus	02	9000
3	Jib Crane Apparatus	02	15000
4	Parallel Force Apparatus	02	45000
5	Centrifugal force apparatus	02	34000
6	Fletcher Trolley	02	25000
7	Slotted Weight	10	7380
8	Conical Weight	5	2700
9	Physical Weight Box	02	2400
10	Spirit Level 6 Inch	02	400
	Total amount in Rs.		**1,35,898 /-**

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Bhadgaon, Gadhinglaj. Dist: Kolhapur Pin:416502

Department of Civil Engineering

Academic Year 2023-24

Name of Lab: CONCRETE TECHNOLOGY LABORATORY			
Sr. No.	**Name of Equipment**	**Quantity**	**Total Price**
1	IS Sieve Set	09	11000
2	Weighing Balance	01	9900
3	Vicat Apparatus	01	2700
4	Gauging Trowel	04	600
5	Graduated Glass Cylinder	01	550
6	Le- Chatlier's Apparatus	01	1200
7	Measuring Cylinder	01	550
8	Pycnometer Bottle	03	7500
9	Funnel	02	100
10	Wire Basket	01	900
11	Slump Cone	01	1800
12	Steel Scale	02	400
13	Mixing Tray	02	2200
14	Rebound Hammer	01	15000
15	Scoop	05	250
16	Specimen Mould	04	3960
17	Vicat Needles	01	100
18	Pocking Rod	03	1050
19	Mechanical Sieve Shaker	01	3200
20	Mixing Pan	01	1500
	Total amount in Rs.		**64,460/-**

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Department of Civil Engineering

Academic Year 2023-24

Name of lab :Environmental Engineering Lab			
Sr. No.	**Name of Equipment**	**Quantity**	**Total Price**
1	Pair of tongue	09	270
2	Spatulla	24	288
3	Rubber tubbing small size	04	120
4	Test tube stand	20	700
5	Test tube holder	12	180
6	Burette stand	12	3300
7	Beaker with spout 250ml	10	200
8	Desicator 4; with lead	05	2375
9	Viscometer U shape	18	180
10	Crussible 25ml with lid	04	140
11	Burette 25ml with Teflon cock	06	1050
12	Pipette 25ml	20	1500
13	Pipette 10ml	20	1100
14	Conical flask 250ml	20	760
15	Measuring cylinder 10ml	20	1100
16	Beaker 25ml	20	820
17	Glass funnel 3”	20	900
18	Glass stirring rod 8”	20	2000
19	Burette 25ml with pinch cock	14	1400
20	Test tube 15*125mm	100	1200
21	Test tube 18*150mm	100	1600
22	Reagent bottle 250ml	60	3600
23	Winchester bottle cap 5lit	03	1650
24	Brush for test tube	36	500
25	Wash bottle cap 500ml plastic	06	250

26	Digital PH meter	01	9500
27	Digital conductivity meter	01	11500
28	Digital potentiometer	01	13500
29	Digital photo colorimeter	01	12500
30	Digital spectrophotometer	01	42500
31	Digital electronic weighing balance	01	12000
32	Distillation unit	01	8500
33	Rectangular muffle furnace	01	34500
34	Electronic hot air oven	01	19500
35	Glass distillation unit	01	22500
	Total amount in Rs.		**2,13,683/-**

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Bhadgaon, Gadhinglaj. Dist: Kolhapur Pin:416502

Department of Electrical Engineering

Academic Year 2023-24

Electrical Engineering lab list

Class	SEM	Name of the lab	Location
FE	I	Basic Electrical	L1
	II	Basic Electronics	L5
SE	III	Analog Electronics Engineering	L5
		Electrical Measurement	L4
		C-Programming	Computer lab
	IV	DC Machine & Transformer	L2
		Power Electronics	L5
		Control System-I	Computer lab
		Electromagnetics	L4
TE	V	Ac Machines	L3
		Power System-II	Computer lab
		Digital Electronics & Microcontroller	L5
		Control System-II	Computer lab

	VI	Electrical Drives-I	L3
		Electrical Machine Design	Drawing hall
BE	**VII**	Advanced Switchgear & Protection	L2
		Computer Methods In Power System	Computer lab
	VIII	HVDC System	Computer lab

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DR.A. D. SHINDE COLLEGE OF ENGINEERING.

Bhadgaon, Gadhinglaj. Dist: Kolhapur Pin:416502

Department of Electrical Engineering

Academic Year 2023-24

Basic Electrical Lab

Sr.No	Name of Equipment	Quantity	Rate /Unit in Rs.	Amount
1	Verification of kirchhoffs law	01	2700/-	2,700
2	Study of R-L-C Series circuit	02	8000/-	16,000
3	a. Wiring on board to study and operae 2 lamp,controlled by 2 switch	01	3500/-	3,500
	b. Staircase wiring using casing capping	01	3,500/-	3,500
	c. Godown wiring using casing capping	01	3,500/-	3,500
4	Working of electric lamps			
	a. Mercury vapor lamp	01	5200/-	5,200
	b. Sodium vapor lamp	01	6500/-	6,500
	c. Metal halide (MH) lamp	01	6500/-	6,500
5	Determination of resisteance and insuctance of a choke coil by voltmeter ammeter method	01	15,500/-	15,500
6	30MHz dual trace CRO: Scientech, MODEL:801	02	19,850/-	39,700
7	30MHz dual trace CRO: Scientech, MODEL:801c	02	20,850/-	41,700
8	Function generator : 1MHz, Scientech, MODEL:4060	02	8,950/-	17,900
9	Function generator : 3MHz, Scientech, MODEL:4061	02	11,500/-	23,000
10	Single DC regulator power supply: 0-30V,2A	02	5,500/-	11,000
11	Dual DC Regulator power supply: 30-0-30V,2A	02	8,500/-	17,000
12	Digital multimeter			
	a. Make : Meco model :603	05	1750/-	8,750
	b. Make : Meco model :9A06	05	2200/-	11,000
	c. Make : Meco model :801 AUTO	05	2650/-	13,250
13	Analog Multimeter	02	1700/-	3400
Total =				**249,600**
Net Amount (discount)				**216,216.00**

Lab in-charge

D.R.A.D. Shinde College of Engineering Bhadgaon • Tal.Gadhinglaj •

HOD

Dinkarrao K. ShindeSmarak Trusts

DR.A. D. SHINDE COLLEGE OF ENGINEERING.

Bhadgaon, Gadhinglaj. Dist: Kolhapur Pin:416502

Department of Electrical Engineering

Academic Year 2023-24

Basic Electronics Lab

Sr.No	Items	Quantity	Amount
1	Basic electronics kit	--	25000
2	CRO	04	80000
3	Function Generator	02	20000
4	Multimeter	04	16000
5	Components (Active & passive Elements)	--	47000
Total =			**188000**

Lab in-charge

HOD

College of Engineering Bhadgaon • Dr. A. D. Shinde • Tal. Gadhinglaj

Dinkarrao K. ShindeSmarak Trusts

DR.A. D. SHINDE COLLEGE OF ENGINEERING.

Bhadgaon, Gadhinglaj. Dist: Kolhapur Pin:416502

Department of Electrical Engineering

Academic Year 2023-24

Analog Electronics Engineering

Sr.No	Name of Equipment	Quantity	Amount
1	Study of various TypeClippers Trainer Kit	01	1823
2	Study of various Type Clampers Trainer Kit	01	1823
3	Study of 2 stage RCcoupled Amplifier Trainer kit	01	1823
4	Study of FET as anAmplifier trainer Kit	01	1823
5	Study of VI characteristics of UIT Trainer Kit	01	1823
6	Op-Amp as Inverting and Non-inverting and Amplifier	01	1823
7	Active Peak detector usingOp-amp Trainer Kit	01	2235
8	MonostableMultivibrator 01using IC 555	01	2235
9	Astablemultivibratorusing IC 741 trainer kit /5551C	01	2235
Total =			**17,640**

Lab in-charge

HOD

College of Engineering Bhadgaon • Dr.A.D.Shinde • Tal.Gadhinglaj

Dinkarrao K. ShindeSmarak Trusts

DR.A. D. SHINDE COLLEGE OF ENGINEERING.

Bhadgaon, Gadhinglaj. Dist: Kolhapur Pin:416502

Department of Electrical Engineering

Academic Year 2023-24

Electrical Measurement

Sr.No	Name of Equipment	Quantity	Amount
1	Wattmeter : 2.5A/5A, 0-150-300-600V, UPF	02	3,119.00
2	C: Lamp Load Bank(3-0,230V,10A)	01	7,472.00
3	Inductive Load Bank (3-0,415V,10A)	01	1,5775.00
4	Capacitive Load Bank (3-0,415V,10A)	01	10,517.00
5	Wheatstone Meter Bridge	01	657.00
6	BE-9 Study of Maxwell Bridge	01	7,,423
7	LVDT Module	01	13,838.00
8	Weight Measurement Using Strain Gauge	01	7,703.00
9	RTD Module	01	8,100.00
Total =			**74,604.00**

Lab in-charge

HOD

College of Engineering Bhadgaon • Dr.A.D.Shinde • Tal.Gadhinglaj

Dinkarrao K. ShindeSmarak Trusts

DR.A. D. SHINDE COLLEGE OF ENGINEERING.

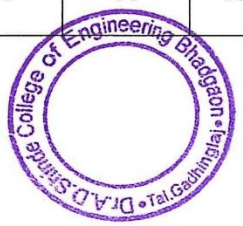
Bhadgaon, Gadhinglaj. Dist: Kolhapur Pin:416502

Department of Electrical Engineering

Academic Year 2023-24

DC Machine & Transformer Lab

Sr.No	Name of Equipment	Quantity	Rate/Unit in Rs.	Amount
1	To determine % efficiency and % regulation of a single phase transformers by direct laoding: Table mounted with complete cicuit diagram, complete setup	01	55,000/-	55,000
2	B-H curve	01	8,900/-	8,900.00
3	1HP DC Shunt machine with mechanical loading arrangement : with table mounted control panel	01	54,500/-	54,500.00
4	Rectifier : (SCR based), 20A capacity	01	45,000/-	45,000.00
5	1 HP Induction motor with mechanical loading arrangement: with table mounted control panel	01	54,500/-	54,500.00
6	Portable type DC voltmeter (0-150-300V)	02	1,800/-	3,600.00
7	Portable type AC ammeter (0-10-20A)	02	1,800/-	3,600.00
8	Portable type DC ammeter (0-10-20A)	02	1,800/-	3,600.00
9	Portable type AC ammeter (0-5-10A)	02	1,800/-	3,600.00
10	Portable type DC ammeter (0-5-10A)	02	1,800/-	3,600.00
11	Tachometer			
	a. Contact type tachometer : 60-50000RPM	01	3,500/-	3,500.00
	b. Analog type tachometer : make: fuji,japan	01	9,500/-	9500.00
12	Portable wattmeter : 1Ph,single element type UPF ::5/10A,150-300-600V	03	4,500/-	13,500.00
13	Portable wattmeter : 1Ph,single element type LPF ::5/10A,150-300-600V	03	5,500/-	16,500.00
14	Rheostat			
	a. 440Ω-1A	02	2,500/-	5000.00
	b. 300Ω-1.4A	02	2,500/-	5000.00
	c. 150Ω-2A	02	3,000/-	6,000.00
	d. 110Ω-2.5A	02	3,500/-	7,000.00
	e. 290Ω-2.8A	02	5,000/-	10,000.00
	f. 100Ω-5A	02	7,500/-	15,000.00
	g. 40Ω-10A	02	11,500/-	23,000.00
15	1-Ph Autotransformer –I/P:230V AC.50Hz.O/P: 0-270V AC, output current 8A	01	8,000/-	8,000.00
16	3-Ph Autotransformer –I/P:440V AC, 50Hz. O/P: 0-470V AC, output current 10A	01	16,500/-	16,500.00



17	1-Ph transformer- 1KVA	01	7,500/-	7500.00
18	3-Ph transformer- 1KVA	01	18,000/-	18,000.00
19	Fabricated & Power Coated Ac Supply Terminal Boards	05	5,500/-	27,500.00
20	Fabricated & Power Coated DC Supply Terminal Boards	05	3,500/-	17,500.00
21	Megger : hand driven, 500V,100M Ω	01	3,500/-	3,500.00
22	Earth resistance tester: (4 terminal type)	01	5,500/-	5,500.00
23	Phase sequence indicator (rotor type)	01	2,900/-	2,900.00
24	Single phase portable power factor meter : single element, dynamometer type, range: 0.1 capacitive to 0.1 inductive ,2.5 A ,250V	01	4,500/-	4,500.00
25	Three phase power factor meter :range : 0.5 lead to 0.5 lag,current- 5A or1A,440 V	01	5,500/-	5,500.00
26	Mains frequency meter	01	2,500/-	2,500.00
27	Current transformer : Primary taps : 10,20,30,50 & 100A & secondary taps : 5A	01	4,500/-	4,500.00
28	Voltage transformer : Primary taps : 0 to 250V & secondary taps : 75/150/300/600V	01	4,500/-	4,500.00
29	Digital multimeter			
	Make: Meco, Model :603	05	1,750/-	8,750.00
	Make: Meco, Model :9A06	05	2,200/-	11,000.00
	Make: Meco, Model :801AUTO	05	2650/-	13250.00
30	Digital clamp meter			
	Make: Meco, Model :3150	02	2,650/-	5,300.00
	Make: Meco, Model :2250 Hz AUTO	02	2,900/-	5,800.00
Total				**5,22,400.00**
Net amount after discount				**452,529.00**

Lab in-charge

HOD

D.R.A.D. Shinde College of Engineering Bhadgaon • Tal.Gadhinglaj •

Dinkarrao K. ShindeSmarak Trusts

DR.A. D. SHINDE COLLEGE OF ENGINEERING.

Bhadgaon, Gadhinglaj. Dist: Kolhapur Pin:416502

Department of Electrical Engineering

Academic Year 2023-24

Power Electronics Lab

Sr.No	Name of Equipment	Quantity	Amount
1	SCR ,MOSFET,IGBT,TRIAC,DIAC characteristics	01	23415
2	1 phase & Bridge Controller	01	24576
3	1phase Dual Converter	01	33947
4	Cycloconverter	01	25041
5	Jones Chopper	01	13937
Total =			**120916**

Lab in-charge

HOD

Dinkarrao K. ShindeSmarak Trusts

DR.A. D. SHINDE COLLEGE OF ENGINEERING.

Bhadgaon, Gadhinglaj. Dist: Kolhapur Pin:416502

Department of Electrical Engineering

Academic Year 2023-24

Ac Machines Lab

Sr.NO	Description	Quantity	Rate	Total cost
01	3phase dimmer	02`	3040	6080
02	Ac supply box	02	3161	6322
03	Inductive load bank	01	15775	15775
04	Single phase 1 KVA transformer	01	2000	2000
05	Parallel operation of 3 phase alternator dc shunt motor set 3 KW DC 2 KVA altr	02		67567
06	Synchronizing control panel alternator set and dc shunt motor	01	33783	33783
06	Synchronous motor 3 hp 3 phase copupled to dc shunt motor (generator)	01	33523	33523
07	Control panel with dc exciter for synchronous motor and dc generator	01	15332	15332
08	1 phase induction motor with mechanical loading	01	10135	10135
09	Control panel of 1 phase induction motor	01	12733	12733
10	Wattmeter 2.5 -5 amp ,150,300,600 volt	02	2598	5197
11	AC ammeter 0-2amp, 0-5amp	02	1645	3290
12	AC ammeter 0-10 amp	02	1645	3291
13	DC ammeter 0-10amp	02	1645	3291
14	AC volt meter ,300v	02	1645	3291
15	AC volt meter 0-600v	01	1645	1645
16	DC volt meter 0-300v	03	1645	4937

17	Current Trsansformer	01	1800	1800
18	Potential Transformer	01	1800	1800
19	1 phase 1KVA	01	2000	2000
20	1phase Dimmer 270 v/4A,2A	02	3040	6080
21	Rheostat 100Oohm,5A	04	4764	19058
Total Cost				253839

Lab In-charge

HOD

College of Engineering Bhadgaon Dr.A.D.Shinde Tal.Gadhinglaj

Dinkarrao K. ShindeSmarak Trusts

DR.A. D. SHINDE COLLEGE OF ENGINEERING.

Bhadgaon, Gadhinglaj. Dist: Kolhapur Pin:416502

Department of Electrical Engineering

Academic Year 2023-24

Electrical Drives Lab

Sr.No.	Name of Equipment	Quantity	Amount
1	DC Motor Speed Control Demonstration	1	12000/-
2	Single Phase fully Controlled Bridge Converter	1	6300/-
3	3 Phase Induction Motor Controlled with IGBT Inverter	1	1800/-
4	3 Phase Induction Motor Speed Controller	1	14000/-
5	3 Phase Fully Controlled Bridge Converter	1	6300/-

Lab In-charge

HOD

Dr.A.D.Shinde College of Engineering Bhadgaon Tal.Gadhinglaj

Dinkarrao K. ShindeSmarak Trusts

DR.A. D. SHINDE COLLEGE OF ENGINEERING.

Bhadgaon, Gadhinglaj. Dist: Kolhapur Pin:416502

Department of Electrical Engineering

Academic Year 2023-24

Switchgear & Protection Lab

Sr. No.	Name of Materials	Qty.	Cost	Amount
1.	Electro Mechanical type Over Voltage Relays Kit with source Unit.	1No.	50,000-00	50,000-00
2.	Electro Mechanical type Over Current Relays Kit with source Unit.	1No.	50,000-00	50,000-00
3.	Micro Processor based Over Current Relay with source Unit	1No.	50,000-00	50,000-00
4.	Micro Processor based Over Current Relay with source Unit	1No.	60,000-00	60,000-00
5.	Micro Processor based E/F included over, under voltage and over current and phase Fault Relay Kit with source Unit. With 1hp induction motor. (simulation panel of 3phase induction motor)	1No.	60,000-00	60,000-00
			TOTAL	2,70,000-00
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		----------		----------
			TOTAL AMOUNT	**2,70,000-00**

Lab In-charge

HOD

Dr. A. D. Shinde College of Engineering Bhadgaon • Tal. Gadhinglaj

Dinkarrao K. ShindeSmarak Trusts

DR.A. D. SHINDE COLLEGE OF ENGINEERING.

Bhadgaon, Gadhinglaj. Dist: Kolhapur Pin:416502

Department of Electrical Engineering

Academic Year 2023-24

Electromagnetics Lab

Sr.No	Name Of Equipment	Quantity	Amount
1	Bernouli Theorem Apparatus	--	2000
2	Superposition Theorem	--	2000
3	Maximum Power Transfer kit	--	2000
Total =			**6000**

Lab in-charge

HOD

D.A.D.Shinde College of Engineering Bhadgaon • Tal.Gadhinglaj •

Dinkarrao K. ShindeSmarak Trusts

DR.A. D. SHINDE COLLEGE OF ENGINEERING.

Bhadgaon, Gadhinglaj. Dist: Kolhapur Pin:416502

Department of Electrical Engineering

Academic Year 2023-24

Computer Lab

Sr No.	Name Of Equipment	Quantity	Amount
1	computer	10	2,00,000
2	MATLAB Software	-	2,50,000
Total			4,50,000

DR. A. D. SHINDE COLLEGE OF ENGINEERING

DADS COE

Dinkarrao K. Shinde SmarakTrust's

Dr. A.D. Shinde College ofEngineering

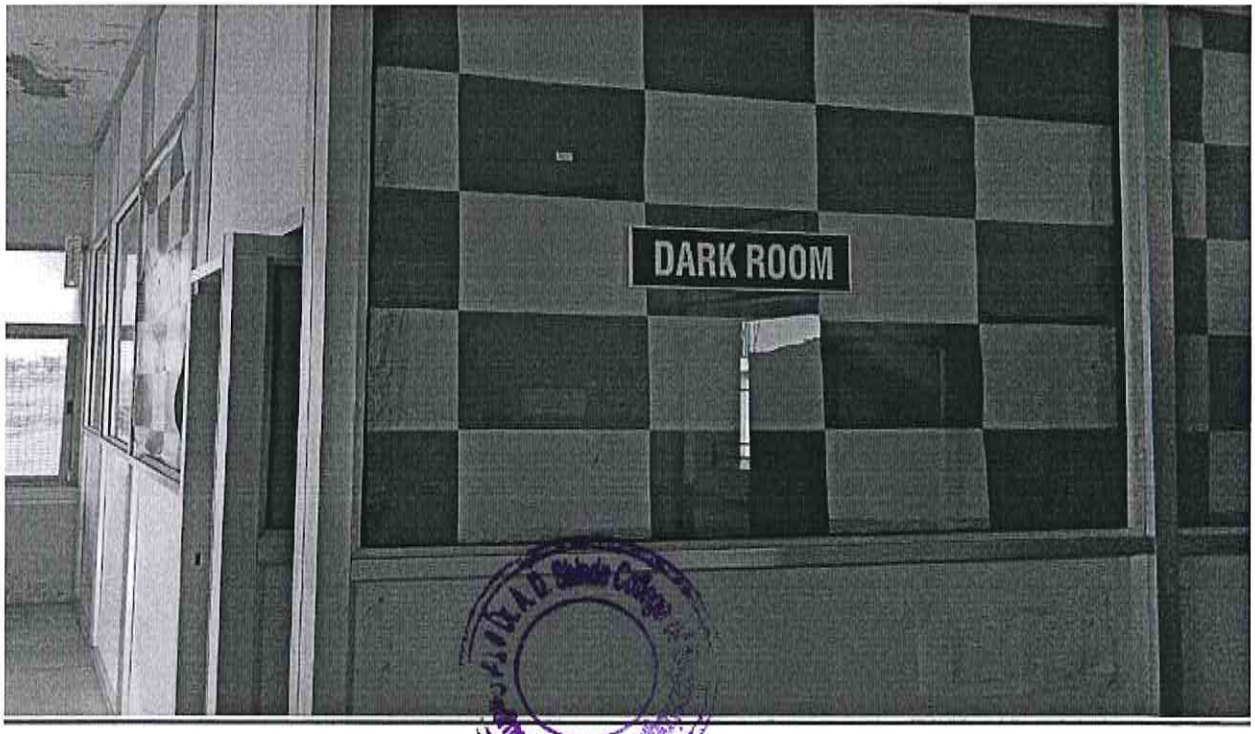
Guddai, Bhadgaon, Tal: - Gadhinglaj, Dist: -Kolhapur

Department of General science&Humanities

PHYSICS LAB COSTING

Sr.NO.	Name of Equipment	Qty	Rate	Total cost
1	Spectometer 6" Brass scale	01	6750	6750
2	Meter scale full wooden	10	110	1100
3	Meter scale half wooden	10	55	550
4	Vernier Calliper with wheel	08	10	800
5	Micrometer screw gauge	10	200	2000
6	Weight box physical cap 100gms	01	475	475
7	Galvanometer 30-0-30Dc	05	300	1500
8	Voltmeter 0-10volts DC	05	300	1500
9	Voltmeter 0-1volts DC	05	300	1500
10	Tunning fork set 8 in box pye type	01	375	375
11	Travelling Microscope	01	6000	6000
12	Sodium Vapour lamp with wooden box	01	3500	3500
13	Retort stand complete with clamp etc	10	350	3500
14	Measuring cylinder 100ml plastic	05	48	48
15	He-Ne Laser	01	4000	44000
16	Semiconductor diode laser	01	2600	2600
17	Diffraction grating & Spectometer	01	9500	9500
18	Mercury Vapour lamp with wooden box	01	4300	4300
19	Polarimeter	01	8000	8000
20	Sodium vapour lamp 35 watts with vaccum jacket	01	5500	5500
21	Forbidden energy gap kit	01	6200	6200
22	Crystal structure	01	15000	15000
23	Sodium Vapour lamp 35 W with wooden case and chok	01	9350	9350
24	Glass Prism	02	50	100
25	Magnetic Campass to inch	01	100	100
26	Magnetic Bar	01	325	325
27	Optical bench one meter long	01	7000	7000
28	Diffraction Grating 15000 L.P.I	01	1200	1200
	Total Costing	Rs 1,67,265.00		

Dr. A. D. Shinde College of Engineering



ENGINEERING PHYSICS LABORATORY

Hemlata
LAB INCHARGE

HOD
General Science & Humanities
Dr.A.D Shinde College of Engineering
A/P.Bhadgaon,Tal.Gadhinglaj

Dinkarrao K. Shinde Smarak Trusts

DR. A. D. SHINDE COLLEGE OF ENGINEERING.

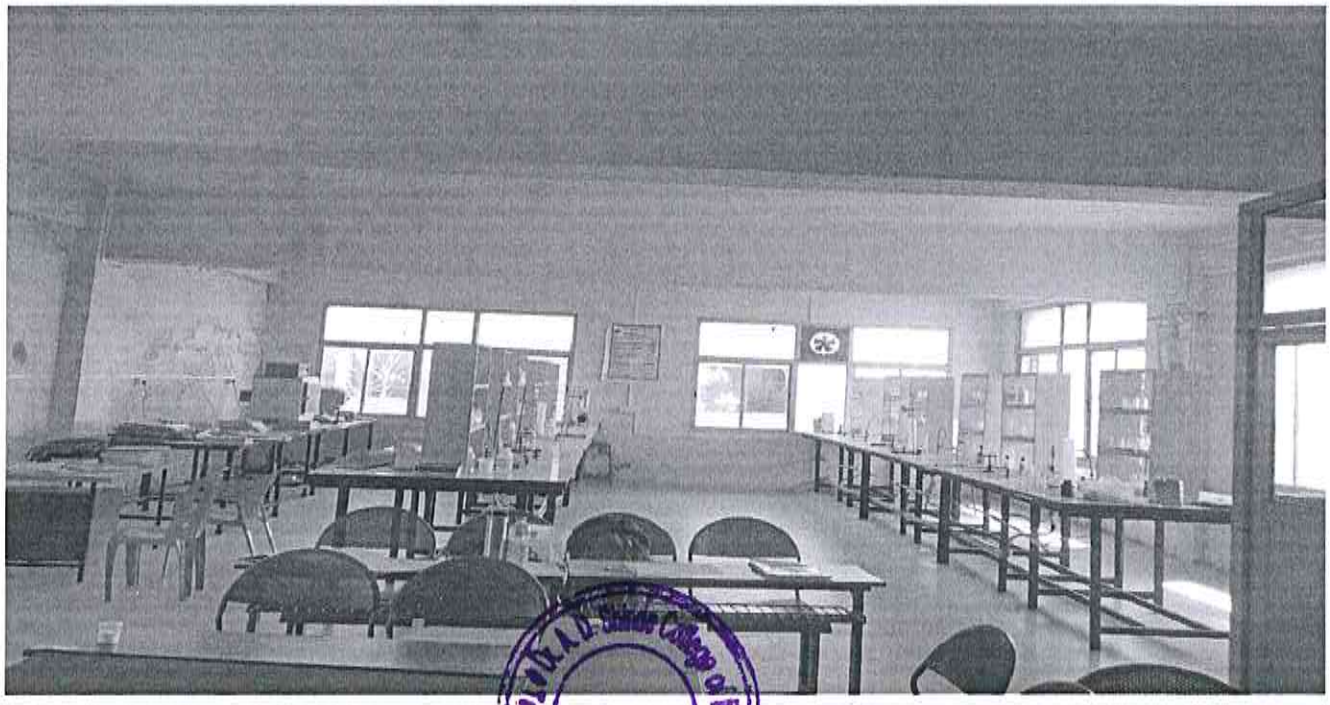
Bhadgaon, Gadhinglaj. Dist: Kolhapur Pin:416502

Academic Year 20223-24

Department of First Year Engineering

SR.NO.	NAME OF EQUIPMENT	QUANTITY	TOTAL AMOUNT
1	Pair of tongue	09	270
2	Spatulla	24	288
3	Rubber tubbing small size Test tube stand	04	120
4	Test tube stand	20	700
5	Test tube holder	12	180
6	Burette stand	12	3300
7	Beaker with spout 250ml	10	200
8	Desicator 4; with lead	05	2375
9	Viscometer U shape	18	180
10	Crussible 25ml with lid	04	140
11	Burette 25ml with Teflon cock	06	1050
12	Pipette 25ml	20	1500
13	Pipette 10 ml	20	1100
14	Conical flask 250ml	20	760
15	Measuring cylinder 10ml	20	1100
16	Beaker 25ml	20	820
17	Glass funnel 3"	20	900
18	Glass stirring rod 8"	20	2000
19	Burette 25ml with pinch cock	14	1400
20	Test tube 15*125mm	100	1200
21	Test tube 18*150mm	100	1600
22	Reagent bottle 250ml	60	3600

23	Winchester bottle cap 5lit Brush for test tube	03	1650
24	Brush for test tube	36	500
25	Wash bottle cap 500ml plastic	06	250
26	Digital PH meter	01	9500
27	Didital conductor meter	01	11500
28	Digital Potentiometer	01	13500
29	Digital colorimeter	01	12500
30	Digital spectrometer	01	42500
31	Digital electronic weighing balance	01	12000
32	Distillation unit	01	8500
33	Rectangular muffle furnace	01	34500
34	Electronic hot air oven	01	19500
35	Glass Diustilation Unit	01	22500
Total amount in Rs			**2,13,683**



ENGINEERING CHEMISTRY LABORATORY

Sundage

LAB Incharge

HOD
General Sciences & Humanities
Dr.A.D Shinde College of Engineering
A/P.Bhadgaon,Tal.Gadhinglaj

Dinkarrao K. Shinde Smarak Trusts

DR. A. D. SHINDE COLLEGE OF ENGINEERING.

Bhadgaon, Gadhinglaj. Dist: Kolhapur Pin:416502

Academic Year 20223-24

Department of First Year Engineering

SR.NO.	NAME OF EQUIPMENT	QUANTITY	TOTAL AMOUNT
1	Desk top	20	3,20,000
2	Head phones	20	4400
3	License subscription	--	23,364
		Total amount in Rs.	**3,47,764**

LANGUAGE LABORATORY

LAB Incharge

HOD
General Science & Humanities
Dr.A.D Shinde College of Engineering
A/P.Bhadgaon,Tal.Gadhinglaj

950/2017 (1)

भारतीय गैर न्यायिक

एक सौ रुपये Rs. 100

रू 100 ONE HUNDRED RUPEES

सत्यमेव जयते

भारत INDIA

INDIA NON JUDICIAL

महाराष्ट्र MAHARASHTRA ◑ 2016 ◑ RF 853967

वि. नं. ६०७४ किंमत रु. १००/- पैकी रु. १००/- दि. १६-०२-१७

श्री./सौ. — शिवशंकर आप्पासाहेब हुक्केरी

रा — भडगांव — ता — गडहिंग्लज

1 6 FEB 2017
SUB. TREASURY OFFICE
GADHINGLAJ

कोड क्र 2606007

NOTED AND REGISTERED
SR. NO. 950/2017

NOTARY
BALASAHEB B. PATIL
KOLHAPUR DIST.
REGD. NO. 817
Exp. Date 12/8/2021
GOVT. OF MAHARASHTRA

AFFIDAVIT

Before the Executive Magistrate/Public Notary,

Tal. Gadhinglaj, Dist. Kolhapur. (M. S.)

I, **Shri Shivshankar Appasaheb Hukkeri,** Aged about- 36 Yrs, Occu.- Typing Center, R/o Bhadgaon, Tal- Gadhinglaj, Dist. Kolhapur do solemnly affirm and declare that,

No. of Corrections this page. Nil

That, **Mr. Vishwanath M. Valaki, of Gadhinglaj** has perused documents like **Grampanchayat Occupancy Certificate with resolution No. 50 dated 23/01/2017, Assessment of Grampanchayat of Village Bhadgaon, Tal. Gadhinglaj bearing G.P.M. No. 1814, 1815 dated 24/01/2017** related to **Dinkarrao K. Shinde Smarak Trust, Gadhinglaj Tal. Gadhinglaj, Dist. Kolhapur** and asked to translate these documents into English Language which were originally in Marathi Language on 15/02/2017.

On there request, I translated these documents **Grampanchayat Occupancy Certificate with resolution No. 50 dated 23/01/2017, Assessment of Grampanchayat of Village Bhadgaon, Tal. Gadhinglaj bearing G.P.M. No. 1814, 1815 dated 24/01/2017** related to **Dinkarrao K. Shinde Smarak Trust, Gadhinglaj Tal. Gadhinglaj, Dist. Kolhapur** which are true and correct and nothing matter is wrong according to my knowledge and belief.

What is stated above is true and correct to the best of my knowledge, belief and information. If this declaration found untrue I will be eligible for fine and punishment U/Sec. 199, 200 AND 193(2) of I.P.C.

GADHINGLAJ
DATE : 17/02/2017

IDENTIFICATION

Kisan .D. Bhanuwade of Gadhinglaj

SIGNATURE OF DEPONENT

SOLEMNLY affirmed before me
by Shushankar Appasaheb Shi... of Bhadg...
Who is identified before me
by Kisan . D. Bhanawade of G...
Whom I personally know
This 17th day of Feb 2017

Before Me

1313

BALASAHEB B. PATIL
Advocate & Notary
'Krishna', Vakil Colony, Dr. Rajendra Prasad Road, GADHINGLAJ,
Dist. Kolhapur - 416 502.
Ph. (02327) 225501, M.9822118537

17 FEB 2017

NOTARY — BALASAHEB B. PATIL — KOLHAPUR DIST. — REGD. NO. 817 — GOVT. OF MAHARASHTRA

This Document Contains Page No. 1 to 06
No. of Corrections on this page.

(3)

Estb: 21/10/1927

GRAMPANCHAYAT BHADGAON

Tal. Gadhinglaj, Dist. Kolhapur.

Phone No.(02327)250451

Dept No. Date: / /201

Grampanchayt
Bhadgaon, Tal. Gadhinglaj,
Dist. Kolhapur

OCCUPANCY CERTIFICATE

Date: 23/01/2017

Hon'ble Secretary,
Dinkarrao K.Shinde Smarak Trust,
Gadhinglaj.

Herein our Grampanchayat has given permission for construction of Building At Mouja Bhadgaon, Tal. Gadinglaj land bearing Gat No. 493/1 of Dr. A.D. Shinde College of Engineering wide Grampanchayat Resolutin No. 50 dated 23/11/2007 and Plan of Dimension Architect, Kolhapur.

The said Building has allotted Gram. Premise No. 1814 and as per sanctioned plan the said premise is allowed to occupy for educational purpose.

Sd/- Sd/-

Gramvikas Officer,
Grampanchayat Bhadgaon
Tal. Gadhinglaj, Dist. Kolhapur

Sarpanch,
Grampanchayat Bhadgaon
Tal. Gadhinglaj, Dist. Kolhapur

Translated from marathi to English by me

Type 8 Rule 32(1)

Record of Tax Assessment for Year 2016-2017 to 2018-2019

Grampanchayat: Bhadgaon Taluka: Gadhinglaj Dist: Kolhapur wards No. 1

Sr. No.	Name of Road - /Galli name	Gat No./c.S.No./	Premise No.	Name of Owner (Holder)	Name of Occupier	Description of Premise	Year of Construction (age of premise in years)	Area Sq/mt (sq.ft)	Ready Recoknor Rate per Sq.mt.			Description	Density as per building use	Capital Value	Rate of assessment	Amount of annual assessment (in rupees)					Date of appeal and mutation made				After Increase or decrease remark as per order made		
									Land	Building	Construction					Building tax	Light tax	Health tax	co./private water tax	total	Building tax	Light tax	Health tax	co. water tax	total		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	
2354	-	493	1815	Secretary, Dinkarrao K. Shinde Smarak Trust, Gadhinglaj	Secretary, Dinkarrao K. Shinde Smarak Trust, Gadhinglaj	Other final house(Stone, brick, Calcium Carbonate or cement) first Floor (length 50' x Breadth 40')	2009	185.81 (2000 sq .ft.)			1360				0.75												
						Other final house(Stone, brick, Calcium Carbonate or cement) first Floor (length 140' x Breadth 50')	2009	650.32 (7000sq.ft.)			13600				0.75												

As per Government G.R. No. VTM 2603/p.k.2068/P.R. 4 dt.20 November 2003, it is directed that the house in the rural area are kept on the joint names of husband-wife.

The said assessment is not ownership and only for tax assessment. The Grampanchayat is not held responsible if there is any sale or purchase transaction on behalf of this assessment. Sd/-

Hence the assessment. dated: 24/01/2017 seal of Grampanchayat, Bhadgaon Gramvikas Officer,

Grampanchayt Bhadgaon,Tal. Gadhinglaj, Dist.K

Type 8 Rule 32(1)

Record of Tax Assessment for Year 2016-2017 to 2018-2019

Grampanchayat: Bhadgaon | Taluka: Gadhinglaj | Dist: Kolhapur | wards No. 1

Sr. No.	Name of Road /Galli name	Gat No./c.S.No./	Premise No.	Name of Owner (Holder)	Name of Occupier	Description of Premise	Year of Construction (age of premise in years)	Area Sq/mt (sq.ft)	Ready Recoknor Rate per Sq.mt.			Description	Density as per building use	Capital Value	Rate of assessment	Amount of annual assessment (in rupees)					Date of appeal and mutation made				After `Increase or decrease and remark as per order made		
									Land	Building	Construction					Building tax	Light tax	Health tax	co./private water tax	total	Building tax	Light tax	Health tax	co. water tax	total		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	
2353	-		1814	Secretary, Dinkarrao K. Shinde Smarak Trust, Gadhinglaj	Secretary, Dinkarrao K. Shinde Smarak Trust, Gadhinglaj	R C C typed house First floor (length 240'x breadth 40')	2009	891.87 (9600 sq ft.)	-		160000				1.2												
						R C C typed house First floor (length 600'x breadth 40')	2009	222.97 (2400 sq ft)	-		160000				1.2												
						R C C typed house First floor (length 240'x breadth 40')	2009	891.87 (9600 sq ft)	-		160000				1.2												

					R C C typed house First floor (length 90'x breadth 40')	2009	334.45 (3600 sq ft)	-		1 6 0 0 0				1.2										
					R C C typed house First floor (length 120'x breadth 40')	2009	445.94 (4800 sq ft)	-		1 6 0 0 0				1.2										
					R C C typed house First floor (length 240'x breadth 40')	2009	891.87 (9600 sq ft.)	-		1 6 0 0 0				1.2										
					R C C typed house First floor (length 90'x breadth 40')	2009	334.45 (3600 sq ft)	-		1 6 0 0 0				1.2										

As per Government G.R. No. VTM 2603/p.k.2068/P.R. 4 dt.20 November 2003, it is directed that the house in the rural area are kept on the joint names of husband-wife.

The said assessment is not ownership and only for tax assessment. The Grampanchayat is not held responsible if there is any sale or purchase transaction on behalf of this assessment. Sd/-

Hence the assessment. dated: 24/01/2017

seal of Grampanchayat, Bhadgaon

Gramvikas Officer,

Grampanchayt Bhadgaon,Tal. Gadhinglaj, Dist.Kol

Annexure 7
Teaching Learning Process

SHIVAJI UNIVERSITY, KOLHAPUR

Electrical Engineering and Technology Structure (Second year to Final Year)

S E M E S T E R – III (Duration – 6 Months)																					
Sr. No.	Course (Subject) Title	TEACHING SCHEME										EXAMINATION SCHEME									
		THEORY			Tutorial			PRACTICAL				THEORY					PRACTICAL				
		Credits	No. of lectures	Hours	Credits	No. of lectures	Hours	Credits	No. of lectures	Hours		Hours	Mode	Marks	Total Marks	Min	TW		POE		
																	Max	Min	Max	Min	
1	Engg. M-III	4	4	4	1	1	1	-	-	-			CIE / ESE	30 70	100	40	-	-	-	-	
2	EEMEC	3	3	3	-	-	-	-	-	-			CIE / ESE	30 70	100	40	25	10	-	-	
3	AEE	4	4	4	-	-	-	1	2	2			CIE /ESE	30 70	100	40	25	10	50	20	
4	EEC	4	4	4	1	1*	1	1	2*	2			CIE/ ESE	30 70	100	40	75	30	-	-	
5	MI	4	4	4	-	-	-	1	2	2			CIE /ESE	30 70	100	40	25	10	50	20	
6	C	-	-	-	-	-	-	1	2	2		-	-	-	-	-	50	20	-	-	
TOTAL		19	19	19	2	2	2	4	8	8					500		200		100		

* For EEC Tutorial is based on Electromagnetic and Practical based on Electric Circuits

S E M E S T E R – IV (Duration – 6 Months)																					
Sr. No.	Course (Subject) Title	TEACHING SCHEME										EXAMINATION SCHEME									
		THEORY			Tutorial			PRACTICAL				THEORY					PRACTICAL				
		Credits	No. of lectures	Hours	Credits	No. of lectures	Hours	Credits	No. of lectures	Hours		Hours	Mode	Marks	Total Marks	Min	TW		POE		
																	Max	Min	Max	Min	
1	DCMT	4	4	4	-	-	-	1	2	2			CIE / ESE	30 70	100	40	25	10	50	20	
2	PE	3	3	3	-	-	-	1	2	2			CIE / ESE	30 70	100	40	25	10	50	20	
3	PS-I	4	4	4	-	-	-	1	2	2			CIE /ESE	30 70	100	40	50	20	-	-	
4	NAS	3	3	3	1	1	1	-	-	-			CIE/ ESE	30 70	100	40	-	-	-	-	
5	CS-I	3	3	3	-	-	-	1	2	2			CIE /ESE	30 70	100	40	50	20	-	-	
6	ENV	3	3	3	-	-	-	-	-	-		-	-	-	-	-	50	20	-	-	
TOTAL		20	20	20	1	1	1	4	8	8					500		200		100		

S E M E S T E R – V (Duration – 6 Months)																				
Sr. No.	Course (Subject) Title	TEACHING SCHEME										EXAMINATION SCHEME								
		THEORY			Tutorial			PRACTICAL				THEORY					PRACTICAL			
		Credits	No. of lectures	Hours	Credits	No. of lectures	Hours	Credits	No. of lectures	Hours		Hours	Mode	Marks	Total Marks	Min	TW		POE	
																	Max	Min	Max	Min
1	DEM	4	4	4	-	-	-	1	2	2			CIE / ESE	30 70	100	40	25	10	50	20
2	ACM	3	3	3	-	-	-	1	2	2			CIE / ESE	30 70	100	40	25	10	50	20
3	PS-II	4	4	4	-	-	-	1	2	2			CIE /ESE	30 70	100	40	50	20	-	-
4	ACS	4	4	4	-	-	-	1	2	2			CIE/ ESE	30 70	100	40	-	-	-	-
5	SS	3	3	3	1	1	1	-	-	-			CIE /ESE	30 70	100	40	25	10	-	-
6	MATLAB	1	1	1	-	-	-	1	2	2		-	-	-	-	-	75	30	-	-
TOTAL		19	19	19	1	1	1	5	10	10					500		200		100	

S E M E S T E R – VI (Duration – 6 Months)																				
Sr. No.	Course (Subject) Title	TEACHING SCHEME										EXAMINATION SCHEME								
		THEORY			Tutorial			PRACTICAL				THEORY					PRACTICAL			
		Credits	No. of lectures	Hours	Credits	No. of lectures	Hours	Credits	No. of lectures	Hours		Hours	Mode	Marks	Total Marks	Min	TW		POE	
																	Max	Min	Max	Min
1	DSP	4	4	4	-	-	-	-	-	-			CIE / ESE	30 70	100	40	-	-	-	-
2	OE	3	3	3	-	-	-	1	2	2			CIE / ESE	30 70	100	40	25	10	-	-
3	EMD	4	4	4	-	-	-	1	2	2			CIE /ESE	30 70	100	40	50	20	50	20
4	PSSC	4	4	4	-	-	-	1	2	2			CIE/ ESE	30 70	100	40	50	20	-	-
5	ED-I	3	3	3	-	-	-	1	2	2			CIE /ESE	30 70	100	40	25	10	50	20
6	EITM	-	-	-	2	2	2	1	2	2		-	-	-	-	-	50	20	-	-
TOTAL		18	18	18	2	2	2	5	10	10					500		200		100	

S E M E S T E R – VII (Duration – 6 Months)																				
Sr. No.	Course (Subject) Title	TEACHING SCHEME										EXAMINATION SCHEME								
		THEORY			Tutorial			PRACTICAL				THEORY					PRACTICAL			
		Credits	No. of lectures	Hours	Credits	No. of lectures	Hours	Credits	No. of lectures	Hours		Hours	Mode	Marks	Total Marks	Min	TW		POE	
																	Max	Min	Max	Min
1	IT	-	-	-	1	1	1	-	-	-		-	-	-	-	-	50	20	-	-
2	EE	2	2	2	-	-	-	-	-	-			CIE / ESE	15 35	50	20	-	-	-	-
3	ASP	4	4	4	-	-	-	1	2	2			CIE /ESE	30 70	100	40	25	10	50	20
4	PQH	3	3	3	1	1	1	-	-	-			CIE/ ESE	30 70	100	40	25	10	-	-
5	CMPS	4	4	4	-	-	-	1	2	2			CIE /ESE	30 70	100	40	25	10	25	10
6	E-I	4	4	4	-	-	-	1	2	2		-	CIE / ESE	30 70	100	40	-	-	-	-
7	SEMINAR	-	-	-	-	-	-	1	2	2		-	-	-	-	-	25	10		
8	PW-I	-	-	-	-	-	-	2	2	4		-	-	-	-	-	25	10	50	20
TOTAL		17	17	17	2	2	2	6	10	12					450		175		125	

S E M E S T E R – VIII (Duration – 6 Months)																				
Sr. No.	Course (Subject) Title	TEACHING SCHEME										EXAMINATION SCHEME								
		THEORY			Tutorial			PRACTICAL				THEORY					PRACTICAL			
		Credits	No. of lectures	Hours	Credits	No. of lectures	Hours	Credits	No. of lectures	Hours		Hours	Mode	Marks	Total Marks	Min	TW		POE	
																	Max	Min	Max	Min
1	LE	2	2	2	-	-	-	-	-	-			CIE / ESE	15 35	50	20	-	-	-	-
2	HVDC	4	4	4	-	-	-	1	2	2			CIE / ESE	30 70	100	40	-	-	50	20
3	EHVAC	4	4	4	1	1	1	-	-	-			CIE /ESE	30 70	100	40	-	-	-	-
4	EGU	4	4	4	-	-	-	1	2	2			CIE/ ESE	30 70	100	40	50	20	-	-
5	E-II	3	3	3	-	-	-	1	2	2			CIE /ESE	30 70	100	40	50	20	-	-
6	PW-II	-	-	-	-	-	-	4	2	6		-	-	-	-	-	100	40	100	40
TOTAL		17	17	17	1	1	1	7	8	12					450		200		150	

COURSE CODE AND DEFINITION

Sr. No.	Course code	Definitions
1	BSC	BASIC SCIENCE COURSES
2	PCC	PROFESSIONAL CORE COURSES
3	MC	MANDATORY COURSE
4	ESC	ENGINEERING SCIENCE COURSES
5	PCE	PROFESSIONAL CORE ELECTIVES
6	SI	SUMMER INTERNSHIP
7	PW	PROJECT Work
8	MP	MINI PROJECT WORK
9	OEC	OPEN ELECTIVE COURSES
10	HM	Humanities and Management

Semester I

Sl. No	Code No.	Subject	Semester	Credits
1.	BSC-P101	Engineering Physics	1	4
2.	BSC-M101	Engineering Mathematics-I	1	4
3.	ESC-P101	Basic Electrical Engineering	1	4
4.	ESC-P102	Basic Civil Engineering	1	4
5.	ESC-P103	Engineering Graphics	1	4
6.	ESC-W101	Workshop Practice-I	1	2
7.	HM-01	Professional Communication-I	1	2
			Total	**24**

Sl. No	Code No.	Subject	Semester	Credits
1.	BSC-C101	Engineering Chemistry	1	4
2.	BSC-M101	Engineering Mathematics-I	1	4
3.	ESC-C101	Fundamentals of Electronics and Computer Programming	1	4
4.	ESC-C102	Applied Mechanics	1	4
5.	ESC-C103	Basic Mechanical Engineering	1	4
6.	ESC-W101	Workshop Practice-I	1	2
7.	HM-01	Professional Communication-I	1	2
			Total	**24**

Semester II

Sl. No	Code No.	Subject	Semester	Credits
1.	BSC-P102	Engineering Physics	2	4
2.	BSC-M102	Engineering Mathematics-II	2	4
3.	ESC-P104	Basic Electrical Engineering	2	4
4.	ESC-P105	Basic Civil Engineering	2	4
5.	ESC-P106	Engineering Graphics	2	4
6.	ESC-W102	Workshop Practice-II	2	2
7.	HM-102	Professional Communication-II	2	2
			Total	**24**

Sl. No	Code No.	Subject	Semester	Credits
1.	BSC-P102	Engineering Chemistry	2	4
2.	BSC-M102	Engineering Mathematics-II	2	4
3.	ESC-C104	Fundamentals of Electronics and Computer Programming	2	4
4.	ESC-C105	Applied Mechanics	2	4
5.	ESC-C106	Basic Mechanical Engineering	2	4
6.	ESC-W102	Workshop Practice-II	2	2
7.	HM-102	Professional Communication-II	2	2
			Total	**24**

Semester III

Sr. No	Code No.	Subject	Semester	Credits
1.	PCC-EE201	Engg. Maths III	3	5
2.	PCC-EE202	Electrical Engineering Materials and Energy Conversion	3	3
3.	PCC-EE203	Analog Electronic Engineering	3	5
4.	PCC-EE204	Electromagnetic and Electrical Circuits	3	6
5.	PCC-EE205	Measurements and Instruments	3	5
6.	BSC-EE102	Programming in C	3	1
			Total	**25**

Semester IV

Sr. No	Code No.	Subject	Semester	Credits
1.	PCC-EE206	DC Machines and Transformers	4	5
2.	PCC-EE207	Power Electronics	4	4
3.	PCC-EE208	Power Systems - I	4	5
4.	PCC-EE209	Network Analysis and Synthesis	4	4
5.	PCC-EE210	Control Systems - I	4	4
6.	MC-EE201	Environmental Studies	4	3
			Total	**25**

Semester V

Sr. No	Code No.	Subject	Semester	Credits
1.	PCC-EE301	Digital Electronics and Microcontroller	5	5
2.	PCC-EE302	AC Machines	5	4
3.	PCC-EE303	Power Systems - II	5	5
4.	PCC-EE304	Advanced Control Systems	5	5
5.	PCC-EE305	Signals and Systems	5	4
6.	BSC-EE306	MATLAB Programming	5	2
			Total	**25**

Semester VI

Sr. No	Code No.	Subject	Semester	Credits
1.	PCC-EE307	Digital Signal Processing	6	4
2.	OCE-EE301	Open Elective	6	4
3.	PCC-EE308	Electrical Machine Design	6	5
4.	PCC-EE309	Power System Stability and Control	6	5
5.	PCC-EE310	Electrical Drives - I	6	4
6.	PCC-EE311	Electrical Maintenance and Electrical Energy Audit	6	3
			Total	**25**

Semester VII

Sr. No	Code No.	Subject	Semester	Credits
1.	PCC-EE401	Industrial Training	7	1
2.	BSC-EE402	Economics for Engineers	7	2
3.	PCC-EE403	Advanced Switchgear and Protection	7	5
4.	PCC-EE404	Power Quality and Harmonics	7	4
5.	PCC- EE405	Computer Methods in Power Systems	7	5
6.	PCE-EE401	Elective – I	7	5
7.	MC-EE401	Seminar	7	1
8.	PW-EE401	Project Work	7	2
			Total	**25**

Semester VIII

Sr. No	Code No.	Subject	Semester	Credits
1.	BSC-EE402	Law for Engineers	8	2
2.	PCC-EE406	HVDC	8	5
3.	PCC-EE407	EHVAC	8	5
4.	PCC-EE408	Electrical Generation and Utilization	8	5
5.	PCE-EE402	Elective – II	8	4
6.	PW-EE402	Project Work	8	4
			Total	**25**

List of Electives

List of Open Elective

(The open elective is a subject taken up by the students from other discipline. The list of subjects provided here is a sample list. On students demand and need of particular Industry the custom made syllabus can be made and submitted to University for approval. The Open Elective is introduced to widen the knowledge base of a student as well as providing the additional skills to the student, The syllabus submitted should contain list of laboratory experiments.)

1. Thermal Engineering
2. Fluid Mechanics
3. Machine design
4. Artificial Intelligence and Robotics
5. Mechatronics
6. Data base Management
7. Rural Technology and Community Development
8. Digital Communication Engineering
9. Infrastructure Management
10. Disaster Management

Elective I

1. FACTS
2. Signal Processing For Electrical Engg.
3. Industrial Automation and SCADA
4. Restructured Power Systems

Elective II

1. Embedded Systems
2. High Voltage Engineering
3. Advanced Relaying

First Year ENGINEERING – CBCS PATTERN (PHYSICS GROUP)

Sr. No	Course	TEACHING SCHEME									EXAMINATION SCHEME							
		THEORY			TUTORIAL			PRACTICAL			THEORY					PRACTICAL (Term wok)		
		Credits	No. of Lecture	Hours	Credits	No. of Lecture	Hours	Credits	No. of Lecture	Hours	Hours	Mode	Marks	Total Marks	%Min	Hours	Max	%Min
SEMESTER - I																		
1	BSC-P101	3	3	3	-	-	-	1	2	2		CIE	30	100	40%	As per BOS Guidelines	25	40%
												ESE	70					
2	BSC-M101	3	3	3	1	1	1	-	-	-		CIE	30	100	40%		25	40%
												ESE	70					
3	ESC-P101	3	3	3	-	-	-	1	2	2		CIE	30	100	40%		25	40%
												ESE	70					
4	ESC-P102	3	3	3	-	-	-	1	2	2		CIE	30	100	40%		25	40%
												ESE	70					
5	ESC-P103	3	3	3	-	-	-	1	2	2		CIE	30	100	40%		25	40%
												ESE	70					
6	HM-01	1	1	1	-	-	-	1	2	2		-	-	-	-		25	40%
7	ESC-W101	1	1	1	-	-	-	1	2	2		-	-	-	-		50	40%
	TOTAL	**17**	**17**	**17**	**1**	**1**	**1**	**6**	**12**	**12**				**500**			**200**	
SEMESTER –II																		
1	BSC-C101	3	3	3	-	-	-	1	2	2		CIE	30	100	40%	As per BOS Guidelines	25	40%
												ESE	70					
2	BSC-M101	3	3	3	1	1	1	-	-	-		CIE	30	100	40%		25	40%
												ESE	70					
3	ESC-C101	3	3	3	-	-	-	1	2	2		CIE	30	100	40%		25	40%
												ESE	70					
4	ESC-C102	3	3	3	-	-	-	1	2	2		CIE	30	100	40%		25	40%
												ESE	70					
5	ESC-C103	3	3	3	-	-	-	1	2	2		CIE	30	100	40%		25	40%
												ESE	70					
6	HM-01	1	1	1	-	-	-	1	2	2		-	-	-	-		25	40%
7	ESC-W101	1	1	1	-	-	-	1	2	2		-	-	-	-		50	40%
	TOTAL	**17**	**17**	**17**	**1**	**1**	**1**	**6**	**12**	**12**				**500**			**200**	
	TOTAL	**34**	**34**	**34**	**2**	**2**	**2**	**12**	**24**	**24**				**1000**			**400**	

CIE – Continuous Internal Evaluation

ESE – End Semester Examination

First Year ENGINEERING – CBCS PATTERN (CHEMISTRY GROUP)

Sr. No	Course	TEACHING SCHEME									EXAMINATION SCHEME							
		THEORY			TUTORIAL			PRACTICAL			THEORY					PRACTICAL (Term wok)		
		Credits	No. of Lecture	Hours	Credits	No. of Lecture	Hours	Credits	No. of Lecture	Hours	Hours	Mode	Marks	Total Marks	%Min	Hours	Max	%Min
SEMESTER - I																		
1	BSC-C101	3	3	3	-	-	-	1	2	2		CIE	30	100	40%	As per BOS Guidelines	25	40%
												ESE	70					
2	BSC-M101	3	3	3	1	1	1	-	-	-		CIE	30	100	40%		25	40%
												ESE	70					
3	ESC-C101	3	3	3	-	-	-	1	2	2		CIE	30	100	40%		25	40%
												ESE	70					
4	ESC-C102	3	3	3	-	-	-	1	2	2		CIE	30	100	40%		25	40%
												ESE	70					
5	ESC-C103	3	3	3	-	-	-	1	2	2		CIE	30	100	40%		25	40%
												ESE	70					
6	HM-01	1	1	1	-	-	-	1	2	2		-	-	-	-		25	40%
7	ESC-W101	1	1	1	-	-	-	1	2	2		-	-	-	-		50	40%
	TOTAL	**17**	**17**	**17**	**1**	**1**	**1**	**6**	**12**	**12**				**500**			**200**	
SEMESTER –II																		
1	BSC-P101	3	3	3	-	-	-	1	2	2		CIE	30	100	40%	As per BOS Guidelines	25	40%
												ESE	70					
2	BSC-M101	3	3	3	1	1	1	-	-	-		CIE	30	100	40%		25	40%
												ESE	70					
3	ESC-P101	3	3	3	-	-	-	1	2	2		CIE	30	100	40%		25	40%
												ESE	70					
4	ESC-P102	3	3	3	-	-	-	1	2	2		CIE	30	100	40%		25	40%
												ESE	70					
5	ESC-P103	3	3	3	-	-	-	1	2	2		CIE	30	100	40%		25	40%
												ESE	70					
6	HM-01	1	1	1	-	-	-	1	2	2		-	-	-	-		25	40%
7	ESC-W101	1	1	1	-	-	-	1	2	2		-	-	-	-		50	40%
	TOTAL	**17**	**17**	**17**	**1**	**1**	**1**	**6**	**12**	**12**				**500**			**200**	
	TOTAL	**34**	**34**	**34**	**2**	**2**	**2**	**12**	**24**	**24**				**1000**			**400**	

CIE – Continuous Internal Evaluation

ESE – End Semester Examination

• Candidate contact hours per week : 30 Hours (Minimum)	• Total Marks for B.E.-I Sem I & II : **1400**
• Theory and Practical Lectures : 60 Minutes Each	• Total Credits for B.E.-I (Semester I & II) : **48**
• 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.	
• **Sem I - SSC : Soft Skill Course :** There shall be an additional compulsory course of 2 Credits (SELF Study) for a course of Democracy, Elections and Good Governance which will not included in total Credits	
• **Sem II - SSC : Soft Skill Course :** Any one from following (i) to (v) (2 Credits) (SELF Study) i) Business Communication & Presentation ii) Event management iii) Personality Development, iv) Yoga & Physical Management v) Resume, Report & proposal writing	

Note :

1. **BSC** : Basic Science Course are compulsory.
2. **HM :** Humanities and Management are compulsory.
3. **ESC :** Engineering Science Course **: ESC – P** courses (subjects) are mandatory for **Physics** group, while **ESC – C** courses (subjects) are mandatory for **Chemistry** group.
4. There will be two groups for Sem I & II Physics and Chemistry. The Candidate's those opting Physics group in Sem I shall appear for Chemistry group in Sem II and Vice-versa.
5. **ESC-W:** Engineering Science Course-Workshops are compulsory.

Second Year CIVIL ENGINEERING – CBCS PATTERN

Sr. No	Course (Subject Title)	TEACHING SCHEME									EXAMINATION SCHEME											
		THEORY			TUTORIAL			PRACTICAL			THEORY					PRACTICAL			TERM WORK		
		Credits	No. of Lecture	Hours	Credits	No. of Lecture	Hours	Credits	No. of Lecture	Hours	Hours	Mode	Marks	Total Marks	Min	Hours	Max	Min	Hours	Max	Min
SEMESTER - III																					
1	BSC-CV301	3	3	3	1	1	1	-	-	-		CIE	30	100	40	As per BOS Guidelines	-	-	2	25	10
												ESE	70								
2	PCC-CV302	3	3	3	-	-	-	1	2	2		CIE	30	100	40		25	10	2	50	20
												ESE	70								
3	ESC-CV303	3	3	3	-	-	-	1	2	2		CIE	30	100	40		25	10	2	25	10
												ESE	70								
4	ESC-CV304	3	3	3	-	-	-	1	2	2		CIE	30	100	40		25	10	2	25	10
												ESE	70								
5	PCC-CV305	4	4	4	-	-	-	1	2	2		CIE	30	100	40		-	-	2	50	20
												ESE	70								
6	ESC-CV306	3	3	3	-	-	-	1	2	2		-	-	-	-		-	-	2	50	20
	TOTAL	**19**	**19**	**19**	**1**	**1**	**1**	**5**	**10**	**10**				**500**			**75**			**225**	
SEMESTER –IV																					
1	ESC-CV401	3	3	3	1	1	1	-	-	-		CIE	30	100	40	As per BOS Guidelines	-	-	2	25	10
												ESE	70								
2	PCC-CV402	3	3	3	-	-	-	1	2	2		CIE	30	100	40		25	10	2	25	10
												ESE	70								
3	PCC-CV403	3	3	3	-	-	-	1	2	2		CIE	30	100	40		25	10	2	25	10
												ESE	70								
4	ESC-CV404	3	3	3	-	-	-	1	2	2		CIE	30	100	40		-	-	2	25	10
												ESE	70								
5	PCC-CV405	3	3	3	-	-	-	2	4	4		CIE	30	100	40		50	20	2	50	20
												ESE	70								
6	ESC-CV406	2	2	2	-	-	-	1	2	2		CIE	30	100	40						
												ESE	70								
7	ESC-CV407	-	-	-	-	-	-	1	2	2		-	-	-	-		-	-	2	50	20
	TOTAL	**17**	**17**	**17**	**1**	**1**	**1**	**7**	**14**	**14**				**600**			**100**			**200**	
	TOTAL	**36**	**36**	**36**	**2**	**2**	**2**	**12**	**24**	**24**				**1100**			**175**			**425**	

CIE- Continuous Internal Evaluation

ESE – End Semester Examination

• Candidate contact hours per week : 30 Hours (Minimum)	• Total Marks for S.E. Sem III & IV : **1700**
• Theory and Practical Lectures : 60 Minutes Each	• Total Credits for S.E. Sem III & IV : **50**
• 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.	

Third Year CIVIL ENGINEERING – CBCS PATTERN

SEMESTER – V

Sr. No	Course (Subject Title)	TEACHING SCHEME									EXAMINATION SCHEME										
		THEORY			TUTORIAL			PRACTICAL			THEORY					PRACTICAL			TERM WORK		
		Credits	No. of Lecture	Hours	Credits	No. of Lecture	Hours	Credits	No. of Lecture	Hours	Hours	Mode	Marks	Total Marks	Min	Hours	Max	Min	Hours	Max	Min
1	PCC-CV501	4	4	4	-	-	-	1	2	2		CIE	30	100	40	As per BOS Guidelines	25	10	2	50	20
												ESE	70								
2	PCC-CV502	3	3	3	-	-	-	1	2	2		CIE	30	100	40		-	-	2	25	10
												ESE	70								
3	PCC-CV503	3	3	3	-	-	-	1	2	2		CIE	30	100	40		-	-	2	25	10
												ESE	70								
4	PCC-CV504	4	4	4	-	-	-	1	2	2		CIE	30	100	40		25	10	2	50	20
												ESE	70								
5	PCC-CV505	2	2	2	-	-	-	2	4	4		-	-	-	-		50	20	2	50	20
6	OEC-CV506	3	3	3	-	-	-	-	-	-		CIE	30	100	40		-	-	-	-	-
												ESE	70								
	TOTAL	**19**	**19**	**19**	**-**	**-**	**-**	**6**	**12**	**12**				**500**			**100**			**200**	

SEMESTER –VI

1	PCC-CV601	3	3	3	1	1	1	-	-	-		CIE	30	100	40	As per BOS Guidelines	-	-	2	25	10
												ESE	70								
2	HM-CV602	4	4	4	-	-	-	1	2	2		CIE	30	100	40		25	10	2	25	10
												ESE	70								
3	PCC-CV603	4	4	4	-	-	-	1	2	2		CIE	30	100	40		25	10	2	25	10
												ESE	70								
4	PCC-CV604	4	4	4	-	-	-	1	2	2		CIE	30	100	40		-	-	2	25	10
												ESE	70								
5	OEC-CV605	3	3	3	-	-	-	-	-	-		CIE	30	100	40		-	-	-	-	-
												ESE	70								
6	PCC-CV606	-	-	-	-	-	-	2	4	4		-	-	-	-		50	20	2	50	20
7	MC-CV607	-	-	-	-	-	-	1	2	2		-	-	-	-		-	-	2	50	20
	TOTAL	**18**	**18**	**18**	**1**	**1**	**1**	**6**	**12**	**12**				**500**			**75**			**225**	
	TOTAL	**37**	**37**	**37**	**1**	**1**	**1**	**12**	**24**	**24**				**1000**			**175**			**425**	

CIE- Continuous Internal Evaluation

ESE – End Semester Examination

• Candidate contact hours per week : 31 Hours (Minimum)	• Total Marks for T.E. Sem V & VI : **1600**
• Theory and Practical Lectures : 60 Minutes Each	• Total Credits for T.E. Sem V & VI : **50**
• 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.	

Final Year CIVIL ENGINEERING – CBCS PATTERN

SEMESTER –VII

Sr. No	Course (Subject Title)	TEACHING SCHEME									EXAMINATION SCHEME										
		THEORY			TUTORIAL			PRACTICAL			THEORY					PRACTICAL			TERM WORK		
		Credits	No. of Lecture	Hours	Credits	No. of Lecture	Hours	Credits	No. of Lecture	Hours	Hours	Mode	Marks	Total Marks	Min	Hours	Max	Min	Hours	Max	Min
1	PCC-CV701	4	4	4	-	-	-	1	2	2		CIE	30	100	40	As per BOS Guidelines	-	-	2	25	10
												ESE	70								
2	PCC-CV702	3	3	3	1	1	1	-	-	-		CIE	30	100	40		-	-	2	25	10
												ESE	70								
3	PCC-CV703	3	3	3	-	-	-	1	2	2		CIE	30	100	40		25	10	2	25	10
												ESE	70								
4	PCC-CV704	3	3	3	-	-	-	1	2	2		CIE	30	100	40		25	10	2	25	10
												ESE	70								
5	PCE-CV705	3	3	3	1	1	1	-	-	-		CIE	30	100	40		25	10	2	25	10
												ESE	70								
6	HM-CV706	2	2	2	-	-	-	1	2	2		-	-	-	-		-	-	2	25	10
7	SI-CV707	-	-	-	-	-	-	-	-	-		-	-	-	-		-	-	2	25	10
8	PW-CV708	-	-	-	-	-	-	1	2	2		-	-	-	-		-	-	2	50	20
	TOTAL	**18**	**18**	**18**	**2**	**2**	**2**	**5**	**10**	**10**				**500**			**75**			**225**	

SEMESTER –VIII

1	PCC-CV801	4	4	4	-	-	-	1	2	2		CIE	30	100	40	As per BOS Guidelines	25	10	2	25	10
												ESE	70								
2	PCC-CV802	3	3	3	-	-	-	1	2	2		CIE	30	100	40		-	-	2	25	10
												ESE	70								
3	PCC-CV803	3	3	3	-	-	-	1	2	2		CIE	30	100	40		-	-	2	25	10
												ESE	70								
4	PCE-CV804	3	3	3	1	1	1	-	-	-		CIE	30	100	40		-	-	-	-	-
												ESE	70								
5	PCE-CV805	3	3	3	1	1	1	-	-	-		CIE	30	100	40		-	-		-	-
												ESE	70								
6	PCC-CV806	-	-	-	-	-	-	2	4	4		-	-	-	-		25	10	2	25	10
7	PW-CV807	-	-	-				2	4	4		-	-	-	-		100	40	2	50	20
	TOTAL	**16**	**16**	**16**	**2**	**2**	**2**	**7**	**14**	**14**				**500**			**125**			**175**	
	TOTAL	**35**	**35**	**35**	**3**	**3**	**3**	**12**	**24**	**24**				**1000**			**200**			**400**	

CIE- Continuous Internal Evaluation ESE – End Semester Examination

• Candidate contact hours per week : 32 Hours (Minimum)	• Total Marks for B.E. Sem VII & VIII : **1600**
• Theory and Practical Lectures : 60 Minutes Each	• Total Credits for B.E. Sem VII & VIII : **50**
• 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.	

COURSE CODE AND DEFINITION

Sr. No.	Course code	Definitions
1	BSC	BASIC SCIENCE COURSES
2	PCC	PROFESSIONAL CORE COURSES
3	MC	MANDATORY COURSE
4	ESC	ENGINEERING SCIENCE COURSES
5	PCE	PROFESSIONAL CORE ELECTIVES
6	SI	SUMMER INTERNSHIP
7	PW	PROJECT WORK
8	MP	MINI PROJECT WORK
9	OEC	OPEN ELECTIVE COURSES
10	HM	HUMANITIES AND MANAGEMENT

SEMESTER - I				
Sr. No	**Code No.**	**Course (Subject Title)**	**Semester**	**Credits**
1	BSC-P101	Engineering Physics	1	4
2	BSC-M101	Engineering Mathematics-I	1	4
3	ESC-P101	Basic Electrical Engineering	1	4
4	ESC-P102	Basic Civil Engineering	1	4
5	ESC-P103	Engineering Graphics	1	4
6	ESC-W101	Workshop Practice-I	1	2
7	HM-01	Professional Communication-I	1	2
TOTAL				**24**
Sr. No	**Code No.**	**Course (Subject Title)**	**Semester**	**Credits**
1	BSC-C101	Engineering Chemistry	1	4
2	BSC-M101	Engineering Mathematics-I	1	4
3	ESC-C101	Fundamentals of Electronics and Computer Programming	1	4
4	ESC-C102	Applied Mechanics	1	4
5	ESC-C103	Basic Mechanical Engineering	1	4
6	ESC-W101	Workshop Practice-I	1	2
7	HM-01	Professional Communication-I	1	2
TOTAL				**24**

SEMESTER - II				
Sr. No	**Code No.**	**Course (Subject Title)**	**Semester**	**Credits**
1	BSC-P102	Engineering Physics	2	4
2	BSC-M102	Engineering Mathematics-II	2	4
3	ESC-P104	Basic Electrical Engineering	2	4
4	ESC-P105	Basic Civil Engineering	2	4
5	ESC-P106	Engineering Graphics	2	4
6	ESC-W102	Workshop Practice-II	2	2
7	HM-102	Professional Communication-II	2	2
TOTAL				**24**

Sr. No	**Code No.**	**Course (Subject Title)**	**Semester**	**Credits**
1	BSC-P102	Engineering Chemistry	2	4
2	BSC-M102	Engineering Mathematics-II	2	4
3	ESC-C104	Fundamentals of Electronics and Computer Programming	2	4
4	ESC-C105	Applied Mechanics	2	4
5	ESC-C106	Basic Mechanical Engineering	2	4
6	ESC-W102	Workshop Practice-II	2	2
7	HM-102	Professional Communication-II	2	2
TOTAL				**24**

SEMESTER - III					
Sr. No	**Code No.**	**Course (Subject Title)**		**Semester**	**Credits**
1	BSC-CV301	M-III	Engineering Mathematics-III	3	4
2	PCC-CV302	SY-I	Surveying-I	3	4
3	ESC-CV303	SOM	Strength of Material	3	4
4	ESC-CV304	FM-I	Fluid Mechanics-I	3	4
5	PCC-CV305	BCM	Building Construction and Material	3	5
6	ESC-CV306	NM	Numerical Method	3	4
TOTAL					**25**

SEMESTER – IV					
Sr. No	**Code No.**	**Course (Subject Title)**		**Semester**	**Credits**
1	ESC-CV401	SM	Structural Mechanics	4	4
2	PCC-CV402	SY-II	Surveying-I	4	4
3	PCC-CV403	CT	Concrete Technology	4	4
4	ESC-CV404	FM-II	Fluid Mechanics-II	4	4
5	PCC-CV405	BDD	Building Design and Drawing	4	5
6	ESC-CV406	ES	Environmental Studies	4	3
7	ESC-CV407	CAD	Computer Aided Design	4	1
TOTAL					**25**

SEMESTER - V					
Sr. No	**Code No.**	**Course (Subject Title)**		**Semester**	**Credits**
1	PCC-CV501	WRE-I	Water Resource Engineering-I	5	5
2	PCC-CV502	DSS	Design of Steel Structures	5	6
3	PCC-CV503	EE-I	Environmental Engineering-I	5	4
4	PCC-CV504	GTE-I	Geotechnical Engineering-I	5	5
5	PCC-CV505	BPD	Building Planning and Design	5	2
6	OEC-CV506	OE-I	Open Elective-I	5	3
TOTAL					**25**

SEMESTER - VI					
Sr. No	**Code No.**	**Course (Subject Title)**		**Semester**	**Credits**
1	PCC-CV601	TOS	Theory of Structures	6	4
2	HM-CV602	EM	Engineering Management	6	5
3	PCC-CV603	EE-II	Environmental Engineering-II	6	4
4	PCC-CV604	GTE-II	Geotechnical Engineering-II	6	5
5	OEC-CV605	OE-II	Open Elective-II	6	4
6	PCC-CV606	SDD-I	Structural Design and Drawing-I	6	2
7	MP/PW-CV607		SEMINAR		1
TOTAL					**25**

SEMESTER - VII					
Sr. No	**Code No.**	**Course (Subject Title)**		**Semester**	**Credits**
1	PCC-CV701	DCS-I	Design of Concrete Structures-I	7	5
2	PCC-CV702	EQ	Earthquake Engineering	7	4
3	PCC-CV703	QSV	Quantity Survey and Valuation	7	4
4	PCC-CV704	TR-I	Transportation Engineering-I	7	4
5	PCE-CV705	EL-I	Professional Elective-I	7	4
6	HM-CV706	LACE	Legal Aspect in Civil Engineering	7	3
7	SI-CV707	FT	Field Training	7	-
8	PW-CV708	PP-I	Project Phase-I	7	1
TOTAL					**25**

SEMESTER - VIII					
Sr. No	**Code No.**	**Course (Subject Title)**		**Semester**	**Credits**
1	PCC-CV701	DCS-II	Design of Concrete Structures-II	8	5
2	PCC-CV702	WRE-II	Water Resource Engineering-II	8	4
3	PCC-CV703	TR-II	Transportation Engineering-II	8	4
4	PCE-CV704	EL-II	Professional Elective-II	8	4
5	PCE-CV705	EL-III	Professional Elective-III	8	4
6	PCC-CV706	SDD-II	Structural Design and Drawing-II	8	2
7	PW-CV707	PP-I	Project Phase-II	8	2
TOTAL					**25**

First Year ENGINEERING – CBCS PATTERN

Sr. No	Course	TEACHING SCHEME									EXAMINATION SCHEME							
		THEORY			TUTORIAL			PRACTICAL			THEORY					PRACTICAL (Term wok)		
		Credits	No. of Lecture	Hours	Credits	No. of Lecture	Hours	Credits	No. of Lecture	Hours	Hours	Mode	Marks	Total Marks	%Min	Hours	Max	%Min
SEMESTER - I																		
1	BSC-P / BSC-C	3	3	3	-	-	-	1	2	2		CIE	30	100	40%	As per BOS Guidelines	25	40%
												ESE	70					
2	BSC-M-I	3	3	3	1	1	1	-	-	-		CIE	30	100	40%		25	40%
												ESE	70					
3	ESC	3	3	3	-	-	-	1	2	2		CIE	30	100	40%		25	40%
												ESE	70					
4	ESC	3	3	3	-	-	-	1	2	2		CIE	30	100	40%		25	40%
												ESE	70					
5	ESC	3	3	3	-	-	-	1	2	2		CIE	30	100	40%		25	40%
												ESE	70					
6	HM-I	1	1	1	-	-	-	1	2	2		-	-	-	-		25	40%
7	ESC-W-I	1	1	1	-	-	-	1	2	2		-	-	-	-		50	40%
	TOTAL	**17**	**17**	**17**	**1**	**1**	**1**	**6**	**12**	**12**				**500**			**200**	
SEMESTER –II																		
1	BSC-P / BSC-C	3	3	3	-	-	-	1	2	2		CIE	30	100	40%	As per BOS Guidelines	25	40%
												ESE	70					
2	BSC-M-II	3	3	3	1	1	1	-	-	-		CIE	30	100	40%		25	40%
												ESE	70					
3	ESC	3	3	3	-	-	-	1	2	2		CIE	30	100	40%		25	40%
												ESE	70					
4	ESC	3	3	3	-	-	-	1	2	2		CIE	30	100	40%		25	40%
												ESE	70					
5	ESC	3	3	3	-	-	-	1	2	2		CIE	30	100	40%		25	40%
												ESE	70					
6	HM-II	1	1	1	-	-	-	1	2	2		-	-	-	-		25	40%
7	ESC-W-II	1	1	1	-	-	-	1	2	2		-	-	-	-		50	40%
	TOTAL	**17**	**17**	**17**	**1**	**1**	**1**	**6**	**12**	**12**				**500**			**200**	
	TOTAL	**34**	**34**	**34**	**2**	**2**	**2**	**12**	**24**	**24**				**1000**			**400**	

CIE – Continuous Internal Evaluation
ESE – End Semester Examination

Note :

• Candidate contact hours per week : 30 Hours (Minimum)	• Total Marks for B.E. Sem I & II : **1400**
• Theory and Practical Lectures : 60 Minutes Each	• Total Credits for B.E.-I (Semester I & II) : **48**
• 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.	
A) Non-Credit Self Study Course : Compulsory Civic Courses (CCC) **For Sem I: CCC – I :** Democracy, Elections and Good Governance **(B) Non-Credit Self Study Course : Skill Development Courses (SDC)** **For Sem II: SDC – I :** Any one from following (i) to (v) i) Business Communication & Presentation ii) Event management iii) Personality Development, iv) Yoga & Physical Management v) Resume, Report & proposal writing	

1. **BSC** : Basic Science Course are compulsory.
2. **HM :**Humanities and Management are compulsory.
3. **ESC :** Engineering Science Course **: ESC – P** courses (subjects) are mandatory for **Physics** group, while**ESC – C** courses (subjects) are mandatory for **Chemistry** group.
4. There will be two groups for Sem I & II Physics and Chemistry. The Candidate's those opting Physics group in Sem I shall appear for Chemistry group in Sem II and Vice-versa.
5. **ESC-W:** Engineering Science Course-Workshops are compulsory.

SECOND YEAR MECHANICAL ENGINEERING– CBCS PATTERN

Sr. No	Course (Subject Title)	TEACHING SCHEME									EXAMINATION SCHEME											
		THEORY			TUTORIAL			PRACTICAL			THEORY					PRACTICAL			TERM WORK		
		Credits	No. of Lecture	Hours	Credits	No. of Lecture	Hours	Credits	No. of Lecture	Hours	Hours	Mode	Marks	Total Marks	Min	Hours	Max	Min	Hours	Max	Min
SEMESTER - III																						
1	BSC-ME201	3	3	3	1	1	1	-	-	-		CIE	30	100	40	As per BOS Guidelines	-	-	2	25	10
												ESE	70								
2	BSC-ME202	3	3	3	-	-	-	1	2#	2#		CIE	30	100	40				2	25	10
												ESE	70								
3	PCC-ME203	3	3	3	-	-	-	1	2	2		CIE	30	100	40		25	10	2	25	10
												ESE	70								
4	PCC-ME204	3	3	3	-	-	-	1	2	2		CIE	30	100	40		25	10	2	25	10
												ESE	70								
5	PCC-ME205	3	3	3	-	-	-	1	2	2		CIE	30	100	40		25	10	2	25	10
												ESE	70								
6	PCC-ME206	-	-	-	-	-	-	1	2	2		-	-	-	-		-	-	2	25	10
7	PCC-ME207	-	-	-	-	-	-	1	2	2		-	-	-	-		-	-	-	25	10
8	PCC-ME208	-	-	-	-	-	-	1	2#	2#		-	-	-	-		-	-	-	25	10
9	MC-ME209	3	3	3	-	-	-	-	-	-		CIE	30	100	40		-	-	-	-	-
												ESE	70								
	TOTAL	**18**	**18**	**18**	**1**	**1**	**1**	**7**	**12**	**12**				**600**			**75**			**200**	
SEMESTER –IV																						
1	PCC-ME210	3	3	3	-	-	-	1	2	2		CIE	30	100	40	As per BOS Guidelines	-	-	2	25	10
												ESE	70								
2	PCC-ME211	3	3	3	-	-	-	1	2	2		CIE	30	100	40		-	-	2	25	10
												ESE	70								
3	PCC-ME212	3	3	3	-	-	-	1	2	2		CIE	30	100	40		25	10	2	25	10
												ESE	70								
4	PCC-ME213	3	3	3	-	-	-	1	2	2		CIE	30	100	40		-	-	2	25	10
												ESE	70								
5	PCC-ME214	4	4	4	-	-	-	-	-	-		CIE	30	100	40		-	-	-	-	-
												ESE	70								
6	PCC-ME215	-	-	-	-	-	-	1	2	2		-	-	-	-		25	10	2	25	10
7	PCC-	-	-	-	-	-	-	1	2	2		-	-	-	-		-	-	2	25	10

	ME216																							
8	PCC-ME217	-	-	-		-	-	-		1	2	2			-	-	-	-		-	-	2	25	10
9	PCC-ME218	-	-	-		-	-	-		1	2	2						-	-	25	10	2	25	10
	TOTAL	**16**	**16**	**16**		-	-	-		**8**	**16**	**16**					**500**			**75**			**200**	
	TOTAL	**34**	**34**	**34**		**1**	**1**	**1**		**16**	**28**	**28**					**1100**			**150**			**400**	

CIE- Continuous Internal Evaluation
ESE – End Semester Examination

• Candidate contact hours per week : 30 Hours (Minimum)	• Total Marks for S.E. Sem III & IV: **1650**
• Theory/Tutorial Duration : 60 Minutes and Practical Duration : 120 Minutes	• Total Credits for S.E. Sem III & IV : **50**
• 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. Basic Science Courses -Mechanical Engineering(BSC-ME) are compulsory.
2. Professional Core Course-MechanicalEngineering (PCC-ME) are compulsory.
3. Mandatory Course (MC-ME)Environmental Studies which is compulsory for theory 70 marks and project work 30 marks.

COURSE CODE AND DEFINITION

Semester III

Sr. No	Code No.	Subject	Credits
1.	BSC-ME201	Engineering Mathematics - III	4
2.	PCC-ME202	*Electrical Technology	4
3.	PCC-ME203	Applied Thermodynamics	4
4.	PCC-ME204	Metallurgy	4
5.	PCC-ME205	Fluid Mechanics	4
6.	PCC-ME206	Machine Drawing	1
7.	PCC-ME207	*Computer Programming Using C++	1
8.	PCC-ME208	Workshop Practice – III	1
9.	MC-ME209	Environmental studies	3
		Total	26

Semester IV

Sr. No	Code No.	Subject	Credits
1.	BSC-ME210	Applied Numerical Methods	4
2.	PCC-ME211	Analysis of Mechanical Elements	4
3.	PCC-ME212	Fluid and Turbo Machinery	4
4.	PCC-ME213	Theory of Machines – I @	4
5.	PCC-ME214	Machine Tools and Processes	4
6.	PCC-ME215	Testing and Measurement	1
7.	PCC-ME216	Computer Aided Drafting	1
8.	PCC-ME217	Computer Graphics	1
9.	PCC-ME218	Workshop Practice – IV	1
		Total	24

THIRD YEAR MECHANICAL ENGINEERING – CBCS PATTERN

SEMESTER – V

Sr. No	Course (Subject Title)	TEACHING SCHEME									EXAMINATION SCHEME										
		THEORY			TUTORIAL			PRACTICAL			THEORY					PRACTICAL			TERM WORK		
		Credits	No. of Lecture	Hours	Credits	No. of Lecture	Hours	Credits	No. of Lecture	Hours	Hours	Mode	Marks	Total Marks	Min	Hours	Max	Min	Hours	Max	Min
1	PCC-ME	3	3	3				1	2	2		CIE ESE	30 70	100	40	As per BOS Guidelines			2	25	10
2	PCC-ME	3	3	3				1	2	2		CIE ESE	30 70	100	40		25	10	2	25	10
3	PCC-ME	3	3	3				1	2	2		CIE ESE	30 70	100	40		25	10	2	25	10
4	PCC-ME	3	3	3	1	1	1					CIE ESE	30 70	100	40				2	25	10
5	PCC-ME	3	3	3				1	2	2		CIE ESE	30 70	100	40				2	25	10
6	OEC-ME	1	2	2	1	1	1					CIE ESE	30 70	100	40				--	--	--
7	PCC-ME	-	-	-				1	2	2									2	25	10
8	PCC-ME	-	-	-				1	2	2									2	25	10
9	PCC-ME	-	-	-				1	1	1									1	25	10
10	PCC-ME							1												25	10
	TOTAL	**16**	**17**	**17**	**1**	**1**	**1**	**8**	**13**	**13**				**600**			**50**			**225**	

SEMESTER –VI

1	PCC-ME	3	3	3	-	-	-	-	-	-		CIE ESE	30 70	100	40	As per BOS Guidelines	-	-	-	-	-
2	PCC-ME	3	3	3	-	-	-	1	2	2		CIE ESE	30 70	100	40		-	-	2	25	10
3	PCC-ME	3	3	3	-	-	-	1	2	2		CIE ESE	30 70	100	40		-	-	2	25	10
4	PCC-ME	3	3	3	-	-	-	1	2	2		CIE ESE	30 70	100	40		25	10	2	25	10
5	PCC-ME	3	3	3	-	-	-	1	2	2		CIE ESE	30 70	100	40		25	10	2	25	10
6	OEC-ME	1	2	2	- -	- -	- -	-	-	-		CIE ESE	30 70	100	40		-	--	--	--	--
7	PCC-ME	-	-	-	-	-	-	1	1	1		-	-	-	-		-	-	2	25	10
8	PCC-ME	-	-	-	-	-	-	2	2	2		-	-	-	-		-	-	2	25	10
9	PCC-ME	-	-	-	-	-	-	1	1	1		-	-	-	-	-	-	-	2	25	10

10	PCC-ME									1												2	25	10
	TOTAL	**16**	**17**	**17**		**1**	**1**	**1**		**8**	**12**	**12**					**600**			**50**			**225**	
	TOTAL	**32**	**34**	**34**		**2**	**2**	**2**		**16**	**25**	**25**					**1200**			**100**			**450**	

CIE- Continuous Internal Evaluation
ESE – End Semester Examination

• Candidate contact hours per week : 30 Hours (Minimum)	• Total Marks for T.E. Sem V& VI:**1750**
• Theory/Tutorial Duration : 60 Minutes and Practical Duration : 120 Minutes	• Total Credits for T.E. Sem V & VI : **50**
• 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.	
• **Sem V &SemVI** :- Open Elective Course has 2+1 credits for one course. Each department / branch has to run at least one Open Elective Course in Sem-V and Sem-VI from the list of Elective Course. It is compulsory.	

Note :

1. Professional Core Courses-Mechanical Engineering (PCC-ME) are compulsory.
2. Open Elective Courses- Mechanical Engineering (OEC-ME) are compulsory

OPEN ELECTIVE-I

Sr. No.	Name of the Subject	Name of the concern Branch
01	Energy and Environment	**Civil Engineering**
02	Enterprise Resource Planning	**Mechanical Engineering**
03	**Electrical Installation and Safety**	**Electrical Engineering**
04	Database Management Systems	**Electronics Engineering**
05	Network Technologies	**Computer Science and Engineering**
06	Logistics Management	**Production Engineering**
07	Renewable Energy Sources	**Environmental Engineering**
08	Entrepreneurship Development	**Chemical Engineering**
09	Smart Sensors	**Instrumentation Engineering**
10	Electric and Hybrid Vehicles	**Automobile Engineering**

11	System Programming	**Information Technology**
12	Digital Communication	**Electronics and Telecommunication Engineering**
13	Bioinformatics	**Bio-Technology Engineering**
14	Missiles and Rockets	**Aeronautical Engineering**

OPEN ELECTIVE-II

Sr. No.	Name of the Subject	Name of the concern Branch
01	Soil and Water Conservation Techniques	**Civil Engineering**
02	Engineering System Modelling and Simulation	**Mechanical Engineering**
03	**Industrial Utilization of Electrial Energy**	**Electrical Engineering**
04	Software Engineering	**Electronics Engineering**
05	Information Security	**Computer Science and Engineering**
06	Engineering Economics	**Production Engineering**
07	Green Building	**Environmental Engineering**
08	Waste Water Engineering	**Chemical Engineering**
09	Piping and Instrumentation Diagram	**Instrumentation Engineering**
10	Computational Fluid Dynamics	**Automobile Engineering**
11	Computer Graphics	**Information Technology**
12	Digital Signal Processing	**Electronics and Telecommunication Engineering**
13	EnviromentalBiotecnology	**Bio-Technology Engineering**
14	Industrial Aerodynamics	**Aeronautical Engineering**

FINAL YEAR MECHANICAL ENGINEERING – CBCS PATTERN

SEMESTER –VII

Sr. No	Course (Subject Title)	TEACHING SCHEME									EXAMINATION SCHEME										
		THEORY			TUTORIAL			PRACTICAL			THEORY					PRACTICAL			TERM WORK		
		Credits	No. of Lecture	Hours	Credits	No. of Lecture	Hours	Credits	No. of Lecture	Hours	Hours	Mode	Marks	Total Marks	Min	Hours	Max	Min	Hours	Max	Min
1	PCC ME	3	3	3	-	-	-	1	2	2		CIE	30	100	40	As per BOS Guidelines	25	10	2	25	10
												ESE	70								
2	PCC ME	3	3	3	-	-	-	1	2	2		CIE	30	100	40		-	-		25	10
												ESE	70								
3	PCC ME	3	3		-	-	-	1	2	2		CIE	30	100	40		25	10	2	25	10
												ESE	70								
4	PCE ME	3	3	3	-		-	1	2	2		CIE	30	100	40				2	25	10
												ESE	70								
5	PCE ME	3	3	3	-	-	-	1	2	2		CIE	30	100	40		-	-	2	25	10
												ESE	70								
6	SI ME	-	-	-	-	-	-	1	-	-		-	-	-	-		-	-		25	10
7	PW ME	-	-	-	1	4	4		-	-		-	-	-	-		25	10		25	10
	TOTAL	**18**	**18**	**18**	**1**	**4**	**4**	**6**	**14**	**14**				**500**			**75**			**175**	

SEMESTER –VIII

1	PCC ME	3	3	3	-	-	-	1	2	2		CIE	30	100	40	As per BOS Guidelines	25	10	2	25	10
												ESE	70								
2	PCC ME	3	3	3	-	-	-	1	2	2		CIE	30	100	40		25	10	2	25	10
												ESE	70								
3	PCC ME	3	3	3	-	-	-	1	2	2		CIE	30	100	40		-	-	2	25	10
												ESE	70								
4	PCE ME	3	3	3	-	-	-	1	2	2		CIE	30	100	40		-	-	2	25	10
												ESE	70								
5	PCE ME	3	3	3	-	-	-	1	2	2		CIE	30	100	40		-	-	2	25	10
												ESE	70								
6	PW ME	-	-	-	-	-	-	5	5	5		-	-	-	-		25	10	5	25	10
	TOTAL	**15**	**15**	**15**	**-**	**-**	**-**	**10**	**15**	**15**				**500**			**75**			**175**	
	TOTAL	**33**	**33**	**33**	**1**	**4**	**4**	**16**	**29**	**29**				**1000**			**150**			**350**	

CIE- Continuous Internal Evaluation
ESE – End Semester Examination

• Candidate contact hours per week : 30 Hours (Minimum)	• Total Marks for B.E. Sem VII & VIII : **1500**
• Theory/Tutorial Duration : 60 Minutes and Practical Duration : 120	• Total Credits for B.E. Sem VII & VIII : **50**

Minutes	
• 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.	
• **Sem VII &Sem VIII: SSC**: Constitution of India and Local Self Government (2 Credits)(Self Study)	

Note :

1. Professional Core Courses-Mechanical Engineering(PCC-ME) are compulsory.
2. Professional Core Electives -MechanicalEngineering (PCE-ME) are compulsory.
3. Summer Internship -Mechanical Engineering (SI-ME) is compulsory.
4. Project Work Mechanical Engineering (PW-ME) is compulsory.
5. Soft Skill Course (SSC) is over and above.

COURSE CODE AND DEFINITION

Semester V

Sr. No	Code No.	Subject	Credits
1.	PCC-ME 301	Control Engineering	
2.	PCC-ME 302	Theory of Machine – II	
3.	PCC-ME 303	Heat and Mass Transfer	
4.	PCC-ME 304	Machine Design – I	
5.	PCC-ME 305	Manufacturing Engineering @	
6.	OEC-ME 306	Open Elective-I	
7.	PCC-ME 307	CAD/CAM Laboratory	
8.	PCC-ME308	Professional Skill Development	
9.	PCC-ME309	Workshop Practice – V	
10.	PCC-ME310	Mini-Project- I	

Semester VI

Sr. No	Code No.	Subject	Credits
1.	PCC-ME 311	Industrial Management and Operation Research	
2.	PCC-ME 312	Industrial Fluid Power	
3.	PCC-ME 313	Metrology and Quality Control	
4.	PCC-ME 314	Machine Design – II	
5.	PCC-ME 315	Internal Combustion Engines	
6.	OEC-ME 316	Open Elective	
7.	PCC-ME 317	Computer Integrated ManufacturingLab	
8.	PCC-ME318	Seminar	

9.	PCC-ME319	Workshop Practice -VI	
10.	PCC-ME320	Mini-Project- II	

Semester VII

Sr. No	Code No.	Subject	Credits
1.	PCC ME 401	Refrigeration and Air Conditioning	
2.	PCC ME 402	Mechanical System Design	
3.	PCC ME 403	Finite Element Analysis	
4.	PCE ME 404	Elective I	
5.	PCE ME 405	Elective II	
6.	SI ME 406	Industrial Training @	
7.	PW ME 407	Project Phase -I	

Semester VIII

Sr. No	Code No.	Subject	Credits
1.	PCC ME 408	Mechatronics	
2.	PCC ME 409	Energy and Power Engineering	
3.	PCC ME 410	Noise and Vibration	
4.	PCE ME 411	Elective III	
5.	PCE ME 412	Elective IV	
6.	PW ME 413	Project Phase –II	

SHIVAJIUNIVERSITY KOLHAPUR

REVISED SYLLABUS AND STRUCTURE

SECOND YEAR (B. Tech) CBCS

Computer Science and Engineering

To be introduced from the academic year 2019-20

(i.e. from June 2019) onwards

(Subject to the modifications will be made from time to time)

SECOND YEAR COMPUTER SCIENCE AND ENGINEERING - CBCS PATTERN

SEMESTER - III

Sr. No.	Course Subject / Title	TEACHING SCHEME									EXAMINATION SCHEME											
		THEORY			TUTORIAL			PRACTICAL			THEORY					PRACTICAL			TERMWORK		
		Credits	N0. Of Lectures	Hours	Credits	No. of Hours	Hours	Credits	No. of Hours	Hours	Hours	mode	marks	Total Marks	MIN.	Hours	MAX	MIN.	Hours	MAX	MIN.
1	BSC - CS301 Applied Mathematics	3	3	3	1	1	1					CIE	30	100	40	AS PER BOS GUIDELINES			AS PER BOS GUIDELINES	25	10
												ESE	70								
2	PCC-CS302 DiscreteMathematics &Structures	3	3	3	1	1	1					CIE	30	100	40					25	10
												ESE	70								
3	PCC- CS303 Data Structures	3	3	3								CIE	30	100	40						
												ESE	70								
4	PCC- CS304 Computer Networks - I	3	3	3				1	2	2		CIE	30	100	40		50	20		25	10
												ESE	70								
5	PCC- CS305 Microprocessors	3	3	3				1	2	2		CIE	30	100	40					25	10
												ESE	70								
6	PCC- CS306 C programming	3	3	3				2	4	4							50	20		50	20
7	HM- CS307 Soft Skills							1	2	2							25	10		25	10
	Total (SEM –III)	***18***	***18***	***18***	***2***	***2***	***2***	***5***	***10***	***10***				***500***			***125***			***175***	

SECOD YEAR COMPUTER SCIENCE AND ENGINEERING - CBCS PATTERN																						
SEMESTER - IV																						
		TEACHING SCHEME									EXAMINATION SCHEME											
Sr. No.	Course Subject / Title	THEORY			TUTORIAL			PRACTICAL			THEORY					PRACTICAL			TERMWORK		
		Credits	N0. Of Lectures	Hours	Credits	No. of Hours	Hours	Credits	No. of Hours	Hours	Hours	mode	marks	Total Marks	MIN.	Hours	MAX	MIN.	Hours	MAX	MIN.
1	PCC-CS401 Automata Theory	3	3	3								CIE	30	100	40	AS PER BOS GUIDELINES			AS PER BOS GUIDELINES		
												ESE	70								
2	PCC- CS402 Computer Networks - II	3	3	3				1	2	2		CIE	30	100	40		50	20		25	10
												ESE	70								
3	PCC- CS403 Computer Organization and Architecture	3	3	3								CIE	30	100	40						
												ESE	70								
4	PCC- CS404 Operating Systems - I	3	3	3				1	2	2		CIE	30	100	40					25	10
												ESE	70								
5	PCC- CS405 Software Engineering	3	3	3								CIE	30	100	40						
												ESE	70								
6	PCC- CS406 Object Oriented Programming	2	2	2				2	4	4							50	20		50	20
7	PW- CS407 Mini Project							1	2	2							50	20		50	20
8	MC-CS408 Environmental Studies	2	2	2	1	1	1					CIE ESE	30 70	100	40						
	Total (SEM –IV)	***19***	***19***	***19***	***1***	***1***	***1***	***5***	***10***	***10***				***600***			***150***			***150***	
	Total	**37**	**37**	**37**	**3**	**3**	**3**	**10**	**20**	**20**				**1100**			**275**			**325**	

CIE- Continuous Internal Evaluation

ESE – End Semester Examination

• Candidate contact hours per week : 30 Hours(Minimum)	• Total Marks for S.E. Sem III & IV : **800 + 900 =1700**
• Theory and Practical Lectures : 60 MinutesEach	• Total Credits for S.E. Sem III & IV : **50 (SEM-III: 25 + SEM -IV:25)**
• In theory examination there will be a passing based on separate head of passing for examination of CIE andESE.	
• There shall be separate passing for theory and practical (term work)courses.	

Note:

1. **BSC-CS**: Basic Science Course – Computer Science and Engineering arecompulsory.
2. **ESC-CS:** Engineering Science Course - Computer Science and Engineering arecompulsory.
3. **PCC-CS:** Professional Core Course – Computer Science and Engineering arecompulsory.
4. **HM-CS:** Humanities and Management- Computer Science and Engineering arecompulsory.
5. **PW-CS:** Project Work-– Computer Science and Engineering arecompulsory.
6. **MC-CS:** Mandatory Course -Environmental Studies which is compulsory for theory 70 marks and project work 30 marks.

S. Y. B. Tech (Computer Science and Engineering) Sem – III

1. Applied Mathematics(BSC-CS301)

TEACHING SCHEME	EXAMINATION SCHEME
Theory : 3 Hrs/Week	**Theory :** ESE 70Marks CIE 30Marks
Tutorial : 1 Hrs/Week	**Term work:** 25 marks
Practical: ---	**Practical :---**
Credits:- 4	

Prerequisite: Basic probability theory , Statistics

Course Objectives:

1. To develop mathematical skills and enhance thinking power ofstudents.
2. To give the knowledge to the students of fuzzy set theory, numerical methods probability and statistics with an emphasis on the application of solvingengineering problems
3. To prepare students to formulate a mathematical model using engineering skills& interpret the solution in realworld.

Course Outcomes:

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

1. Describe the statistical data numerically by using Lines of regression and Curve fittings.
2. Solve basic problems in probability theory, including problems involvingthe binomial, Poisson, and normaldistributions.
3. Calculate numericalIntegration.
4. Define fuzzy sets using linguistic words and represent these sets by membership functions, convexity, Normality, support,etc.
5. Solve examples on the principle in performing fuzzy number arithmeticoperations such as Addition, Multiplication & fuzzyequation.
6. Solve assignment problems by using different techniques of operationresearch.

Unit No.	Contents	No.of Lectures
1.	**Correlation, Regression & CurveFitting:** Introduction, Karl Pearson's Coefficient of Correlation.,Lines of regression of bivariate data., Fitting of Curves by method of Least-squares, FittingofStraight lines. Fitting of exponential curves. Fitting of second degree Parabolic curves.	06
2.	**ProbabilityDistribution:** Random variables,Discrete Probability distribution,Continuousprobability distribution,BinomialDistribution,PoissonDistribution,Normal Distribution.	06

3.	**NumericalIntegration:** Newton Cotes formulae.TrapezoidalRule,Simpson's 1/3rd rule.Simpson's 3/8th rule, Weddle's Rule.	06
4.	**Introduction to Fuzzysets:** Crisp set and Fuzzy set, Basic concepts of fuzzy sets, Basic operationsonfuzzy sets,Properties of fuzzy sets	06
5.	**Fuzzy Arithmetic:** Fuzzy numbers,Fuzzy cardinality, Arithmetic Operationson Fuzzy numbers,Solutions of Fuzzy equations of type A + X = B&A.X	06
6.	**Assignment Problem:** Definition, Balanced and Unbalancedassignment problem, Hungarian Method., Balanced assignmentproblems.,Unbalanced assignment problems. Traveling salesmen problem.	09

TEXTBOOKS:

1. Advance Engineering Mathematics by Erwin Kreyszig (WileyIndia).
2. Mathematical Methods of Science and Engineering, by Kanti B. Datta(Cengage Learning)
3. Advanced Engineering Mathematics, 3e, by Jack Goldberg (OxfordUniversity Press).
4. Engineering Mathematics by V. Sundaram (VikasPublication).
5. Higher Engineering Mathematics, by B. S. Grewal (Khanna PublicationDelhi).
6. Higher Engineering Mathematics, by B. V. Ramana (TataMcGraw-Hill).
7. Advanced Engineering Mathematics, by H. K. Das (S. ChandPublication).
8. Fuzzy Sets and Fuzzy Logic: Theory and Applications, by George J. Klir andBo Yuan (Prentice Hall of India Private Limited).
9. Applied Mathematics by Navneet D. Sangle (CengagePublication)

General Instructions:

1. For the term work of 25 marks, batch wise tutorials are to beconducted.
2. Number of assignments should be at least six (All units should becovered).

S. Y. B. Tech (Computer Science and Engineering) Sem – III

2. Discrete Mathematics & Structures (PCC-CS302)

TEACHING SCHEME	EXAMINATION SCHEME
Theory : 3 Hrs/Week	**Theory :** ESE 70Marks CIE 30Marks
Tutorial : 1 Hrs/Week	**Term work:** 25 marks
Practical: ---	**Practical :---**
Credits:- 4	

Prerequisite: Basic Mathematics

Course Objectives:

1. To expose the students to the mathematical logic related to computer sciencefareas.
2. To enhance the problem solving skills in the areas of theoretical computerscience.
3. To use mathematical concepts in the development of computerapplications.

Course Outcomes:

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

1. Apply logic concepts in designing aprogram.
2. Illustrate basic set concepts & apply operations onset.
3. Minimize the BooleanFunction.
4. Apply basic concepts of probability to solve real worldproblem.
5. Represent data structures using graph concepts.
6. Design abstract machine, detectdeadlocks.

Unit No.	Contents	No. of Lectures
1	**Mathematical Logic:** Statements & Notations, Connectives, Statement Formulas & truth table, Well formed formulas, Tautologies , Equivalence of formulas, Duality law, Tautological Implications, Functionally complete set of connectives, Other connectives, Normal Forms, Theory of Inference for statement calculus.	10
2	**Set Theory:** Basic concepts of set theory, Operations on Sets, Ordered pairs & n-tuples, Cartesian product	04
3	**Relations & Functions:** Relations. Properties of binary relations. Matrix & Graph Representation of Relation., Partition & covering of Set, Equivalence Relations. , Composition of Binary Relation., POSET&Hasse Diagram, Functions, Types of Functions, Composition of functions..	06

4	**AlgebraicSystems:** Algebraic Systems: Examples & general Properties, Semi groups & Monoids, Groups: Definitions & Examples, Subgroup & Homomorphism.	06
5	**Lattice andBooleanAlgebra:** Lattice as partially ordered sets, Lattice as Algebraic Systems., Special Lattices., Boolean Algebra: Definitions & examples, Boolean Functions., Representation & Minimization of Boolean Functions.	08
6	**GraphTheory:** Basic concepts of graph theory., Paths, Reachability & Connectedness, Matrix, Representations of Graphs., Storage Representation & Manipulations of Graphs. PERT & Related technologies.	05

Text Books:

1. "DiscreteMathematicalStructureswithApplicationtoComputerScience"byJ.P.Tremblay& R. Manohar (MGH International)

Reference Books:

1. Discrete Mathematics –SemyourLipschutz, Marc Lipson (MGH), Schaum's outlines.
2. Discrete Mathematics and its Applications – Kenneth H. Rosen (AT&T Bell Labs) (mhhe.com/rosen)
3. Discrete Mathematical Structures – Bernard Kolman, Robert Busby, S. C. Ross and Nadeemur-Rehman (PearsonEducation)

TERM WORK :

4. It should consist of minimum 10 to 12 assignments based on topics of syllabus & Exercise problems mentioned in text books out of which 4 to 5 implementations of above assignments must be using 'C' programming language.

S. Y. B. Tech (Computer Science and Engineering) Sem – III

3. Data Structures (PCC-CS303)

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

Prerequisite: C programming

Course Objectives:

1. To make the students familiar with basic datastructures.
2. To provide students with foundation in computer programming/problem.
3. To teach the students to select appropriate data structures in computerapplications.
4. To provide the students with the details of implementation of various datastructures.

Course Outcomes:

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

1. Identify the appropriate data structure for specific application.
2. Design and analyze programming problemstatements.
3. Chose appropriate sorting and searchingalgorithms.
4. Outline the solution to the given software problem with appropriate datastructure.

Unit No.	Contents	No.of Lectures
1	**Basic of DataStructures** Data structure- Definition, Types of data structures, DataStructureOperations, Algorithms: Complexity, Time and Space complexity.	03
2	**Searching and SortingTechniques** Linear search, Binary search, Hashing – Definition, hash functions, Collision, Bubble sort, Selection sort, Insertion sort, Merge sort, Quick sort, Radix sort, Complexity and analysis.	07
3	**Stacks andQueues** Stack: Definition, operations, Array representation of stack, applications Queue: Definition, operations, Array representation of queue,applications,Circular queue, Priority queue, Deque.	07

4	**LinkedLists** Definition, representation, operations, implementation and applications ofsingly, doubly and circular linked lists. Linked representation of stack and Queue.	06
5	**Trees** Terminology, representation, binary tree, traversal methods, binary search tree, AVL search tree, B tree, B+ tree, Heaps- Operations and their applications, Heap sort.	06
6	**Graphs:** Basic concept of graph theory, storage representation, graph traversal techniques- BFS and DFS, Graph representation using sparse matrix.	06

TEXT BOOKS:

1. Schaum's Outlines Data Structures – Seymour Lipschutz (MGH)

REFERENCE BOOKS:

2. Data Structure using C- A. M. Tanenbaum, Y. Langsam, M. J. Augenstein(PHI)
3. Data Structures- A Pseudo code Approach with C – Richard F. Gilberg and Behrouz A. Forouzon 2nd Edition

S. Y. B. Tech (Computer Science and Engineering) Sem – III

4. Computer Networks – I (PCC-CS304)

TEACHING SCHEME	EXAMINATION SCHEME
Theory : 3 Hrs. / Week	**Theory :** ESE 70Marks CIE 30Marks
Tutorial : ---	**Term work:** 25
Practical: 2 Hrs. /Week	**Practical :**50
Credit:- 4	

Course Objectives: To perceive fundamental concepts of Computer Networks

1. To understand layered architecture and basic networkingprotocols
2. To illustrate the TCP/IP protocol internal details

Course Outcomes:

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

1. Demonstrate concepts of ComputerNetworks.
2. Explain OSI and TCP/IP layeredarchitecture
3. Implement network and data linklayer.
4. Demonstrate TCP protocol indetail.
5. To analyze the protocol structure using network analyzingtools.
6. apply the principals of socket programming in thenetworks.

Unit No.	Contents	No. of Lectures
1	**Introduction to Computer Network:** Overview of OSI layer Model and TCP/IP protocol model, Addressing, Underlying technologies for LANs, WANs, and Switched WANs.	05
2	**Data Link Layer** Design issues for Data Link Layers, Framing methods, Error control: detection and correction, Flow control, Elementary Data Link protocols, Sliding window Protocols, Go back n, Selective repeat.	06
3	**Medium Access Control Sub layer:** Static and Dynamic channel allocation, Multiple Access protocols ALHOA, CSMA, Collision Free Protocols, Ethernet: IEEE 802.3, IEEE 802.4, IEEE 802.5 standards, Wireless LANS 802.11 standards	06
4	**Network Layer:** IPv4 Addresses: Classful Addressing Other Issues, Sub-netting and Super netting, Class less Addressing, Delivery, Forwarding and routing; Routing methods: Shortest path, Link state, Distance vector routing and broadcast routing,	06

Congestion control algorithms: Principles, Congestion prevention policies, congestion control in datagram subnet, Load Shedding, Jitter Control.

5	**Internet Protocol:** IPDatagramformat,Fragmentationandreassemblymodels,ARP,RARP,ICMP, IGMP	08
6	**TransportLayer:** The Transport service primitives, UDP:ProcesstoProcesscommunication,UserDatagramFormat,Operationand uses of UDP. TCP: TCP Services and Features, TCP segment format, TCP Connections, Flow and error control in TCP, TCP Timers; Berkeley Sockets: Socket Addresses, Elementary Socket system calls byte ordering and address conversion routines, connectionless iterative server, connection oriented concurrent server, TCP and UDP Client serverPrograms.	08

TEXT BOOKS:

1. TCP/IP protocol suit 4th Ed. – Behrouz A. Forouzen (Tata Mag.Hill)
2. Computer Networks – Andrew S. Tanenbaum(PHI)
3. Unix Network Programming – W. Richard Stevens (PHI)

REFERENCEBOOKS*:*

1. TCP/IP Illustrated, The Protocols, Vol. I – W. Richard Stevens, G. Gabrani (PearsonEducation.)
2. Internetworking with TCP/IP, Vol. I Principles, Protocols, and Architectures – D. E. Comer (PearsonEd.)
3. Internetworking with TCP/IP, Vol. III, Client-Server Programming and Application (2nd Ed.) –D. E. Comer, David L. Stevens (Pearson Ed.)

TERM WORK

1. Study and demo of LAN, WAN and various connecting devices andcomponents
   - List out component and devices required for a std. LAN,WAN
2. Study, design and configuration of IEEE 802.3 Ethernet and IEEE 802.11Wireless
   - LANs (ReferringRFCs)
3. Study of following connectivity test tools with all its options–
4. ifconfig, arp, route,traceroute
5. nmap, netstat,finger
6. Implementing Framingmethods
7. Implementing Elementary data link protocol (Stop & waitprotocol)
8. Implementation of Error detection (CRC)code
9. Implementation of Error detection codes (Hamming)
10. Programs to understand IP addressing, classful & classlessaddressing
11. Implementation of sliding windowprotocol.

12. Implement shortest path routingalgorithm.

13. Programs for connection oriented (TCP) client-server using socketprogramming
14. Programs for connection less (UDP) client-server using socketprogramming
15. Study of network protocol analyzer (Ethereal or Wire-Shark) and understanding packet formats for UDP, TCP, ARP, ICMPprotocols.

INTRUCTIONS FOR PRACTICAL EXAMINATIONS AND TERMWORK:

Term Work: It should consist of 10-12 experiments based on the syllabus and should be implemented by using Socket Programming. The study experiments should consist of some practical work and observations.

S. Y. B. Tech (Computer Science and Engineering) Sem – III

5. Microprocessors (PCC-CS305)

TEACHING SCHEME	EXAMINATION SCHEME
Theory : 03 Hrs / Week	**Theory :** ESE 70Marks CIE 30Marks
Tutorial : ---	**Term work :** 25 marks
Practical :02 Hrs / Week	**Practical :---**
Credits:- 4	

Prerequisite: Fundamental of Electronics and Basic Computer

Course Objectives:

1. To learn the Architecture and Basic Programmingmodel.
2. To give the hands onexperienceof Assembly language programming for 8085 and 8086 Microprocessors
3. Differentiate between Microprocessors and Microcontrollers
4. To differentiate the microprocessorfamily.

Course Outcomes:

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

1. Describe the Architecture of 8085 microprocessors andmicrocontroller
2. Classify the 8086 Assembly Instructions set and use in Assembly languagePrograms
3. Explain Programming model's of 8086 microprocessors
4. Classify the 8086 Assembly Instructions set and use in Assembly languagePrograms
5. Understand the higher processor architecture
6. Understand the need for otherMicroprocessors

Unit No.	Contents	No. of Lectures
1	Architecture of 8085 Classification of Instructions, Instruction set of 8085 Introduction to 8051 Micro controllers	06
2	The Microprocessor and its Architecture: a) Internal Microprocessor Architecture b) Real Mode Addressing Addressing Mode: a) data Addressing Mode b) Program Memory Addressing Mode c) Stack memory Addressing mode..	06
3	Data movement Instruction , PUSH and POP , Load Effective Address String Data Transfer Arithmetic Instruction:	06

	a) Addition b) Subtraction c)Comparison d) Multiplication e) Division BCD & ASCII Arithmetic, AssemblerDetails.	
4	Logic & Program ControlInstruction: a) Basic LogicInstruction Shift & Rotate, Jump Group and Procedures Machine Control & Miscellaneous Instructions Basic Interrupt Processing, HardwareInterrupts	06
5	80386Microprocessor: Introduction to 80386 Microprocessor, The Memory System Special 80386 Registers80386 Memory Management , Virtual 8086 Mode Introduction to Protected Mode memory Addressing,Memory Paging Mechanism	09
6	PentiumProMicroprocessor Introduction to Pentium Pro Microprocessor, Internal Structure of the Pentium Pro, The Memory System Multiple Core technology.	06

TEXT BOOKS:

1. The INTEL Microprocessors; Architecture, Programming and Interfacing By Barry B Brey (8th Edition)
2. Microprocessors and Microcontrollers- N.Senthi Kumar, M, Saravanam and SJeevananthan (Oxford UniversityPress)

REFERENCE BOOKS:

7. Microprocessors Architecture, Programming and Application with 8085 by Ramesh Gaonkar 2 The Microcomputer Systems: the 8086.8088 Family By Yu Chenn A. Gibson (PHI Ltd)

List of Laboratory Experiments:

1. To convert different number from decimal to binary, octal to hexadecimal & vice versa &alsostudy of logic gates.
2. Perform hands on experiment using 8085kit.
3. Storing and displaying the content stored at different registers and memorylocation
4. Implementation of 8085 programs involving data transfer and arithmetic instructionset.
5. Implementation of 8085 programs involving logical and bit manipulation instructionset.
6. Implementation of 8086 programs involving branch instruction and machine control instructionset.
7. Implementation of DOS debugsutility.
8. Use of assembler directive and find the count and the sum of even, odd numbers from the givenarray.
9. Implementation of string data transfer instructions and use of Db directive for declaration of 2-Darray
10. Implementation of Dos interrupts to read char from keyboard and display on thescreen.
11. Implementation of basic logic instruction, shift and rotate instruction and BCD and ACSII arithmetic instructions.
12. To study memory management unit of 80386 processor which include address calculation, descriptor and pagingmechanisms.

S. Y. B. Tech (Computer Science and Engineering) Sem – III

6. C Programming (PCC-CS306)

TEACHING SCHEME	EXAMINATION SCHEME
Theory : 3 Hrs / Week	**Theory :**---
Tutorial : ---	**Term work:** 50 marks
Practical: 4 Hrs. / Week	**Practical :** 50marks
Credits:- 5	

Prerequisite: Digital Electronics ,Computer Fundamentals

Course Objectives:

1. To learn concepts of arrays and pointers inC
2. To learn file handling in C
3. To learn memory management inC
4. To learn structures inC

Course Outcomes:

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

1. Articulate the principles of procedure oriented problem solving andprogramming.
2. Explain programming fundamentals including statements, control flow andrecursion
3. Able to formulate problems and implement algorithmsinC . .
4. Analyze and use data structures to solve the complexproblemstatements. .
5. Demonstrate file operations using file handling concepts through developingapplications.

Unit No.	Contents	No.of Lectures
1	**Introduction toC:** The Form of a C Program, The Library and Linking, Separate Compilation,Compilinga C Program, C's Memory Map; Expressions – The Basic Data Types, Modifying the Basic Types, Identifies Names, Variables, The Four C Scopes, Type Qualifiers-const, volatile, Storage Class Specifiers; Statements - Selection Statements, Iteration Statements, Jump Statements, Expression Statements, BlockStatements.	6
2	**Console I/O & Basics of ArrayandStrings.** Console I/O: Reading and Writing Characters, Reading and Writing Strings, Formatted Console I/O, printf(), scanf(), Suppressing Input. Arrays and Strings- Two-Dimensional Arrays, Arrays of Strings, Multidimensional Arrays, Array Initialization, Variable-Length Arrays.	6
3	**Functions:** The General Form of a Function, Understanding the Scope of a Function, Parameter passing, Passing arrays to functions, Function Arguments, argc and argv-Arguments to main(),The return Statement, What Does main( ) Return?,	6

Recursion, Function Prototypes, Declaring Variable Length Parameter Lists, The inline Keyword.

4	**Pointers:** What Are Pointers?, Pointer Variables, The Pointer 0perators, Pointer Expressions, Pointers and Arrays, Arrays of Pointers, Multiple Indirection, Initializing Pointers, Pointers to Functions and structures, C's Dynamic Allocation Functions, restrict-Qualified Pointers, Problems withPointers.	6
5	**Structures, Unions, Enumerations, andtypedef :** Structures, Arrays of Structures, Passing Structures to Functions, Structure Pointers, Arrays and Structures Within Structures, Unions, Bit-Fields, Enumerations, Using sizeof to Ensure Portability, typedef .	6
6	**File I/O :** FileI/O,StandardCvs.UnixFileI/O,StreamsandFiles,FileSystemBasics,fread() and fwrite(), fseek() and Random-Access I/O, fprintf( ) and fscanf(), The Standard Streams.	6

Instructions for Practical Examinations:

It should consist of minimum 10-12 experiments based on the syllabus and concepts mention below. Students of different batches should implement different programs. Student should perform all experiments using GCC under Linux environment.

TEXT BOOKS:

1. C the Complete Reference by Herbert Schild (Tata McGraw Hill) 4thEdition.
2. The C Programming Language- Brian W. Kernighan, Dennis Ritchie 2ndEdition.

REFERENCE BOOKS:

1. Programming in ANSI C by E.Balaguruswamy.(TataMcGraw Hill)4thEdition.
2. Let Us C By Yashavant P. Kanetkar, 5thEdition.

List of Experiments

1. BranchingStatements
2. Looping
3. Arrays
4. Functions
5. StorageClass.
6. Structures.
7. Implementation ofSTACK.
8. Implementation ofQUEUE.
9. Implementation of LINKEDLIST.
10. Copy Contents of one file to anotherfile.
11. Implementation ofGRAPH.
12. Implementation ofTREE.

S. Y. B. Tech (Computer Science and Engineering) Sem – III

7. SOFT SKILLS (HM-CS307)

TEACHING SCHEME	EXAMINATION SCHEME
Theory : ---	**Theory :---**
Tutorial : ---	**Term work:** 25 Marks
Practical: 2 Hrs. / Week	**Practical :** 25Marks
Credits:- 1	

Prerequisite: English language

Course Objectives:

1. To make the engineering students aware of the importance, the role and the content of soft skills through instruction, knowledge acquisition, demonstration andpractice.
2. To develop and nurture the soft skills of the students through individual andgroup activities.
3. To expose students to right attitudinal and behavioral aspects and to build the same throughactivities
4. To encourage the all round development of students by focusing on softskills.

Course Outcomes:

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

1. Effectively communicate through verbal/oral communication and improve thelistening skills
2. Actively participate in group discussion / meetings / interviews and prepare &deliver presentations.
3. Function effectively in multi-disciplinary and heterogeneous teams through the knowledge ofteam work, Inter-personal relationships, conflict management and leadershipquality.

Contents

Unit No	
1	**Understanding Communication Skills:** Verbal Communication - Effective Communication - Active listening – Articulation Paraphrasing – Feedback Non- Verbal Communication- Body Language of self and others
2	**Behavioral Skills /Self Development:** SWOT Analysis, Confidence improvement, values, positive attitude, positive thinking and self esteem.
3	**Leadership and Team Building** Culture and Leadership- Salient Features of Corporate Culture, Leadership Styles,Leadership Trends,Team Building- Team Development Stages, Types of Teams, Attributes of a successful team – Barriers involved
4	**Developing Writing skills** E-mail writing, report writing, resumes writing, practice.

Stress and Time Management

5 Stress in Today's Time- Identify the Stress Source, Signs of Stress, Ways to Cope with Stress.Healthier Ways to Combat Stress, Steps to be taken in the Organizations: Open communication, Time Management, Working towards Your Goals, Smart Work, Prioritize yourTasks

Professional Skill

6 Ethics, Etiquette and Mannerism-All types of Etiquette (at Meetings, Etiquette at Dining. Involuntary Awkward Actions, Public Relations Office(PRO)'s Etiquettes) Technology Etiquette: Phone Etiquette, Email Etiquette, Social Media Etiquette, Video Conferencing Etiquette, InterviewEtiquette.
Dressing Etiquettes: for Interview, offices and social functions.
Ethical Values: Importance of Work Ethics, Problems in the Absence of Work Ethics.

TERM WORK:

1. The instructor shows videos to enhance skills supporting career aspects and discussion about same videos. Multiple set of observations based on videos can be prepared by students.
2. Multiple set of activity based assignments can be prepared to allow multiple skills exposurefor example a group task encouraging discussions, team building,value sharing, leadership and role play all at the same time. Every student must be given adequate opportunity to participate actively in each activity.
3. Each student will write one report based on visit / project / business proposaletc.
4. Faculty may arrange one or more sessions from following: Yoga and Meditation. Stress management, relaxation exercises, and fitness exercises. Time management and personal planningsessions.
5. The student must prepare the journal in the form of report elaborating the activities performed in the lab. Continuous assessment of laboratory work is to be done based on overall performance and lab assignments performance of student. Each lab assignment assessment will assign grade/marks based on parameters with appropriate weightage. Suggested parameters for overall assessment as well as each lab assignment assessment include- timely completion, performance, punctuality, neatness, enthusiasm, participation and contribution in various activities-SWOT analysis, presentations, team activity, event management, group discussion, Group exercises and interpersonal skills and similar otheractivities/assignments.

TEXT BOOKS:

1. Developing Communication Skills by Krishna Mohan and MeeraBanerji;MacMillan India Ltd., Delhi
2. Gajendra Singh Chauhan, Sangeeta Sharma: Soft Skills – An Integrated Approach to Maximize Personality, WILEY INDIA, ISBN:13:9788126556397
3. Essentials of Effective Communication, Ludlow and Panthon; Prentice Hall ofIndia.

REFERENCE BOOKS:

1. Indrajit Bhattacharya, ―An Approach to Communication Skills‖, Delhi, Dhanpat Rai,2008.
2. Seven Spiritual Laws of Success - DeepakChopra
3.Simon Sweeney, ―English for Business Communication‖, Cambridge University Press, ISBN13:978-0521754507.

S. Y. B. Tech (Computer Science and Engineering) Sem – IV

1. Automata Theory(PCC-CS-401)

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

Prerequisite: Basic Mathematical Concepts, Sets, graphs. **Course Objectives:**

1. To introduce students to the mathematical foundations of computation, the theory offormal languages andgrammars
2. To strengthen the students' ability to understand and conduct mathematical proofsfor computations
3. To make the students understand the use of automata theory in Compliers & SystemProgramming.
4. To analyze and design finite automata, pushdown automata, grammars & Turingmachines

Course Outcomes:

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

1. Understand basic concepts of Regular Language and Regular Expressions
2. Select appropriate abstract machine to recognize a given formallanguage.
3. Generate complex languages by applying Union, Intersection, Complement, Concatenationand Kleene * operations on simplelanguages.
4. Apply parsing concepts for syntaxanalysis.
5. Be familiar with thinking analytically and intuitively for problem solving situations in relatedareas of theory in computerscience.

Unit No	Contents	No. of Lectures
1	**Regular Languages and Finite Automata** Proofs,RecursiveDefinitions,Regularexpressionsandregularlanguages,Finite Automata,unions,intersection&complementsofregularlanguages,Applications of FA	7
2	**Nondeterminism and Kleene's Theorem** Nondeterministic finite automata, NFA with null transition, Equivalence of FA's, Kleene's Theorem (Part I & Part II), Minimal Finite Automata	6
3	**Context free Grammars** Definition, Union, Concatenation and Kleene *'s of CFLs, Derivation trees and ambiguity, Simplified forms and normal forms	5

4	**Parsing andPushdownAutomata** Definition of Pushdown Automata, Deterministic PDA, Equivalence of CFG's& PDA's, Top down parsing, bottom up parsing.	6
5	**Context free languages** CFL's and non CFL's**,** Pumping Lemma, intersections and complementsof CFLs	5
6	**Turing Machines** Definition,TMaslanguageacceptors,combiningTuringMachines**,**Computing partial function with a TM, Multi-tape TMs, and Universal TM	7

Text Books:

1. Introduction to Languages & the Theory of Computations – John C. Martin (Tata MGHEdition)
2. Discrete Mathematical Structures with applications to Computer Science – J .P. Trembley & R. Manohar (MGH)

Reference Books:

1. Introduction to Automata Theory, Languages and computation – John E. Hopcraft,Raje
2. Motwani, Jeffrey D. Ullman (PearsonEdition)
3. Introduction to theory of Computations – Michael Sipser (ThomsonBooks/Cole)
4. Theory of Computation –VivekKulkarni

S. Y. B. Tech (Computer Science and Engineering) Sem – IV

2. Computer Networks-II (PCC-CS-402)

TEACHING SCHEME	EXAMINATION SCHEME
Theory : 3 Hrs/Week	**Theory :** ESE 70Marks CIE 30Marks
Tutorial : ---	**Term work:** 25 marks
Practical: 2 Hrs/Week	**Practical :** 50Marks
Credits:- 4	

Prerequisite: Computer Network-I.

Course Objectives:

1. To understand the Client server model & socketinterface
2. To perceive IPv6 addressing and protocol
3. To explain and learn basic internet technologyprotocols
4. Simulate protocols using softwaretools.

Course Outcomes:

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

1. program the client server model usingsockets
2. understand and apply next generation protocol and addressingmodel
3. elaborate the fundamentals of Domain NameSystems
4. apply the concepts of Remote login and FTP in networkapplications
5. learn fundamentals of web, HTTP and e-mail communication protocols.
6. understand multimedia streaming and relevant protocols.

Unit No	Contents	No. of Lectures
1	**Client server model & socket interface:** The Socket Interface, The Client Server model andSoftwaredesign, Concurrent processinginclient-serversoftware,AlgorithmsandissuesinClient-Serverdesign, Multiprotocol Servers, Multiservice Servers, Concurrency in clients, Unix Internet Super server (inetd).	6
2	**Next Generation IPv6 and ICMPv6:** IPV6 addresses, packet format, ICMPV6, Transaction from IPV4 to IPV6	5
3	**BOOTP, DHCP and Domain name system:** Name Space, Domain Name Space, Distribution of name space, and DNS in internet, Resolution, DNS massages, Types of records, Compression examples, and encapsulation. BOOTP, DHCP	6

4	**Remote Login: TELNET and File TransferFTP,TFTP:** Concept, NVT, Embedding, Options & options/sub-option negotiation, controlling the server, Out-of-band signaling, Escape charter, Mode of operation, user interface. **FTP:** Connections, Communication, Command processing, File transfer, User interface, Anonymous FTP, TFTP.	6
5	**Web Applications Service Protocols:** HTTP: Architecture, Web Documents, HTTP Transaction, RequestandResponse, HTTP Headers and Examples, Persistent Vs Non- Persistent HTTP, Proxy servers. **Electronic Mail:** Architecture, User agent, addresses, Delayed delivery, SMTP commands and responses, Mail transfer phases, MIME, POP3	7
6	**Multimedia In Internet:** Streaming stored audio/video, Streaming live audio/video, Realtimeinteractive audio/video, Real Time Transport Protocol (RTP), Real Time Transport Control Protocol (RTCP), Voice Over IP (VoIP), Session Initiation Protocol (SIP)	6

Text Books:

1. TCP/IP Protocol Suite by Behrouz A. Forouzan McGraw-Hill Publication, 4thEdition.
2. Computer Networks by Andrew STanenbaum.

Reference Books:

1. Data Communications and Networking by Behrouz AForouzan
2. Internetworking with TCP/IP by Douglas Comer
3. Computer Networking: A Top-Down Approach by Jim Kurose

Term work:

It should consist of minimum 8 - 10 experiments based on the following guidelines

1. Client program using UDP to connect to well known services (echo, time of the day serviceetc.).
2. Implementing concurrent TCP multiserviceclient/server.
3. Implementing Iterative UDP client/server.
4. Study of following DNS Tools with all its options. nslookup, dig, host,whois.
5. Implement trivial file transfer protocol (TFTP).
6. Configuration of basic services for FTP, HTTP, Telnet etc. on LinuxPlatform
7. Write program to send a mail using SMTP commands and receive a mail using POP3commands.
8. Capturing & Analyzing operation of various application layer protocols using network protocol analyzer. (Wireshark andtcpdump)
9. Study of various streaming multimedia protocols in Internet (Using various audio/video streaming services on theInternet)

S. Y. B. Tech (Computer Science and Engineering) Sem – IV

3. Computer Organization and Architecture (PCC-CS-403)

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

Prerequisite: Basic Computer and Microprocessor

Course Objectives:

1. To provide a high-level overview of Computerorganization.
2. To discuss the basic of I/O addressing andaccess.
3. To make the students aware of overall design and architecture of computer and itsorganization.
4. To analyze performance issues in processor and memory design of a digitalcomputer.

Course Outcomes:

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

1. recapitulate the history of computer system and the basic concepts of computer architectureand organization.
2. understand the concept of I/Oorganization.
3. apply the different algorithms to perform arithmeticoperations.
4. articulate the design issues in the development ofprocessor.
5. conceptualize instruction levelparallelism.
6. understand the concept of memorytechniques.

Unit No	Contents	No.of Lectures
1	**Computer Evolution andPerformance** Evolution of computer – Mechanical Era: Babbage's Difference Engine, Electronic Era: First generation, IAS Computers, Instruction Set and Instruction Execution, Second generation, Input-Output Operation, Programming Language, Third generationand VLSI Era – IC Circuits, Performance Consideration and Measures, Speed up Techniques, Difference between RICS and CISC.	5
2	**Input and OutputOrganization** Accessing I/O devices, Direct Memory Access (DMA), Buses: SynchronousBusand Asynchronous Bus, Interface Circuits, Standard IO Interface.	6
3	**Arithmetic** Addition and Subtraction of Signed Numbers, Design of fast Adders,Multiplication of Positive numbers , Signed Operand Multiplication, Fast Multiplication, Integer Division, Floating Point Number Operations: IEEE 754 Floating Point Format, Arithmetic Operations	8
4	**The Processing Unit** Some fundamental Concepts, Execution of complete Instruction,Multiplebus	6

	organization, Hardwired control, Micro programmed Control **Pipelining**	
5	Basic Concepts: Role of Cache Memory, Pipeline Performance. DataHazards:Operand Forwarding, Handling Data Hazards in Software and Side Effects and Instruction Hazards: Unconditional Branches and Conditional Branches and Branch Prediction	5
	Computer Memory System	
6	Some Basic Concepts, Types of Memories :ROM and RAM, SemiconductorRAMmemory, Cache Memories: Mapping functions, Replacement Algorithms, Example of Mapping Techniques	6

Text Books:

1. Computer Architecture and Organization-John P Hayes (MGH) 3rd Edition
2. Computer Organization – Carl Hamacher, ZvonkoVranesic and SafwatZaky . Publisher: Tata McGraw Hill. 5th Edition.

Reference Books:

4. Computer Systems Organization & Architecture – John D. Carpinelli (PearsonEducation)
5. http://cse.stanford.edu/class/sophomore-college/projects-00/risc/risccisc/(RISC vs.CISC)
6. http://www.cpu-world.com/sspec/

S. Y. B. Tech (Computer Science and Engineering) Sem – IV

4. Operating System I (PCC-CS-404)

TEACHING SCHEME	EXAMINATION SCHEME
Theory : 3 Hrs/Week	**Theory :** ESE 70Marks CIE 30Marks
Tutorial : ---	**Term work:** 25 marks
Practical: 2 Hrs/Week	**Practical :---**
Credits:- 4	

Prerequisite: Computer Network-I.

Course Objectives:

1. To make the students understand basic concepts of operatingsystem
2. To expose the students to various functions of the Operating system and theirusage
3. To give hands on exposure to Linux commands and systemcalls.

Unit No.	Contents	No.of Lectures
1	**Overview of OS** Abstract view of an operating system,Fundamental principles of OS operations, OS interaction with the computer and user programs, Efficiency ,system performance and user service,Batch Processing System, Multiprogramming System, The Time Sharing System, The Real Time Operating System, Distributed operating system, Operation of OS, Operating system with monolithic structure,Virtual machine operating system, Kernel based operating system, Microkernel based operatingsystem	6
2	**Processes, Threads and Synchronization** Processes andprograms,Implementing processes, Threads, Process synchronization, Race condition, Critical Section, Synchronization approaches, Classic process synchronization problems, Semaphores, Monitors	6
3	**Process Scheduling** Scheduling terminology and concepts,Nonpreemptive scheduling policies, Preemptive scheduling policies, Long, Medium and short term scheduling	6
4	**Deadlock** What is deadlock, Deadlock in resourceallocation,Handling Deadlocks : Deadlock Detection and Resolution, Deadlock prevention, Deadlock avoidance	6
5	**Memory Management** Managing the memory hierarchy, Static and Dynamic Memory Allocation, Heap Management, Contiguous Memory Allocation and Non Contiguous Allocation, Segmentation and Segmentation with paging, Virtual memory basics, Demand paging, Page replacementpolicies	6

6	**File systems and I/O systems** Overview of file processing, Filesandfile operations, Fundamental file organizations and access methods, Layers of the Input Output control system, Overview of I/O system	6

Text Books:

1. Operating Systems –A Concept Based approach –Dhananjay M Dhamdhere (TMGH).3rd edition.
2. Operating System Concepts –Abraham Silberschatz, Peter B. Galvin &Grege Gagne(Wiley)

Reference Books:

1. UNIX Concepts and Applications –Sumitabha Das(TMGH).
2. Operating System: Concepts and Design –Milan Milenkovic (TMGH)
3. Operating System with case studies in Unix, Netware and Windows NT –Achyut S. Godbole (TMGH).

Term work:

The tutorials should be conducted on the following guidelines.

1. Six assignments should be based on theoretical / analytical concepts, preferably from the exercises of the books covering all topics of thesyllabus.
2. Four assignments should on usage of Unix / Linux commands and system calls concerned with General purpose utilities, file system, handling ordinary files, basic file attributes, the Shell, the Process and Filters using regular expressions as mentioned in the reference book at serial no.1.
3. Installation of any two operating system usingVmware.

These assignments should be practically conducted during the tutorial sessions.

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5. Software Engineering (PCC-CS-405)

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

Course Objectives:

1. To expose the students to basic concepts & principles of softwareengineering.
2. To make the student aware of the importance of SDLC in their project developmentwork.
3. To expose the students to software testing techniques and software qualitymanagement.

Course Outcomes:

1. Comprehend systematic methodologies of SDLC(Software Development LifeCycle)
2. Discriminate competing and feasible system requirements indicating correct real world problem scope and prepare stepwise system conceptual model using stakeholder analysis and requirementvalidation.
3. Prepare SRS document for aproject
4. Apply software design and developmenttechniques
5. Develop a quality software project through effective team-building, planning, scheduling and risk
6. Understand testing methods at each phase ofSDLC

Unit No.	Contents	No.of Lectures
1	**The software Problem** Cost, Schedule & Quality, Scale and Change, Software Processes: Process & Project, Component Software Processes, Software Development process Models, Project Management Process.	6
2	**Software Requirements Analysis & specification** Value of Good SRS, Requirement Process, Requirements Specification, Other Approaches for Analysis ,Validation	5
3	**Software Planning & Scheduling** Responsibilities of Software Project Manager, Project Planning, Project Scheduling, Project Staffing, People CMM, Risk Management	6
4	**Design** Design Concepts, Function Oriented Design, Object Oriented Design, Detail Design,Verification,Metrics	6

5	**Coding & Testing** Coding & Code Review,Testing, UnitTesting,Black Box ,Testing,White Box Testing, Program Analysis Tools,Integration Testing, System Testing	7
6	**Software Reliability &Quality Management** Reliability,SoftwareQuality,Software Quality Management System, ISO 9000, SEI capability Maturity Model, Six Sigma, Agile Software Development & Extreme Programming, Agile Project Management	6

Text Books:

1. Software Engineering: A precise Approach – Pankaj Jalote (Wiley India) (Unit1,2,4).
2. Fundamentals of Software Engineering – Rajib Mall (3rd Edition)(PHI) (Unit 5,6).
3. Software Engineering by Jan Sommerville (9th Edition) Pearson (Unit 6, 7 &6.8).
4. Software Engineering Principles & Practices by RohitKhuranaITLESL (2nd Edition) Vikas Publishing House Pvt. Ltd. (Unit3).

Reference Books:

1. Software Engineering – Concepts & Practices –Ugrasen Suman (CenageLearning)
2. Software Engineering Fundamentals –Behforooz& Hudson (Oxford: Indian Edition1st)

S. Y. B. Tech (Computer Science and Engineering) Sem – IV

6. Object Oriented Programming (PCC-CS406)

TEACHING SCHEME	EXAMINATION SCHEME
Theory : 2 Hrs/Week	**Theory :**---
Tutorial : ---	**Term work:** 50 marks
Practical: 4 Hrs/Week	**Practical :** 50marks
Credits:- 4	

Pre- requisites: Basics Of C Programming Language

Course Objectives:

1. To learn advanced features of the C++ programming language as a continuation of the previouscourse.
2. To learn the characteristics of an object-oriented programming language: data abstractionand information hiding, inheritance, and dynamic binding of the messages to themethods.
3. To learn the basic principles of object-oriented design and software engineering in terms of software reuse and managingcomplexity.
4. To enhance problem solving and programming skills in C++ with extensive programming projects.
5. To become familiar with the LINUX software developmentenvironment.

Course Outcomes:

After the completion of this course, a successful student will be able to do the following:

1) Use the characteristics of an object-oriented programming language in aprogram.
2) Use the basic object-oriented design principles in computer problemsolving.
3) Use the basic principles of software engineering in managing complex softwareproject.
4) Program with advanced features of the C++ programming language.
5) Develop programs in the LINUX programming environment.

Unit No.	Contents	No. of Lectures
1	**Basics of Object Oriented Programming** The Origins of C++,Features of Object Oriented Programming, relations of Classes & Structures, Classes & Objects, Encapsulation, Data Abstraction, Inheritance, Inline Function, Constructor &Destructor ,function overloading & Operator overloading, Static class member, Static Member Function, Scope resolution Operator, Access members Data member & member Function, Defining member functions, Passing Object to Functions, Nested classes, local classes, Friend functions, Friend class	5
2	**Pointers , Arrays, Dynamic allocation Operator** Arrays Of Object, Pointers to Object, THIS pointer, type checking C++ Pointers, Pointers to Derived types, Pointers to Class members Dynamic Allocation Pointers :-New & Delete Operator	3
3	**Functions & Operator Overloading** Functions Overloading, Operator Overloading, Types Of Constructors, Destructors, Operator Overloading Using Friend Function, Unary & Binary Operator Overloading(Arithmetic, Comparison Operator Overloading),Assignment Operator Overloading(=,+=)	4
4	**Inheritance & Virtual Function** Inheritance, Single Inheritance, Types of Derivations, Passing parameters to base ,Multiple Inheritance, Multilevel Inheritance, Hybrid Inheritance ,Hierarchical Inheritance , Virtual function, Calling a Virtual function through a base class reference, Virtual functions are hierarchical, Pure virtual functions, Abstract classes, Early and late binding.	5
5	**Templates & Exception handling** Function Template ,Class Template, Generic Classes ,Generic Functions, Applying Generic Functions Type Name, export keyword Power of Templates Standard Template Library (STL):-STL Container, STL Algorithm, STL iterator. Exception handling :-Exception handling fundamentals, Catching, Throwing ,& Handling Exception, Exception handling options,	5

6	**I/O System Basics,FileI/0** Streams ,File Pointers & Redirections Streams, C++ stream, C++ Predefined stream classes, Formatted I/O, C++ file I/O, manipulators, fstream and the File classes, File operations, namespaces, std namespaces	4

TERM WORK:

- It should consist of minimum 10-12 experiments based on the syllabusand concepts mention below. Students of different batches should implement different programs based on thefollowing guidelines
- Student should perform the Practicals on Linuxplatform

List of Experiments

1. Classes &objects
2. Constructors &destructors
3. Friend function and Friendclass
4. Inline Function, Static data members & memberfunctions,
5. Array, Array of Objects, Pointer to Object, THIS pointer, Dynamic allocation operators (New & Delete)
6. Function overloading, Operator overloading (unary/binary/arithmetic/comparison)
7. Inheritance (multilevel, multiple, hybrid, Hierarchical)
8. Virtual function and Virtual class, early and latebinding
9. Generic function &classes
10. STL
11. ExceptionHandling
12. Filehandling

TEXT BOOKS:

1. The Complete Reference C++ by Herbert Schild(Tata McGraw Hill) 4th Edition andonwards.
2. Object oriented Programming in C++ by Rajesh K.Shukla(Wiley) IndiaEdition

REFERENCE BOOKS:

1 Object-Oriented Programming with C++ by E. Balaguruswamy. (Tata McGraw-Hill) 6th Edition and onwards
2. Object oriented Programming with C++- by SouravSahay (Oxford) 2nd edition

S. Y. B. Tech (Computer Science and Engineering) Sem – IV

7. Mini Project (PW-CS407)

TEACHING SCHEME	EXAMINATION SCHEME
Theory : ---	**Theory :**---
Tutorial : ---	**Term work:** 50 marks
Practical: 2 Hrs/Week	**Practical :** 50marks
Credits:- 3	

Pre-requisites: Knowledge of software engineering and C/C++

Course Objectives:

1. To expose the students to solve the real worldproblems.
2. To utilize the techniques. Skills and modern Engineering tools for building theproject.
3. To follow the methods and tasks as per SDOLCApproach

Course Outcomes:

1. Define the problemstatement.
2. Organize, Plan and prepare the detailed projectactivities.
3. Construct Flowchart, System Architecture based on the projectdescription
4. Implement the solution for theirproblem.

Platform: - C, C++

Course Contents/Description:-

The Mini Project should be undertaken preferably by a group of 3-4 students who will jointly work together and implement the project. The Mini Project topic should be based on the any one subject concepts that students have studied for their Academic Year. The group will select the project with the approval of the guide and submit the name of the project with a synopsis of the proposed work not more than 02 to 03 pages. In the Synopsis they have to state Flowchart, Usage of the logic, algorithm, functions and suitable data structure for implementing the solution. They have to implement project using C, C++languages.

S. Y. B.Tech (Computer Science and Engineering) Sem – IV

8. ENVIRONMENTAL STUDIES(PCC-CS408)

	TEACHING SCHEME	EXAMINATION SCHEME
	Theory : 2 Hrs/Week	**Term work:**
	Tutorial : 1 Hr/week	**Theory** 100
	Practical:	**Practical :**
	Credits:- 3	

SHIVAJI UNIVERSITY, KOLHAPUR

SYLLABUS AND STRUCTURE

SECOND YEAR (B. Tech.)

Electronics & Computer Science Engineering.

To be introduced from the academic year 2023-24

(i.e., from June 2023) onwards

Semester III

Sr. No	Code No.	Subject	Semester	Credits
1	BSC-ECS-301	Engineering Mathematics – III	3	4
2	PCC-ECS-301	Electronic Devices	3	5
3	PCC-ECS-302	Digital Electronics	3	4
4	PCC-ECS-303	Data Structures and Algorithms	3	4
5	PCC-ECS-304	Database Management System	3	4
6	PCC-ECS-305	Programming in C	3	3
		Total		24

Semester IV

Sr. No	Code No.	Subject	Semester	Credits
1	PCC-ECS-401	Electronic Circuits	4	4
2	PCC-ECS-402	Controls and Instrumentation	4	4
3	PCC-ECS-403	Computer Network	4	4
4	PCC-ECS-404	Microprocessors and Microcontrollers	4	4
5	PCC-ECS-405	Discrete Structure & Automata Theory	4	4
6	PCC-ECS-406	Programming in C++	4	3
7	MC-ECS-401	Environment Studies	4	3
		Total		26

*****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 pointes 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.

SECOND YEAR ELECTRONICS & COMPUTER SCIENCE ENGINEERING – CBCS PATTERN

Semester Examination

Sr. No	Course (Subject Title)	TEACHING SCHEME									EXAMINATION SCHEME										
		THEORY			TUTORIAL			PRACTICAL			THEORY					PRACTICAL			TERM WORK		
		Credits	No. of Lecture	Hours	Credits	No. of Lecture	Hours	Credits	No. of Lecture	Hours	Hours	Mode	Marks	Total Marks	Min	Hours	Max	Min	Hours	Max	Min
SEMESTER III																					
1	BSC-ECS-301	3	3	3	1	1	1	-	-	-		CIE	30	100	40	As per BOS Guidelines	-	-		25	10
												ESE	70								
2	PCC-ECS-301	4	4	4	-	-	-	1	2	2		CIE	30	100	40		-	-		25	10
												ESE	70								
3	PCC-ECS-302	3	3	3	-	-	-	1	2	2		CIE	30	100	40		50	20		25	10
												ESE	70								
4	PCC-ECS-303	3	3	3	1	1	1					CIE	30	100	40		-	-		25	10
												ESE	70								
5	PCC-ECS-304	3	3	3	-	-	-	1	2	2		CIE	30	100	40		50	20		25	10
												ESE	70								
6	PCC-ECS-305	2	2	2	-	-	-	1	2	2		-	-	-	-		50	20		25	10
	TOTAL	**18**	**18**	**18**	**2**	**2**	**2**	**4**	**8**	**8**				**500**			**150**			**150**	
SEMESTER IV																					
1	PCC-ECS-401	3	3	3	-	-	-	1	2	2		CIE	30	100	40	As per BOS Guidelines	50	20		25	10
												ESE	70								
2	PCC-ECS-402	3	3	3	-	-	-	1	2	2		CIE	30	100	40					25	10
												ESE	70								
3	PCC-ECS-403	3	3	3	-	-	-	1	2	2		CIE	30	100	40		50	20		25	10
												ESE	70								
4	PCC-ECS-404	3	3	3	-	-	-	1	2	2		CIE	30	100	40		-	-		25	10
												ESE	70								
5	PCC-ECS-405	3	3	3	1	1	1	-	-	-		CIE	30	100	40		-	-		-	-
												ESE	70								
6	PCC-ECS-406	2	2	2	-	-	-	1	2	2							50	20		50	20
7	MC-ECS-401	2	2	-	1	1	1	-	-	-		CIE	30	100	40		-	-		-	-
												ESE	70								
	TOTAL	**19**	**19**	**19**	**2**	**2**	**2**	**5**	**10**	**10**				**600**			**150**			**150**	
	TOTAL	**37**	**37**	**37**	**4**	**4**	**4**	**9**	**18**	**18**				**1100**			**300**			**300**	

CIE- Continuous Internal Evaluation. ESE – End Semester Examination

• Candidate contact hours per week: 30 Hours (Minimum)	• Total Marks for S.E. Sem III & IV: 1700
• Theory and Practical Lectures: 60 Minutes	• Total Credits for S.E. Sem III & IV: 50
• 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. **BSC-ECS**: Basic Science Course- Electronics & Computer Science Engineering are compulsory.

2. **PCC-ECS:** Professional Core course –Electronics & Computer Science Engineering are compulsory.

3. **MC-ECS:** Mandatory Course: Environmental Studies which is compulsory for theory 70 marks and project work 30 marks.

SHIVAJI UNIVERSITY, KOLHAPUR

ELECTRONICS AND COMPUTER SCIENCE ENGINEERING

MATHEMATICS-III

Course Details

Class	S. Y. B. Tech Sem - III
Course Code and Course Title	BSC-ECS-301- Engineering Mathematics - III
Prerequisites	Basic Trigonometry, Derivative and Integration, Basic Probability.
Teaching scheme: Lecture /Practical/Tutorial	3/0/1
Credits	3+1
Evaluation scheme CIE/ESE for Theory	30/70

Teaching scheme	Examination scheme
Lectures: 03Hrs/week	Theory: 100 Marks, 70(ESE)+30(CIE)
Tutorial: 01Hr/week	TW: 25 Marks

Objectives:

The course is aimed

1. To develop mathematical skills and enhance thinking power of students

2. To give the knowledge to the students of fuzzy set theory, Linear Differential Equations probability, Laplace transforms, Fourier series with an emphasis on the application of solving engineering problems

3. To prepare students to formulate a mathematical model using engineering skills & interpret the solution in real world.

Course Outcomes:

On successful completion of course learner will be able to;

1. Make use of Linear Differential Equations to solve the Electrical Engineering problems.

2. Apply knowledge of vector differentiation to find directional derivatives, curl and divergence of vector fields.

3. Define fuzzy sets using linguistic words and represent these sets by membership functions, convexity, Normality, support, etc.

4. Develop Fourier series expansion of a function over the given interval.

5. Find Laplace transforms of given functions and use it to solve linear differential equations.

6. Solve basic problems in probability theory, including problems involving the binomial, Poisson, and normal distributions.

Section - I

UNIT NO	CONTENTS	HOURS
1	**Linear Differential Equations (LDE) and its applications:** 1.1 Linear Differential equations with constant coefficients. 1.2 Rules to find complementary function. 1.3 Methods to find particular Integral (e^{ax}, sinax or cosax, x^m, e^{ax}sinax or e^{ax}cosax. 1.4 Cauchy's homogeneous linear differential equations. 1.5 Applications of linear differential equations with constant coefficients to Electrical engineering	7
2	**Vector Differential Calculus:** 2.1 Differentiation of vectors. 2.2 Gradient of scalar point function. 2.3 Directional derivative. 2.4 Divergence of vector point function. 2.5 Curl of a vector point function. 2.6 Irrotational, Solenoidal and Scalar potential function of a vector field.	7
3	**Introduction to Fuzzy sets:** 3.1 Crisp set and Fuzzy set. 3.2. Basic concepts of fuzzy sets 3.3 Basic operations on fuzzy sets. 3.4 Properties of fuzzy sets.	7
Section-II		
4	**Fourier Series:** 4.1 Introduction. 4.2 Definition, Euler's formulae. 4.3 Dirichlet's conditions. 4.4 Change of interval. 4.5 Expansions of odd and even functions. 4.6 Half range series.	7
5	**Laplace Transform and its Applications:** 5.1 Laplace transform of elementary functions. 5.2 Properties of Laplace transforms (First Shifting, Change of scale property, Multiplication & Division by t). 5.3 Laplace transforms of derivatives and integral. 5.4 Inverse Laplace transforms by partial fractions & convolution theorem. 5.5 Solution of Linear differential equation with constant coefficients using Laplace transform.	7
6	**Probability Distribution:** 6.1 Random variables. 6.2 Discrete Probability distribution. 6.3 Continuous probability distribution.	7

	6.4 Binomial Distribution. 6.5 Poisson Distribution. 6.6 Normal Distribution.	
Total		42

Text Books:

01 Higher Engineering Mathematics, by B. S. Grewal (Khanna Publication Delhi.)

02 Applied Mathematics Wartikar P N and Wartikar J N, (Pune Vidyarthi Grah Prakashsn)

Reference Books:

01 Advance Engineering Mathematics by Erwin Kreyszig (Wiley India.)

02 Mathematical Methods of Science and Engineering, by Kanti B. Datta (Cengage Learning.)

03 Advanced Engineering Mathematics, 3e, by Jack Goldberg (Oxford University Press.)

04 Engineering Mathematics by V. Sundaram (Vikas Publication.)

05 Higher Engineering Mathematics, by B. S. Grewal (Khanna Publication Delhi.)

06 Higher Engineering Mathematics, by B. V. Ramana (Tata McGraw-Hill)

07 Advanced Engineering Mathematics, by H. K. Das (S. Chand Publication.)

08 Fuzzy Sets and Fuzzy Logic: Theory and Applications, by George J. Klir and Bo Yuan (Prentice Hall of India Private Limited.)

09 Applied Mathematics by Navneet D. Sangle (Cengage Publication)

General Instructions:

1)For the term work of 25 marks, batch wise tutorials are to be conducted. The number of students per batch per tutorial should be as per university rules.

2)Number of assignments should be at least six (All units should be covered).

SHIVAJI UNIVERSITY, KOLHAPUR

ELECTRONICS AND COMPUTER SCIENCE ENGINEERING

Electronics Devices

Course Details

Class	S. Y. B. Tech Sem - III
Course Code and Course Title	PCC-ECS-301- Electronics Devices
Prerequisites	Basic Circuit Law's, Semiconductor diode, Zener diode, BJT details.
Teaching scheme: Lecture /Practical/Tutorial	4/1/0
Credits	4+1
Evaluation scheme CIE/ESE for Theory	30/70

Teaching scheme	Examination scheme
Lectures: 04Hrs/week	Theory: 100 Marks, 70(ESE)+30(CIE)
Tutorial: NA	TW: 25 Marks
Practical: 02Hrs/week	ESE: NA

Course Objectives:

1. To deliver the knowledge of basic semiconductor devices.

2. To enhance comprehension capabilities of students through understanding of electronic devices.

3. To introduce and motivate students to the use of advanced nano electronic devices

4. To analyses amplifiers using BJT and FET based devices.

Course Outcomes:

After successful completion of the course students will be able to:

1. Explain the working of semiconductor devices.

2. Interpret the characteristics of semiconductor devices.

3. Analyze Electronics circuits using BJT and FET (DC & AC analysis)

4. Compare various biasing circuits &configurations of BJT and MOSFETs.

5. Select best circuit for the given specifications/application.

6. Describe the working of advanced nano electronic devices

Section-I

Unit	CONTENTS	Hours
1	**P-N Junction Diode & Applications** 1.1 Theoretical description of basic structure & construction, symbol, operation under zero bias, forward bias & reverse bias, avalanche breakdown, V-I characteristics & temperature effects (no mathematical analysis or numerical examples) 1.2 Application of P-N junction diode as clippers & clampers (different types of configurations with input-output waveforms & transfer characteristics; theoretical description & analysis of each circuit; numerical examples)	6
2	**Special Semiconductor Devices** 1.1 Zener diode as the voltage regulator (theoretical description only which includes construction of circuit diagram, operation / working for varying DC input voltage & varying load resistance, concept of line regulation & load regulation – no numerical examples 1.2 Construction, structure, symbol, operating principle, working & V-I characteristics of special semiconductor devices such as Varactor diode, Schottky diode, Photo diode, Light emitting diode (LED) & Solar cells	6
3	**Bipolar Junction Transistor (BJT)** 3.1 BJT construction & structure, symbol, operation, voltages & currents, V-I characteristics of common emitter (CE), common base (CB) & common collector (CC) configuration, Early effect & concept of leakage current 3.2 DC Circuit Analysis: DC load line, Q-point & region of operation, common BJT configurations, biasing circuits, bias stability and concept of thermal runaway, analysis of biasing circuits (numerical examples to be included) 3.3 AC Analysis of BJT Amplifiers: AC load line, small signal models: h-parameter model, re model, hybrid-pi (rπ) model. AC equivalent circuits and analysis to obtain voltage gain, current gain, input impedance, output impedance of CE amplifier using hybrid-pi (rπ) model only	9
Section-II		
4	**Field Effect Devices (FET)** 4.1 JFET: Construction, symbol, operation, V-I & transfer characteristics MOSFET: Construction, operation, symbol, V-I & transfer characteristics of the DMOSFET & E-MOSFET (theoretical description only for JFET & MOSFET) 4.2 DC Circuit Analysis: DC load line, Q-point & region of operation, common MOSFET configurations of common source (CS), common drain (CD) & common gate (CG), analysis of biasing circuits (numerical examples only for E-MOSFET & D-MOSFET; no JFET) 4.3 AC Analysis: AC load line, small signal (AC) model of the MOSFET & its equivalent circuit, small signal (AC) analysis of common source (CS) configuration MOSFET amplifier only (numerical examples included)	09
5	**Rectifiers &Filters** 5.1 Rectifiers: Working & mathematical analysis of full – wave Centre tapped	06

	rectifier & bridge type rectifier (mathematical analysis include expressions for the DC / average & RMS output voltage, DC / average & RMS output current & ripple factor; numerical examples included) 5.2 Filters: Capacitor (C), Inductor (L), Inductor – Capacitor (LC), C-L-C (π) with circuit diagram, waveforms, working / operation & expression for ripple factor (Theoretical description only – no analysis or numerical examples to be included)	
6	**Emerging Electronic Devices** 6.1 Single Electron Transistor (SET) & Quantum Dots (theoretical description only – construction, structure & nature of operation, characteristics & applications) 6.2 Memristor & Spintronic devices (theoretical description only – construction, structure & nature of operation, characteristics & applications)	06
Total		42

Text Books:

1. Donald A. Neamen, "Electronic Circuit Analysis and Design", TATA McGraw Hill, 2nd Edition
2. Adel S. Sedra, Kenneth C. Smith and Arun N Chandorkar, "Microelectronic Circuits Theory and Applications", International Version, OXFORD International Students Edition, Fifth Edition.
3. James Morris & Krzysztof Iniewski, Nano-electronic Device Applications Handbook by CRC Press

Reference Books:

1. Boylestead," Electronic Devices and Circuit Theory", Pearson Education

2. David A. Bell, "Electronic Devices and Circuits", Oxford, Fifth Edition.

3. Muhammad H. Rashid, "Microelectronics Circuits Analysis and Design", Cengage

4. S. Salivahanan, N. Suresh Kumar,"Electronic Devices and Circuits", Tata McGraw Hill.

5. Millman and Halkies, "Integrated Electronics", Tata McGraw Hill.

List of Experiment: (Minimum 08 Experiments are to be performed.)

1. V-I Characteristics of PN junction diode.
2. V-I Characteristics of photodiode.
3. Study of Clippers & Clampers.
4. Zener diode as a voltage regulator.
5. Study of transistor biasing circuit
6. Study of frequency response of RC coupled amplifier
7. V-I Characteristics of JFET.
8. V-I characteristics of MOSFET.
9. Study of Centre tap Full Wave Rectifier with and without filter
10. Study of Full Wave Bridge Rectifier with and without filter

SHIVAJI UNIVERSITY, KOLHAPUR

ELECTRONICS AND COMPUTER SCIENCE ENGINEERING

Digital Electronics

Course Details

Class	S. Y. B. Tech Sem - III
Course Code and Course Title	PCC-ECS-302- Digital Electronics
Prerequisites	Number system, Basic Gates.
Teaching scheme: Lecture /Practical/Tutorial	3/1/0
Credits	3+1
Evaluation scheme CIE/ESE for Theory	30/70

Teaching scheme	Examination scheme
Lectures: 03Hrs/week	Theory: 100 Marks, 70(ESE)+30(CIE)
Tutorial: NA	TW: 25 Marks
Practical: 02Hrs/week	ESE: 50 Marks

Course Objectives:

1. To understand various number systems &codes and to introduce students to various logic gates, SOP, POS form and their minimization techniques
2. To teach the working of combinational circuits, their applications and implementation of combinational logic circuits using MSI chips.
3. To teach the elements of sequential logic design, analysis and design of sequential circuits.
4. To understand various counters and shift registers and its design using MSI chips.
5. To explain and describe various logic families and Programmable Logic Devices.
6. To train students in writing programs with Verilog hardware description languages.

Course Outcomes:

After successful completion of the course students will be able to

1. Perform code conversion and able to apply Boolean algebra for the implementation and minimization of logic functions.
2. Analyze, design and implement Combinational logic circuits.
3. Analyze, design and implement Sequential logic circuits.
4. Design and implement various counter using flip flops and MSI chips.
5. Understand TTL & CMOS logic families, PLDs, CPLD and FPGA

6. Understand basics of Verilog Hardware Description Language and its programming with combinational and sequential logic circuit

Section-I

Unit	CONTENTS	Hours
I	**Fundamentals of Digital Design**	07
	1.1 Number Systems and Codes: Review of Number System, Binary Code, Binary Coded Decimal, Octal Code, Hexadecimal Code and their conversions, Binary Arithmetic: One's and two's complements,	
	1.3 **Codes**: Excess-3 Code, Gray Code, Weighted code, Parity Code: Hamming Code	
	1.4 **Logic Gates and Boolean Algebra**: Digital logic gates, Realization using NAND, NOR gates, Boolean Algebra, De Morgan's Theorem, SOP and POS representation, K Map up to four variables	
2	**Combinational Circuits using basic gates as well as MSI devices**	07
	2.1Arithmetic Circuits: Half adder, Full adder, Ripple carry adder, Carry Look ahead adder, Half Subtractor, Full Subtractor, multiplexer, cascading of Multiplexer, demultiplexer, decoder, Comparator (Multiplexer and demultiplexer gate level upto 4:1)	
	2.2 MSI devices: IC7483, IC74151, IC74138, IC7485.	
3	**Elements of Sequential Logic Design**	07
	3.1 Sequential Logic: Latches and Flip-Flops. RS, JK, Master slave flip flops, T & D flip flops with various triggering methods, Conversion of flip flops,	
	3.2 Counters: Asynchronous, Synchronous Counters, Up Down Counters, Mod Counters, Ring Counter, Twisted ring counter, Shift Registers, Universal Shift Register.	
Section-II		
4	**Sequential Logic Design:**	07
	4.1 Sequential Logic Design: Mealy and Moore Machines, clocked synchronous state machine analysis, state reduction techniques (inspection, partition and implication chart method) and state assignment, sequence detector, Clocked synchronous state machine design.	
	4.2 Sequential logic design practices: MSI counters (7490, 7492, 7493,74163, 74169) and applications, MSI Shift registers (74194) and their applications	
5	**Logic Families and Programmable Logic Devices**	06
	5.1 **Logic Families:** Types of logic families (TTL and CMOS), characteristic parameters (propagation delays, power dissipation, Noise Margin, Fan-out and Fan-in), transfer characteristics of TTL NAND (Operation of TTL NAND gate), CMOS Logic: CMOS inverter, CMOS NAND and CMOS NOR, Interfacing CMOS to TTL and TTL to CMOS.	
	5.2 **Programmable Logic Devices**: Concepts of PAL and PLA. Simple logic implementation using PAL and PLA, Introduction to CPLD and FPGA	

	architectures, Numerical based on PLA and PAL	
6	**Introduction to Verilog HDL**	08
	6.1Basics: Introduction to Hardware Description Language and its core features, synthesis in digital design, logic value system, data types, constants, parameters, wires and registers. Verilog Constructs: Continuous & procedural assignment statements, logical, arithmetic, relational, shift operator, always, if, case, loop statements, Gate level modelling, Module instantiation statements	
	6.2 Modelling Examples: Combinational logic e g. Arithmetic circuits, Multiplexer, Demultiplexer, decoder, Sequential logic e g. flip flop, counters.	
Total		42

Text Books:

1. R. P. Jain, Modern Digital Electronics, Tata McGraw Hill Education, Third Edition 2003.
2. Morris Mano, Digital Design, Pearson Education, Asia 2002.
3. J. Bhaskar, A Verilog HDL Primer, Third Edition, Star Galaxy Publishing, 2018.

Reference Books:

1. Digital Logic Applications and Design – John M. Yarbrough, Thomson Publications, 2006
2. John F. Warkerly, Digital Design Principles and Practices, Pearson Education, Fourth Edition, 2008.
3. Stephen Brown and Zvonko Vranesic, Fundamentals of digital logic design with Verilog design, McGraw Hill, 3rd Edition.
4. Digital Circuits and Logic Design – Samuel C. Lee, PHI
5. William I. Fletcher, "An Engineering Approach to Digital Design", Prentice Hall of India.
6. Parag K Lala, "Digital System design using PLD", BS Publications, 2003.
7. Charles H. Roth Jr., "Fundamentals of Logic design", Thomson Learning, 2004.

List of Experiments: (Minimum 08 Experiments are to be performed.)

1. Verification and interpretation of truth table for AND, OR, NOT, NAND, NOR, Ex-OR, Ex-NOR gates
2. Realization of logic functions with the help of Universal Gates (NAND, NOR)
3. Verification of De Morgans theorem.
4. To Study and Verify Half and Full adder.
5. To Study and Verify Half and Full Subtractor
6. Verify the truth table of RS & JK flip-flops using NAND and NOR gates
7. Study of ring counter.
8. Design shift register by using IC 74194.
9. Study of CPLD and FPGA devices.
10. Study of arithmetic logic circuits by using Verilog HDL.

SHIVAJI UNIVERSITY, KOLHAPUR

ELECTRONICS AND COMPUTER SCIENCE ENGINEERING

Data Structures and Algorithms

Course Details

Class	S. Y. B. Tech Sem - III
Course Code and Course Title	PCC-ECS-303- Data Structures and Algorithms
Prerequisites	C-Programming
Teaching scheme: Lecture /Practical/Tutorial	3/0/1
Credits	3+1
Evaluation scheme CIE/ESE for Theory	30/70

Teaching scheme	Examination scheme
Lectures: 03Hrs/week	Theory: 100 Marks, 70(ESE)+30(CIE)
Tutorial: 01Hr/week	TW: 25 Marks
Practical: NA	ESE: NA

Course Prerequisite:

C Programming

Course Objectives:

1. To understand and demonstrate basic data structures (such as Arrays, linked list, stack, queue, binary tree, graph).
2. To implement various operations on data structures.
3. To study different sorting and searching techniques.
4. To choose efficient data structures and apply them to solve real world problems

Course Outcomes:

After successful completion of the course students will be able to;

1. Implement various linear data structures.
2. Implement various nonlinear data structures.
3. Select appropriate sorting and searching techniques for a given problem and use it
4. Develop solutions for real world problems by selecting appropriate data structure and algorithms.
5. Analyze the complexity of the given algorithms.

Section-I

UNIT	CONTENTS	HOURS
1	**Introduction to Data Structures** Introduction to Data Structures, Types of Data Structures – Linear and Nonlinear, Operations on Data Structures, Concept of array, Static arrays vs Dynamic Arrays, structures. Introduction to Analysis of Algorithms, characteristics of algorithms, Time and Space complexities, Asymptotic notations.	07
2	**Stack and Queues** Introduction, Basic Stack Operations, Representation of a Stack using Array, Applications of Stack – Well form-ness of Parenthesis, Infix to Postfix Conversion and Postfix Evaluation. Queue, Operations on Queue, queue-Round Robin Algorithm.	06
3	**Linked List** Introduction, Representation of Linked List, Linked List v/s Array, Types of Linked List - Singly Linked List (SLL), Operations on Singly Linked List: Insertion, Deletion, reversal of SLL, Print SLL. Implementation of Stack and Queue using Singly Linked List. Introduction to Do Representation of a Queue using array, Circular Queue, concept of priority Queue, Applications of Qubly Linked List and Circular Linked List	08
Section-II		
4	**Trees** Introduction, Tree Terminologies, Binary Tree, Types of Binary Tree, Representation of Binary Trees, Binary Tree Traversals, Binary Search Tree Operations on Binary Search Tree, Applications of Binary Tree – Expression Tree, Huffman Encoding.	07
5	**Graphs** Introduction, Graph Terminologies, Representation of graph (Adjacency matrix and adjacency list), Graph Traversals – Depth First Search (DFS) and Breadth First Search (BFS), Application – Topological Sorting	06
6	**Introduction to Sorting and Searching** Introduction to Searching: Linear search, Binary search, Sorting: Internal VS. External Sorting, Sorting Techniques: Bubble, Insertion, selection, Quick Sort, Merge Sort, Comparison of sorting Techniques based on their complexity. Hashing Techniques, Different Hash functions, Collision & Collision resolution techniques: Linear and Quadratic probing, Double hashing.	08
	Total	42

Text Books:

1.Data Structures Using C, Aaron M Tenenbaum, Yedidyah Langsam, Moshe J Augenstein, Pearson Education

2. Introduction to Data Structure and its Applications Jean-Paul Tremblay, P. G.Sorenson

3. Data Structures using C, Reema Thareja, Oxford

4. C and Data structures, Prof. P.S.Deshpande, Prof. O.G.Kakde, Dreamtech Press.

5. Data Structures: A Pseudocode Approach with C, Richard F. Gilberg& Behrouz A. Forouzan, Second Edition, CENGAGE Learning

Reference Books:

1. Data Structure Using C, Balagurusamy.

2. Data Structures using C and C++, Rajesh K Shukla, Wiley – India

3. ALGORITHMS Design and Analysis, Bhasin, OXFORD.

4. Data Structures Using C, ISRD Group, Second Edition, Tata McGraw-Hill.

5. Computer Algorithms by Ellis Horowitz and Sartaj Sahni, Universities Press.

6. Data Structures, Adapted by: GAV PAI, Schaum's Outline

SHIVAJI UNIVERSITY, KOLHAPUR

ELECTRONICS AND COMPUTER SCIENCE ENGINEERING

Database Management Systems

Course Details

Class	S. Y. B. Tech Sem - III
Course Code and Course Title	PCC-ECS-304 Database Management Systems
Prerequisites	Data Models & mapping
Teaching scheme: Lecture /Practical/Tutorial	3/1/0
Credits	3+1
Evaluation scheme CIE/ESE for Theory	30/70

Teaching scheme	Examination scheme
Lectures: 03Hrs/week	Theory: 100 Marks, 70(ESE)+30(CIE)
Tutorial: NA	TW: 25 Marks
Practical:02Hrs/week	ESE: 50 Marks

Course Objectives:

1. Develop entity relationship data model and its mapping to relational model
2. Learn relational algebra and formulate SQL queries
3. Apply normalization techniques to normalize the database
4. Understand concepts of transaction, concurrency control and recovery techniques

Course Outcomes:

After successful completion of the course students will be able to:

1. Recognize the need of database management system
2. Design ER and EER diagram for real life applications
3. Construct relational model and write relational algebra queries.
4. Formulate SQL queries
5. Apply the concept of normalization to relational database design.
6. Describe the concepts of transaction, concurrency and recovery

Section-I

Unit No.	Contents		Hrs.
1		**Introduction to Database Concepts**	07
	1.1	Introduction, Characteristics of databases	
	1.2	File systems v/s Database systems	
	1.3	Data abstraction and Data Independence	
	1.4	DBMS system architecture	
	1.5	Database Administrator	
2		**Entity–Relationship Data Model**	07
	2.1	The Entity-Relationship (ER) Model	
	2.2	Entity types: Weak and strong entity sets, Entity sets, Types of Attributes, Keys	
	2.3	Relationship constraints: Cardinality and Participation	
	2.4	Extended Entity-Relationship (EER) Model: Generalization, Specialization and Aggregation	
3		**Relational Model and Relational Algebra**	07
	3.1	Introduction to the Relational Model	
	3.2	Relational schema and concept of keys	
	3.3	Mapping the ER and EER Model to the Relational Model	
	3.4	Relational Algebra – operators, Relational Algebra Queries.	
Section-II			
4		**Structured Query Language (SQL)**	07
	4.1	Overview of SQL	
	4.2	Data Definition Commands	
	4.3	Integrity constraints: Key constraints, Domain Constraints, Referential integrity, Check constraints	
	4.4	Data Manipulation commands, Data Control commands	
	4.5	Set and string operations, aggregate function - group by, having	
	4.6	Views in SQL, joins, Nested and complex queries, Triggers	
5		**Relational–Database Design**	06
	5.1	Pitfalls in Relational-Database designs	
	5.2	Concept of normalization	
	5.3	Function Dependencies	
	5.4	First Normal Form, 2NF, 3NF, BCNF.	
6		**Transactions Management and Concurrency and Recovery**	08
	6.1	Transaction Concept, Transaction states	
	6.2	ACID properties	
	6.3	Transaction Control Commands	
	6.4	Concurrent Executions	
	6.5	Serializability: Conflict and View	
	6.6	Concurrency Control: Lock-based, Timestamp-based protocols	
	6.7	Recovery System: Log based recovery	
	6.8	Deadlock handling	

	Total	42

Text Books:

1. Korth, Slberchatz, Sudarshan, Database System Concepts, 6th Edition, McGraw Hill

2. Elmasri and Navathe, Fundamentals of Database Systems, 5th Edition, Pearson education

3. Raghu Ramkrishnan and Johannes Gehrke, Database Management Systems, TMH

Reference Books:

1. Peter Rob and Carlos Coronel, Database Systems Design, Implementation and Management‖, Thomson Learning, 5th Edition
2. Dr.P.S. Deshpande, SQL and PL/SQL for Oracle 10g, Black Book, Dreamtech Press
3. G. K. Gupta, Database Management Systems, McGraw Hill., 2012

List of experiments:

1. Draw an E-R Diagram of any organization.
2. Reduce above mentioned E-R Diagram into tables.
3. Normalize any database from first normal form to Boyce-Codd Normal Form (BCNF)
4. Write a program of Database connectivity with any object-oriented language.
5. Create table with integrity constraints like primary key, check, not null and unique.
6. Create table with referential integrity constraints with foreign key, on delete cascade and on delete set null.
7. Display the results of set operations like union, intersections & set difference.
8. Display the results of Join Operations like cross join, self-join, inner join, natural join, left outer join, right outer join and full outer join.
9. Display the records using Aggregate functions like min, max, avg, sum & count. Also use group by, having clauses. 12. Display the results using String operations.
10. Create & Update views for any created table.
11. Study of No Sql.

SHIVAJI UNIVERSITY, KOLHAPUR

ELECTRONICS AND COMPUTER SCIENCE ENGINEERING

Programming in C

Course Details

Class	S. Y. B. Tech Sem - III
Course Code and Course Title	PCC-ECS-305 Programming in C
Prerequisites	Data Models & mapping
Teaching scheme: Lecture /Practical/Tutorial	2/1/0
Credits	2+1

Evaluation scheme CIE/ESE for Practical

Teaching scheme	Examination scheme
Lectures: 02Hrs/week	Theory: 100 Marks, 70(ESE)+30(CIE)
Tutorial: NA	TW: 25 Marks
Practical: 02Hrs/week	ESE: 50 Marks

Course Objectives:

The course aims to:

1 To understand how to design flowchart and algorithms for procedure-oriented programs.

2 To develop programming skills using the fundamentals and basics of C Language, control structures and looping statements.

3 3 To enable effective usage of arrays, structures, functions, pointers and to implement the memory management concepts.

4 4 To design and implement programs using files handling and user defined types.

Course Outcomes:

Upon successful completion of this course

1. Student will be able to understand the basic concepts of procedure-oriented programming language.
2 Student will be able to use the control statements, looping statements and functions concepts.
3 Student will be able to design programs using user defined functions and data type.
4. Student will be able to design & apply the skills for solving the engineering problems.

Course Contents

1. Programming Fundamentals, Flow chart, Algorithm, Standard notations, Selection Procedure, Loops, Sub Algorithms, Compilers, Interpreters, The Library and Linking. 04 Hrs.

2. Introduction to C Introduction to Constants, Variables, Data Types, Operators, Expressions, Structure of C Programming, Identifiers, Decision & Loop control statements. 05 Hrs.

3. Arrays and Structures Arrays: Introduction to 1-Dimensional arrays, Declaration and Initialization of 1-Dimensional arrays, Declaration and Initialization of 2-Dimensional arrays, Declaration and Initialization of Multi-Dimensional arrays. Structures-Declaring of Structures, Accessing Structure elements, arrays of structures. 04 Hrs.

4. Functions and Pointers Introduction of functions, need for functions, Multifunction Programming, Elements of functions, Definition and declaration of functions, return values and their types, function call, arguments, return value, nesting and recursion Pointers- Introduction to pointers, pointer variables, Declaration and initialization of pointer variable, accessing pointer.

05 Hrs.

5. Strings Declaration and Initialization of string, Reading from Terminal, Writing to screen, Standard library string functions. 03 Hrs.

6. File handling File operation, counting character tabs, spaces, file copy program, file opening modes, text file- binary file, Real time case study. 03 Hrs.

Text Books:

1 Let Us C Yashawant Kanetkar, 13th Edition BPB Publications (unit II, VI)

2 Programming in ANSI C , E Balagurusamy, 5th edition, Tata Mc Graw Hill (unit III. IV, V)

Reference Books:

1 The C Programming Language, Brian W. Kernighan, Dennis M. Ritchi , IInd edition, Prentice Hall of India.

List of Experiments (Minimum 10 + mini project):

1. Develop Program using decision control statements
2. Develop Program using control statements
3. Develop Program using loop control statements
4. Develop Program using functions
5. Develop Program using pointers
6. Develop Program using array
7. Develop Program using two dimensional arrays
8. Develop Program using structures
9. Develop Program using dynamic memory allocation
10. Develop Program using strings
11. Develop Program using any sorting technique
12. Develop Program using file handling.
13. Mini project

SHIVAJI UNIVERSITY, KOLHAPUR

ELECTRONICS AND COMPUTER SCIENCE ENGINEERING

ELECTRONICS CIRCUITS

Course Details

Class	S. Y. B. Tech Sem - IV
Course Code and Course Title	PCC-ECS-401- ELECTRONICS CIRCUITS
Prerequisites	Electronics Devices.
Teaching scheme: Lecture /Practical/Tutorial	3/1/0
Credits	3+1
Evaluation scheme CIE/ESE for Theory	30/70

Teaching scheme	Examination scheme
Lectures: 03Hrs/week	Theory: 100 Marks, 70(ESE)+30(CIE)
Tutorial: NA	TW: 25 Marks
Practical: 02 Hrs/week	ESE: 50 Marks

Course Objectives:

1. To enhance comprehension capabilities of students through understanding of electronic circuits.

2. To perform low frequency and high frequency analysis of single stage amplifiers.

3.To teach fundamental principles of operational amplifiers.

4. To develop an overall approach for students from selection of integrated circuit, specification, functionality and applications

Course Outcomes:

After successful completion of the course students will be able to

1. Evaluate the performance of amplifiers through frequency response.

2. Analyse differential amplifiers for various performance parameters

3. Express mathematically the performance parameters in terms of circuit parameters

4. Choose appropriate circuit for the given specifications/ applications

5. Describe various applications and circuits based on operational amplifiers.

6. Design an application with the use of integrated circuits.

Section-I

Unit		CONTENTS	Hours
1		**Frequency Response of Amplifiers**	7
	1.1	Low frequency response & analysis, effect of the coupling, bypass & load capacitances on single stage MOSFET amplifier for common source (CS)configuration (mathematical analysis & numerical examples included)	
	1.2	High frequency response & analysis, effect of parasitic capacitances on MOSFET amplifier, high frequency equivalent circuit of MOSFET, Miller's theorem, effect of Miller's capacitance, unity gain bandwidth (mathematical analysis & numerical examples included)	
	1.3	Introduction to multi-stage amplifiers – need & necessity, different types of couplings (DC, R-C & transformer) with advantages & disadvantages, the MOSFET cascade amplifier (theoretical description only)	
2		**Differential Amplifiers**	7
	2.1	Basic MOSFET differential amplifier, DC characteristics, transfer characteristics, small signal (AC) analysis of only dual input balanced output (DIBO) for differential mode gain & common mode gain, common mode rejection ratio (CMRR) & input resistance / impedance	
	2.2	MOSFET differential amplifier with an active load (theoretical description & only mathematical analysis – no numerical examples)	
3		**Operational Amplifiers**	7
	3.1	The ideal operational amplifier (op-amp), internal block diagram of op-amp, characteristics of op-amp, ideal & practical op-amp parameters / specifications (no detailed description or any analysis), mathematical model of op-amp, IC 741 op-amp with pin diagram & description	
	3.2	Operational amplifier open loop & closed loop configurations (theoretical description only), the concept of virtual ground & virtual short	
Section-II			
4		**Applications of Operational Amplifier**	8
	4.1	Types of negative feedback – voltage series, voltage shunt, current series & current shunt (theoretical description only), the op-amp inverting amplifier & op-amp noninverting amplifier (mathematical analysis for derivation of output voltage only, numerical examples & designing)	
	4.2	Adder, summing amplifier, averaging circuit, subtractor, integrator (ideal), differentiator (ideal), difference amplifier, current amplifier & 3 op-amp instrumentation amplifier (only mathematical analysis for derivation of output voltage with numerical examples & designing included)	
	4.3	Current to voltage converters (I to V) & voltage to current converters (V to I) – floating load & grounded load (mathematical analysis only – no numerical)	
5		**Oscillators &Comparators**	7
	5.1	Oscillators: RC phase shift oscillator, Wien bridge oscillator & the crystal oscillator (theoretical description only – no mathematical analysis), numerical example & design problem on RC phase shift oscillator & Wien bridge oscillator	
	5.2	Waveform Generators: Square wave generator & triangular wave generator	

		(only theoretical description – no mathematical analysis or designing examples)	
	5.3	Comparators: Inverting comparator, non-inverting comparator, zero crossing detector (ZCD) & Schmitt Trigger (numerical examples & designing problem on the inverting Schmitt Trigger for both symmetrical & non-symmetrical configurations), window detector / comparator (theoretical description only)	
6		**Special Purpose Integrated Circuits**	6
	6.1	IC 555 timer internal block diagram & pin configuration, operation in astable & monostable multivibrator with mathematical analysis & numerical examples, design problems on astable & monostable multivibrator, applications in astable& monostable configuration	
	6.2	ADC 0808 / 0809 & interfacing, DAC0808 & interfacing (theoretical description only	
	6.3	Functional block diagram & working of the LT 1070 monolithic switching regulator (theoretical description only)	
		Total	42

Text Books:

1.Donald A. Neamen, “Electronic Circuit Analysis and Design”, TATA McGraw Hill,

2nd Edition. 2.Ramakant A. Gayakwad, “Op-Amps and Linear Integrated Circuits”, Pearson Prentice Hall, 4th Edition.

Reference Books:

1. Robert Boylestad," Electronic Devices and Circuit Theory", Pearson.

2.David A. Bell,“Electronic Devices and Circuits”, Oxford, Fifth Edition.

3. Muhammad H. Rashid, “Microelectronics Circuits Analysis and Design”, Cengage

4. S. Salivahanan, N. Suresh Kumar,“Electronic Devices and Circuits”, Tata McGraw Hill.

5. D. Roy Choudhury and S. B. Jain, “Linear Integrated Circuits”, New Age International Publishers, 4th Edition.

6. Sergio Franco, “Design with operational amplifiers &analog integrated circuits”, Tata McGraw Hill, 3rd edition

7. William D. Stanley, “Operational Amplifiers with Linear Integrated Circuits”, Pearson, 4th Edition.

List of experiments:

1. Study of operational amplifier.
2. Design of inverting, non-inverting amplifier & their frequency response.
3. Design of Summing amplifier.
4. Design, build and test precision half & full wave rectifier.
5. Design, build and test Comparator and Schmitt trigger.
6. Design of Butterworth filters.
7. Design, build and test square wave generator.
8. Design, build and test triangular wave generator.
9. Design, build and test Integrator.
10. Design, build and test Differentiator.
11. Design and implement oscillator using Op-Amp.

SHIVAJI UNIVERSITY, KOLHAPUR

ELECTRONICS AND COMPUTER SCIENCE ENGINEERING

CONTROLS & INSTRUMENTATION

Course Details

Class	S. Y. B. Tech Sem - IV
Course Code and Course Title	PCC-ECS-402- Controls & Instrumentation
Prerequisites	Applied Maths, Applied Physics, Basic Electrical Engineering.
Teaching scheme: Lecture /Practical/Tutorial	3/1/0
Credits	3+1
Evaluation scheme CIE/ESE for Theory	30/70

Teaching scheme	Examination scheme
Lectures: 03Hrs/week	Theory: 100 Marks, 70(ESE)+30(CIE)
Tutorial: NA	TW: 25 Marks
Practical: 02 Hrs/week	ESE: NA

Course Objectives:

1. To develop the ability to model control systems and determine their time response and frequency response.

2. To develop the ability to analyse stability of control systems.

3. To develop the ability to understand instruments and data acquisition systems.

Course Outcomes:

After successful completion of the course students will be able to

1. Derive the transfer functions for the given control systems.

2. Analyse the performance of control systems based on the time domain and frequency domain specifications.

3. Judge the stability of the given control systems using appropriate stability criteria.

4. Understand and explain the working principle of sensors and transducers.

5. Explain various parameters of data acquisition systems. 6. Describe instrument communication standards.

Section-I

Unit		CONTENTS	Hours
1		**Introduction to Control Systems and Mathematical Models**	7
	1.1	Introduction to control systems: The control system, servomechanisms, digital control.	
	1.2	Mathematical models: Transfer functions, block diagram algebra, block diagram reduction, signal flow graphs.	
2		**Time response analysis and stability analysis in time domain**	7
	2.1	Time response analysis: standard test signals, time response of first and second order systems, steady state errors and error constants.	
	2.2	Stability in time domain: The concept of stability, necessary conditions for stability, Hurwitz stability criterion, Routh stability criterion, relative stability analysis.	
	2.3	Stability analysis using root locus technique.	
3		**Stability Analysis in frequency domain and Introduction to advances in control systems**	7
	3.1	Introduction to frequency response analysis, correlation between time and frequency domain.	
	3.2	Stability analysis using Bode plots.	
	3.3	Nyquist stability criterion and stability analysis using Nyquist plot.	
	3.4	Introduction to advances in control systems: adaptive control, fuzzy logic control and neural networks. Introduction to distributed control systems.	
Section-II			
4		**Sensors and Transducers**	8
	4.1	Introduction to sensors and transducers. Various types of sensors. Various types of transducers and their principle of operation. Selection criteria of transducers.	
	4.2	Displacement and pressure transducers: potentiometers, pressure gauges, Linear variable differential transducer (LVDT), strain gauges.	
	4.3	Temperature transducers: working principle, ranges and applications of resistance temperature detectors (RTD), thermocouple and thermistor temperature transducers.	
5		**Signal conditioning DAS, Data logger and SCADA**	7
	5.1	Introduction to instrumentation systems, data acquisition system (DAS), use of DAS in Intelligent instrumentation system. Design of pressure and temperature measurement system using DAS. Data logger, its types and applications. SCADA communication architecture, types, applications, open SCADA protocols. Cloud based SCADA systems. Introduction to fibre optic instrumentation.	
6		**Telemetry and Instrument communication standards**	6
	6.1	Introduction to telemetry, landline telemetry, radio telemetry and types of multiplexing.	
	6.2	Instrument interfacing, Current loop, RS232/485, Field bus, Modbus, GPIB, USB Protocol, and HART communication Protocol.	

Total	42

Text Books:

1. I. J. Nagrath, M. Gopal, "Control System Engineering", 5th edition, New Age International Publishers 2. B. S. Manke, "Linear Control Systems", Khanna Publishers, New Delhi.

3. D. Patranabis, "Principle of Industrial Instrumentation", Tata McGraw Hill.

4. A.K. Sawhney, "Electrical & Electronic Measurement & Instrumentation" – DRS. India

5. H.S.Kalsi, "Electronic Instrumentation"-TMH, 2nd Edition

Reference Books:

1. K. Ogata, "Modern Control Engineering", PHI, New Delhi

2. Norman S. Nise, "Control System Engineering", John Wiley and Sons.

3. B. C. Kuo, "Automatic Control Systems", PHI, New Delhi

4. C. S. Rangan, G. R. Sharma and V. S. Mani, 'Instrumentation Devices and Systems', Tata McGraw-Hill Publishing Company Ltd.

5. Helfrick & Cooper, "Modern Electronic Instrumentation & Measuring Techniques" – PHI

List of experiments

1. Introduction of MATLAB and control system tool box.
2. Program To find zeros and poles & to Create Transfer Function of given system.
3. Program to study Block Diagram Reduction by using MATLAB.
4. Study of Hurwitz stability criterion.
5. Study of Routh stability criterion
6. Program to perform frequency response analysis of system using Bode diagram.
7. Program to obtain Nyquist plot of given system.
8. Displacement measurement using LVDT.
9. Temperature measurement using RTD.
10. Study of supervisory control and data acquisition system.
11. Study of telemetry.

SHIVAJI UNIVERSITY, KOLHAPUR

ELECTRONICS AND COMPUTER SCIENCE ENGINEERING

COMPUTER NETWORK

Course Details

Class	S. Y. B. Tech Sem - IV
Course Code and Course Title	PCC-ECS-403- Computer Network
Prerequisites	
Teaching scheme: Lecture /Practical/Tutorial	3/1/0
Credits	3+1
Evaluation scheme CIE/ESE for Theory	30/70

Teaching scheme	Examination scheme
Lectures: 03Hrs/week	Theory: 100 Marks, 70(ESE)+30(CIE)
Tutorial: NA	TW: 25 Marks
Practical: 02 Hrs/week	ESE: 50 Marks

Course Objectives:

To perceive fundamental concepts of Computer Networks

1. To understand layered architecture and basic networking protocols
2. To illustrate the TCP/IP protocol internal details

Course Outcomes:

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

1. Demonstrate concepts of Computer Networks.
2. Explain OSI and TCP/IP layered architecture
3. Implement network and data link layer.
4. Demonstrate TCP protocol in detail.
5. To analyze the protocol structure using network analyzing tools.
6. apply the principals of socket programming in the networks.

Section 1

Unit		CONTENTS	Hours
1		Introduction to Computer Network:	6
	1.1	Overview of OSI layer Model and TCP/IP protocol model	
	1.2	Addressing, Underlying technologies for LANs	
	1.3	WANs, and Switched WANs	
2		Data Link Layer	6
	2.1	Design issues for Data Link Layers	
	2.2	Framing methods, Error control: detection and correction	
	2.3	Flow control, Elementary Data Link protocols	
	2.4	Sliding window Protocols, Go back n, Selective repeat.	
3		Medium Access Control Sub layer:	6
	3.1	Static and Dynamic channel allocation	
	3.2	Multiple Access protocols ALHOA	
	3.3	CSMA, Collision Free Protocols, Ethernet: IEEE 802.3	
	3.4	IEEE 802.4, IEEE 802.5 standards	
	3.5	Wireless LANS 802.11 standards	
Section-II			
4		Network Layer	7
	4.1	IPv4 Addresses: Classful Addressing Other Issues	
	4.2	Sub-netting and Super netting, Class less Addressing	
	4.3	Delivery, Forwarding and routing	
	4.4	Routing methods: shortest path, Link state, Distance vector routing and broadcast routing	
	4.5	Congestion control algorithms: Principles, Congestion prevention policies	
	4.6	congestion control in datagram subnet, Load Shedding, Jitter Control	
5		Internet Protocol:	8
	5.1	IP Datagram format, Fragmentation and reassembly models, ARP, RARP, ICMP, IGMP.	
6		Transport Layer	8
	6.1	The Transport service primitives	
	6.2	UDP: Process to Process communication, User Datagram Format, Operation and uses of UDP	
	6.3	TCP: TCP Services and Features, TCP segment format, TCP Connections, Flow and error control in TCP	
	6.4	TCP Timers; Berkeley Sockets: Socket Addresses, Elementary Socket system calls byte ordering and address conversion routines	
	6.5	connectionless iterative server, connection oriented concurrent server, TCP and UDP Client server Programs	
Total			42

TEXT BOOKS:

1. TCP/IP protocol suit 4thEd. – Behrouz A. Forouzen (Tata Mag.Hill)

2. Computer Networks – Andrew S. Tanenbaum (PHI)

3. Unix Network Programming – W. Richard Stevens (PHI)

REFERENCE BOOKS:

1. TCP/IP Illustrated, The Protocols, Vol. I – W. Richard Stevens, G. Gabrani (Pearson Education.)

2. Internetworking with TCP/IP, Vol. I Principles, Protocols, and Architectures – D. E. Comer (Pearson Ed.) 3. Internetworking with TCP/IP, Vol. III, Client-Server Programming and Application (2nd Ed.) –D. E. Comer, David L. Stevens (Pearson Ed.)

TERM WORK

1. Study and demo of LAN, WAN and various connecting devices and components • List out component and devices required for a std. LAN, WAN

2. Study, design and configuration of IEEE 802.3 Ethernet and IEEE 802.11Wireless • LANs (Referring RFCs)

3. Study of following connectivity test tools with all its options–

4. ifconfig, arp, route, traceroute

5. nmap, netstat, finger

6. Implementing Framing methods

7. Implementing Elementary data link protocol (Stop & wait protocol)

8. Implementation of Error detection (CRC)code

9. Implementation of Error detection codes (Hamming)

10. Programs to understand IP addressing, classful & classless addressing

11. Implementation of sliding window protocol.

12. Implement shortest path routing algorithm.

13. Programs for connection oriented (TCP) client-server using socket programming

14. Programs for connection less (UDP) client-server using socket programming

15. Study of network protocol analyzer (Ethereal or Wire-Shark) and understanding packet formats for UDP, TCP, ARP, ICMP protocols.

SHIVAJI UNIVERSITY, KOLHAPUR

ELECTRONICS AND COMPUTER SCIENCE ENGINEERING

MICROPROCESSOR & MICROCONTROLLER

Course Details

Class	S. Y. B. Tech Sem - IV
Course Code and Course Title	PCC-ECS-404- Microprocessor & Microcontroller
Prerequisites	Electronics Devices, Digital Electronics
Teaching scheme: Lecture /Practical/Tutorial	3/1/0
Credits	3+1
Evaluation scheme CIE/ESE for Theory	30/70

Teaching scheme	Examination scheme
Lectures: 03Hrs/week	Theory: 100 Marks, 70(ESE)+30(CIE)
Tutorial: NA	TW: 25 Marks
Practical: 02 Hrs/week	ESE: NA

Course Objectives:

1. To study the concepts and basic architecture of a Microprocessor and Microcontroller.

2. To write Assembly language programs for Microprocessors and Micro controllers for various applications.

3. To know the importance of different peripheral devices and their interfacing to 8086 and 8051.

4. To build Microprocessor and Microcontroller based systems.

Course Outcomes:

After successful completion of the course students will be able to;

1. Explain 16-bit Microprocessor architectures and fundamental concepts of Microcontrollers

2. To develop programming skills for Microprocessors and Microcontrollers

3. To interface various devices in Microprocessor and Microcontroller systems

4. To design and implement Microprocessor and Microcontroller based systems.

Section I

Unit		CONTENTS	Hours
1		**The 8086 Microprocessor**	7
	1.1	8086 Architecture	
	1.2	Memory Segmentation	
	1.3	8086 pin description	
	1.4	Interrupts and Interrupt service routines, Dedicated interrupts, Software interrupts	
2		**8086 programming**	7
	2.1	Addressing modes	
	2.2	Instruction Set and Assembler Directives	
	2.3	Assembly language programming	
3		**8086 Interfacing –Part I**	7
	3.1	Generating the 8086 System Clock and Reset Signals using 8284 clock generator	
	3.2	8086 Minimum and Maximum Mode CPU Modules	
	3.3	Minimum and Maximum Mode Timing Diagrams	
	3.4	Memory interfacing.	
Section-II			
4		**8086 Interfacing –Part II**	6
	4.1	8255-PPI: Functional Block Diagram and description, Operating Modes	
	4.2	8259- PIC: Functional Block Diagram and description, Cascaded mode of operation	
	4.3	System design (including Memory and I/O)	
5		**The 8051 Microcontroller**	7
	5.1	Differences between a Microprocessor and Microcontroller	
	5.2	Architecture of 8051	
	5.3	Memory Organization of the 8051	
	5.4	Addressing modes	
	5.5	Instruction set	
	5.6	Assembly language programming.	
6		**8051 Interfacing**	8
	6.1	I/O port programming	
	6.2	Programming 8051 Timers	
	6.3	Serial Port Programming	
	6.4	Interrupts Programming	
	6.5	LCD & Keyboard Interfacing	
	6.6	ADC, DAC & Sensor Interfacing	
	6.7	Stepper Motor and DC motor Interfacing	
		Total	**42**

Text Books:

1. 8086/8088 family: Design Programming and Interfacing: By John Uffenbeck (Pearson Education)

2. Microprocessor and Interfacing: By Douglas Hall (TMH Publication)

3. The 8051 Microcontroller and Embedded Systems Using Assembly and C: By M. A. Mazidi, J. C. Mazidi, Rolin D. McKinlay, Pearson Education, 2ndEdition.

4. The 8051 Microcontroller: ByKenneth J. Ayala, Cengage Learning India Pvt. Ltd, 3rdEdition

Reference Books:

1. Microcomputer Systems: 8086/8088 family Architecture, Programming and Design: By Liu & Gibson (PHI Publication).

2. The INTEL Microprocessors, Architecture, Programming and Interfacing: By Barry B. Brey (PearsonPublishers, 8th Edition)

3. Microcontrollers: Architecture, Programming, Interfacing and System Design: By RajKamal, Pearson Education, 2005.

4. The 8051 Microcontroller Based Embedded Systems: By Manish K Patel, McGraw Hill, 2014.

5. Microcontroller Theory And Applications:By Ajay V Deshmukh, Tata Mcgraw Hill

List of experiments:

1. To convert different number from decimal to binary, octal to hexadecimal & vice versa &also study of logic gates.
2. Perform hands on experiment using 8086 kits.
3. Storing and displaying the content stored at different registers and memory location.
4. Implementation of 8086 programs involving data transfer and arithmetic instruction set.
5. Implementation of 8086 programs involving logical and bit manipulation instruction set.
6. Implementation of 8086 programs involving branch instruction and machine control instruction set.
7. Data transfer. - block move, exchange, sorting, finding largest element in an array.
8. Arithmetic instructions - addition/subtraction, multiplication, square & cube. (16 bits arithmetic operations)
9. Boolean & logical instructions (bit manipulations)
10. Programs to generate delay using serial port and on-chip timer / counter.
11. Simple calculator using six-digit seven segment display and hex keyboard interface to 8051.
12. Stepper and dc motor control interface to 8051

SHIVAJI UNIVERSITY, KOLHAPUR

ELECTRONICS AND COMPUTER SCIENCE ENGINEERING

DISCRETE STRUCTURE & AUTOMATA THEORY

Course Details

Class	S. Y. B. Tech Sem - IV
Course Code and Course Title	PCC-ECS-405- Discrete structure & Automata Theory
Prerequisites	Engineering Mathematics I, II & III
Teaching scheme: Lecture /Practical/Tutorial	3/0/1
Credits	4
Evaluation scheme CIE/ESE for Theory	30/70

Teaching scheme	Examination scheme
Lectures: 03Hrs/week	Theory: 100 Marks, 70(ESE)+30(CIE)
Tutorial: 01Hr/week	TW: NA
Practical: NA	ESE:NA

Course Objectives:

1. To cultivate clear thinking for Creative Problem Solving.

2. To train students to understand and construct Mathematical Proofs.

3. To introduce the notions of Sets, Relations, Functions, Graphs and their applications.

4. To build concepts of theoretical design of Basic machines, Deterministic and Non-Deterministic Finite and Pushdown Machines.

5. To gain the conceptual understanding of fundamentals of Grammars.

6. To prepare students with the mathematical aspects in other courses such as Formal Specification, Verification, Artificial Intelligence etc.

Course Outcomes:

After successful completion of the course students will be able to

1. Understand the notion of mathematical thinking, mathematical proofs and to apply them in problem solving.

2. Reason Logically.

3. Perform operations with Sets, Relations, Functions, Graphs and their applications.

4. Design Deterministic Finite Automata (DFA) and Non-deterministic Finite Automata (NFA) and Pushdown Automata with understanding of power and limitations.

5. Design Context Free Grammar and perform the operations like simplification and normal forms.

6. Apply Discrete Structures and Automata Theory concepts into solving real world computing problems in the domain of Formal Specification, Verification, Artificial Intelligence etc.

Section-I

Unit		CONTENTS	Hours
1		**Set Theory and Logic**	7
	1.1	Set Theory: Fundamentals - Sets and Subsets, Venn Diagrams, Operations on sets, Laws of Set Theory, Power Set,.	
	1.2	Principle of Inclusion and Exclusion, Mathematical Induction.	
	1.3	Propositions and Logical operations, Truth tables, Equivalence, Implications	
	1.4	Laws of Logic, Normal Forms, Inference	
	1.5	Predicates and Quantifiers	
2		**Relations and Functions**	7
	2.1	Relations- Definition, Properties of Relations	
	2.2	Types of binary relations (Equivalence and partial ordered relations),	
	2.3	Closures, Poset, Hasse diagram and Lattice	
	2.4	Functions-Definition, Types of Functions (Injective, Surjective and Bijective)	
	2.5	Identity and Inverse Functions	
	2.6	Pigeonhole Principle, Extended Pigeonhole Principle	
3		**Graph Theory**	7
	3.1	Graphs and their basic properties - degree, path, cycle, subgraphs, Types of graphs.	
	3.2	Definitions, Paths and circuits: Eulerian and Hamiltonian, Planner Graph.	
	3.3	Isomorphism of graphs, Dijkstra Shortest Path Algorithm	
	3.4	Trees, Types of Trees	
Section-II			
4		**Finite Automata**	7
	4.1	Introduction of Automata and its applications	
	4.2	Deterministic Finite Automata (DFA) and Nondeterministic Finite Automata (NFA): Definitions, transition diagrams and Language recognizers, NFA to DFA Conversion.	
	4.3	Eliminating epsilon-transitions from NFA	
	4.4	FSM with output: Moore and Mealy machines	
5		**Regular Expression (RE) and Regular Grammar (RG)**	6
	5.1	Regular Grammar and Regular Expression (RE): Definition, Equivalence and Conversion from RE to RG and RG to RE.	
	5.2	Equivalence of RE and FA, Converting RE to FA and FA to RE.	
6		**Context Free Grammar (CFG) and Push Down Automata (PDA)**	8

	6.1	Grammars: Chomsky hierarchy, CFG- Definition, Sentential forms, Leftmost and Rightmost derivations	
	6.2	Context Free languages (CFL): Parsing and Ambiguity. CFLs: Simplification and Applications	
	6.3	Normal Forms: Chomsky Normal Form	
	6.4	PDA- Definition, Transitions (Diagrams, Functions and Tables), Design of PDA with Graphical Notation and Instantaneous Descriptions.	
		Total	**42**

Text Books:

1. Bernad Kolman, Robert Busby, Sharon Cutler Ross, Nadeem-ur-Rehman, "Discrete Mathematical Structures", Pearson Education.
2. C.L.Liu, "Elements of Discrete Mathematics", Second edition 1985, McGraw-Hill Book Company, Reprinted 2000.
3. John E. Hopcroft, Rajeev Motwani, Jeffery D. Ullman, "Introduction to Automata Theory, Languages And Computation‖", Pearson Education.
4. Vivek Kulkarni, "Theory of Computation", Oxford University Press, India.

Reference Books:

1. K.H.Rosen, "Discrete Mathematics and applications", fifth edition 2003, Tata McGraw Hill publishing Company.
2. Y N Singh, "Discrete Mathematical Structures", Wiley-India.
3. J .L.Mott, A.Kandel, T.P .Baker, Discrete Mathematics for Computer Scientists and Mathematicians, second edition 1986, Prentice Hall of India.
5. J. P. Trembley, R. Manohar "Discrete Mathematical Structures with Applications to Computer Science", Tata McGraw-Hill.
6. Seymour Lipschutz, Marc Lars Lipson," Discrete Mathematics" Schaum's Outline, McGraw Hill Education.

6. Daniel I. A. Cohen," Introduction to Computer Theory", Wiley Publication.
7. Michael Sipser, "Theory of Computation", Cengage learning.
8. J. C. Martin, "Introduction to Languages and the Theory of Computation", Tata McGraw Hill.
9. Krishnamurthy E. V., "Introductory Theory of Computer Science", East-West Press.
10. Kavi Mahesh, "Theory of Computation: A Problem Solving Approach", Wiley-India.

SHIVAJI UNIVERSITY, KOLHAPUR

ELECTRONICS AND COMPUTER SCIENCE ENGINEERING

PROGRAMMING IN C++

Course Details

Class	S. Y. B. Tech Sem - IV
Course Code and Course Title	PCC-ECS-406- Programming in C++
Prerequisites	Computer Fundamentals
Teaching scheme: Lecture /Practical/Tutorial	2/1/0
Credits	3
Evaluation scheme CIE/ESE for Theory	30/70

Teaching scheme	Examination scheme
Lectures: 03Hrs/week	Theory: 100 Marks, 70(ESE)+30(CIE)
Tutorial: NA	TW: 50 Marks
Practical: 02Hrs/week	ESE: 50 Marks

Course Objectives:

The course aims to:

1 To understand features of object-oriented programming and design C++ classes

2 To understand how to overload functions and operators in C++.

3 To learn how to implement copy constructors and class member functions.

4 To learn how inheritance and virtual functions implement dynamic binding with polymorphism.

5 To learn how design inheritance for code reuse in C++.

6 To learn how to design and implement generic classes with C++ templates and exception handling

Course Outcomes:

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

1 Student will be able to understand the basic concepts of procedure-oriented programming language.

2 Student will be able to use the class, objects, function and operator overloading concepts

3 Student will be able to understand and implement the concept of inheritance, template and exception handling applications

4. Student will be able to design & apply the skills for solving the engineering problems.

Section I

Unit		CONTENTS	Hours
1		Introduction To Object Oriented Programming	4
	1.1	Difference between procedure-oriented programming and object-oriented programming	
	1.2	basic concepts and features of object-oriented programming	
	1.3	structures and classes, declaration of class, member functions	
	1.4	defining the object of class	
	1.5	accessing member of class, array of class objects.	
2		Overloading	4
	2.1	Function overloading	
	2.2	assignment operator overloading	
	2.3	binary operator overloading	
	2.4	unary operator overloading	
3		Constructors And Destructors	4
	3.1	Constructors- copy constructor	
	3.2	default constructors, destructors	
	3.3	inline member function	
	3.4	friend function, dynamic memory allocation.	
Section-II			
4		Polymorphism	4
	4.1	Polymorphism, early binding	
	4.2	polymorphism with pointers, virtual functions	
	4.3	late binding, pure virtual functions,	
	4.4	abstract base classes, constructor under inheritance	
	4.5	destructor under inheritance, virtual destructors, virtual base classes	
5		Inheritance	4
	5.1	Introduction, Single Inheritance	
	5.2	Types Of Base Classes- Direct, Indirect	
		Array Of Class Object and Single Inheritance, Multiple Inheritances.	
6		Template And Exception Handling	4
	6.1	Function template	
	6.2	class template	
	6.3	exception handling	
		Total	**24**

Text Books:

1 Programming with C++ D Ravichandran, II edition, Tata Mc Grow Hill

2 Object oriented Programming with C++, E Balagurusamy, Mc Grow Hill

Reference Books:

1 The C++ Programming Language, Brian W. Kernighan, Dennis M. Ritchi , IInd edition, Prentice Hall of India.

List of Experiments (Minimum 10 + mini project):

1. Develop a Program for implementation of array a) One-dimensional array b) multi-dimensional array 2. Develop a Program for implementation of classes and Objects.

3. Develop a Program for implementation of types of constructor a. Default constructor b. Parameterized constructor c. Copy constructor

4. Develop a Program for implementation of polymorphism

5. Develop a Program for implementation of Friend Functions in Class

6. Develop a Program for implementation of types of inheritance a. Single level Inheritance b. Multi-level Inheritance c. Multiple Inheritance d. Hybrid Inheritance e. Hierarchical inheritance

7. Develop an Object-oriented Program to Insert the Number in an Array

8. Develop an Object-oriented program to Delete the Number in an Array

9. Develop an Object-oriented program on Bubble Sort

10. Develop an Object-oriented program to Perform Linear or binary search

11. Develop an Object-oriented program to Insert and delete a Node in Link List

12. Develop an Object-oriented program to implement stack using linked list.

13. Mini project.

SHIVAJI UNIVERSITY, KOLHAPUR

ELECTRONICS AND COMPUTER SCIENCE ENGINEERING

ENVIRONMENTAL STUDIES

Course Details

Class	S. Y. B. Tech Sem - IV
Course Code and Course Title	MC-ECS-401- Environmental Studies
Prerequisites	Basic knowledge about natural process and fundamentals of environmental aspects
Teaching scheme: Lecture /Practical/Tutorial	2/0/1
Credits	3
Evaluation scheme CIE/ESE for Theory	30/70

Teaching scheme	Examination scheme
Lectures: 02Hrs/week	Theory: 100 Marks, 70(ESE)+30(CIE)
Tutorial: 01Hr/week	TW: NA
Practical: NA	ESE: NA

Course Objectives:

The course aims to

1. To apply measures to Protect the environment, to maintain the quality of life
2. Environmental Education is important in conservation of natural resources and minimize or stops its over exploitation.
3. Design and evaluate strategies, technologies& methods for sustainable management of Environmental system and for the remediation or restoration of degraded environment
4. Social problems as well as social issues such as population explosion, exploitation on natural resources, Global warming, Acid rain, Ozone layer depletion, various natural disaster and its management, local level environmental problems, Water conservation, Environmental pollution and throws light on the methods of solution.

Course Outcomes:

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

1. To develop ability to protect the environment through ecofriendly lifestyle.
2. To give knowledge of natural resource conservation
3. To make able to implement sustainable technologies for environmental restoration.
4. To understand social issues and suggest solution

Unit		CONTENTS	Hours
1		**Nature of Environmental Studies.**	2
	1.1	Definition, Scope and Importance of Environment	
	1.2	Multidisciplinary nature of environmental studies	
	1.3	Need for public awareness.	
2		**Natural Resources and Associated Problems**	6
	2.1	Definition and Types of Natural Resources.	
	2.2	a) Forest resources: Use and over-exploitation, deforestation, dams' benefits and problems.	
	2.3	b) Water resources: Use and over-utilization of surface and ground Water, floods. Drought, conflicts over water.	
	2.4	c) Mineral resources: Usage and exploitation. Environmental effects of Extracting and using mineral resources.	
	2.5	D)Food resources: World food problem, changes caused by agriculture effect of modern agriculture, fertilizer-pesticide Problems	
	2.6	E) Energy resources: Growing energy needs, renewable and nonrenewable Energy resources, use of alternate energy sources. Solar energy, Wind energy, Hydal energy, Tidal energy, Biomass energy, nuclear energy.	
	2.7	F) Land resources: Land as a resource, land degradation, man induced Landslide, Soil erosion. Role of individuals in conservation of natural resources	
3		**Ecology and Biodiversity**	10
	3.1	Concept of an ecosystem. Structure and function of ecosystem. - Producers, consumers and decomposers. Food chains, food webs. Energy flow in the ecosystem. Ecological pyramids. Ecological Succession. Introduction, types, characteristics features	
	3.2	structure and function of the following ecosystem a) Forest ecosystem, b) Grassland ecosystem, c) Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes). d)Aquatic ecosystems (rivers, oceans, estuaries).	
	3.3	Introduction- Definition: genetic, species and ecosystem diversity. Bio-geographical classification of India. Value of biodiversity	
	3.4	consumptive use, productive use, social, ethical, aesthetic and option values. India as a mega- diversity nation	
	3.5	Hot Spots of Biodiversity. Endangered and Endemic Species of India	
	3.6	Threats to Biodiversity: - Habitat Loss, Poaching of Wildlife and Man-wild life Conflicts. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.	
4		**Environmental Pollution**	6
	4.1	Definition: Causes, effects and control measures of: Air pollution Water pollution, Marine pollution, Soil Pollution	
	4.2	Noise pollution, Thermal Pollution, Nuclear hazards, Solid waste Management	
	4.3	Causes, effects and control measures of urban and industrial wastes Role of an individual in prevention of pollution.	
5		**Social Issues and the Environment**	7

	5.1	Disaster management: Floods, Earthquake, Cyclone Tsunami and Landslides. From Unsustainable to Sustainable Development.	
	5.2	Water conservation, rain water harvesting, watershed management Resettlement and rehabilitation of people; its problems and concerns	
		Environmental ethics: Issue and possible solutions. Global warming acid rain, Ozone layer depletion Waste Land Reclamation.	
6		**Environmental protection and Environmental field work (mini project)**	9
	6.1	Environment Protection Act – 1986, Air (Prevention and Control of Pollution) Act. 1981	
	6.2	Water (Prevention and control of Pollution)	
	6.3	Forest Conservation Act. 1980. Act. Wildlife Protection Act. 1972 Environmental Field Project Report	
		Total	**24**

Text Books:

1. Dr. Jay Samant, "Environmental studies", Shivaji University, Kolhapur
2. Anubha Kaushik & C.P.Kaushik., "Perspectives in Environmental studies", New Age international Publisher, 2004.
3. Gouri Suresh, "Environmental studies & Ethics", I. K. International Publishing House, Pvt. Ltd.
4. Erach Barucha, "Environmental studies"

Reference Books:

1. Sharma B.K., "Environmental Chemistry", Goel Publication House, Meerut, 2001
2. Agarwal, K.C., "Environmental Biology", Nidi Pub. Ltd., Bikaner. 2001
3. Bharucha Erach, "The Biodiversity of India", Mapin Publishing Pvt. Ltd.
4. De A.K., "Environmental Chemistry", Wiley India. Western Ltd.
5. Rao M. N. and Datta, A.K., Waste Water Treatment, Oxford & IBH Publ. Co. Pvt. Ltd., 345p. 1987
6. Trivedi R.K. and P.K. Gokel, "Introduction to air pollution", Tecgbi-Science Publications (TB)

Annexure 8
EOA

All India Council for Technical Education

(A Statutory body under Ministry of Education, Govt. of India)

Nelson Mandela Marg,Vasant Kunj, New Delhi-110070 Website: www.aicte-india.org

APPROVAL PROCESS 2023-24

Extension of Approval (EoA)

F.No. Western/1-36463073869/2023/EOA Date: 15-May-2023

To,

The Secretary,
Tech. & Higher Education Deptt.
Govt. of Maharashta, Mantralaya,
Annexe Building, Mumbai-400032

Sub: Extension of Approval for the Academic Year 2023-24

Ref: Online application of the Institution submitted for Extension of Approval for the Academic Year 2023-24

Sir/Madam,

In terms of the provisions under the All India Council for Technical Education (Grant of Approvals for Technical Education) Regulations, 2020 notified on 4th February 2020 and amended on 24th February 2021 and norms standards, procedures and conditions prescribed by the Council from time to time, I am directed to convey the approval to:

Permanent Id	1-2183608891	**Application Id**	1-36463073869
Name of the Institution	DR. A. D. SHINDE COLLEGE OF ENGINEERING	**Name of the Society/Trust**	DINKARRAO SHINDE SMARAK TRUST
Institution Address	GUDDAI A/P: BHADGAON TAL: GADHINGLAJ DIST : KOLHAPUR, GADHINGLAJ, KOLHAPUR, Maharashtra, 416502	**Society/Trust Address**	A/P: GADHINGLAJ TAL : GADHINGLAJ DIST : KOLHAPUR PIN CODE :416502 STATE : MAHARASHTRA,GADHINGLAJ,KOLHAPUR,Maharashtra,416502
Institution Type	Private-Self Financing	**Region**	Western
Year of Establishment	2014		

To conduct following Courses with the Intake indicated below for the Academic Year 2023-24

Level	Program	Course	Affiliating Body (University /Body)	Intake Approved for 2022-23	Intake Approved for 2023-24	NRI Approval Status	FN / Gulf quota/ OCI/ Approval Status
UNDER GRADUATE	ENGINEERING AND TECHNOLOGY	CIVIL ENGINEERING	Shivaji University, Kolhapur	60	60	No	No
UNDER GRADUATE	ENGINEERING AND TECHNOLOGY	COMPUTER SCIENCE AND ENGINEERING	Shivaji University, Kolhapur	60	60	No	No

Level	Program	Course	Affiliating Body (University /Body)	Intake Approved for 2022-23	Intake Approved for 2023-24	NRI Approval Status	FN / Gulf quota/ OCI/ Approval Status
UNDER GRADUATE	ENGINEERING AND TECHNOLOGY	ELECTRICAL ENGINEERING	Shivaji University, Kolhapur	60	60	No	No
UNDER GRADUATE	ENGINEERING AND TECHNOLOGY	ELECTRONICS AND COMPUTER SCIENCE	Shivaji University, Kolhapur	60	60	No	No
UNDER GRADUATE	ENGINEERING AND TECHNOLOGY	MECHANICAL ENGINEERING	Shivaji University, Kolhapur	60	60	No	No

It is mandatory to comply with all the essential requirements as given in APH 2023-24 (Appendix 6)

Important Instructions

1. The State Government/ UT/ Directorate of Technical Education/ Directorate of Medical Education shall ensure that 10% of reservation for Economically Weaker Section (EWS) as per the reservation policy for admission, operational from the Academic year 2019-20 is implemented without affecting the reservation percentages of SC/ ST/ OBC(NCL) / General. However, this would not be applicable in the case of Minority Institutions referred to the Clause (1) of Article 30 of Constitution of India. Such Institution shall be permitted to increase in annual permitted strength over a maximum period of two years.

2. The Institution offering courses earlier in the Regular Shift, First Shift, Second Shift/Part Time are now amalgamated as total intake and shall have to fulfil all facilities such as Infrastructure, Faculty and other requirements as per the norms specified in the Approval Process Handbook 2023-24 for the Total Approved Intake. Further, the Institutions Deemed to be Universities/ Institutions having Accreditation/ Autonomy status shall have to maintain the Faculty: Student ratio as specified in the Approval Process Handbook.

3. Strict compliance of Anti-Ragging Regulation, Establishment of Committee for SC/ ST, Establishment of Internal Committee (IC), Establishment of Online Grievance Redressal Mechanism, Barrier Free Built Environment for disabled and elderly persons, Fire and Safety Certificate should be maintained as per the provisions made in Approval Process Handbook and AICTE Regulation notified from time to time.

4. In case of any differences in content in this Computer generated Extension of Approval Letter, the content/information as approved by the Executive Council / General Council as available on the record of AICTE shall be final and binding.

5. As per the AICTE Notification dated 29.01.2014 and amended thereto, it shall be mandatory for each Technical Education Institution, University Department and Institution Deemed to be University imparting Technical Education to get accreditation (NBA) for at least 60% of the eligible courses in the next ONE (1) Years' time, otherwise EoA for the subsequent Academic Year (A.Y. 2024-25) shall not be issued by the Council.

6. Deemed to be University**:** Institutions Deemed to be Universities (Running Technical Education Programmes), it is mandatory to have AICTE approval from the Academic Year 2018-19 in compliance of the Hon'ble Supreme Court Order dated 03-11-2017 passed in CA No.17869- 17870 /2017.

Prof.Rajive Kumar
Member Secretary, AICTE

Copy to:

1. **The Director Of Technical Education**, Maharashtra**

2. **The Registrar**,**
   Shivaji University, Kolhapur

3. **The Principal / Director,**
   DR. A. D. SHINDE COLLEGE OF ENGINEERING
   Guddai
   A/P: Bhadgaon
   Tal: Gadhinglaj
   Dist : Kolhapur,
   Gadhinglaj,Kolhapur,
   Maharashtra,416502

4. **The Secretary / Chairman,**
   A/P: GADHINGLAJ
   TAL : GADHINGLAJ
   DIST : KOLHAPUR
   PIN CODE :416502
   STATE : MAHARASHTRA
   GADHINGLAJ,KOLHAPUR
   Maharashtra,416502

5. Guard File(AICTE)

Note: Validity of the Course details may be verified at http://www.aicte-india.org/

** Individual Approval letter copy will not be communicated through Post/Email. However, a consolidated list of Approved Institutions(bulk) may be downloaded from the respective login id's.

This is a computer generated Statement. No signature Required

Annexure 9
Accounted audited statements for the last three years

Annexure 10
Best Practices adopted

The institute best practices

- Alternate sources of energy and energy conservation measures
- Management of the various types of degradable and non-degradable waste
- Water conservation
- Green campus initiatives
- Disabled-friendly, barrier free environment during last five years.

1. Report of Energy Conservation

Submitted by

Dr.A. D. Shinde College of Engineering Bhadagaon, Gadhinglaj
Kolhapur, Maharashtra, India.

The cheapest and cleanest energy is that which is not used. The Energy Conservation Initiative reduces campus-wide energy consumption and helps the campus meet the target goal of carbon neutrality by targeting efficiency projects in heating, cooling, building systems, and lighting.

The Energy Conservation Initiative (ECI) studies and identifies high-impact energy-saving projects across the DADSCOE campus, ECI is managed by a dedicated team in the Energy Management.

Green engineering practices improve the life cycle of the components of machines which convert energy from one form into another.

Energy can be conserved by reducing waste and losses, improving efficiency through technological upgrades, improving operations and maintenance, changing users' behaviors through user profiling or user activities, monitoring appliances, shifting load to off-peak hours, and providing energy-saving recommendations. Observing appliance usage, establishing an energy usage profile, and revealing energy consumption patterns in circumstances where energy is used poorly, can pinpoint user habits and behaviors in energy consumption. Appliance energy profiling helps identify inefficient appliances with high energy consumption and energy load. Seasonal variations also greatly influence energy load, as more air-conditioning is used in warmer seasons and heating in colder seasons. Achieving a balance between energy load and user comfort is complex yet essential for energy preservation. On a large scale, a few factors affect energy consumption trends, including political issues, technological developments, economic growth, and environmental concerns.

- Current buildings

Energy conservation measures have primarily focused on technological innovations to improve efficiencies and financial incentives with theoretical explanations obtained from the mentioned analytical traditions. Existing buildings can improve energy efficiency by changing structural maintenance materials, adjusting the composition of air conditioning systems, selecting energy-saving equipment, and formulating subsidy policies. These measures can improve users' thermal comfort and reduce buildings' environmental impact. The selection of combinatorial optimization schemes that contain measures to guide and restrict users' behavior in addition to carrying out demand-side management can dynamically adjust energy consumption. At the same time, economic means should enable users to change their behavior and achieve a low-carbon life. Combination optimization and pricing incentives reduce building energy consumption and carbon emissions and reduce users' costs.

Energy monitoring through energy audits can achieve energy efficiency in existing buildings. An energy audit is an inspection and analysis of energy use and flows for energy conservation in a structure, process, or system intending to reduce energy input without negatively affecting output. Energy audits can determine specific opportunities for energy conservation and efficiency measures as well as determine cost-effective strategies. Training professionals typically accomplish this and can be part of some national programs discussed

above. The recent development of smartphone apps enable homeowners to complete relatively sophisticated energy audits themselves. For instance, smart thermostats can connect to standard HVAC systems to maintain energy-efficient indoor temperatures. In addition, data loggers can also be installed to monitor the interior temperature and humidity levels to provide a more precise understanding of the conditions. If the data gathered is compared with the users' perceptions of comfort, more fine-tuning of the interiors can be implemented. Building technologies and smart meters can allow commercial and residential energy users to visualize the impact their energy use can have in their workplaces or homes. Advanced real-time energy metering can help people save energy through their actions.

Energy conservation through users' behaviors requires understanding household occupants' lifestyle, social, and behavioral factors in analyzing energy consumption. This involves one-time investments in energy efficiency, such as purchasing new energy-efficient appliances or upgrading the building insulation without curtailing economic utility or the level of energy services, and energy curtailment behaviors which are theorized to be driven more by social-psychological factors and environmental concerns in comparison to the energy efficiency behaviors. Replacing existing appliances with newer and more efficient ones leads to energy efficiency as less energy is wasted throughout. Overall, energy efficiency behaviors are identified more with one-time, cost-incurring investments in efficient appliances and retrofits, while energy curtailment behaviors include repetitive, low-cost energy-saving efforts.

To identify and optimize residential energy use, conventional and behavioral economics, technology adoption theory and attitude-based decision-making, social and environmental psychology, and sociology must be analyzed. The techno-economic and psychological literature analysis focuses on the individual attitude, behavior, and choice/context/external conditions. In contrast, the sociological literature relies more on the energy consumption practices shaped by the social, cultural, and economic factors in a dynamic setting.

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2. DEGRADABLE AND NON-DEGRADABLE WASTE MANAGEMENT

Submitted by

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Waste can be defined as discarded and useless materials which do not possess any value.

Solid waste is generated from different sources, such as households, industries, agriculture, commercial spaces, and other human activities, and poses significant environmental and public health risks. Thus, effective solid waste management is a necessity.
As per UNICEF, solid waste is categorized into Biodegradable and Non-Biodegradable waste. Biodegradable waste includes kitchen waste, agricultural waste, and human and animal waste, which can be decomposed by the biological action of living microorganisms.

However, non-biodegradable wastes are those which cannot be decomposed biologically. It includes plastic, metal, glass, etc.

This is the reason why non-biodegradable waste management using different technologies and solutions has assumed greater importance today.

What is Non-biodegradable Waste?

As mentioned, any waste type which cannot be decomposed by natural or biological processes is considered non-biodegradable waste.

Besides plastic, glass, and metals, it includes cardboard, paper, old clothes, thermocol sheets, cans, man-made polymer, biomedical waste, chemical waste, electronics, batteries, etc.

residing in the campus but also of those living in the vicinity. Providing a healthy and safe environment is therefore of utmost priority at DADSCOE Campus.

SOLID WASTE MANAGEMENT:

Solid waste management in the University is accomplished either by inhouse utilization/ consumption or by outsourcing its collection and disposal to an authorized agency. Over 700 bins have been provided across the campus for collection of the solid waste generated at different sources in the University. These bins are color coded specific to a category of solid waste.

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Waste collection

3. Water conservation:

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The central area of the new building of college has a rainwater harvesting system for better groundwater recharge. The stored water in this tank can be used for gardening purposes and supply to the running track. The institution has a wastewater unit Installation of a sewage treatment plant near this area is also planned and related paperwork started

Advantages: The benefits of the rainwater harvesting system are listed below.

- This technology is relatively simple, easy to install and operate.
- Promotes both water and energy conservation.
- Improves the quality and quantity of groundwater.
- It reduces soil erosion, storm water runoff, flooding and pollution of surface water.
- It is an excellent source of water with no chemicals, dissolved salts and free from all minerals

The ground water is pumped into the storage tank located at college building. The water is distributed to through well laid pipelines. Drinking water will be supplied by purifying RO plant for 2 sector in our college campus.

Entire distribution system is well supervised by repair and maintanence department of the college to ensure that there are no leakages and wastage of water through taps and valves etc. All the stakeholders of the college are well educated to use water economically and efficiently.

Drinking Water Facility

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4. GREEN CAMPUS

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