Yashoda Shikshan Prasarak Mandal's
YASHODA TECHNICAL CAMPUS, SATARA
NH-4, Wadhe Phata, Satara. Tele Fax- 02162-271238/39/40
Website- www.yes.edu.in, Email-registrar_ytc@yes.edu.in
Approved by AICTE / PCI New Delhi, Govt. of Maharashtra (DTE, Mumbai)
Affiliated to DBATU Lonere & Shivaji University, Kolhapur/ MSBTE, Mumbai.
NAAC B+ **Institute Code – 6757**

Prof. Dasharath Sagare	Prof. Ajinkya Sagare	Dr. Vivekkumar Redasani
Founder, President	Vice-President	Director

6.5.2 - The institution reviews its teaching learning process, structures & methodologies of operations and learning outcomes at periodic intervals through IQAC set up as per norms and recorded the incremental improvement in various activities

Yashoda Shikshan Prasarak Mandal's
YASHODA TECHNICAL CAMPUS, SATARA
Faculty of MCA
AY 2022-23

COURSE FILE

Name of Faculty: Dr. Sunita Jadhav
Academic Year: 2022-23
Class: MCA-I

Department: MCA
Semesters:
Subject Name: IP

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YASHODA TECHNICAL CAMPUS 6757 SATARA
YASHODA TECHNICAL CAMPUS 6750 SATARA
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Yashoda Technical Campus
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Teaching Workload

S. No.	Class	Subject	T	P	Total
1	MCA I	Introduction to Programming	4	4	08
2	MCA I	Bridge Course	01	-	01
3	MCA I	GFM		2	2
4	MCA II	Mega Project		2	2
5	MCA II	Aptitude Test		2	2
		Total Load	05	10	15 Hrs

Additional Responsibilities Given

No.	Head of the Committee	Designation	Responsibilities
1	Head of Department	HOD	Managing all Administrative work of the department including teaching load and all other departmental activities
2	Admission Co-ordinator		All responsibility of admission co-ordination, Campaigning planning and execution
3	Statutory committees		Design statutory committees, agenda, Minutes of meetings of statutory committees(10 registers)
4	NBA Co-ordinator		Preparation and Submission of Pre-Qualifier, Self-Assessment Report (SAR), Keeping or maintaining all record/Files ready for NAAC/ NBA Process.
5	FC Co-ordinator		Confirmation and verification of uploaded documents as per requirement and handling throughout FC as well as overall doubts and queries in FC

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Program Educational Objectives (PEO's)

PEO I	Technical Expertise	Implement fundamental domain knowledge of core courses for developing effective computing solutions by incorporating creativity and logicalreasoning.
PEO II	Successful Career	Deliver professional services with updated technologies in Computer application based Career.
PEO III	Interdisciplinary andLife Long Learning	Develop leadership skills and incorporate ethics, team work with effective communication & timemanagement in the profession. Undergo higher studies, certifications and technology research as per market needs.

Program Outcomes: PO's

PO's.

PO1. Computational Knowledge: Understand and apply mathematical foundation, computing and domain knowledge for the conceptualization of computing models from defined problems.

PO2. Problem Analysis: Ability to identify, critically analyze and formulate complex computing problems using fundamentals of computer science and application domains.

PO3. Design / Development of Solutions: Ability to transform complex business scenarios and contemporary issues into problems, investigate, understand and propose integrated solutions using emerging technologies

PO4. Conduct Investigations of Complex Computing Problems: Ability to devise and conduct experiments, interpret data and provide well informed conclusions.

PO5. Modern Tool Usage: Ability to select modern computing tools, skills and techniques necessary for innovative software solutions

PO6. Professional Ethics: Ability to apply and commit professional ethics and cyber regulations in a global economic environment.

PO7. Life-long Learning: Recognize the need for and develop the ability to engage in continuous learning as a Computing professional.

PO8. Project Management and Finance: Ability to understand, management and computing principles with computing knowledge to manage projects in multidisciplinary environments.

PO9. Communication Efficacy: Communicate effectively with the computing community as well as society by being able to comprehend effective documentations and presentations.

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PO10. Societal & Environmental Concern: Ability to recognize economical, environmental, social, health, legal, ethical issues involved in the use of computer technology and other consequential responsibilities relevant to professional practice.

PO11. Individual & Team Work: Ability to work as a member or leader in diverse teams in multidisciplinary environment.

PO12. Innovation and Entrepreneurship: Identify opportunities, entrepreneurship vision and use of innovative ideas to create value and wealth for the betterment of the individual and society.

Program Specific Outcomes: PSOs

PSO 1. Ability to pursue careers in IT industry/ consultancy/ research and development, teaching and allied areas related to computer applications.

PSO 2. Comprehend, explore and build up computer programs in the areas allied to Algorithms, System Software, Multimedia, Web Design and Big Data Analytics for efficient design of computer-based systems of varying complexity.

Course Outcomes (COs): On completion of the course, student will be able to:-

CO1	Explain and Apply the Object Oriented Concepts for Solving Real Problem.
CO2	Create Debug and Run Simple Java Programs using the Java SDK Environment.
CO3	Develop the Small Applications using networking and Multithreading.
CO4	Apply Events Management and Layout Managers Using AWT, Swing for Developing the Software for Various Problems.

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SHIVAJI UNIVERSITY, KOLHAPUR-416 004. MAHARASHTRA
Affiliation T-1 Section (0231) 2609089 , 2609136 & 2609146
शिवाजी विद्यापीठ, कोल्हापूर - ४१६ ००४. महाराष्ट्र
(संलग्नता टी-१ विभाग -२६०९०८९,२६०९९३६ व २६०९९४६)
Website : www.unishivaji.ac.in E-mail : affiliation1@unishivaji.ac.in
Estd:1962
A++ Accredited by NAAC
(2021) with CGPA 3.52

शिवाजी विद्यापीठ/संलग्नता टी.१/ प्रशांत/ 3685 दिनांक : 17 JUN 2022

400083

परिपत्रक

शैक्षणिक वर्ष २०२२- २०२३ या करिता खालील विद्याशाखांच्या पदवी तसेच पदव्युत्तर वर्षाच्या सत्रारंभ व सत्रसमाप्ती तारखा पुढील प्रमाणे राहतील.

विद्याशाखा	प्रथम सत्र		द्वितीय सत्र	
	सत्रारंभ	सत्रसमाप्ती	सत्रारंभ	सत्रसमाप्ती
कला, वाणिज्य, विज्ञान, सामाजिकशास्त्रे, (पदवी अभ्यासक्रम)	01/08/2022	15/12/2022	02/01/2023	17/06/2023
पदव्युत्तर अभ्यासक्रम (विद्यापीठ व महाविद्यालयीन)	01/08/2022	15/12/2022	02/01/2023	03/07/2023
कला व ललितकला (बी.आर.टी. व बी.डेस. पदवी अभ्यासक्रम)	01/08/2022	15/12/2022	02/01/2023	17/06/2023
वाणिज्य व व्यवस्थापन (बी.बी.ए., बी.सी.ए.,पदवी अभ्यासक्रम)	01/08/2022	15/12/2022	02/01/2023	17/06/2023
समाजकार्य (पदवी अभ्यासक्रम)	01/08/2022	15/12/2022	02/01/2023	17/06/2023
समाजकार्य (पदव्युत्तर अभ्यासक्रम)	01/08/2022	15/12/2022	02/01/2023	03/07/2023
शिक्षणशास्त्र (पदवी अभ्यासक्रम)द्वितीय, तृतीय व चतुर्थ वर्षासाठी)	01/08/2022	15/12/2022	02/01/2023	17/06/2023
शिक्षणशास्त्र (पदव्युत्तर द्वितीय वर्ष अभ्यासक्रम)	01/08/2022	15/12/2022	02/01/2023	03/07/2023
विधी (पदवी अभ्यासक्रम) तृतीय व चतुर्थ व पाचव्या वर्षासाठी	01/08/2022	15/12/2022	02/01/2023	17/06/2023
विधी (पदव्युत्तर अभ्यासक्रम)	01/08/2022	15/12/2022	02/01/2023	03/07/2023
अभियांत्रिकी, टेक्सटाईल, वास्तुशास्त्र, (पदवी अभ्यासक्रम) चतुर्थ वर्षासाठी	01/08/2022	15/12/2022	02/01/2023	17/06/2023
फार्मसी (पदवी अभ्यासक्रम) तृतीय व चतुर्थ वर्षासाठी)	01/08/2022	15/12/2022	02/01/2023	17/06/2023
आंतरविद्याशाखीय आणि अभ्यास केंद्रांतर्गत अभ्यासक्रम	01/08/2022	15/12/2022	02/01/2023	03/07/2023

शैक्षणिक वर्ष २०२२-२०२३ या मधील विधी, वाणिज्य व व्यवस्थापन, अभियांत्रिकी व फार्मसी या विद्याशाखाच्या सत्रारंभ व सत्रसमाप्तीच्या तारखा खालील प्रमाणे राहतील.

विद्याशाखा	प्रथम सत्र		द्वितीय सत्र	
	सत्रारंभ	सत्रसमाप्ती	सत्रारंभ	सत्रसमाप्ती
विधि विद्याशाखा (द्वितीय वर्ष पदवी ३ व ५ वर्ष अभ्यासक्रम)	12/09/2022	14/1/2023	01/02/2023	25/07/2023
वाणिज्य व व्यवस्थापन विद्याशाखा (पदव्युत्तर द्वितीय वर्ष अभ्यासक्रम एम.बी.ए., एम.सी.ए.)	17/08/2022	20/12/2022	02/01/2023	12/07/2023
अभियांत्रिकी विद्याशाखा (पदवी द्वितीय व तृतीय वर्ष)	17/08/2022	20/12/2022	02/01/2023	27/06/2023
अभियांत्रिकी विद्याशाखा (पदव्युत्तर द्वितीय वर्ष अभ्यासक्रम)	10/10/2022	31/01/2023	06/02/2023	28/08/2023
फार्मसी विद्याशाखा (द्वितीय वर्ष पदवी)	17/08/2022	20/12/2022	02/01/2023	27/06/2023
फार्मसी विद्याशाखा (पदव्युत्तर द्वितीय वर्ष अभ्यासक्रम)	10/10/2022	31/01/2023	06/02/2023	28/08/2023

टिप- शैक्षणिक वर्ष २०२२-२०२३ या करिता विधी, वाणिज्य व व्यवस्थापन, अभियांत्रिकी व फार्मसी या अभ्याक्रमांच्या प्रथम वर्ष सत्रारंभ व सत्रसमाप्ती तारखा शासनाने जाहिर केल्यानंतर प्रवेश प्रक्रियेनुसार कळविण्यात येतील.

डॉ.व्ही.एन.शिंदे
प्रभारी कुलसचिव

प्रति,
१. प्राचार्य/संचालक, सर्व संलग्न महाविद्यालये/ मान्यताप्राप्त शिक्षण संस्था.
२.विभागप्रमुख, सर्व अधिविभाग, शिवाजी विद्यापीठ, कोल्हापूर.
३.विभागप्रमुख, सर्व प्रशासकीय विभाग, शिवाजी विद्यापीठ, कोल्हापूर. सदरचे परिपत्रक विद्यापीठाच्या संकेतस्थळावर www.unishivaji.ac.in - Affiliation-Affiliation T-१ Circulars मध्ये उपलब्ध आहे.

YASHODA TECHNICAL CAMPUS SATARA

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Academic Calender for MCA- Sem I,III (2022-23)

Week No	Month	Week days						Event
		Mon	Tue	Wed	Thu	Fri	Sat	
1	Aug	XX	XX	XX	XX	XX	XX	Academic Calender,time table workload finalisation
2		XX	XX	XX	XX	XX	XX	Statutory committies meetings, cultural committee meeting
3		XX	XX	17	18	19	20	20-HOD interaction with student, Purchase committeee meeting,GFM meeting,Cultural meeting.
4		22	23	24	25	26	27	18 MCA II Commencement of class , 22 Staff welfare committee meeting, 27. Disaster mangement
5		29	30	31				30 Attadance Display, Student Absent Calls Absent Student Report to Parents 31-Ganesh Chaturthi
6	Sept				1	2	3	2 Libraray committee meeting,Assignments, Statutory committee work,5 Guest lecture
7		5	6	7	8	9	10	3 Training & placement comm Meeting
8		12	13	14	15	16	17	10 Publicity committee,12 staff meeting,13Wall magazine committee meeting ,Student Absent Calls
9		19	20	21	22	23	24	24-Alumni Association meeting
10		26	27	28	29	30		29 Advisory committee meeting,30 display of attendance, Student Absent Calls, Absent Student Report to Parents
14	Oct						1	1-MCA-I commencement, 1-Hostel & health care committee,Antiragging committee meeting
12		3	4	5	6	7	8	5-Dasara 6 programming workshop,Statutory committee work
13		10	11	12	13	14	15	15-Student Absent Calls
14		17	18	19	20	21	22	22-Hostel Health care committee meeting
15		24	25	26	27	28	29	24,25,26-Diwali
16		31						31 Display of attendace, Student Absent Calls, Absent Student Report to Parents
17	Nov		1	2	3	4	5	1 to7 MID TERM, 4 Antiragging committee meeting
18		7	8	9	10	11	12	8-Gurunanak Jayanti 9-guest Lecture,Statutory committee work
19		14	15	16	17	18	19	10 Student Absent Calls, 18 Anti sextual harrashment committee meeting, ,Industrial visit meeting,19 parent meeting
20		21	22	23	24	25	26	26 Gymkhana Meeting,21-26 Result Display of MID TERM
21		28	29	30				30-Display of attendace, Student Absent Calls, Absent Student Report to Parents
22	Dec				1	2	3	1-IQAC meeting, staturory committees meeting
23		5	6	7	8	9	10	10 Student Absent Calls, 20 Grivence redressal cell
24		12	13	14	15	16	17	12 to 17 TERM END EXAM
25		19	20					20 Term End & Attadance Display, Student Absent Calls, Absent Student Report to Parents, Result Display of TERM END , Take Student Feedback

est Marks & Attendance displ	Public Holiday	Activities			

1. Monthly 2 GFM meeting will be conducted .
2. Soft skill,Aptitude training will be arranged according to convenience
3. University Paper Solutio will be taken at the time of submission
4. Tentative Oral Exam will be in month of November
5. Tentative Theory Exam will be in month of December

Term commencement	Last Working Day	Theory & Practical examination
16-Aug-22	20-Dec-22	As per Shivaji University Notification

Date:- 07/07/2022

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HOD
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FACULTY OF MCA

YSPM's

Yashoda Technical Campus, Faculty of MCA, Satara.

Master Time Table Odd Semester (MCA I, MCA II) 2022-2023

Time/ Day	Class	10:00 AM To 11:00 AM	11:00 AM To 12:00 AM	12:00 AM To 01:00 PM	01:00 PM To 01:40 PM	01:40 PM To 02:40 PM	02:40 PM To 02:50 PM	02:50 PM To 03:50 PM	03:50 PM To 04:50 PM
Mon	MCA I	PM&OB SSJ	BC VVK	CA&OS SVT	* * * * LONG * * RE- CESS * * * * *	KM VVK	* * * * SHORT * * * * RECESS * * * *	RDBMS(Lab) VVK(F1) / IP(Lab) SPJ(F2)	
	MCA II	CC SVT	DA PSG	JP SSJ		CS SSJ		ED PSG	MEGA Pr All Faculty
	MCA I	RDBMS VVK	IP SPJ	CA&OS SVT		PM&OB SSJ		KM VVK	STAT XYZ
	MCA II	CC SVT	ED PSG	CS SSJ		MEGA Pro All Faculty		JP(Lab) SSJ(S1) / DA(Lab) PSG(S2)	
Wed	MCA I	RDBMS VVK	IP SPJ	PM&OB SSJ		KM VVK		STAT XYZ	Library All Faculty
	MCA II	CS SSJ	ED PSG	CC SVT		MEGA Pro All Faculty		JP(Lab) SSJ(S2) / DA(Lab) PSG(S1)	
Thu	MCA I	RDBMS(Lab) VVK(F2) / IP(Lab) SPJ(F1)		CA&OS SVT		PM&OB SSJ		STAT XYZ	
	MCA II	CC SVT	JP SSJ	DA PSG		MEGA Pro All Faculty		Library All Faculty	CS SSJ
	MCA I	RDBMS VVK	IP SPJ	KM VVK		Bridge Course All Faculty		Bridge Course All Faculty	
	MCA II	DA PSG	JP SSJ	ED PSG		MEGA Pro All Faculty		SPORT RTG	
	MCA I	RDBMS VVK	IP SPJ	CA&OS SVT		BC VVK		GFM All Faculty	
	MCA II	DA PSG	JP SSJ	MOOC PSG Aptitude Test All Faculty		MOOC PSG Aptitude Test All Faculty			

Time Table In-Charge

HOD MCA

H. O. D.

YSPM's YASHODA TECHNICAL CAMPUS, SATARA

FACULTY OF MCA

DIRECTOR

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Yashoda Technical Campus, Faculty of MCA, Satara.

Individual Time Table MCA I and MCA II Odd Semester

Faculty Name: Dr. Sunita Jadhav.

Time/ Day	Class	10:00 AM To 11:00 AM	11:00 AM To 12:00 AM	12:00 AM To 01:00 PM	01:00 PM To 01:40 PM	01:40 PM To 02:40 PM	02:40 PM To 02:50 PM	02:50 PM To 03:50 PM	03:50 PM To 04:50 PM
Mon	MCA I				LONG RECESS		SHORT RECESS	IP(Lab) SPJ(F2)	MEGA Pr All Facult
	MCA II								
Tues	MCA I		IP SPJ			MEGA Pro All Faculty			
	MCA II								
Wed	MCA I		IP SPJ					Library All Facult	
	MCA II					MEGA Pro All Faculty			
Thu	MCA I	IP(Lab) SPJ(F1)							
	MCA II					MEGA Pro All Faculty		Library All Faculty	
Fri	MCA I		IP SPJ			Bridge Course All Faculty		Bridge Course All Faculty	
	MCA II					MEGA Pro All Faculty			
Sat	MCA I		IP SPJ						
	MCA II			Aptitude Test All Faculty		Aptitude Test All Faculty		GEM All Faculty	

Time Table In-Charge

HOD MCA

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MCA Part II Semester IV

Sr. No.	Course Type	Course Code	Course Title	Theory contact hours per week	Practical hours per week	Credits	University exam	Internal continuous assessment	Total
1	Core	CC401	Artificial Intelligence and Soft Computing	4		4	70	30	100
2	Core	CC402	Advance Java Programming	4		4	70	30	100
3	Core	CC403	Internet of Things	4		4	70	30	100
4	DSE	DSE404	1. Block Chain Technology 2. Mobile Applications 3. Web Application - Security 4. Web Mining	4		4	70	30	100
5	AEC	AEC 405	Research Methodology	4		4	70	30	100
6	AEC	AEC 406	Personality Development	2		2	-	50	50
7	DSE	DSE407	Seminar	2		2	-	50	50
8	Core	CC408	Lab based on CC401		2	2	50		50
9	Core	CC49	Lab based on CC402		2	2	50		50
10	Core	CC410	Mini Project		4	4	80	20	100
				24	**8**	**32**	**530**	**270**	**800**

Credit Distribution Chart for MCA Program

Sr. No	Particulars	Credits	Percentage of Credits
1	CC- Compulsory Courses	88	68
2	GE- General Electives	8	7
3	DSE- Domain Specific Electives	10	8
4	AEC- Ability Enhancement	22	17
	Total	128	100

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outlines.

11.Advance Accountancy:- M.C. Shukla & T.S. Grewal
12.Advance Accountancy:- S.C. Jain & K.L. Narang

20. Syllabus:

M.C.A. Part-I Semester I
Paper CC101: Introduction to Programming
(Choice Based Credit System)

Course Outcomes	**Students of this course will be able to :** 1. Understand Basic Syntax of Python Programming. 2. Demonstrate and implement concepts of object oriented methodology using Python. 3. Develop problem solving skills and their implementation through Python 4. Design Graphical user Interfaces in Python.		
Marks:100	Total Hours of Teaching: 60	University Exam :70	Internal : 30
Syllabus Contents:			
Unit 1:	**Introduction to Programming :** Role of programming languages, Need to study programming languages, Characteristics of Programming Languages, Programming language paradigms: Imperative, Object Oriented, Functional, Logic, Event Driven and Concurrent Programming. **OVERVIEW** – History, Features and Applications, Installing and Running Python Program, Modes: interpreter, editor and IDE,– Python Identifiers, Keywords , Indentation, Multi-Line Statements, Quotation, Comments , Waiting for the User Input, Multiple Statements on a Single Line **VARIABLE TYPES** - Assigning Values to Variables, Multiple Assignment, Standard Data Types (Numbers, Strings, Lists, Tuples, Dictionary), Data Type Conversion and Casting **OPERATORS** - Types of Operators, Operators Precedence **STRINGS** - Accessing Values in Strings, Updating Strings, Escape Characters, String Special Operators, String Formatting Operator, Triple Quotes, Unicode String, Built-in String Methods, Regular Expression and Pattern Matching.	**15Periods**	
Unit 2:	**DECISION MAKING** - If, if-else, elif Statement, Nesting of If statement, Using if-else as switch-case **LOOPS** - While Loop, The Infinite Loop, For Loop, Iterating by Sequence Index, Using else Statement with Loops, Nested Loops, Break, Continue & Pass Statement. **LISTS** - Python Lists, Accessing Values in Lists, Updating Lists, Deleting List Elements, Basic List Operations, Indexing, Slicing, and Matrixes, Built-in List Functions and Methods. **TUPLES** - Accessing Values in Tuples, Updating Tuples, Deleting Tuple Elements, Basic Tuples Operations, Indexing, Slicing, and Matrixes , No Enclosing Delimiters :, Built-in Tuple Functions, Combining Lists and Tuples. **Sets** -Concept of Sets , creating, initializing and accessing the elements of ,Sets operation. **DICTIONARY**- Accessing Values in Dictionary, Updating Dictionary, Delete Dictionary Elements, Properties of Dictionary Keys, Built-in	**15 Periods**	

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	Dictionary Functions and Methods.	
Unit 3:	**FUNCTIONS** - Defining and Calling a Function, Function Arguments, Keyword Arguments, Default Arguments, Variable Length Arguments, Passing by Reference Versus Passing by Value, The Anonymous Functions, The return Statement, Returning multiple values, Scope of Variables, Global vs Local variables **MODULES** - The import Statement, The from import and import * Statement, Locating Module, Creating and importing user defined modules, dir( ) Function, The globals( ) and locals( ) Functions, The reload( ) Function, Packages in Python, Creating and using packages. **EXCEPTIONS**– Introduction &, need of Exception, Handling an Exception with try-except, The except Clause with No Exceptions & with Multiple Exceptions, try-finally, try-except-else clause, User-Defined Exceptions	**15 Periods**
Unit 4:	**FILES I/O** – Opening and Closing Files, The open Function, The file Object Attributes, The close( ) Method, Reading and Writing Files, The write( ) and writelines( ) Methods, The read( ), readline( ) and readlines( ) Methods, Opening file in appending mode, File Positions, seek( ) function, Renaming and Deleting Files, rename( )& remove( ) Method, Directories in Python, mkdir( ), chdir( ), getcwd( )&rmdir( ) Methods, File and Directory Related Methods **CLASSES AND OBJECTS** - Overview of OOP Terminology, Creating Classes, Creating Instance Objects, Accessing Attributes, static member attributes & Built-In Class Attributes, Destroying Objects (Garbage Collection, Class Inheritance, Multiple, Hierarchical and Multi-level inheritance, Overriding Methods, Overloading Operators, Data Hiding. **Multithreading, Database Access using python** **GUI Programming using Tkinter**– using Label, Message Widget, Buttons, Radiobuttons, Checkboxes, Entry Widgets, Canvas Widgets, Sliders, Text Widget, Dialogs, Layout Management.	**15 Periods**
	Reference Books: 1. R. NageswaraRao, "Core Python Programming", Dreamtech 2. Programming with python, A users Book, Michael Dawson, Cengage Learning 3. Python Essential Reference, David Beazley, Third Edition 5. Python Bible 4. Practical Programming: An introduction to Computer Science Using Python, second edition, Paul Gries, Jennifer Campbell, Jason Montojo, The Pragmatic Bookshelf. 5. Python for Informatics: Exploring Information, Charles Severance 6. John V Guttag. "Introduction to Computation and Programming Using Python", Prentice Hall of India 7. Learning Python By Mark Lutz,O'Reilly Publication 8. Python Learning Guide (BPB publications)	

YASHODA TECHNICAL CAMPUS 6757 SATARA

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Teaching Plan

Academic Year: 2022-23

Subject: Introduction to Programming

Class: MCA-I (SEM-I)

Teacher Name: Prof. Dr. Sunita Jadhav

Reference Books

Code	Author/Publication	Title
A	R. NageswaraRao, , Dreamtech	Core Python Programming
B	A users Book, Michael Dawson, Cengage Learning	Programming with python
C	David Beazley, Third Edition 5. Python Bible	Python Essential Reference
D	second edition, Paul Gries, Jennifer Campbell, Jason Montojo, The Pragmatic Bookshelf	Practical Programming: An introduction to Computer Science Using Python
E	Charles Severance	Python for Informatics: Exploring Information
F	John V Guttag, Prentice Hall of India	Introduction to Computation and Programming Using Python

Lect No.	Unit Name	Subtopic Names	Planned date	Execution date	Ref. Book Code	Academic Co-ordinator Sign
1	Unit I	**Introduction to Programming :** Role of programming languages, Need to study programming language, Characteristics of Programming Languages	22/11/22	22/11/22	A,D	
2		Programming language paradigms: Imperative, Object Oriented	23/11/22	23/11/22		
3		Functional, Logic, Event Driven and Concurrent Programming.	24/11/22	24/11/22		
4		History, Features and Applications	25/11/22	25/11/22		
5		Installing and Running Python Program, Modes: interpreter, editor and IDE	26/11/22	26/11/22		
6		Python Identifiers, Keywords , Indentation, Multi-Line Statements, Quotation, Comments, Waiting for the User Input, Multiple Statements on a Single Line	29/11/22	29/11/22		
7		Assigning Values to Variables, Multiple Assignment, Standard Data Types (Numbers, Strings, Lists, Tuples, Dictionary)	30/11/22	30/11/22		
8		Data Type Conversion and Casting	1/12/22	1/12/22		
9		Types of Operators, Operators Precedence	2/12/22	2/12/22		
10		Accessing Values in Strings, Updating Strings, Escape Characters, String Special Operators	5/12/22	6/12/22		

11		String Formatting Operator, Triple Quotes, Unicode String, Built-in String Methods, Regular Expression and Pattern Matching	7/12/22	7/12/22		

Lect No.	Unit Name	Sub topic Names	Planned date	Execution date	Ref. Book Code	Academic Co-ordinator Sign
12		**DECISION MAKING** - If, if-else, elif Statement, Nesting of If statement), Using if-else as switch-case	9/12/22	9/12/22		
13		**LOOPS** - While Loop, The Infinite Loop, For Loop	10/12/22	10/12/22		
14		Iterating by Sequence Index, Using else Statement with Loops, Nested Loops	13/12/22	13/12/22		
15		Break, Continue & Pass Statement	14/12/22	14/12/22		
16		**LISTS** - Python Lists, Accessing Values in Lists, Updating Lists, deleting List Elements, Basic List Operations, Indexing, Slicing	15/12/22	15/12/22		
17	Unit-II	Matrixes, Built-in List Functions and Methods, **TUPLES** - Accessing Values in Tuples, Updating Tuples, Deleting Tuple Elements	16/12/22	16/12/22	B, D	
18		Basic Tuples Operations, Indexing, Slicing, and Matrixes	20/12/22	20/12/22		
19		No Enclosing Delimiters :, Built-in Tuple Functions, Combining Lists and Tuples	21/12/22	21/12/22		
20		**Sets** -Concept of Sets , creating, initializing and accessing the elements of ,Sets operation	23/12/22	23/12/22		
21		**DICTIONARY**- Accessing Values in Dictionary, Updating Dictionary, Delete Dictionary Elements, Properties of Dictionary Keys, Built-in Dictionary Functions and Methods	24/12/22	20/12/22		
22		**FUNCTIONS** - Defining and Calling a Function, Function Arguments, Keyword Arguments	10/01/23	10/01/23		
23		Default Arguments, Variable Length Arguments, Passing by Reference versus Passing by Value	11/01/23	11/01/23		
24	Unit III	The Anonymous Functions, The return Statement, Returning multiple values, Scope of Variables, Global vs Local variables	13/01/23	13/01/23	B,F	
25		**MODULES** - The import Statement, The from import and import * Statement	14/01/23	14/01/23		
26		Locating Module, Creating and importing user defined modules, dir( ) Function, The globals( ) and locals( ) Functions	17/01/23	17/01/23		
27		The reload( ) Function, Packages in Python, Creating and using packages	18/01/23	18/01/23		

28		**EXCEPTIONS**– Introduction &, need of Exception, Handling an Exception with try-except,	20/01/23	20/1/23		
29		The except Clause with No Exceptions & with Multiple Exceptions	24/01/23	24/1/23		
30		try-finally, try-except-else clause, User-Defined Exceptions	25/01/23	25/1/23		
31		**FILES I/O** – Opening and Closing Files, The open Function, The file Object Attributes	27/01/23	27/1/23		
32		The close( ) Method, Reading and Writing Files, The write( ) and writelines( ) Methods	31/01/23	31/1/23		
33		The read( ), readline( ) and readlines( ) Methods, Opening file in appending mode, File Positions, seek( ) function	1/02/23	1/2/23		
34		Renaming and Deleting Files, rename( )& remove( ) Method	03/02/23	03/2/23		
35		Directories in Python, mkdir( ), chdir( ), getcwd( )&rmdir( ) Methods, File and Directory Related Methods	07/02/23	7/2/23		
36	UNIT IV	**CLASSES AND OBJECTS** - Overview of OOP Terminology, Creating Classes, Creating Instance Objects, Accessing Attributes	08/02/23	8/2/23	B,D,F	
37		static member attributes & Built-In Class Attributes, Destroying Objects (Garbage Collection,	10/02/23	10/2/23		
38		Class Inheritance, Multiple, Hierarchical and Multi-level inheritance	14/02/23	14/2/23		
39		Overriding Methods, Overloading Operators, Data Hiding,	15/02/23	15/2/23		
40		**Multithreading, Database Access using python**	17/02/23	17/2/23		
41		**GUI Programming using Tkinter**– using Label, Message Widget, Buttons, Radio buttons, Checkboxes, Entry Widgets	21/02/23	21/02/23		
42		Canvas Widgets, Sliders, Text Widget, Dialogs, Layout Management	22/02/23	22/2/23		
		Make up classes	25/02/23	25/2/23		
		Practice	28/02/23	28/2/23		

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Subject Incharge

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H. O. D.

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Faculty of MCA

Practical Plan

Academic Year: 2022-23 **Subject:** Introduction to Programming (CC101)

Class: MCA-I (SEM-I) **Teacher Name:** Prof. Dr. Sunita Jadhav

S. No	Title of experiment	Planned Date	Date of Execution
1	Program to demonstrate basic data type & Operators in python	24/11/22	24/11/22
2	Compute the GCD of two numbers.	28/11/22	28/11/22
3	Program to demonstrate Input through the keyboard using input () function.	01/12/22	1/12/22
4	Write a Program for checking whether the given number is even number or not.	05/12/22	5/12/22
5	Accept the number from the user a) Find the square root of a number (Newton's method) b) To write a python program to find exponentiation (power of a Number	08/12/22	8/12/22
6	Write a program using a while loop that asks the user for a number, and prints a countdown from that number to zero.	12/12/22	12/12/22
7	Write a python program to display prime Numbers up to 100.	15/12/22	15/12/22
8	Create a string named 'Satara' a) Find the Occurrences of 'a' in given string b) Check whether 'tara' is substring of given string or not c) Display the last character in the string d) Display first three characters in the string e) Concatenate 'YSPM' with given String	19/12/22	19/12/22

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	f) Find the Length of the String g) Display all sting in lower case h) Display all sting in upper case i) Display the index of 't' j) Check whether the given string is ends with r or not.		
9	Write a program to accept the three numbers from the user a) Calculate the absolute value of each number and add them b) Display the result with float representation	22/12/22	22/12/22
10	Create a list named 'machine' and assign the list values as 400,850,600,210,99,23,56,777,428,657,210 Using list methods do the following a) Remove 428 from the list b) Get the index of 600 c) Insert 1414 in the list after 777 d) Extend the list by adding [999,888] e) Count the occurrences of 210 f) Sort the list g) Reverse the list h) Display the last four values i) Remove the last value of list	02/01/23 & 16/01/23	16/01/2023
11	Write a program to read a text file and display its contents	19/01/23	19/1/23
12	Create any tuple with different data types and perform following on Tuple a) add an item in a tuple b) get the 4th element from Tuple c) get the 4th element from last of a tuple d) find the occurrences of any repeated items e) check whether an element exists within a tuple f) remove an item from a tuple g) get first 3 elements in tuple h) get any item by using Index i) find the length of a tuple j) reverse a tuple	23/01/23 & 30/01/23	30/1/23
13	Program to demonstrate dictionary in python a) add key to dictionary b) concatenate dictionaries to create it	2/02/23 & 06/02/23	6/2/23

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	new dictionary c) check if a given key already exists in a dictionary d) remove a key from a dictionary e) print a dictionary line by line		
14	Define two sets S and D with any values you want and do the following a)Add 'g' to the set S b)Display difference of the two sets c)Display the common values in set S and D d)Check whether set S is in set D e)Check whether D is superset of S f)Remove 'a' from set S g)Display the values that are in S and in D but not in both h)Take the union of two sets i)Remove all elements from set S	09/02/23 & 13/02/23	13/02/23
15	Build a basic GUI, take two buttons "up" and "down", write events such that clicking on up button number will increase and clicking on down button number will decrease.	16/02/23 & 20/02/23	20/2/23

Note: Other than list some extra practical's taken for practice purpose

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13/2/2023

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Assignments

Unit: I Introduction to Programming

1. Write characteristics of programming Language?
2. List out and explain the different data types in Python?
3. Describe Operators in Python.
4. Explain built in string methods in Python.

Unit: II Introduction to Programming

1. What is list? Explain accessing, adding and removing of elements from list with example.
2. Enlist any five dictionary methods with short description.
3. Demonstrate how to add, delete and update elements, checking length in dictionary with illustrate python code.
4. List and explain Decision Control Statements and Iterative Statements in Python.
5. State how break statement can be used in loops? Explain with an example.

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Unit: III Functions Modules and Exceptions

1. Write a python program using function to compute area of triangle, square, circle and rectangle.
2. Differentiate global variables and local variables
3. What are modules? How do you use them in your program
4. What is lambda function? Explain it with proper syntax.
5. Describe exception handling with suitable example in Python.

Unit: IV Files I/O, Classes and Objects

1. Differentiate between class variable and instance variable or what are the types of variables in class.
2. Explain the main features of Object Oriented Programming Language?
3. What do you understand by term programming paradigm? Explain any three programming paradigm.
4. Explain Multithreading in Python with example.

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Name- Badgujar Hemant Vijay class - MCA-I
Subject- IP Roll No- 01

Assignment No. 4

Q.1 Differentiate between class variable & instance variable or what are the types of Variables class.

Ans. Instance Variable-
It is basically a class variable without a static modifier and is usually shared by all class instance across different objects, these variable can have different values. They are tied to a particular object instance of the class, therefore, the contents of an instance variable are totally independent of one object instance to other.

example- class Taxes
{
int count;
/* ... */
}

class Variable -
It is basically a static variable that can be declare anywhere at class level with static Across different objects, these variables can have only one value. These variables are not tied to any of the class,

Therefore, can share across all objects of the class.

example- class Taxes
{
static int count;
/*... */
}

	Instance Variable	class Variable
1)	It is a variable whose value is instance specific & now shared among instance.	1) It is a variable that defines a specific attribute or property for a class.
2)	These variable cannot be shared bet^n classes. Instead, they only belong to one specific class.	2) These variables can be shared between class & its subclasses.
3)	It usually reserves memory for data that the class needs.	3) It usually maintains a single changed value for all instance of class even if no instance object of the class exists.
4)	It is generally created when an instance of the class created.	It is generally created when the program begins

5)	It normally retains values as long as the object exists.	It normally retains values until the program terminate.
6)	It has many copies so every object has its own personnal copy of instance variable.	It has only one copy of the class variable so it is charged among diff object of the class.
7)	It can be accessed directly by calling variable names inside the class.	It can be accessed by calling with the class name
8)	The variables are declared without using the static Keyword	these variables are declared using the keyword static
9)	changes that are made to those variable through one object will not reflect in another object	changes that are need to these variables through one object will reflect in another object.

Q 2 Explain the main features of object oriented Programming language.

Ans. object oriented programming model that uses classes of object. It utlized to break down a software program into reusable code blue prints called classes. that you may use to build specific instance of things object-oriented programming language include javascript, c++, java & Python to name a few.

Top feathers of oops -

Inheritance -

The attributes that you inherit from your parents are a simple illustration of inheritance classes may inherit characteristics from other classes thanks to inheritance parent classes in other words, extend properties & behaviour to child classes. Reusbility is aided via inheritance. Prototyping is another name for inheritance in javascript.

Consider the application Polygon, which represents several shapes we are expected to make two distinct sorts of Polygons : a Rectangle & a Triangle.

Encapsulation -

Encapsulation is the process of enclosing all critical information inside an object & only revealing a chosen set of it the outside world.

i.e. code inside the class template defines attributes & behaviours.

The data & methods are then enclosed in the object when it is created from the class. Inside a class, encapsulation conceal the underlying software code implementation and the internal data of the object. Encapsulation necessitates designing certain field as private while others are made public.

- methods & attributes only available from other methods in the same class make up the private/internal interface.
- methods & attributes that are available from outside the class are known as the public/external interface.

Abstraction-

Abstraction refers to the users interaction with just a subset of an objects characteristics & operations. To access a complicated item, Abstraction uses simpler high level techniques.

- simple items are used to show complexity
- Keep complicated information hidden from the user.

simple classes are used to indicate complexity in abstraction. Encapsulation may extension of abstraction.

A Real-life Example of Abstraction-

Abstraction reveals just the most significant facts to the user while hiding the underlying intricacies.

E.g. When we ride a bike we only know how to ride it but not how it works. We also have no idea how on the inside.

Polymorphism-

Polymorphism refers to the correction of items that have similar behaviour.

E.g object may override common parent behaviour with particular child behaviour through inheritance. method overriding & method overriding are two ways that polymorphism enables the same method to perform various actions.

There are two types of Polymorphism-

method overriding-

method overriding is used to in runtime polymorphism. When a chail class overides a parent classes method, the child class might offer an alternative implementation.

method overiding

method overiding is used to in compiled time polymorphism. Though two methods or function may share the same name the number of arguments can vary into the method

(all many. Therefore, depending on the no. of parameters entered, you may obtain different result.

2.3) What do you understand by term Programming Paradigm? Explain any three Programming language.

Ans- Paradigm can also be termed as method to solve some problem or some task. Programming Paradigm is an approach to solve problem using some programming language or also we can say it is a method to solve the problem using table & techniques that are available to us following some approach. There are lots for programming language that are known but all them need to follow some strategy when they are implemented & this method do lang/strategy is paradigm. Apart from varieties of programming language there are lots of paradigms to fulfill each & every demand. They are discussed below.

1) Imperative Programming Paradigm-
It is one of the oldest programming paradigm. It features close relation to machine architecture. It is based on von neumann architecture. It works by changing the program state through assignment statements. It performs task by changing

the goal. The Paradigm consist of several statement & after execution of all the result is stored.

Advantages-
1) Very simple to implemented.
2) It contains loops, variables etc.

Disadvantage-
1) Complex problem cannot be solved.
2) less efficient & less productive
3) Parallel Programming is divided into three broad categories.

1) Procedural programming paradigm-
Paradigm emphasizes on procedure in terms of underlying machine model Procedural & Imperative approach. It has the ability to reuse the code & it was born at that time it was in use because of its reusability.

ii) object oriented programming -
The program it written as a collection of classes & object which are meant for communication. The smallest and basic entity is object & all kind of computation is performed on the object only. more emphasis is on data rather procedure. It can handle almost all kind of real life problems which are today in existence.

Advantages -

• Data security • Inheritance • code reusability
• flexible & abstraction is also present

iii) Parallel Processing approach -

Parallel Processing is the processing of program introduction by dividing them among multiple processors. A Parallel Processing system passes many no. of processor with the objective of running them.

2) Declaration Programming Paradigm -

It is divided as logic function database
It computer science the declarative programming is a style of building program that express logic of computation without talking about its control flow. it often consider program as theories of some logic. It may simplify writing parallel programs the focus is on what needs to be done rather how it should be done basically emphasis on what code is actually doing. It just declares the result we want rather how it has be produced. This is the only diff^n betⁿ imperative & declarative programming paradigms.

i) logic Programming Paradigms -

It can be turned [illegible] model of computation. It would [illegible] problems like

Puzzles, series etc.
In logic Programming we have a Knowledge base which we known before & along with the question & knowledge base which is given to machine, it Produce result. In normal Programming languages such as concept of Knowledge base not available but while using the concept of artificial intelligence machine learning we have some models like perception model which is using the same mechnism.

Function Programming Paradigms-
The functional Programming Paradigms has its roots in mathematics & it is language independent The key principle of this Paradigms is the execution of series of mathematical function the central model for the abstract^n is the function which are meant for some specific computation & not the data structure.

Database / Data driven Programming approach-
The programming methodology is used on data & its movement Program statements are defined by data rather than hard coding a series of steps A database program is the heart of business information system & Provides the [illegible] data entry, update, query &

4. Explain multithreading in Python with example.

S- Multithreading is defined as the ability of a processor execute multiple threads are currently.

In a simple, single-core cpu, it is a achieved using frequent switching between threads. This is term as context switching In context switching, the state of a thread is saved & state of another thread is loaded whenever any interrupt take place. context switching take place so frequently that all the threads appear to the running parallel.

* Multi threading in Python

In Python the threading module provides a very simple & intuitive API for spawning multiple threads in a program let us consider a simple example using a threading module.

```
import threading

def Print cube(num):
    Print("cube {}".format(num * num * num))
def Print square(num):
    Print("square {}".format(no * no))
if __name__
```

```
t1 = threading.Thread(target=print_square,
                      args=(10,))
t2 = threading.Thread(target=print_cube,
                      args=(10,0))

t1.start()
t2.start()
t1.join()
t2.join()

Print("Done!")
```

Square : 100
Cube : 1000
Done!

Yashoda Technical Campus, Satara
Faculty of MCA
MCA-I SEM-I (2022-23)
Roll No. List

Roll No.	Student Name	Roll No.	Student Name
1	BADGUJAR HEMANT VIJAY	35	KOTHAMBIRE SHRUTI SANJAY
2	BHANAGE SIDDHARTH MAHESH	36	KSHIRSAGAR OMKAR RAJESH
3	BHINGARDEVE ABHIJEET LALASO	37	KULKARNI RADHA RANJEET
4	BHISE SWATI TATYABA	38	LAHUTE SAKSHI VIJAY
5	BHONGALE SANKET DATTATRAYA	39	LAWAND TANUJA VYANKAT
6	BHOSALE AISHWARYA VIKRAM	40	MAHADIK SUMIT SANTOSH
7	BOBADE NIVEDITA SHITALKUMAR	41	MANE GANESH VISHVANATH
8	BODAKE PRANITA SURESH	42	MANE PRADNYA PRADIP
9	BUJAWADEKAR PARTH PANDURANG	43	MANE RAJVARDHINI RAJU
10	CHAVAN KUNAL SADASHIV	44	MANE ROHIT VILAS
11	CHAVAN NIRANJAN MARUTI	45	MANE SNEHAL SANJAY
12	CHAVAN RUTUJA ARVIND	46	MORE NAMRATA ARUN
13	CHAVAN SHIVPRASAD ABASO	47	NALAWADE AKSHATA ANNASO
14	CHOUGULE SOURABH UMESH	48	NANAWARE JANHAVI PRASHANT
15	DEOKAR GANESH RAJENDRA	49	NEVASE AKASH DASHARATH
16	DESHMUKH NEHA SANTOSH	50	NIKAM SEJAL VIKAS
17	DHAGE SAYALI VIJAY	51	NIKAM SHUBHANKAR MACHCHHINDRANATH
18	DUDHANE KALYANI BHALCHANDRA	52	PANDIT ABHISHEK RAJESH
19	GAIKWAD ABHISHEK KALYAN	53	PARDESHI PRIYANKA GOPAL
20	GAIKWAD PRATIKSHA DILIP	54	PAWAR ABHIJEET NANASO
21	JADHAV AISHWARYA SANJAY	55	PAWAR AKSHAY LAXMAN
22	JADHAV HARSHADA DADASO	56	PAWAR PRATIKSHA ANIL
23	JADHAV NISHA UTTAM	57	PAWAR RAJESHWARI HANMANT
24	JADHAV SHIVANI PRAKASH	58	PRAJAPATI DHIRAJ ARVIND
25	JADHAV SHREYA BHALCHANDRA	59	PUJARI AKASH VIDYADHAR
26	JADHAV SOURABH MADHUKAR	60	SAKUNDE AARTI SANJAY
27	KADAM ANIKET SURYAKANT	61	SAKUNDE SAKSHI SHIVAJI
28	KADAM JAYDIP DADASO	62	SAPKAL ROHAN TRIMBAK
29	KADAM OMKAR PRAKASH	63	SHAIKH ALTAMASH ALTAF
30	KADAM PRITI ASHOK	64	SHEKHAR SWAPNIL DILIP
31	KAMBLE POURNIMA NIVAS	65	SHELAR RUTUJA BABASO
32	KAMBLE TEJAS TANAJI	66	SHINDE PRATHMESH KAILAS
33	KHARAT ATHARV BIPIN	67	SHINDE SHIVATEJ KIRAN
34	KHULE SHREYAS NANASO	68	WAIDANDE PRAFULL RAJESH

YASHODA TECHNICAL CAMPUS SATARA

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Faculty of MCA

Theory Attendance

Class: MCA I SEM: I

Roll No	Student Name	22/11/22	23/11/22	24/11/22	25/11/22	26/11/22	25/11/22	26/11/22	29/11/22	30/11/22	1/12/22	2/12/22	6/12/22	7/12/22	9/12/22	10/12/22	13/12/22	14/12/22	15/12/22	16/12/22	20/12/22	21/12/22	23/12/22	24/12/22
	Lect. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	Badgujar Hemant Vijay	P	P	P		P		P	P	P	.	P	P	P	P		P	P	P	.	P	P	P	P
2	Bhanage Siddharth Mahesh	P	.	P		P		P		P		P		P			P	P	P		P			
3	Bhingardeve Abhijeet Lalaso	P	P																					
4	Bhise Swati Tatyaba	P	.	P		P		P		P		P	P		P	P		P		P		P	P	
5	Bhongale Sanket Dattatraya	P	P	P		P		P		P	P	P		P	P		P	P	P	P	P	P	.	
6	Bhosale Aishwarya Vikram	P	P	P	.		P	P	P	P	P	.	P	P	P	P	P	P	.	.	P	P		
7	Bobade Nivedita Shitalkumar	P	P		P		P																	
8	Bodake Pranita Suresh	P	P																					
9	Bujawadekar Parth Pandurang	P		P	P		P	P		P	P	P	P	P	P	P	.	.	P	P	.	P	P	
10	Chavan Kunal Sadashiv	P		P	.	.	.	P	P															
11	Chavan Niranjan Maruti	P					P	P	P		.	P	P		P	P	.	P	P	.	P	P	P	P
12	Chavan Rutuja Arvind		P				P	P	P		.	.		P	P	P	P	P	P	P	.	P	P	P
13	Chavan Shivprasad Abaso	.	.	.	P		P	P	P	P	.	.		P	P	.	P	.		P	P	.	P	P
14	Chougule Sourabh Umesh	.				P	P	P	P	P	P	P	P	.		.	P	P	.	P	P	P	.	P
15	Deokar Ganesh Rajendra	P									.	.	.	P			.	.	P	P				
16	Deshmukh Neha Santosh	P	P	P		P	P	P	P	P	P	P		.			P	P	P	P	P	.	P	
17	Dhage Sayali Vijay	.											.	P				P	.	.	P			
18	Dudhane Kalyani Bhalchandra	P				P	P	P		P		P		P		P	P			P	P	P		
19	Gaikwad Abhishek Kalyan	P																						
20	Gaikwad Pratiksha Dilip	.				P	P	P		P		P	P	P	P	P	P	P	P	P	P	P	P	
21	Jadhav Aishwarya Sanjay	P													.									
22	Jadhav Harshada Dadaso	.	P	P		P	P		P	P	P	P	P	P										
23	Jadhav Nisha Uttam	.																						
24	Jadhav Shivani Prakash	P				P	P	P	P	P			P	P	P		P	P	P	P	P	P		
25	Jadhav Shreya Bhalchandra	P																						
26	Jadhav Sourabh Madhukar	P			P	P	P	P	P	P	P		P	P	P	P	P	P	P	P	P	P	P	
27	Kadam Aniket Suryakant	P																						
28	Kadam Jaydip Dadaso	.		P	P	P	P	P	P	P	P	P	P	P	P	P	.	.	.	P	P	P	P	P
29	Kadam Omkar Prakash	P		.		P	P	P	P	P	P		.		P	P	P		.	.	P	P		
30	Kadam Priti Ashok	P	P	P	P	P	.	.		P	P			P	P	P	.	.	P			P	P	
31	Kamble Pournima Nivas	.																						
32	Kamble Tejas Tanaji	.	P	P		P	P		P	P	P	P	.	.	P	P	P	P	P	P	P	P	P	P
33	Kharat Atharv Bipin	P	.	.	.	.	P	P	P	P	P	P	.	.		P	P	.	P	P	P	P	P	
34	Khule Shreyas Nanaso	P	P				P																	
35	Kothambire Shruti Sanjay	.			.	.	.	P	P	P	.	P	P	P	P	.		.	P	P	P	P	P	P
36	Kshirsagar Omkar Rajesh	P	.	P	P	P	.	.	.	P	.	.	P		P	.	.	P		P	P	P	P	P
37	Kulkarni Radha Ranjeet	.	.	.		.	P	P		P	P	P	P	P	.	.	.	.	P	.	.	P		
38	Lahute Sakshi Vijay	.	.	P	P	.	.	.	P	P	P	.	.	.	P	P	P	P	P	P	P	P	P	P
39	Lawand Tanuja Vyankat	.	.	.	.	.	P	P	P	P	.	P	P	.	P	P	P	P	P	.	.	P	P	P
40	Mahadik Sumit Santosh	P	P	P		P	P		P	P	P	P	.	P	.	P		P	P	P	P	P	P	.
	Topic Covered	...e Python	characteristic of Prog	Eco & paradigm	History & appln	Installing Python	Python Identifiers	Standard data type	Data type conversion	Types of operators	Escape sequences	Decision making stat	Loops	Break & Continue	List & operations	Tuples & operations	Slicing & Indexing	Delimiters	Set	Dictionary	Functions	Default arguments	Anonymous func	Global + local var

Yashoda Technical Campus, Satara

Faculty of MCA

Theory Attendance

Subject: Introduction to Programming **Year:** 2022-23

10/11/23	14/11/23	16/11/23	17/11/23	17/11/23	18/11/23	20/11/23	24/11/23	25/11/23	27/11/23	31/11/23	4/12/23	6/12/23	7/12/23	8/12/23	10/12/23	14/12/23	18/12/22	19/12/22	24/12/22	26/12/22	28/12/22	28/12/22							Total no of Lec Attend	% of Attend
24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52		
						P		P		P				P		P				P		P								
P	P																	P		P			P							
		P		P		P				P		P		P		P				P										
P																		P				P								
	P	P		P		P		P	P		P	P	P	P	P	P							P							
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		P		P		P		P	P	P		P	P	P	P	P														
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	P	P		P	P		P	P	P	P	P	P	P		P	P		P												
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P	P	P		P		P		P	P	P		P	P		P	P							P							
P		P		P		P	P											P		P										
P	P	P		P																										
									P			P	P		P	P		P		P		P								
P		P			P			P		P		P		P	P															
				P					P		P		P					P												
P																				P		P								
				P					P						P															
		P											P			P		P		P										
P				P		P		P					P		P							P								
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P		P		P		P			P				P		P							P								
				P							P							P		P										
P				P				P							P															
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		P			P			P		P		P			P			P												
				P	P		P		P				P					P		P		P								
															P			P												
				P			P				P									P		P								
	P			P	P	P	P	P		P	P				P			P												
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	P		P	P			P		P	P		P	P		P	P		P												
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	P	P		P	P	P		P	P	P	P		P	P		P		P												
		P				P			P		P		P	P				P		P		P								
P		P		P																P		P								
											P	P		P	P			P		P										
		P		P		P		P		P										P		P								
				P				P				P			P			P		P										
Passing by reference	Returning multi values	Return statement	modules import	locating module	packages in python	exceptions	multiple exception	try finally block	Files I/O		close write &	overriding method	[illegible]	[illegible]	[illegible]	from [illegible]	classes & object	static member	class instance	[illegible] mul.	[illegible] practical									

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No.	Date	Topic
24	10/1/23	
25	11/1/23	Introduction to prog lang
26	13/1/23	Characteristic of python
27	14/1/23	oops paradigm
28	17/1/23	History & Appln
29	18/1/23	Installing python
30	20/1/23	python identifiers
31	24/1/23	Standard Data type
32	25/1/23	python identifiers
33	27/1/23	Data type conversion
34	31/1/23	Types of operator
35	01/2/23	Escape sequences
36	3/02/23	Decision making st
37	7/02/23	Loops
38	8/02/23	Break & Continue
39	10/2/23	List & operations
40	14/2/23	Tuples & operations
41		Slicing / indexing
42		Delimiters
43		Set
44		Dictionary
45		Fu
46		
47		
48		
49		
50		
51		
52		
Total No Of Lectures Attended		
% of Attendance		

Subject Incharge

DIRECTOR
Yashoda Technical Campus
Satara

MCA HOD
H. O. D.
YASHODA TECHNICAL CAMPUS, SATARA
FACULTY OF MCA

Roll No	Student Name	Date	24/11/22	25/11/22	26/11/22	27/11/22	28/11/22	29/11/22	30/11/22	1/12/22	2/12/22	3/12/22	5/12/22	7/12/22	9/12/22	10/12/22	13/12/22	14/12/22	15/12/22	16/12/22	19/12/22	20/12/22	21/12/22	23/12/22	24/12/22
		Lect. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
41	Mane Ganesh Vishvanath																								
42	Mane Pradnya Pradip		P		P		P			P	P		P		P	P		P	P		P		P		P
43	Mane Rajvardhini Raju																								
44	Mane Rohit Vilas		P	P	P	P	P	P				P	P		P	P		P		P	P		P		P
45	Mane Snehal Sanjay																								
46	More Namrata Arun		P	P			P			P			P			P			P		P				
47	Nalawade Akshata Annaso																						P		
48	Nanaware Janhavi Prashant			P			P			P			P		P		P			P		P	P		P
49	Nevase Akash Dasharath																								
50	Nikam Sejal Vikas		P		P			P		P			P		P			P		P	P				
51	Nikam Shubhankar Machchhindranath		P		P		P			P					I		P		P		P		P		
52	Pandit Abhishek Rajesh		P			P			P			P		P				P			P		P		
53	Pardeshi Priyanka Gopal																								
54	Pawar Abhijeet Nanaso		P		P		P	P		P		P			P			P		P		P	P		P
55	Pawar Akshay Laxman																								
56	Pawar Pratiksha Anil		P	P		P		P	P			P		P			P		P		P		P		
57	Pawar Rajeshwari Hanmant																								
58	Prajapati Dhiraj Arvind		P		P			P			P		P			P		P			P		P		P
59	Pujari Akash Vidyadhar																								
60	Sakunde Aarti Sanjay		P			P		P		P	P				P		P		P		P	P	P		P
61	Sakunde Sakshi Shivaji																								
62	Sapkal Rohan Trimbak			P				P					P								P				P
63	Shaikh Altamash Altaf				P			P			P		P				P					P			
64	Shekhar Swapnil Dilip		P					P			P				P					P					
65	Shelar Rutuja Babaso		P		P						P		P												P
66	Shinde Prathmesh Kailas		P		P			P		P					P		P		P		P				P
67	Shinde Shivatej Kiran				P			P					P												
68	Waidande Prafull Rajesh		P		P			P		P		P					P		P			P		P	P
	Topic Covered		Intro to Python	Characteristics of Prog	OOPS Paradigm	History & appl	Installing Python	Python identifiers	standard data type	Data type conversion	Types of operators	Escape sequence	Decision making	Loops	break & continue	List of operators	Tuples & operation	slicing indexing	Delimeters	Set, dictionary	functions	Default Arguments	Anonymous fun	Local & global var	

Python assignment marks

Roll No	A1	A2	A3	A4	Roll No	A1	A2	A3	A4
1	9	9	9	9	31	9	8	9	9
2	10	9	8	9	32				
3	9	10	9	10	33	9	8	8	
4	8	8	8	9	34		9	8	
5					35			8	
6	8	9	8	9	36				
7	9	10	9	9	37				
8	8	8	9	9	38	9	7	8	9
9	9	8	9	9	39		9	9	9
10	9	9	8	8	40				
11		9		9	41	9	9	9	9
12			9	9	42	8	8	8	8
13					43	9	9	9	9
14					44	10	9	9	8
15					45	9	9	8	9
16	10	9	9	8	46	8	9	8	9
17					47	9	9	8	9
18	8	8	9	9	48				
19					49	8	8	8	8
20	10	8	9	9	50	9	9	9	9
21	10	9	8	9	51				8
22					52	10	9	9	9
23					53	10	9	8	9
24					54	8	8	8	8
25	8	8	8	8	55	9	8	8	8
26					56	9	9	9	9
27	10	8	8	9	57	8	7	9	8
28								8	9
29	9	9	9	8	59	9			
30	9	7	8	9		10	10	9	10

Roll No.	A_1	A_2	A_3	A_4
61	9	9	8	9
62				
63	8	9	9	9
64				
65			8	9
66	8	8	9	9
67				
68				

YASHODA TECHNICAL CAMPUS 6757 SATARA

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Yashoda technical Campus,Satara

Faculty of MCA

Department of MCA

Subject:Organizational Behavior **Subject Code:BM41**

Academic Year:2019-20

Course Exit Survey

A. Student Information					
Name:		Email ID:			
Class:		Contact No:			
B. Educations Experience					
Please answer the following questions that best describes your experiences as a student at Master of Computer Application Department YTC,Satara.					
Sr. No.	**Statement**	**CO**	**Strongly Agree (5)**	**Agree (3)**	**Neutral (1)**
1	I can Understand Group behavior , team building	BM41.1			
2	I can Understand Organizational culture ,Change and Development	BM41.2			
3	I am able to Understand the knowledge of teamwork in project	BM41.3			
4	I can Understand the mechanism of group structure.	BM41.4			
Please give your specific comment/sugessions if any:					

Date:

Place:

Sign

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Introduction to Programming [CC101]

Question Bank

Unit -IV Object Oriented Programming

Sr.NO	Question	Marks
1	What is class method? Give proper syntax for explanation	5
2	Explain the concept of public and private members using proper python program	5
3	List and explain concepts of OOP	5
4	Write a class that displays students information	8
5	write about monolithic programming	5
6	Differentiate structured vs object oriented programming	8
7	Explain the terms. 1. Inheritance 2. Data abstraction 3. Encapsulation 4. Polymorphism 5. containership	5
8	Give brief of classification of programming paradigm	6
9	Explain class methods and self object with examples	5
10	Write a program to deposit or withdraw money in a bank account	6
11	What do you understand by term programming paradigm? Explain any three programming paradigm.	5
12	Explain the main features of Object Oriented Programming Language?	5
13	Explain the three levels of data protection with example.	8
14	What is class? How to create object and call methods of a class.	8
15	Differentiate between class variable and instance variable or what are the types of variables in class.	8
16	Write a short note on Special class methods- __init__() and __del__()?	6
17	What does self argument signify in the class? Give example	5
18	Explain/Differentiate between public and private variables?	5

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19	With the help of example explain the concept of Instance Methods, class methods and static methods.	5
20	Write a note on object oriented programming concept.	8
21	What is the result of the below lines of code? class Test(object): def __init__(self): self.x = 1 t = Test()print t.xprint t.xprint t.xprint t.x	8
22	Define Terms 1) Polymorphism 2) Inheritance	5
23	Differentiate between class and object	5
24	Explain the concept of class methods and self object with suitable example.	5
25	Differentiate procedural programming vs object oriented programming	8

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15	What are various decision statements supported by python explain with example?	8
16	What is purpose of pass statement in python?	5
17	Explain with example else statement in loop	5
18	What is list? Explain accessing, adding and removing of elements from list with example.	8
19	What is dictionary? How to add and remove elements in dictionary?	5
20	Explain following operations of list with an example -- max, sum, all, len , not in	5
21	Program that check given no. is prime or not	5
22	Explain selection / conditional statements in python.	8
23	Write a program in python to find factorial of a number using while loop.	5
24	Enlist any five dictionary methods with short description.	5
25	Explain any four operators of the tuple with example.	5
26	Explain Tuple and List. Also state the difference between them?	5
27	Explain Loop Control statements in Python	
28	Explain Selection Decision Control statements in Python	8
29	List and explain Decision Control Statements and Iterative Statements in Python	8
30	Write a python program to create list, tuple and Display it.	5
31	Create two list of integers in Python. Display elements of two list. Merge Two list and Display merged List	5
32	Define Dictionary? give example?	5
33	State how else statement can be used in loops? Explain with an example.	5
34	Explain methods to add and delete element from lists	5
35	Express the syntax for if…elif…else condition and give an example	5
36	Demonstrate how to add, delete and update elements, checking length in dictionary with illustrate python code	5
37	Brief about Escape Sequence in Python with example?	5
38	Mention 5 methods used with list and explain with an example	8
39	Write a program that determines whether the entered value is alphabet, digit or a space.	5

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Yashoda Shikshan Prasarak Mandal's

Yashoda Technical Campus, Satara

Faculty of Pharmacy

(B. Pharm, M. Pharm)

Wadhe Phata, NH 4, Satara

(Affiliated to Shivaji University / DBATU, Lonere)

ACADEMIC DIARY

Name of Faculty: Dr. Avinash Mahadeo Bhagwat

Designation : Professor

Department : B. Pharmacy

Academic Year : 2022-23 **Term :** I

Semester : VII

DIRECTOR
Yashoda Technical Campus
Satara

Principal
Yashoda Technical Campus
Faculty of Pharmacy, Satara.

Yashoda Shikshan Prasarak Mandal's

Yashoda Technical Campus, Satara

Faculty of Pharmacy

(B. Pharm, M. Pharm)

Wadhe Phata, NH-4, Satara

(Affiliated to Shivaji University / BATU / MSBTE)

Personal Information

Name of Faculty: Dr. Avinash Mahadeo Bhagwat-

Designation : Professor **Qualification** M. Pharm PhD

Department : B. Pharmacy **Date of Joining :** 02/07/2012

Academic Year : 2022-23 **Term** I **Semester :** VII

Employee ID No. : _____ **PAN No. :** ADYPB4151A

Blood Group : B +ve

Aadhar Card No. : 9713 4096 9369

Local Address 467/7A, F-8, Savali Apartment, Uttekarnagar, Sadar Bazar, Satara - 415 001

Permanent Address — As above —

E-mail Id : amb.bpharm@yes.edu.in **Contact :** 9405250790

YASHODA TECHNICAL CAMPUS 6757 SATARA

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Teaching Workload

S. No.	Class	Subjects	T	P	Total
1	IV B.pharm	Instrumental Methods of Analysis (IMA)	4	12	16

Individual Time Table

Time / Day	10 - 11	11 - 12	12 - 01	1 - 1.40	1.40 - 2.40	2.40 - 3.40	3.40 - 4.40
MON		IMA (Th)		R	— IMA :- A batch —		
TUE		IMA (Th)		E	— IMA :- B batch —		
WED		IMA (Th)		C	— IMA :- C batch —		
THU		IMA (T)		E			
FRI				S			
SAT				S			

Dr. Arinash M. Bhagwat
Subject Incharge

HOD

Teaching Plan

Academic Year: 2022-23 Subject: IMA (BP701T)

Class: IV B.Pharm, Sem - VII Name of Teacher: Dr. AM Bhagwat

Reference Book Code:

Code	Author/Editor	Title
A	Instr Gr. Chatwal, S. Anand	Instrumental Methods of Chemical Analysis
B	Kasture, Mahadik, More	Pharmaceutical Analysis Vol II
C	Mahadik, Sathiyanarayanan	Instrumental Methods of Analysis

Lect. No.	Unit Name	Subtopic Names	Planned Date	Execution Date	Ref. Book Code	Teaching Aid	Faculty Sign	HOD Sign
1	UV Visible	Electronic transitions	17/8/22	17/8/22	A	Black Board		
2	Spectroscopy	Chromophore, Auxochr, Shifts	22/8/22	22/8/22	A	〃		
3		Solvent effect, Bk Laws	23/8/22	24/8/22	A	〃		
4		Instru - Source, Monochrom	29/8/22	29/8/22	A	〃		
5		Instru - Sample cell, Detectors	30/8/22	30/8/22	A	〃		
6		Applications	5/9/22	5/9/22	A	〃		
7	Fluorimetry	Theory, Singlet, Doublet, triplet	6/9/22	6/9/22	A	〃, AV		
8		Factors affecting Fluorescence	7/9/22	7/9/22	A	〃		
9		Quenching, Instru-I	12/9/22	12/9/22	A	〃		
10		Instru-II, Applications	13/9/22	13/9/22	A	〃		
11	IR Spectroscopy	Intro, Vibrations	14/9/22	14/9/22	A	〃		
12		Sample handl, Factors affect	19/9/22	19/9/22	A	〃		
13		Instrumentation	20/9/22	20/9/22	A	〃		
14		Applications	21/9/22	21/9/22	A	〃		
15	Flame	Principle, Interferences	26/9/22	26/9/22	A	〃, AV		
16	Photometry	Instrn, Applications	27/9/22	27/9/22	A	〃		
17	AAS	Principle, Interferences	28/9/22	28/9/22	A	〃		
18		Instrn, Applications	3/10/22	3/10/22	A	〃		
19	Nephelo -	Principle, Instru-I	11/10/22	4/10/22	A, B	〃		
20	- Turbidometry	Instru-II, Applications	12/10/22	10/10/22	A, B	〃		
21	Intro Chromatography	Introduction	17/10/22	11/10/22	A	〃		
22	Adv Part. C. Chromatography	Methodology, Adv	18/10/22	18/10/22	A	〃		
23		DB-Adv, Applications	19/10/22	25/10/22 (e)	A	〃		
24	TLC	Intro, Principle, Methodology	1/11/22	1/11/22	A, B	〃		
25		Adv, DB-adv, Applications	2/11/22	2/11/22	A	〃		

Dr. Arinash M. Bhagwat
Subject Incharge

Academic Incharge

Principal

YASHODA TECHNICAL CAMPUS SATARA

DIRECTOR
Yashoda Technical Campus
Satara

Teaching Plan

Academic Year: _____ Subject: _____

Class: _____ Name of Teacher: _____

Reference Book Code:

Code	Author/Editor	Title

Lect. No.	Unit Name	Subtopic Names	Planned Date	Execution Date	Ref. Book Code	Teaching Aid	Faculty Sign	HOD Sign
26	Paper	Intro, Methodology	7/11/22	9/11/22	A, B	Black Board		
27	Chromatography	Dev. Tech, Adv, Disadv, Ap	9/11/22	10/11/22(E)	A, B	—"—		
28	Electrophoresis	Intro, Principle, Factors	14/11/22	14/11/22	C	—"—		
29		Paper, Gel Electropho.	15/11/22	15/11/22	C	—"—		
30		Capillary, Applications	16/11/22	16/11/22	C	—"—		
31	Gas	Intro, Theory, Principle	21/11/22	17/11/22(E)	A, B	—"—, AV		
32	Chromatography	Instrumentation	22/11/22	18/11/22(E)	A, B	—"—		
33		Derivatn, Temp Program	23/11/22	21/11/22	A, B	—"—		
34		Adv, Disadv, Applications	28/11/22	22/11/22	A, B	—"—		
35	HPLC	Intro, Theory, Principle	29/11/22	23/11/22	A	—"—		
36		Instrumentation - I	30/11/22	26/11/22(E)	A	—"—		
37		Instrumentation - II	5/12/22	28/11/22	A	—"—		
38		Adv, Applications	6/12/22	29/11/22	A	—"—		
39	IEC	Intro, Class^n, Resins	7/12/22	30/11/22	B	—"—, PPT		
40		Prop^s, Mechanism, Factors	12/12/22	1/12/22(E)	B	—"—		
41		Methodology, Applications	19/12/22	2/12/22(E)	B	—"—		
42	GPC	Intro, Theory, Instru-I	20/12/22	5/12/22	B	—"—		
43		Instru-II, Applications	21/12/22	6/12/22	B	—"—		
44	Affinity	Intro, Theory, Instru-I	26/12/22	7/12/22	C	—"—		
45	Chromatography	Instru-II, Applications	27/12/22	8/12/22(E)	C	—"—		

Dr. Avinash M. Bhagwat
Subject Incharge

Academic Incharge

Principal

YASHODA TECHNICAL CAMPUS 6757 SATARA

DIRECTOR
Yashoda Technical Campus
Satara

Theory Attendance **Yashoda Technical**

Class : IV B.pharm Sem. : VII

Roll No.	Name of Student \ Date	17/8/22	22/8/22	24/8/22	29/8/22	30/8/22	5/9/22	6/9/22	7/9/22	12/9/22	13/9/22	14/9/22	19/9/22	20/9/22	21/9/22	26/9/22	27/9/22	28/9/22	3/10/22	4/10/22	10/10/22
	Lecture No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	Ms. Pawara A.D.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
2	Mr. Bhosale V.V.	0	1	0	2	3	4	5	6	0	7	8	9	10	11	12	13	14	0	15	16
3	Ms. Deshpande S.S.	0	1	2	3	4	0	5	6	7	8	9	10	11	0	12	13	14	15	16	17
4	Ms. Chavan A.R.	1	0	2	3	4	5	6	0	7	8	9	10	11	12	13	0	14	15	16	17
5	Ms. Deshmukh S.M.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
6	Mr. Javanjal C.R.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
7	Mr. Dhavale P.M.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
8	Mr. Shinde P.K.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	0
9	Mr. Deshmukh S.K.	1	2	0	3	4	5	6	7	8	0	9	10	11	12	13	0	14	15	16	17
10	Ms. Gaikwad S.Y.	1	2	3	0	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	3
11	Mr. Jamdade V.Y.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
12	Ms. Shelke V.R.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
13	Ms. Adsul K.R.	1	2	0	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	0	18
14	Ms. Maske H.H.	0	1	2	3	4	5	6	7	8	0	9	10	11	12	13	14	15	16	17	18
15	Mr. Yadav S.R.	1	0	2	3	4	0	5	6	7	8	9	10	11	12	0	13	14	15	16	17
16	Mr. Jaigude S.S.	1	2	3	0	4	5	6	7	8	9	10	11	0	12	13	14	15	16	17	18
17	Mr. Patil S.J.	0	1	2	3	4	5	6	7	0	8	9	10	11	12	13	14	15	0	16	17
18	Mr. Kadam N.N.	1	0	2	3	4	5	0	6	7	8	9	10	11	12	13	14	0	15	16	17
19	Mr. Pisal T.B.	0	1	2	3	4	5	6	7	8	9	10	0	11	12	13	14	15	16	17	18
20	Mr. Sawant P.S.	0	1	2	3	4	5	6	7	8	0	9	10	11	12	13	14	15	16	17	18
21	Mr. Kamble P.P.	1	2	3	0	4	5	6	7	8	9	10	11	12	13	0	14	15	16	17	18
22	Mr. Jadhav R.S.	1	0	2	3	4	5	6	7	8	0	9	10	11	12	13	14	15	16	17	18
23	Ms. Pathan U.S.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
24	Ms. Adsul H.C.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	0	[illegible]
25	Mr. Shedmake A.C.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
26	Mr. Nalawade S.N.	0	1	2	3	4	5	6	0	7	8	9	10	11	12	13	14	15	16	17	18
27	Ms. Patsute A.R.	0	1	2	3	4	5	6	7	8	9	0	10	11	12	13	14	15	16	17	0
28	Mr. Nikam A.S.	1	2	0	3	4	5	6	7	8	9	10	11	12	0	13	14	15	16	17	18
29	Ms. Rao V.M.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
30	Ms. Shelke S.S.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Topic Covered	UV - Electronic transitions	Chromophor, Auxo., Shift	Solvent effect, B&L Law etc	Instru. Source, Monochro.	Instru - Sample cell, Detectors	Applications	Fluorimetry - Th, Singl. Dub, Trip.	Factor affecting fluoro.	Quenching, Instru-I	Instru-II, Applications	IR - Intro, vibrations	Sample hand., Factors aff.	Instrumentation	Applications	FP - Principle, Interf.	Instru^n, Applications	AAS - principle, Interf.	Instru, Applications	NT - Principle, Instru-I	Instru-II, Applications
	Initials of Teacher																				

Yashoda Technical

Theory Attendance

Class : IV B.pharm **Sem. :** VII

Roll No.	Name of Student / Lecture No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Date	17/8/22	22/8/22	24/8/22	29/8/22	30/8/22	5/9/22	6/9/22	7/9/22	12/9/22	13/9/22	14/9/22	19/9/22	20/9/22	21/9/22	26/9/22	27/9/22	28/9/22	3/10/22	4/10/22	10/10/22
1	Ms. Pawara A. D.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
2	Mr. Bhosale V. V.	0	1	0	2	3	4	5	6	0	7	8	9	10	11	12	13	14	0	15	16
3	Ms. Deshpande S. S.	0	1	2	3	4	0	5	6	7	8	9	10	11	0	12	13	14	15	16	17
4	Ms. Chavan A. R.	1	0	2	3	4	5	6	0	7	8	9	10	11	12	13	0	14	15	16	17
5	Ms. Deshmukh S. M.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
6	Mr. Javanjal C. R.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
7	Mr. Dhavale P. M.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
8	Mr. Shinde P. K.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	0
9	Mr. Deshmukh S. K.	1	2	0	3	4	5	6	7	8	0	9	10	11	12	13	0	14	15	16	17
10	Ms. Gaikwad S. Y.	1	2	3	0	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	0
11	Mr. Jamdade V. Y.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
12	Mr. Shelke N. R.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
13	Ms. Adsul K. R.	1	2	0	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	0	18
14	Ms. Maske H. H.	0	1	2	3	4	5	6	7	8	0	9	10	11	12	13	14	15	16	17	18
15	Mr. Yadav S. R.	1	0	2	3	4	0	5	6	7	8	9	10	11	12	0	13	14	15	16	17
16	Mr. Jaiqude S. S.	1	2	3	0	4	5	6	7	8	9	10	11	0	12	13	14	15	16	17	18
17	Mr. Patil S. J.	0	1	2	3	4	5	6	7	0	8	9	10	11	12	13	14	15	0	16	17
18	Mr. Kadam N. N.	1	0	2	3	4	5	0	6	7	8	9	10	11	12	13	14	0	15	16	17
19	Mr. Pisal T. B.	0	1	2	3	4	5	6	7	8	9	10	0	11	12	13	14	15	16	17	18
20	Mr. Sawant P. S.	0	1	2	3	4	5	6	7	8	0	9	10	11	12	13	14	15	16	17	18
21	Mr. Kamble P. P.	1	2	3	0	4	5	6	7	8	9	10	11	12	13	0	14	15	16	17	18
22	Mr. Jadhav R. S.	1	0	2	3	4	5	6	7	8	0	9	10	11	12	13	14	15	16	17	18
23	Ms. Pathan U. S.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
24	Ms. Adsul H. C.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	0	19
25	Mr. Shedmake A. C.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
26	Mr. Nalawade S. N.	0	1	2	3	4	5	6	0	7	8	9	10	11	12	13	14	15	16	17	18
27	Ms. Patsute A. R.	0	1	2	3	4	5	6	7	8	9	0	10	11	12	13	14	15	16	17	0
28	Mr. Nikam A. S.	1	2	0	3	4	5	6	7	8	9	10	11	12	0	13	14	15	16	17	18
29	Ms. Rao V. M.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
30	Ms. Shelke S. S.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Topic Covered	UV - Electronic transitions	Chromophor, Auxo., Shift	Solvent effect, Bll Lawds	Instru. - Source, Monochro.	Instru - Sample cell, Detectors	Applications	Flurometry - Th, Sing. St, Trip	Factor affecting Fluro.	Quenching, Instru - I	Instru - II, Applications	IR - Intro, Vibrations	Sample hand, factors aff.	Instrumentation	Applications	FP - Principle, Instrum.	Instru, Applications	AAS - principle, Instrum	Instru, Applications	NT - Principle, Instru - I	Instru - II, Applications
	Initials of Teacher																				

Yashoda Technical

Theory Attendance Sem. : VII

Class : IV B.pharm

Roll No.	Name of Student (Date / Lecture No.)	17/8/22	22/8/22	24/8/22	29/8/22	30/8/22	5/9/22	6/9/22	7/9/22	12/9/22	13/9/22	14/9/22	19/9/22	20/9/22	21/9/22	26/9/22	27/9/22	28/9/22	3/10/22	4/10/22	10/10/22
	Lecture No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	Ms. Pawara A. D.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
2	Mr. Bhosale V. V.	0	1	0	2	3	4	5	6	0	7	8	9	10	11	12	13	14	0	15	16
3	Ms. Deshpande S. S.	0	1	2	3	4	0	5	6	7	8	9	10	11	0	12	13	14	15	16	17
4	Ms. Chavan A. R.	1	0	2	3	4	5	6	0	7	8	9	10	11	12	13	0	14	15	16	17
5	Ms. Deshmukh S. M.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
6	Mr. Javanjal C. R.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
7	Mr. Dhavale P. M.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
8	Mr. Shinde P. K.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	0
9	Mr. Deshmukh S. K.	1	2	0	3	4	5	6	7	8	0	9	10	11	12	13	0	14	15	16	17
10	Ms. Gaikwad S. Y.	1	2	3	0	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	[illegible]
11	Mr. Jamdade V. Y.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
12	Ms. Shelke V. R.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
13	Ms. Adsul K. R.	1	2	0	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	0	18
14	Ms. Maske H. H.	0	1	2	3	4	5	6	7	8	0	9	10	11	12	13	14	15	16	17	18
15	Mr. Yadav S. R.	1	0	2	3	4	0	5	6	7	8	9	10	11	12	0	13	14	15	16	17
16	Mr. Jaigude S. S.	1	2	3	0	4	5	6	7	8	9	10	11	0	12	13	14	15	16	17	18
17	Mr. Patil S. J.	0	1	2	3	4	5	6	7	0	8	9	10	11	12	13	14	15	0	16	17
18	Mr. Kadam N. N.	1	0	2	3	4	5	0	6	7	8	9	10	11	12	13	14	0	15	16	17
19	Mr. Pisal T. B.	0	1	2	3	4	5	6	7	8	9	10	0	11	12	13	14	15	16	17	18
20	Mr. Sawant P. S.	0	1	2	3	4	5	6	7	8	0	9	10	11	12	13	14	15	16	17	18
21	Mr. Kamble P. P.	1	2	3	0	4	5	6	7	8	9	10	11	12	13	0	14	15	16	17	18
22	Mr. Jadhav R. S.	1	0	2	3	4	5	6	7	8	0	9	10	11	12	13	14	15	16	17	18
23	Ms. Pathan U. S.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
24	Ms. Adsul H. C.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	0	[illegible]
25	Mr. Shedmake A. C.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
26	Mr. Nalawade S. N.	0	1	2	3	4	5	6	0	7	8	9	10	11	12	13	14	15	16	17	18
27	Ms. Patsute A. R.	0	1	2	3	4	5	6	7	8	9	0	10	11	12	13	14	15	16	17	0
28	Mr. Nikam A. S.	1	2	0	3	4	5	6	7	8	9	10	11	12	0	13	14	15	16	17	18
29	Ms. Rao V. M.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
30	Ms. Shelke S. S.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Topic Covered	UV - Electronic transition	Chromophor, Auxo., Shift	Solvent effect, B&L Laws	Instru. - Source, Monochro.	Instru - Samplecell, Detectors	Applications	Fluorometry - Th., Sngl., Dbl., Trip.	Factor affecting Fluro.	Quenching, Instrn.-I	Instru.-II, Applications	IR - Intro, vibrations	Sample handl, Factors aff.	Instrumentation	Applications	FP - Principle, Interf.	Instruⁿ, Applications	AAS - principle, Interf.	Instru, Applications	NT. - Principle, Instru.-I	Instru-II, Applications
	Initials of Teacher	[signature]	[signature]	[signature]	[signature]	[signature]	[signature]	[signature]	[signature]	[signature]	[signature]	[signature]	[signature]	[signature]	[signature]	[signature]	[signature]	[signature]	[signature]	[signature]	[signature]

Campus, Satara.

Subject: IMA (BP701T) **Year :** 2022-23

11/10/22	12/10/22	27/10/22	1/11/22	2/11/22	9/11/22	10/11/22	14/11/22	15/11/22	16/11/22	17/11/22	18/11/22	21/11/22	22/11/22	23/11/22	26/11/22	29/11/22	29/11/22	30/11/22	1/12/22	2/12/22	5/12/22	6/12/22	7/12/22	8/12/22						% of Attendance
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	
20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44						97.77
17	18	19	0	20	21	22	23	24	25	0	26	27	28	29	0	30	31	32	0	33	34	35	36	37						82.22
18	19	20	21	22	23	24	0	25	26	27	28	29	30	31	32	33	0	34	35	36	37	38	39	40						88.88
18	0	19	20	21	22	23	24	25	0	26	27	28	29	30	31	32	33	34	35	36	0	37	38	39						86.66
21	22	23	24	25	26	27	28	29	30	31	32	0	33	34	35	36	37	38	39	40	41	42	43	44						97.77
0	21	22	23	24	25	26	27	28	0	29	30	31	32	0	33	34	0	35	36	37	38	39	40	41						91.11
21	22	23	0	24	25	26	27	28	29	30	0	31	32	33	34	35	36	37	38	0	39	40	41	42						93.33
19	20	21	22	23	24	25	0	26	27	28	29	30	31	32	33	0	34	35	36	37	38	39	40	41						91.11
18	0	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41						91.11
19	20	21	22	0	23	24	25	26	27	28	0	29	30	31	32	33	34	35	36	0	37	38	39	40						88.88
0	21	22	23	0	24	25	26	0	27	28	29	30	31	32	0	33	34	35	36	37	0	38	39	40						88.88
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45						100
19	20	21	0	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42						93.33
19	20	21	22	23	0	24	25	26	27	0	28	29	30	31	32	33	34	35	0	36	37	38	39	40						88.88
18	0	19	20	21	22	23	0	24	25	26	27	28	29	30	0	31	32	33	34	35	36	37	38	39						86.66
19	20	21	22	23	24	25	26	27	28	29	30	0	31	32	33	34	35	36	37	38	39	40	41	42						93.33
0	18	19	20	21	22	23	24	25	26	27	28	29	0	30	31	32	33	34	35	36	37	38	39	40						88.88
18	19	20	21	22	23	24	25	0	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41						91.11
19	20	0	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	0	36	37	38	39	40	41						91.11
19	20	21	22	23	24	25	26	27	28	29	30	0	31	32	33	34	35	36	37	38	39	40	41	42						93.33
19	20	21	22	23	0	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	0	39	40	41						91.11
19	0	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	0	35	36	37	38	39	40	41						91.11
21	22	23	24	25	26	27	28	29	30	31	32	0	33	34	35	36	37	38	39	40	41	42	43	44						97.77
20	21	22	23	24	25	0	26	27	28	29	30	31	32	33	34	35	36	37	0	38	39	40	41	42						93.33
84	22	23	24	25	26	27	28	29	30	21	32	33	34	35	36	37	38	39	40	0	41	42	43	44						97.77
19	20	21	0	22	23	24	25	26	27	28	29	30	31	32	33	0	34	35	36	37	38	39	40	41						91.11
18	19	20	21	22	23	24	25	26	0	27	28	29	30	31	32	33	34	35	36	0	37	38	39	40						88.88
19	20	21	22	23	24	25	26	27	28	29	30	0	31	32	33	34	35	36	37	38	39	40	41	42						93.33
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45						100
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	0	36	37	38	39	40	41	42	43	44						97.77
Chromatography - Intro	cc - . methodology, Adv	DS-adv, Applications	TLC - Intro, Principle, Metho	Adv, DS-adv, Applications	PC - Intro, Methodology	DowTech; Adv, AD-adv, Appli	Electrophoresis - Intr, Pri, Pat	Paper, Gel - Electrophoresis	Capillary, Applications	GC - Intro, Th, Principle	Instrumentation	Drying, Temp Programm	Adv, DS-adv, Applications	HPLC - Intro, Th, Principle	Instrumentation - I	Instrumentation - II	Adv, Applications	IEC - Intro, Ideal Resins	Prep, mechanism, Factors	Methodology, Applications	GPC - Intr, Th, Instru-I	Instru - II, Applications	AC - Intr. Th, Instru-I	Instru - II, Applications						Average of Lecture Attendance
																														Average of Percentage Attendance
																														Name and Sign. of Principal

Theory Attendance — **Yashoda Technical**

Class : _____ Sem. : _____

Roll No.	Name of Student (Date / Lecture No.)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
31	Ms. Lokhande R.S.	0	1	2	3	4	5	0	6	7	8	9	10	11	12	0	13	14	15	16	17
32	Ms. Randive S.S.	1	2	0	3	4	5	6	7	8	0	9	10	11	12	13	14	15	16	17	18
33	Ms. Kulkarni C.P.	0	1	2	3	4	5	6	7	8	9	10	11	0	12	13	14	15	16	17	18
34	Ms. Sathe K.A.	1	2	3	4	0	5	6	7	8	9	10	11	12	13	14	15	0	16	17	18
35	Ms. Pol T.R.	1	2	3	4	5	6	7	0	8	9	10	11	12	0	13	14	15	16	17	18
36	Ms. Sakpal S.R.	0	1	2	3	4	5	6	7	8	9	0	10	11	12	13	14	15	16	17	18
37	Ms. Shinde P.C.	1	2	3	0	4	5	6	7	8	9	10	11	12	13	14	15	16	17	0	18
38	Ms. Shinde A.A.	1	2	3	4	5	6	7	8	0	9	10	11	12	13	14	15	16	17	18	19
39	Ms. Gadade P.M.	0	1	2	3	4	5	0	6	7	8	9	10	11	12	13	14	15	0	16	17
40	Ms. Mulani S.A.	1	2	3	4	5	0	6	7	8	9	10	11	12	13	0	14	15	16	17	18
41	Ms. Desai R.P.	0	1	2	3	4	5	6	7	8	0	9	10	11	12	13	14	15	16	17	18
42	Mr. Kadam R.S.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
43	Ms. Mane M.R.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
44	Ms. Gavade A.J.	1	2	0	3	4	5	6	7	8	9	10	11	12	13	14	15	16	0	17	18
45	Ms. Jagdale P.V.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
46	Mr. Kakade S.A.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
47	Ms. Ghanwat A.R.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
48	Ms. Pawar D.R.	0	1	2	3	4	0	5	6	7	8	9	10	11	12	13	14	15	16	0	17
49	Ms. Lohar K.R.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
50	Mr. Pawar R.R.	0	1	2	3	4	5	0	6	7	8	9	10	0	11	12	13	14	15	0	16
51	Ms. Mane S.S.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
52	Ms. Patil S.Y.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
53	Mr. Ghorpade R.S.	1	2	3	4	0	5	6	7	0	8	9	10	11	12	13	14	0	15	16	17
54	Ms. Gurav A.S.	1	0	2	3	4	5	6	7	8	9	10	11	0	12	13	14	15	16	17	18
55	Ms. Lakhpate S.S.	1	2	3	0	4	5	6	7	8	0	9	10	11	12	13	14	15	16	17	18
56	Ms. Jadhav P.U.	0	1	2	3	4	5	0	6	7	8	9	10	11	12	13	14	0	15	16	17
57	Ms. Pise S.S.	0	1	2	0	3	4	5	6	7	8	9	10	11	0	12	13	14	15	16	17
58	Ms. Pansande Y.B.	0	1	2	3	4	0	5	6	7	8	9	0	10	11	12	13	0	14	15	16
59	Mr. Bhandirge S.U.	1	2	0	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
60	Ms. Bhoite S.S.	0	1	2	3	4	5	6	7	0	8	9	10	11	12	13	14	15	16	17	0
	Topic Covered																				
	Initials of Teacher																				

Campus, Satara.

Subject: _____ **Year :** _____

21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	% of Attendance
18	19	20	21	22	23	0	24	25	26	27	28	29	0	30	31	32	33	34	35	36	37	38	39	40						88·88
0	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	0	36	37	38	39	40	41						91·11
19	20	21	22	23	24	25	26	27	28	29	0	30	31	32	33	34	35	36	37	38	39	40	41	42						93·33
19	20	21	22	0	23	24	25	26	27	28	29	30	31	32	33	0	34	35	36	37	38	39	40	41						91·11
19	20	21	22	23	24	25	26	0	27	28	29	30	31	32	33	34	35	36	37	0	38	39	40	41						91·11
19	20	21	22	23	24	25	26	27	28	29	30	31	32	0	33	34	35	36	37	38	39	40	41	42						93·33
19	20	0	21	22	23	24	25	26	27	28	29	0	30	31	32	33	34	35	36	37	38	39	40	41						91·11
20	0	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	0	37	38	39	40	41	42						93·33
18	19	20	21	22	23	0	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41						91·11
19	20	21	22	23	24	25	26	27	0	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42						93·33
0	19	20	21	22	23	24	25	26	27	0	28	29	30	31	32	33	0	34	35	36	37	38	39	40						88·88
21	22	23	24	25	26	27	28	29	30	31	32	33	34	0	35	36	37	38	39	40	41	42	43	44						97·77
21	22	23	24	25	26	0	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44						97·77
19	20	21	22	0	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	0	40	41						91·11
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	0	41	42	43	44						97·77
21	22	0	23	24	25	26	27	28	29	30	0	31	32	33	34	35	36	0	37	38	39	40	41	42						93·33
0	21	22	23	24	25	0	26	27	28	29	30	31	32	0	33	34	35	36	37	38	39	40	41	42						93·33
18	19	20	21	22	23	24	25	26	0	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41						91·11
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	0	36	37	38	39	40	41	42	43	44						97·77
17	0	18	19	20	21	22	23	24	0	25	26	27	28	0	29	30	31	0	32	33	34	35	36	37	38					82·22
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45						100
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	0	42	43	44						97·77
18	19	20	21	22	23	24	25	26	27	28	0	29	30	31	32	33	34	35	36	37	38	39	40	41						91·11
19	20	21	22	23	24	25	26	27	0	28	29	30	31	32	33	34	0	35	36	37	38	39	40	41						91·11
19	20	0	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42						93·33
18	19	20	21	22	23	24	25	26	0	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41						91·11
18	0	19	20	21	22	23	24	25	26	27	28	29	0	30	31	32	33	34	35	36	37	38	39	40						88·88
0	17	18	19	20	21	22	23	24	25	0	26	27	28	29	30	31	0	32	33	34	35	0	36	37						82·22
20	21	22	23	24	25	26	27	28	29	30	0	31	32	33	34	35	36	37	38	0	39	40	41	42						93·33
18	19	20	21	22	23	24	0	25	26	27	28	29	30	31	32	33	0	34	35	36	37	38	39	40						88·88
																														Average of Lecture Attendance
																														Average of Percentage Attendance
																														Name and Sign. of Principal

Yashoda Technical

Theory Attendance

Class : _____ **Sem. :** _____

Roll No.	Name of Student	Date / Lecture No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
61	Mr. Pawar S. S.		0	1	2	3	4	5	0	6	7	8	9	10	11	0	12	13	14	0	15	16
62	Ms. Dhavale P. P.		1	2	3	0	4	5	6	7	8	0	9	10	11	12	13	14	15	16	17	18
63	Mr. Dhumal P. B.		0	1	2	3	4	5	6	7	8	9	10	11	0	12	13	14	15	16	17	18
64	Ms. Gadhave D. S.		1	2	3	4	0	5	6	7	8	9	10	11	12	13	14	0	15	16	17	18
65	Ms. Karne L. S.		1	0	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	0	18
66	Ms. Nanaware S. V.		—	—	—	—				Y	D	—	—	—	—	—	—	—	—	—	—	—
67	Ms. Pusari S. R.		1	2	0	3	4	5	6	7	8	9	0	10	11	12	13	14	15	16	17	18
68	Mr. Sagare D. V.		0	1	2	3	4	5	6	0	7	8	9	10	11	12	0	13	14	15	16	0
69	Mr. Sawant G. S.		0	1	2	0	3	4	0	5	6	7	0	8	9	10	11	12	0	13	14	15
70	Mr. Vanjari P. R.		1	0	2	3	0	4	5	6	7	8	9	10	0	11	12	13	14	15	16	17
		Topic Covered																				
		Initials of Teacher																				

Campus, Satara.

Subject: _____ **Year :** _____

21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	% of Attendance
17	18	0	19	20	21	22	23	0	24	25	26	27	28	0	29	30	31	32	33	34	35	36	37	0						82.22
19	20	21	22	23	0	24	25	26	27	28	29	30	31	32	33	34	35	0	36	37	38	39	40	41						91.11
19	20	21	22	23	24	25	26	27	28	29	30	31	0	32	33	34	35	36	37	38	39	40	41	42						93.33
19	0	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	0	39	40	41						91.11
19	20	21	22	23	24	25	26	27	0	28	29	30	31	32	33	0	34	35	36	37	38	39	40	41						91.11
—	—	—	—	—	—	—	—	—	—	Y	D	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	YD
19	20	21	22	0	23	24	25	26	27	28	29	30	31	32	33	34	35	36	0	37	38	39	40	41						91.11
17	18	19	20	21	22	0	23	24	25	26	0	27	28	29	30	31	0	32	33	34	35	36	0	0						80
16	17	18	0	19	20	21	22	23	24	25	26	27	28	0	29	30	31	32	33	34	0	35	36	37						82.22
0	0	19	20	21	22	23	24	25	26	27	28	0	29	30	31	32	33	34	0	35	36	37	38	39						86.66

Average of Lecture Attendance: 41.01

Average of Percentage Attendance: 91.46

Dr. V. K Redekari

Name and Sign. of Principal

Theory Attendance

Yashoda Technical

Class : IV B. Pharm Sem. : VII

Roll No.	Name of Student	Date	19/8/22	24/8/22	26/8/22	27/8/22	29/8/22	2/9/22	10/9/22	12/9/22	16/9/22	19/9/22	23/9/22	24/9/22	26/9/22	30/9/22	3/10/22	7/10/22	8/10/22	10/10/22	14/10/22	17/10/22
		Lecture No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
		Hours	3	3	3	6	3	3	6	3	3	3	3	6	3	3	3	3	6	3	3	3
25	Mr. Shedmke A. C.		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
29	Ms. Rao V. M.		1	0	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
51	Ms. Mane S. S.		1	2	3	0	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
56	Ms. Jadhav P. U.		1	2	3	4	5	6	7	8	0	9	10	11	12	13	14	15	16	17	18	19
58	Ms. Pansande Y. B.		0	1	2	3	4	0	5	6	7	8	0	9	10	11	12	13	14	15	0	16
														—								
		Topic Covered	M1: Gen. Intro P. Anm.	Intro to QA, QC & GLP	Intro to Regulatory Guidelines	M2: Basic Exp. Tech.	GLP	Calibration of Glassware	Calibration of Anp. Instr.	Reagent/chemical	" "	" "	Analysis of Nanograph	" "	" "	M3: Experiments	Instm. Handling	Potentiometer	Conductivitymeter	UV Spectrophotometer	HPLC	UV spectra	IR spectra	NMR spectra
		Initials of Teacher																				

Campus, Satara.

Subject: Practice School (150 Hrs) Year : 2022 - 23

3	6	3	6	3	3	3	3	6	3	3	3	3	6	3	3	3	3	6	3	3										
21/10/22	22/10/22	28/10/22	29/10/22	31/10/22	4/11/22	7/11/22	11/11/22	12/11/22	14/11/22	18/11/22	21/11/22	25/11/22	26/11/22	28/11/22	2/12/22	5/12/22	9/12/22	10/12/22	12/12/22	13/12/22										% of Attendance
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	
20	21	22	23	0	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	-	—	—	→		1	4	4	Hrs	96
20	21	22	23	24	25	26	27	28	29	30	0	31	32	33	34	35	36	37	38	39	-	—	—	→		1	4	4	Hrs	96
20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	-	—	—	→		1	4	4	Hrs	96
20	21	22	23	24	25	26	27	28	29	30	31	32	33	0	34	35	36	37	38	39	-	—	—	→		1	4	4	Hrs	96
17	18	19	0	20	21	22	23	24	0	25	26	29	28	0	29	30	0	31	32	0		—	—	→		1	2	0	Hrs	80

Mass speakm.	
Intn. pse speakm.	
Intro. to SOP	
"	
"	
SOP preparation.	
"	
"	
M4! Int. of Results	
Instru. Handling	
PH Met, Condu. Meter	
UV, HPLC	
Int. of speakm	
IR speakm	
UV speakm	
NMR speakm	
Mass speakm	
Prpn of SOP	
"	
"	
MS! Report Writing	
"	
"	
Submission of Report	

Average of Lecture Attendance: 139.2 Hrs.

Average of Percentage Attendance: 92.8%

Dr. V. K. Redasani

Name and Sign. of Principal

YASHODA TECHNICAL CAMPUS 6757 SATARA

DIRECTOR
Yashoda Technical Campus
Satara

Practical Plan

Academic Year: 2022-23

Subject: IMA (BP705P)

Class: IV B.Pharm, Sem - VII

Name of Teacher: Dr. A M Bhagwat

Sr. No.	Name of Practical	Planned Date			Execution Date			Faculty Sign.
		Batch A	Batch B	Batch C	Batch A	Batch B	Batch C.	
1	Determination of λmax of Paracetamol soln	22/8/22	23/8/22	17/8/22	22/8/22	30/8/22	17/8/22	
2	Effect of solvent on absorption maxim	29/8/22	30/8/22	24/8/22	29/8/22	30/8/22	24/8/22	
3	Percentage purity of Para. tab. by Sing. Pt. std	5/9/22	6/9/22	7/9/22	5/9/22	6/9/22	7/9/22	
4	% Purity of Para. tab. by std. abs. Value method	12/9/22	13/9/22	14/9/22	12/9/22	13/9/22	14/9/22	
5	Assay of paracetamol tab by Calib curve method	19/9/22	20/9/22	21/9/22	19/9/22	20/9/22	21/9/22	
6	Assay of Paracetamol & Ibuprofen tab by Simul. eq. method	26/9/22	27/9/22	28/9/22	26/9/22	27/9/22	28/9/22	
7	Qualitative analysis of mixt of A.As. by APC	3/10/22	11/10/22	12/10/22	3/10/22	4/10/22	12/10/22	
8	Identifin of A.As. mixt by CPC	17/10/22	18/10/22	19/10/22	10/10/22	11/10/22	12/10/22	
9	Seperation of sugars by TLC	31/10/22	25/10/22	2/11/22	31/10/22	1/11/22	2/11/22	
10	Quenching of Anilline by nitrating mixt	7/11/22	1/11/22	9/11/22	14/11/22	1/11/22	9/11/22	
11	Estimation of Dextrose by colorimetry	14/11/22	15/11/22	16/11/22	14/11/22	15/11/22	16/11/22	
12	Estimation of Sodium by Flamephotometry	21/11/22	22/11/22	23/11/22	21/11/22	22/11/22	23/11/22	
13	Det. of Cl^- & SO_4^{--} by Nephelo turbidometry	28/11/22	29/11/22	30/11/22	28/11/22	29/11/22	30/11/22	
14	Demonstration of HPLC	5/12/22	6/12/22	7/12/22	5/12/22	6/12/22	7/12/22	
15	Introduction to Gas chromatography	12/12/22	13/12/22	14/12/22	12/12/22	13/12/22	7/12/22	

Dr. Avinash M. Bhagwat
Subject Incharge

HOD / Academic Incharge

Principal

Yashoda Technical Campus Satara
DIRECTOR

Practical Attendance

Subject IMA (BP705P) **Class / Sem.** : IV B.Ph, Sem. VII **Batch :** A

Roll No.	Name of Student / Practical	Date	23/8/22	24/8/22	5/9/22	12/9/22	19/9/22	26/9/22	3/10/22	10/10/22	31/10/22	14/11/22	14/11/22	21/11/22	28/11/22	5/12/22	12/12/22	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	% of Attendance
		Practical	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15															
1	Ms. Pawara A.D.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15														100
2	Mr. Bhosale V.V.		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14														93.33
3	Ms. Deshpande S.S.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15														100
4	Ms. Chavan A.R.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15														100
5	Ms. Deshmukh S.M.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15														100
6	Mr. Javanjal C.R.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15														100
7	Mr. Dhavale P.M.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15														100
8	Mr. Shinde P.K.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15														100
9	Mr. Deshmukh S.K.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15														100
10	Ms. Gaikwad S.Y.		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14														93.33
11	Mr. Jamdade V.Y.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15														100
12	Ms. Shelke V.R.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15														100
13	Ms. Adsul K.R.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15														100
14	Ms. Maske H.H.		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14														93.33
15	Mr. Yadav S.R.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15														100
16	Mr. Jaighde S.S.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15														100
17	Mr. Patil S.J.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15														100
18	Mr. Kadam N.N.		1	2	0	3	4	5	6	7	8	9	10	11	12	13	14														93.33
19	Mr. Pisal T.B.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15														100
20	Mr. Sawant P.S.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15														100
21	Mr. Kamble P.P.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15														100
22	Mr. Jadhav R.S.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15														100
23	Ms. Pathan U.S.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15														100
	Topic Covered		Det. of λ max	Solvent effect	Assay - single pt. std. method	Assay - Abs. Value method	Assay - Calibration Curve Method	Assay - Multipoint S.Std. method	Synth. of A.A. — HPC	Synth. of A.A. — CPC	Synth. sugars — TLC	Quenching of Aniline	Pentose - Colorimetry	Sodium - Flamephotometry	Cl⁻, SO_4^{--} - Nephelometry	Demo - HPLC	Demo/Intro - GC															
	Initials of Teacher																														

Dr. Avinash M. Bhagwat
Name and Sign. of Teacher

Academic Incharge

Principal

Avg of Attendance 14.82

Avg of % Attendance 98.84

Practical Attendance

Subject: IMA (BP705P) Class / Sem.: IV B.Ph, Sem-VII Batch: B

Roll No.	Name of Student	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	% of Attendance
	Date	30/8/24	3/9/24	6/9/24	13/9/24	20/9/24	27/9/24	4/10/24	11/10/24	1/11/24	11/11/24	15/11/24	22/11/24	29/11/24	6/12/24	13/12/24	
24	Ms. Adsul H.C.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	100
25	Mr. Shedmake A.C.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	100
26	Mr. Malawade S.N.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	100
27	Ms. Patsute A.R.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	100
28	Mr. Nikam A.S.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	100
29	Ms. Rao V.M.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	100
30	Ms. Shelke S.S.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	100
31	Ms. Lokhande R.S.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	93.33
32	Ms. Randive S.S.	A	2	0	3	4	5	6	7	8	9	10	11	12	13	14	100
33	Ms. Kulkarni C.P.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	100
34	Ms. Sathe K.A.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	100
35	Ms. Pol T.R.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	93.33
36	Ms. Sakpal S.R.	A	2	3	0	4	5	6	7	8	9	10	11	12	13	14	100
37	Ms. Shinde P.C.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	100
38	Ms. Shinde A.A.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	100
39	Ms. Gadade P.M.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	100
40	Ms. Mukni S.A.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	100
41	Ms. Desai R.P.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	100
42	Mr. Kadam R.S.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	100
43	Ms. Mane M.R.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	100
44	Ms. Gavade A.J.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	100
45	Ms. Jagdale P.V.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	100
46	Mr. Kakade S.A.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
##																	

Topic Covered	
1	Det. of λmax
2	Solvent effect
3	Assay - Single pt. Std. method
4	Assay - Abs. Value Method
5	Assay - Calibration Curve Method
6	Assay - Ibuprofen S. Ex. method
7	Soph A.A. - APC
8	Soph A.A. - CPC
9	Soph Sugars - TLC
10	Quenching of Aniline
11	Dextrose - Colorimetry
12	Sodium - Flamephotometry
13	Cl-, SO4 -- Nephelometry/Turbidometry
14	Demo - HPLC
15	Demo - GC

Initials of Teacher

Avg of Attendance: 14.91

Avg of % Attendance: 99.42

Dr Avinash M. Bhagwat
Name and Sign. of Teacher

Academic Incharge

Principal

DIRECTOR
Yashoda Technical Campus
Satara

Practical Attendance

Subject IMA (BP705P) Class / Sem. : IV B.Ph, Sem-VII Batch : C

Roll No.	Name of Student / Date / Practical	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	28	29	30	% of Attendance
		17/9/24	24/9/24	7/10/24	14/10/24	21/10/24	28/10/24	1/11/24	11/11/24	21/11/24	31/11/24	16/12/24	23/12/24	30/12/24	7/1/25	7/1/25																
47	Ms. Ghanwat A.R.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15																100
48	Ms. Pawar D.R.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15																100
49	Ms. Lohar K.R.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15																100
50	Mr. Pawar R.R.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15																100
51	Ms. Made S.S.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15																100
52	Ms. Pabl S.V.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15																100
53	Ms. Ghorpade R.S.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15																100
54	Ms. Gurav A.S.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15																100
55	Ms. Lakhapate S.S.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15																100
56	Ms. Jadhav P.U.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15																100
57	Ms. Pise S.S.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15																100
58	Ms. Pansare Y.B.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14																93.33
59	Mr. Bhandirge S.U.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15																100
60	Ms. Bhoite S.S.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14																93.33
61	Mr. Pawar S.S.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15																100
62	Ms. Dhavale P.P.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15																100
63	Ms. Dhumal P.B.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15																100
64	Ms. Gadhave L.S.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15																100
65	Ms. Karne L.S.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15																100
66	Ms. Nanaware S.V.	—	—	—	—	—	—	—	—	—	AD	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	AD
67	Ms. Pujari S.R.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15																100
68	Mr. Sagare D.V.	0	1	2	0	3	0	4	5	6	7	8	9	10	11	12																80
69	Mr. Sawant G.S.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14																93.33
70	Ms. Vanjari P.R.	0	1	2	3	4	5	6	7	8	9	10	11	12		14																93.33
																AD																
	Topic Covered	Det. of λ max	Solvent effect	Assay - single pt. std. method	Assay - Abs. Value method	Assay - Calibn Curve Method	Assay - Ibuprofen S.Eq. method	Spn A.A. - AFC	Spn A.A. - CPC	Spn sugars - TLC	Quenching of Aniline	Denature - Colorimetry	Sodium - Flamephotometry	U.V. Spn - Nephelometry	Demo - HPLC	Demo - GC																
	Initials of Teacher																															

Dr. Avinash M. Bhagwat
Name and Sign. of Teacher

Academic Incharge

Principal

Avg of Attendance: 14.69

Avg of % Attendance: 97.97

YASHODA TECHNICAL CAMPUS 6757 SATARA

DIRECTOR
Yashoda Technical Campus
Satara

Periodic Test Marksheet

Subject Code : BP701T

Class: IV B. Pharm, Sem - VII

Subject: IMA

Marks out of: 15

Theory/Practical

Year: 2022 - 23

Roll No.	Marks Obtained				Roll No.	Marks Obtained				Roll No.	Marks Obtained			
	I	II	III	Avg.		I	II	III	Avg.		I	II	III	Avg.
1	10	10		10	26	11	13		12	51	12	13		13
2	10	11		11	27	8	12		10	52	15	14		15
3	13	12		13	28	12	12		12	53	11	11		11
4	11	12		12	29	14	14		14	54	12	13		13
5	10	11		11	30	13	13		13	55	10	12		11
6	12	11		12	31	11	11		11	56	12	12		12
7	11	12		12	32	10	12		11	57	13	13		13
8	11	12		12	33	14	13		14	58	12	11		12
9	11	12		12	34	12	12		12	59	13	13		13
10	Ab	11		6	35	13	13		13	60	11	11		11
11	11	11		11	36	12	12		12	61	10	11		11
12	12	13		13	37	11	11		11	62	13	12		13
13	8	13		11	38	9	12		11	63	12	13		13
14	13	11		12	39	11	12		12	64	13	13		13
15	8	10		9	40	13	14		14	65	13	14		14
16	10	11		11	41	10	11		11	66	—	YD		—
17	10	10		10	42	13	12		13	67	12	13		13
18	10	10		10	43	13	13		13	68	4	5		5
19	8	10		9	44	10	13		12	69	12	12		12
20	10	12		11	45	10	13		12	70	12	11		12
21	11	12		12	46	13	11		12	71				
22	9	11		10	47	12	13		13	72				
23	13	12		13	48	13	13		13	73				
24	10	11		11	49	13	13		13	74				
25	11	11		11	50	12	11		12	75				

Dr. Avinash M. Bhagwat

Name & Signature of Teacher

DIRECTOR
Yashoda Technical Campus
Satara

Signature of HOD

Periodic Test Marksheet

Class: IV B. Pharm. Sem - VII

Subject Code : BP705P

Marks out of: 10

Theory/Practical

Subject: IMA

Year: 2022-23

Roll No.	Marks Obtained				Roll No.	Marks Obtained				Roll No.	Marks Obtained			
	I	II	III	Avg.		I	II	III	Avg.		I	II	III	Avg.
1	6	7		7	26	8	7		8	51	7	7		7
2	6	7		7	27	5	6		6	52	10	9		10
3	8	9		9	28	7	6		7	53	6	7		7
4	7	8		8	29	9	9		9	54	8	8		8
5	6	7		7	30	7	7		7	55	6	6		6
6	6	7		7	31	Ab	7		4	56	8	8		8
7	7	7		7	32	6	7		7	57	6	7		7
8	7	7		7	33	7	8		8	58	6	6		6
9	7	6		7	34	6	7		7	59	8	8		8
10	7	7		7	35	7	6		7	60	7	7		7
11	8	7		8	36	6	7		7	61	8	8		8
12	7	8		8	37	7	7		7	62	6	8		7
13	6	7		7	38	7	8		8	63	7	8		8
14	8	8		8	39	5	7		6	64	8	8		8
15	7	7		7	40	9	8		9	65	7	8		8
16	7	6		7	41	9	7		8	66	—	YD	—	—
17	6	6		6	42	7	7		7	67	7	7		7
18	8	7		8	43	8	8		8	68	Ab	6		3
19	6	6		6	44	8	7		8	69	7	6		7
20	7	7		7	45	5	7		6	70	8	7		8
21	7	6		7	46	7	7		7	71				
22	7	7		7	47	7	8		8	72				
23	9	9		9	48	7	8		8	73				
24	7	7		7	49	7	8		8	74				
25	9	7		8	50	7	7		7	75				

Dr. Avinash M. Bhagwat

Name & Signature of Teacher

Signature of HOD

DIRECTOR
Yashoda Technical Campus
Satara

डॉ. बाबासाहेब आंबेडकर तंत्रशास्त्र विद्यापीठ, लोणेरे
Dr. Babasaheb Ambedkar Technological University, Lonere
(Established under Act No XXIX of 2014 by government of Maharashtra)
विद्याविहार, लोणेरे-रायगड ४०२ १०३ (महाराष्ट्र) Vidyavihar, Lonere - Raigad 402 103 (Maharashtra)
Tel: (02140) 275142 Student Helpline: 02140-275212
Website: www.dbatu.ac.in, E-mail: registrar@dbatu.ac.in

Dr. Bhagwan F. Jogi
Registrar

डॉ. भगवान फ. जोगी
कुलसचिव

Dated:12/ 08/2022

Academic Calendar 2022-23 (Odd Semester) (Engineering)

Sl. No.	Activity	Commencement Date	Concluding Date	Total Days	Engineering
1	Admissions: B.Tech. Second, Third and Final Year; M.Tech. Second year.	September 01, 2022	September 10, 2022	10	UG and PG
2	Commencement of Classes of Second, Third and Final Year	September 01, 2022	December 19, 2022	110	UG and PG
3	Dissertation Examination of the Academic Year 2021-2022	September 01, 2022	September 10, 2022	10	PG
4	Mid-Semester Examinations	October 12, 2022	October 21, 2022	09	UG and PG
5	Submission of Dissertation Proposal to University	October 18, 2022	October 21, 2022	04	PG
6	Display of Mid-Semester Examination Marks	October 28, 2022	October 31, 2022	04	UG and PG
7	Scrutiny of Master's Level Dissertation Work Proposal	November 01, 2022	November 03, 2022	03	PG
8	Exam Form Filling for Regular & Supplementary Examinations	November 01, 2022	November 08, 2022	08	UG and PG
9	Exam Form Filling for Regular & Supplementary Examinations with Late Fee	November 09, 2022	November 15, 2022	07	UG and PG
10	University Tech Fest 2021	November 17, 2022	November 19, 2022	03	UG and PG
11	End of Classes	--	December 19, 2022	110	UG and PG
12	Practical/Project/Seminar Examinations	December 20, 2022	December 23, 2022	04	UG and PG
13	Uploading Internal, Mid Semester, Practical, Project and Seminar marks on University portal	December 22, 2022	December 24, 2022	03	UG and PG
14	End Semester Regular & Supplementary Examination	December 26, 2022	January 21, 2023	26	UG and PG
15	Internship/Industrial Training#				
16	Vacation	January 1, 2023	January 20, 2023	20	Faculty and Staff

Yashoda Technical Campus 6757

DIRECTOR
Yashoda Technical Campus
Satara

YASHODA TECHNICAL CAMPUS 6757 SATARA

डॉ. बाबासाहेब आंबेडकर तंत्रशास्त्र विद्यापीठ, लोणेरे
Dr. Babasaheb Ambedkar Technological University, Lonere
(Established under Act No XXIX of 2014 by government of Maharashtra)
विद्याविहार, लोणेरे रायगड ४०२ १०३ (महाराष्ट्र) Vidyavihar, Lonere - Raigad 402 103 (Maharashtra)
Tel. (02140) 275142 Student Helpline: 02140-275212
Website: www.dbatu.ac.in, E-mail: registrar@dbatu.ac.in
डॉ. भगवान फ. जोगी
कुलसचिव
Dr. Bhagwan F. Jogi
Registrar

Date: 12/08/2022

				120	UG and PG
17	Commencement of Classes	February 1, 2023	May 31, 2022	10	UG and PG
18	Remedial Examination	February 21, 2023	March 3,2023		

=Industrial training will be carried out after completion of odd semester or in the staggered manner in the period of entire odd semester (Preferably on Saturdays, Sundays and Holidays) and partially in the vacation after odd semester. Another option could be permit the training in online mode which is not less than 120 hours.

Table 2 : List of Festivals / Holidays

Sl. No.	Festivals / Holidays	Date
1	Dasara	Wednesday, 05 October, 2022
2	Diwali Laxmi Pujan	Monday, 24 October, 2022
3	Diwali Balipratipada	Wednesday, 26 October, 2022
4	Guru Nanak Jayanti	Tuesday, 08 November, 2022

Table 3 : Following Holidays fall on Sunday

Sl. No.	Festivals / Holidays	Date
1	Mahatma Gandhi Jayanti	02 October, 2022
2	Id-E-Milad	09 October, 2022
3	Christmas	25 December, 2022

12.08.2022

(Dr. B. F. Jogi)
Registrar

YASHODA TECHNICAL CAMPUS 6757 SATARA

DIRECTOR
Yashoda Technical Campus
Satara

डॉ. बाबासाहेब आंबेडकर तंत्रशास्त्र विद्यापीठ, लोणेरे
Dr. Babasaheb Ambedkar Technological University, Lonere
(Established under Act No XXIX of 2014 by Government of Maharashtra)
विद्याविहार, लोणेरे-रायगड-४०२ १०३ (महाराष्ट्र) Vidyavihar, Lonere - Raigad 402 103 (Maharashtra)
Tel : (02140) 275142 Student Helpline : 02140-275212
स्वातंत्र्याचा अमृत महोत्सव

Dr. Bhagwan F. Jogi
Registrar

डॉ. भगवान फ. जोगी
कुलसचिव

DBATU /REG/DSY/ 2022 / 277 **Dated: 11/ 11/ 2022**

Subject: Academic Calendar Direct Second Year Semester-III (AY 2022-2023)

Academic Calender Direct Second Year Semester-III (AY 2022-2023)

Sr. No.	Activity	Commencement Date	Concluding Date	Total Days	Level
1	Commencement of Classes	14th November 2022	20th February 2023	86	Direct Second Year
2	Mid Semester Examination	19th January 2023	21st January 2023	03	Direct Second Year
3	End of Classes	- -	20th February 2023	--	Direct Second Year
4	Practical Examination	21st February 2023	22nd February 2023	02	Direct Second Year
5	End Semester Examination	06th March 2023	11th March 2023	06	Direct Second Year
6	Result Declaration	- -	17th April 2023	--	Direct Second Year
7	Commencement of Classes forNext semester	13th March 2023	- -		Direct Second Year
Holidays	• 25th Dec. 2022 Christmas • 26th Jan. 2023 Republic Day • 18th Feb. 2023 Mahashivratri • 19th Feb. 2023 Chhatrapati Shivaji Maharaj Jayanti	• 07th Mar. 2023 Dhulivandan • 22nd Mar. 2023 Gudi Padwa • 30th Mar. 2023 Ram Navami • 04th Apr. 2023 Mahavir Jayanti		• 07th Apr. 2023 Good Friday • 14th Apr. 2023 Dr. Babasaheb Ambedkar Jayanti • 01st May 2023 Maharashtra Din • 05th May. 2023 Buddha Pournima	

* For Direct Second Year students all Saturdays (excluding Government Holidays) shall be considered as a working days.
* Regular SY & DSY Exams. will be conducted at the same time from 6th – 11th March 2023.
* SY Regular students will have to complete their internship requirement before exams.

Dr. B. F. Jogi
Registrar
REGISTRAR
Dr. Babasaheb Ambedkar Technological University
LONERE 402 103.
Tal Mangaon, Dist. Raigad, (Maharashtra)

Copy submitted for information: Office of Hon'ble Vice-Chancellor
Copy to:
1. All heads of departments
2. Affiliated Institutes
3. Academic Section
4. Controller of Examinations

Dr.Babasaheb Ambedkar Tech. University LONERE RAIGAD Maharashtra

YASHODA TECHNICAL CAMPUS 6757 SATARA

DIRECTOR
Yashoda Technical Campus
Satara

डॉ. बाबासाहेब आंबेडकर तंत्रशास्त्र विद्यापीठ, लोणेरे
Dr. Babasaheb Ambedkar Technological University, Lonere
(Established under Act No XXIX of 2014 by Government of Maharashtra)
विद्याविहार, लोणेरे-रायगड-४०२ १०३ (महाराष्ट्र) Vidyavihar, Lonere - Raigad 402 103 (Maharashtra)
Tel : (02140) 275142 Student Helpline : 02140-275212
स्वातंत्र्याचा अमृत महोत्सव

Dr. Bhagwan F. Jogi
Registrar

डॉ. भगवान फ. जोगी
कुलसचिव

DBATU /REG/ OFC/ 2023/383 Dated: 24 / 03/ 2023

Academic Calendar Semester-II Revised (AY 2022-2023)

Sr. No.	Activity	Commencement Date	Concluding Date	Level
1	Commencement of Classes	1st April 2023	20th June 2023	UG
2	Mid Semester Examination	8th May 2023	12th May 2023	UG
3	End of Classes	-	20th June 2023	UG
4	End Semester Examination	21st June 2023	30th June 2023	UG
5	Practical Examination	1st July 2023	10th July 2023	UG
6	Result Declaration	-	30th July 2023	UG
7	Commencement of Classes for Next semester	1st August 2023		UG
Holidays	18 Feb – Mahashivratri 19 Feb – Chatrapati Shivaji Maharaj Jayanti 7 March – Dhulivandan 22 March – Gudi Padwa 30 March – Ram Navami 4 April – Mahavir Jayanti 7 April – Good Friday		14 April – Dr Babasaheb Ambedkar Jayanti 22 April – Ramzan Eid 1 May – Maharashtra Din 5 May – Buddha Pournima 29 June – Bakari Eid	

1) All Sundays to be made working except public holidays.
2) Institute may allot additional lectures than prescribed to cover the syllabus.

Dr. B. F. Jogi
Registrar
REGISTRAR
Dr. Babasaheb Ambedkar Technological University
LONERE 402 103.
Tal. Mangaon, Dist. Raigad, (Maharashtra)

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Copy to:
1. All heads of departments
2. Affiliated Institutes
3. Academic Section
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Dr. Babasaheb Ambedkar Tech. University LONERE RAIGAD Maharashtra

DIRECTOR
Yashoda Technical Campus
Satara

डॉ. बाबासाहेब आंबेडकर तंत्रशास्त्र विद्यापीठ, लोणेरे
Dr. Babasaheb Ambedkar Technological University, Lonere
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विद्याविहार, लोणेरे-रायगड-४०२ १०३ (महाराष्ट्र) Vidyavihar, Lonere - Raigad 402 103 (Maharashtra)
Tel : (02140) 275142 Student Helpline : 02140-275212
स्वातंत्र्याचा अमृत महोत्सव

Dr. Bhagwan F. Jogi
Registrar

डॉ. भगवान फ. जोगी
कुलसचिव

DBATU /REG/ AC / 2022 /366/A Dated: 18/03/2023

Academic Calendar – UG Sem. IV Revised (AY 2022 – 23)

Sr. No.	Activity	Commencement Date	Concluding Date	Total Days	Level
1	Commencement of Classes	20th March 23	20th June 23	90	UG
2	Mid Semester Examination	8th May 2023	12th May 23	05	UG
3	End of Classes		20th June 23		UG
4	End Semester Examination	21st June 23	30th June 23	10	UG
5	Practical/Project/Seminar Examination	1st July 23	10th July 23	04	UG
6	Result Declaration		30th July 23		
7	Commencement of Classes for next semester	1st Aug. 23			
Holiday	18 Feb – Mahashivratri 19 Feb – Chatrapati Shivaji Maharaj Jayanti 7 March – Dhulivandan 22 March – Gudi Padwa 30 March – Ram Navami 4 April – Mahavir Jayanti 7 April – Good Friday		14 April – Dr Babasaheb Ambedkar Jayanti 22 April – Ramzan Eid 1 May – Maharashtra Din 5 May – Buddha Pournima 29 June – Bakari Eid		

1) All Sundays to be made working except public holidays.
2) Institute may allot additional lectures than prescribed to cover the syllabus.

Dr. Babasaheb Ambedkar Tech. University LONERE RAIGAD Maharashtra

Dr. B. F. Jogi
Registrar
REGISTRAR
Dr. Babasaheb Ambedkar Technological University
LONERE 402 103,
Tal. Mangaon, Dist. Raigad, (Maharashtra)

DIRECTOR
Yashoda Technical Campus
Satara

डॉ. बाबासाहेब आंबेडकर तंत्रशास्त्र विद्यापीठ, लोणेरे

Dr. Babasaheb Ambedkar Technological University, Lonere

(Established under Act No XXIX of 2014 by government of Maharashtra)
विद्याविहार, लोणेरे-रायगड ४०२ १०३ (महाराष्ट्र) Vidyavihar, Lonere - Raigad 402 103 (Maharashtra)
Tel: (02140) 275142 Student Helpline: 02140-275212
Website: www.dbatu.ac.in, E-mail: registrar@dbatu.ac.in

Dr. Bhagwan F. Jogi
Registrar

डॉ. भगवान फ. जोगी
कुलसचिव

Dated:12/ 08/2022

Academic Calendar 2022-23 (Odd Semester) (Engineering)

Sl. No.	Activity	Commencement Date	Concluding Date	Total Days	Engineering
1	Admissions: B.Tech. Second, Third and Final Year; M.Tech. Second year.	September 01, 2022	September 10, 2022	10	UG and PG
2	Commencement of Classes of Second, Third and Final Year	September 01, 2022	December 19, 2022	110	UG and PG
3	Dissertation Examination of the Academic Year 2021-2022	September 01, 2022	September 10, 2022	10	PG
4	Mid-Semester Examinations	October 12, 2022	October 21, 2022	09	UG and PG
5	Submission of Dissertation Proposal to University	October 18, 2022	October 21, 2022	04	PG
6	Display of Mid-Semester Examination Marks	October 28, 2022	October 31, 2022	04	UG and PG
`7	Scrutiny of Master's Level Dissertation Work Proposal	November 01, 2022	November 03, 2022	03	PG
8	Exam Form Filling for Regular & Supplementary Examinations	November 01, 2022	November 08, 2022	08	UG and PG
9	Exam Form Filling for Regular & Supplementary Examinations with Late Fee	November 09, 2022	November 15, 2022	07	UG and PG
10	University Tech Fest 2021	November 17, 2022	November 19, 2022	03	UG and PG
11	End of Classes	--	December 19, 2022	110	UG and PG
12	Practical/Project/Seminar Examinations	December 20, 2022	December 23, 2022	04	UG and PG
13	Uploading Internal, Mid Semester, Practical, Project and Seminar marks on University portal	December 22, 2022	December 24, 2022	03	UG and PG
14	End Semester Regular & Supplementary Examination	December 26, 2022	January 21, 2023	26	UG and PG
15	Internship/Industrial Training#				
16	Vacation	January 1, 2023	January 20, 2023	20	Faculty and Staff

YASHODA TECHNICAL CAMPUS 6757 SATARA

DIRECTOR
Yashoda Technical Campus
Satara

डॉ. बाबासाहेब आंबेडकर तंत्रशास्त्र विद्यापीठ, लोणेरे

Dr. Babasaheb Ambedkar Technological University, Lonere

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विद्याविहार, लोणेरे-रायगड ४०२ १०३ (महाराष्ट्र) Vidyavihar, Lonere - Raigad 402 103 (Maharashtra)

Tel: (02140) 275142 Student Helpline: 02140-275212

Website: www.dbatu.ac.in, E-mail: registrar@dbatu.ac.in

Dr. Bhagwan F. Jogi
Registrar

डॉ. भगवान फ. जोगी
कुलसचिव

Date: 12/08/2022

17	Commencement of Classes	February 1, 2023	May 31, 2022	120	UG and PG
18	Remedial Examination	February 21, 2023	March 3,2023	10	UG and PG

#Industrial training will be carried out after completion of odd semester or in the staggered manner in the period of entire odd semester (Preferably on Saturdays, Sundays and Holidays) and partially in the vacation after odd semester. Another option could be permit the training in online mode which is not less than 120 hours.

Table 2 : List of Festivals / Holidays

Sl. No.	Festivals / Holidays	Date
1	Dasara	Wednesday, 05 October, 2022
2	Diwali Laxmi Pujan	Monday, 24 October, 2022
3	Diwali Balipratipada	Wednesday, 26 October, 2022
4	Guru Nanak Jayanti	Tuesday, 08 November, 2022

Table 3 : Following Holidays fall on Sunday

Sl. No.	Festivals / Holidays	Date
1	Mahatma Gandhi Jayanti	02 October, 2022
2	Id-E-Milad	09 October, 2022
3	Christmas	25 December, 2022

YASHODA TECHNICAL CAMPUS 6757 SATARA

12.08.2022

DIRECTOR
Yashoda Technical Campus
Satara

(Dr. B. F. Jogi)
Registrar

YSPM's YASHODA TECHNICAL CAMPUS, SATARA

Academic Calender for Engineering A.Y. (2022-23) (Even Sem) (TY and Final year)

Week No	Month	Week days						Event
		Mon	Tue	Wed	Thu	Fri	Sat	
1	February			1	2	3	4	
2		6	7	8	9	10	11	13-17: Institute Level FDP 18:- Shivjayanti Celebration
3		13	14	15	16	17	H	1- Commencement of classes
4		20	21	22	23	24	25	20-24:- Sports Week, Departmental FDP
5		27	28					27:-Traditional Day 28:-Annual Gathering
4	March			1	2	3	H	
5		6	7	8	9	10	11	03- Monthly Attendance Review 06- Monthly attendance display on notice board.
6		13	14	15	16	17	H	15:-GFM 25:-YashoTech Fest'23.
7		20	21	22	23	24	25	27 March to 1 April- Mid Semester Examinations(MSE)
8		27	28	29	30	31		31- Monthly assesment of Course and lab file
9								
10	April						H	
11		3	4	5	6	7	8	5:-Display of Mid Semester Exam(MSE) Assessment on Notice Board
12		10	11	12	13	14	H	08- Monthly Attendance Review 10:- Monthly attendance display
13		17	18	19	20	21	22	19:-GFM, 17-21:-SDP for SY and TY
14		24	25	26	27	28	29	29:-Parents Meet, 26-29:-Industrial Visit 29- Monthly assesment of Course and lab file
15	May	1	2	3	4	5	H	02:- Monthly Attendance Review 05:- Monthly attendance display
16		8	9	10	11	12	13	15:- Syllabus Completion 100%
17		15	16	17	18	19	H	20-End of Classes 25-27 :- Practical/Project/Seminar examinations
18		22	23	24	25	26	27	28-30:-Practical/Project and CA Marks uploading on university website
		29	30	31				

Total 90 days

17th July Commencement of Classes for Next Semester

Holiday			
Communication with parents	Test Marks & Attendance	Holiday	Activities
		H	

1. Program on Soft skills, Aptitude training will be arranged on last Saturday of every month.
2. HOD Meeting with student on 4th Saturday of every month.
3. Training Program/Expert Lecture Guidance Seesion scheduled on every second Saturday of every month.
4. One Industrail Visit For SY, TY, B.Tech at end of April or first week of May.
5. Parent Meeting will be scheduled on 25th April 2023.
6. Atleast One workshop should be organized in this Semester.
7. Pre-placement Workshop
8. Internship after end of semester.
9. ESE 12-23 June
10. Result Declaration 22July

Term commencement	Last Working Day	Theory & Practical examination
1st February 2023	20th May 2023	As per BDATU University Notification

Date:- 30/01 /2023

Dr. S V Dalshetwar
Academic Dean

DIRECTOR
Yashoda Technical Campus
Satara

Principal

YSPM's YASHODA TECHNICAL CAMPUS, SATARA

Academic Calender for Engineering A.Y. (2022-23) (Odd Sem)

Week No	Month	Week days						Event
		Mon	Tue	Wed	Thu	Fri	Sat	
1	September(23)				1	2	H	1-Commencement of Classes
2		5	6	7	8	9	10	SDP SE, TE and final Year
3		12	13	14	15	16	H	SSP SE, TE and final Year
4		19	20	21	22	23	24	22:-GFM,30:- Monthly assesment of Course and lab file
5		26	27	28	29	30		
4	October(21)						H	05:-YSPM VARDHAPAN DIN,DASARA
5		3	4	5	6	7	8	03- Monthly Attendance Review 06- Monthly attendance display
6		10	11	12	13	14	H	03-07 Expert Lecture Week
7		17	18	19	20	21	22	12 to 21- Mid Semester Examinations
8		H	25	H	27	28	29	13:-GFM,31- Monthly assesment of Course and lab file
9		31						
10	November(23)		1	2	3	4	H	04- Monthly Attendance Review 9:- Monthly attendance display
11		7	H	9	10	11	12	01 to 08:-Exam form filling Regular & Supplementary 08:-Gurunank Jayanti
12		14	15	16	17	18	H	09 to 15:-Exam form filling Regular & Supplementary with late fee
13		21	22	23	24	25	26	25:-Parents Meet
14		28	29	30				15:-GFM,30- Monthly assesment of Course and lab file
15	December(14)				1	2	H	02:- Monthly Attendance Review 06:- Monthly attendance display
16		5	6	7	8	9	10	04:- Syllabus Completion 100%
17		12	13	14	15	16	H	19-End of Classes 20-23 :- Practical/Project/Seminar examinations
18		19						22-24:-Practical/Project and CA Marks uploading on university website
								26 Dec - 21 Jan:-End Semester Regular & Supplementary Examination
								1st Jan-20Jan Vacation

Total 81 days

1st February Commencement of Classes for Next Semester

Holiday			
Communication with parents	Test Marks & Attendance	Holiday	Activities
		H	

1. Program on Soft skills, Aptitude training will be arranged on last Saturday of every month.
2. HOD Meeting with student on 4th Saturday of every month.
3. Training Program/Expert Lecture Guidence Seesion scheduled on every second Saturday of every month.
4. One Industrail Visit For TY, B.Tech in the month of January.
5. Parent Meeting will be scheduled on 25th Nov 2022
6. Atleast One workshop should be organized in this Semester.
7. Industry Institute Interaction in the month of Oct.

Term commencement	Last Working Day	Theory & Practical examination
1st September 2022	19th December 2022	As per BDATU University Notification

Date:- 29/08 /2022

Dr. S V Baishetwar
Academic Dean

DIRECTOR
Yashoda Technical Campus
Satara

Prof.Dr.D S Badkar
Principal

Yashoda Shikshan Prasarak Mandal's

Yashoda Technical Campus,Satara

(Approved by AICTE,Delhi/Approved by Govt of Maharastra DTE) Email: principalengg_ytc@yes.edu.in
Web : www.yes.edu.in NH-4, wadhe,Satara,Tele Fax-02162-271238/39/9172220775
Faculty of Engineering

Department of Electrical Engineering

ICT availability

Sr. No	Class	ICT Tool
1	316	LCD Projector

Yashoda Technical Campus 6757 Satara

HOD- Electrical
Dr. N. M. Jamadar

YASHODA TECHNICAL CAMPUS 6757 SATARA

DIRECTOR
Yashoda Technical Campus
Satara

Certificate *of* COMPLETION

This is to certify that

Najmuddin Jamadar

has successfully completed

Webinar on Hydrogen Fuel Cell System

a course offered by ISIEINDIA in as a part of its industry oriented skill based education program

Vinod Gupta
CEO, ISIEINDIA

Certificate ID: ***9025-5383-1703-4769***

Issue Date: ***22 May 2023***

YASHODA TECHNICAL CAMPUS 6757 SATARA

DIRECTOR
Yashoda Technical Campus
Satara

Supported By: SMEV

Powered by: ISIEINDIA

Certificate *of* COMPLETION

This is to certify that

Suhani Jamadar

has successfully completed

Webinar on Hydrogen Fuel Cell System

a course offered by ISIEINDIA in as a part of its industry oriented skill based education program

Vinod Gupta
CEO, ISIEINDIA

Certificate ID: ***4880-2997-6792-3487***

Issue Date: ***22 May 2023***

YASHODA TECHNICAL CAMPUS 6757 SATARA

DIRECTOR
Yashoda Technical Campus
Satara

ISIEINDIA Verified

Supported By: SMEV

Powered by: ISIEINDIA

Suhani Jamadar <snj_ele@yes.edu.in>

QP Template

3 messages

Controller of Examinations <coe@dbatu.ac.in> Sat, Jul 22, 2023 at 12:22 PM
To: "snj_ele@yes.edu.in" <snj_ele@yes.edu.in>

PFA of QP Template.

With regards,

Controller of Examinations (In-charge)
Dr. Babasaheb Ambedkar Technological University
Lonere - Raigad Pin - 402103 Maharashtra INDIA.
mail : coe@dbatu.ac.in
Contact: +91-9421259080

BTEEPE405C.docx
18K

Suhani Jamadar <snj_ele@yes.edu.in> Sat, Jul 22, 2023 at 12:57 PM
To: Controller of Examinations <coe@dbatu.ac.in>

Please find the attachment.
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BTEEPE405C.docx
23K

Suhani Jamadar <snj_ele@yes.edu.in> Sat, Jul 22, 2023 at 1:04 PM
To: Controller of Examinations <coe@dbatu.ac.in>

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2 attachments

BTEEPE405C.docx
23K

BTEEPE405C.pdf
233K

YSPM

Yashoda Shikshan Prasarak Mandal's
Yashoda Technical Campus
Faculty of Engineering
Department of Electrical Engineering
A.Y.: 2021-2022

Date: 23/12/2022

NOTICE

All the final year students of Electrical Engineering Department are informed that High Voltage Engineering practical session is held on 24/12/2022 at ADCET Ashta.

The students should come in uniform and ID card, shoes compulsory. Reporting time 8.30 AM Sharp in college campus.

Attendance is mandatory.

Note: Breakfast and Lunch will not be provided

HOD
(Electrical Engineering)

H.O.D.
Electrical Engineering
Yashoda Technical Campus, Satara

YASHODA TECHNICAL CAMPUS 6757 SATARA

DIRECTOR
Yashoda Technical Campus
Satara

Yashoda Shikshan Prasarak Mandal's
YASHODA TECHNICAL CAMPUS, SATARA
NAAC B+
NH-4, Wadhe Phata, Satara., Tele Fax- 02162-271238/39/40
Website- www.ycs.in, Email-principalengg_ytc@yes.edu.in
Approved by AICTE, DTE, Mumbai, Affiliated to BATU, Lonere / MSBTE, Mumbai.

Prof. Dasharath Sagare — President
Prof. Ajinkya Sagare — Vice President
Dr. D. S. Badkar — Principal

Ref. No. - YSPM/YTC/2022 - 23/

Date :- 22/12/2022

To,

The Head of Department,

Annasaheb Dange College of Engineering & Technology,

Ashta.

Subject:- Permission to use HVE and ED Laboratories

With reference to above mentioned subject ,B.Tech Final year students from the department of Electrical Engineering of Yashoda Technical Campus , Satara (Student Count :- 35) want to visit and performed **High Voltage Engineering & Electric Drive** subjects practical at your Electrical Engineering Laboratories .I request you to consider our application and allow for the same .

Looking forward to a positive response.

Thanking you

Received
24/12/22

Principal

YSPM's Yashoda Technical Campus 6757 SATARA Satara

DIRECTOR Yashoda Technical Campus Satara

Principal
Yashoda Technical Campus,
Faculty of Engineering

Yashoda Shikshan Prasarak Mandal's
YASHODA TECHNICAL CAMPUS, SATARA
FACULTY OF ENGINEERING
NAAC- B+
NH-4, Wadhe Phata, Satara. Tele Fax- 02162-271238/39/40
Website- www.yes.edu.in, Email: - principalengg_ytc@yes.edu.in
Approved by AICTE, DTE, Mumbai, and DBATU Affiliated.

Prof. Dasharath Sagare
President

Prof. Dr. Badkar D.S
Principal

Ref. No. - YSPM/YTC/ADMIN/231 /2022-23

Date: - 24 / 12 /2022

To,
Head of Department,
Electrical Engineering
ADCET, Ashta

Subject: Thanking Letter from Yashoda Technical Campus Satara for HVE & ED laboratory Visit for Practical Session.

Respected Sir,

With due regards, we Yashoda Technical Campus show our gratitude for your Cooperation and time you provided on **24th Dec 2022.** It was a learning experience for our students and we highly appreciate your cooperation and helpful hand to make this session a learning experience for our students.

Sincere Regards,

Received
24/12/22

H.O.D.
Electrical Engineering
Yashoda Technical Campus, Satara

DIRECTOR
Yashoda Technical Campus
Satara

Yashoda Shikshan Prasarak Mandal's

YASHODA TECHNICAL CAMPUS, SATARA

Faculty of Engineering

Department of Electrical Engineering

Final Year B.Tech Visit at ADCET, Ashta, Sangali

Roll No	PRN No.	Name of the Student
1	PRN:1967571293005	DESAI PRITAM ADHIK
2	PRN:2067571293010	MAGAR SUSHANT SHIVAJI
3	PRN:2067571293011	GHARGE SWAPNIL SHANKAR
4	PRN:2067571293012	/KAMBLE PRAMILA BAPUSAHEB
5	PRN:2067571293013	SANAS ROHAN SANJAY
6	PRN:2067571293014	KIRVE SAMEER SURYAKANAT
7	PRN:2067571293015	/PAWAR KAJAL PRAMODBHAI
8	PRN:2067571293016	/SHINDE PRIYANKA MAHESH
9	PRN:2067571293017	/MORE KAJAL PRABHAKAR
10	PRN:2067571293018	SHIVANKAR ABIJEET SANTOSH
11	PRN:2067571293019	/PARAMANE PRADNYA DHANASING
12	PRN:2067571293020	KATE RISHIKESH ASHOK
13	PRN:2067571293021	KOKATE AMAN SANJAY
14	PRN:2067571293022	/SABALE SHRADDHA SANJAY
15	PRN:2067571293023	/MALUSARE SHIVANI VISHWANATH
16	PRN:2067571293024	BIRAMANE PRATHAMESH SANTOSH
17	PRN:2067571293025	PATIL SUMIT SANJAY ✓
18	PRN:2067571293026	BAGAL GANESH BAJIRAO
19	PRN:2067571293027	INAMDAR AFAROJ SIKANDAR
20	PRN:2067571293028	NALAWADE PRASAD ASHOK
21	PRN:2067571293029	/CHOUGULE UMA ASHOK
22	PRN:2067571293030	GARDI SURAJ DILIP
23	PRN:2067571293031	GHODAKE GANESH VASANT
24	PRN:2067571293032	THAKARE BHUSHAN KASHINATH
25	PRN:2067571293033	BARGE ANIKET SAMBHAJI
26	PRN:2067571293034	BHASME VAIBHAV SANTOSH
27	PRN: 2067572017 1129310015	Shewale Atul Bhagwan
28 33	PRN - 2067571293042	Nikita Shivaji Shinde
	PRN - 2067571293036	Ashi Balkrishna Mane
	PRN - 2067571293043	Prajakta Sadashiv Shelke

DIRECTOR
Yashoda Technical Campus
Satara

H.O.D.
Electrical Engineering
Yashoda Technical Campus, Satara

Yashoda Shikshan Prasarak Mandal's
YASHODA TECHNICAL CAMPUS, SATARA
Faculty of Engineering
Department of Electrical Engineering

YSPM

Report of Practical Session Visit

Date: – 24/12/2022

Name of the Institute :- **ADCET, Ashta**
Subject :- **High voltage engineering**
Time :- **10:00am to 07:00pm**

Major Points :-

- During the visit student were given information about the HVE lab.
- Following practical's were conducted
    1. Impulse wave shape of sample wave
    2. Equipotential point plotting by Electrolytic tank
    3. Breakdown voltage test of oil
    4. 5 KV insulation test
    5. 5 stage impulse generator
    6. Breakdown voltage test of Air(Sphere Gap) for AC voltage
    7. Breakdown voltage test of Air(Sphere Gap) for D-C voltage
- Apart from the experiments the students were given information about S.O.P. for the HVE lab.

YASHODA TECHNICAL CAMPUS 6757 SATARA

DIRECTOR
Yashoda Technical Campus
Satara

Yashoda Shikshan Prasarak Mandal's
YASHODA TECHNICAL CAMPUS, SATARA
Faculty of Engineering
Department of Electrical Engineering

Photo Gallery

YASHODA TECHNICAL CAMPUS 6757 SATARA

DIRECTOR
Yashoda Technical Campus
Satara

Yashoda Shikshan Prasarak Mandal's
YASHODA TECHNICAL CAMPUS, SATARA
NAAC- B +
NH-4, Wadhe Phata, Satara. Tele Fax- 02162-271238/39/40
Website- www.yes.edu.in, Email-principalengg_ytc@yes.edu.in
Approved by AICTE, DTE, Mumbai, Affiliated to DBATU (Lonere), SUK/ MSBTE,

Prof. Dasharath Sagare
Founder, President

Dr. Badkar D.S.
Principal

Ref. No. - YSPM/YTC/ ADMIN/2415 / 2022-23

Date: - 12/05/2023

To,
Mr. Prathamesh Mane
Lead Design Engineer,
Silabs Tech.
Hyderabad.

Subject: Invitation for Guest Lecture.

Respected Sir,

With due regards, on behalf of YSPM's YTC, Satara. We would like you to have a Guest Lecture on **"Industrial Opportunity in VLSI "** for Electrical students on date **13/05/2023**. Please intimate the date & time. The lecture will be scheduled as per your convenience at Yashoda Technical Campus, Satara.

Your valuable guidance and knowledge will certainly bring a positive change in students and we believe that your experience and knowledge to this field is unparalleled and a lecture on this topic will be of great benefit.

We look forward to a positive confirmation, an honor for us indeed.

Received
12/05/2023

Yashoda Technical Campus 6757 Satara

Principal
Principal
Faculty of Engineering
YSPM's Yashoda Technical Campus,Satara

YASHODA TECHNICAL CAMPUS 6757 SATARA

DIRECTOR
Yashoda Technical Campus
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Sincere Regards,

Received
13/05/2023

Principal

Yashoda Technical Campus 6757 Satara

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Yashoda Technical Campus 6757 Satara • Endue

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Received
13/05/2023

Principal
Principal
Faculty of Engineering
YSPM's Yashoda Technical Campus,Satara

DIRECTOR
Yashoda Technical Campus
Satara

Yashoda Shikshan Prasarak Mandal's

YASHODA TECHNICAL CAMPUS, SATARA

Faculty of Engineering

Department of Electrical Engineering

Guest Lecture Attendance

Second Year A.Y.2022-23

Roll No	PRN No.	Name of the Student	Sign
1	2167571293001	SAYYAD ABDULKADIR JAMIL	13/5/23
2	2167571293002	SUYASH RAVINDRA ROKHADE	
3	2167571293003	VINAY SURYAKANT GHADGE	
4	2167571293004	NAVALE SHUBHAM VAMAM	
5	2167571293007	KUMBHAR SHREYASH DHANANJAY	
6	2167571293010	KADAM SAHIL SANJAY	
7	2167571293011	THAKARE PRIYANKA KASHINATH	
8	2167571293012	YADAV OMKAR GORAKHNATH	
9	2167571293013	JADHAV ROHIT DILIP	
10	2267571293501	DESHMUKH SANDESH SAMPAT	
11	2267571293502	DESHMUKH ADITYA BALASO	
12	2267571293503	MANE DIVYA LAXMAN	
13	2267571293504	BARPATE SANKET SARJERAO	
14	2267571293505	SHEDAGE PRAVIN SHANKAR	
15	2267571293506	RATHI SAGAR RAJESH	
16	2267571293507	MANE VAISHNAVI MADHAV	
17	2267571293508	DEVKAR SHUBHAM SHARAD	
18	2267571293509	SHINDE SOURABH ANIL	
19	2267571293510	PANDIT OMKAR NITIN	O.N.Pandit
20	2267571293511	BHILARE PRAJYOT JALINDAR	
21	2267571293512	SHIRKE ROHIT AJIT	
22	2267571293513	KADAM OMPRASAD DIPAK	
23	2267571293514	KHOT SURAJ VILAS	
24	2267571293515	LOKHANDE HARISH SURESH	
25	2267571293516	NIKAM PRANALI PRMOD	
26	2267571293517	NALAWADE SHUBHAM BHANUDAS	
27	2267571293518	MOMIN ARBAZ SALIM	A.S.MOMIN
28	2267571293519	LONDHE SHUBHAM VASANT	
29	2267571293520	KASHID AKSHAY ARJUN	
30	2267571293521	JANGAM DEEP SUNIL	
31	2267571293522	SHELKE VAIBHAV NANA	
32		SHREYAS SANJAYKUMAR JADHAV	

13/5/2023

H.O.D.

Electrical Engineering

Yashoda Technical Campus, Satara

Yashoda Shikshan Prasarak Mandal's

YASHODA TECHNICAL CAMPUS, SATARA

Faculty of Engineering

Department of Electrical Engineering

Guest Lecture Attendance

Third Year A.Y.2022-23

Sr. No	Enrollment Number	Full Name	Sign
1	T2067571293001	ABHISHEK SUNIL SHINDE	
2	T2067571293002	MULANI AMAN MUNIR	
3	T2067571293003	ASHITOSH VASANT KHARSHIKAR	
4	T2067571293004	MEGHA VASANT PHALKE	
5	T2067571293006	BADEKAR PRADHYUMNA SANJAY	
6	T2067571293008	SAWANT ROHAN SHARAD	
7	T2067571293010	VAIBHAV ANANDA SANKPAL	
8	T2067571293011	SHINGATE YASH DEEPAK	
9	2167571293501	SNEHA SANTOSH CHAVAN	
10	2167571293502	GULIK MINAL PANDURANG	
11	2167571293503	BARGE YATINDRA NITIN	
12	2167571293504	TONSHAL RUPESH RAJKUMAR	
13	2167571293505	GHADAGE CHAITALI PANDHARINATH	
14	2167571293506	POONAM SATYAWAN JADHAV	
15	2167571293507	BANDE AJINKYA SUDHANSHU	
16	2167571293508	JAWALE SHUBHAM SANJAY	
17	2167571293509	SAHIL ABHIJIT KADAM	
18	2167571293510	SHINDE PRANIL MADHAV	
19	2167571293511	MULANI FAIZ KASAM	
20	2167571293512	JADHAV AKANKSHA JADHAV	
21	2167571293513	SHINDE SHUBHAM HARI	
22	2167571293514	THORAWADE PRITAM RAMESH	
23	2167571293515	PAWAR YASH RAJENDRA	
24	2167571293516	KALE AISHWARYA NANDKUMAR	
25	2167571293517	JADHAV OMKAR GORAKHNATH	
26	2167571293518	PRIYANKA SUDHIR PAWAR	
27	2167571293519	NIHAR SANJAY THORAT	
28	2167571293520	RUDRUKE SANIKA KISHOR	
29	2167571293521	PRATIK MACHHINDRANATH KUMBHAR	
30	2167571293524	KHARAT ROHIDAS LAXMAN	
31	2167571293525	KULKARNI PARAG GANESH	
32	2167571293527	LEMBHE MEGHRAJ BHANUDAS	
33	2167571293528	AKSHAY MAHAVIR PATIL	

DIRECTOR
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Satara

H.O.D.
Electrical Engineering
Yashoda Technical Campus, Satara

Dr. Babasaheb Ambedkar Technological University, Lonere.

Dr. Babasaheb Ambedkar Technological University

(Established as a University of Technology in the State of Maharashtra)

(under Maharashtra Act No. XXIX of 2014)

P.O. Lonere, Dist. Raigad, Pin 402 103, Maharashtra

Telephone and Fax. : 02140 -275142

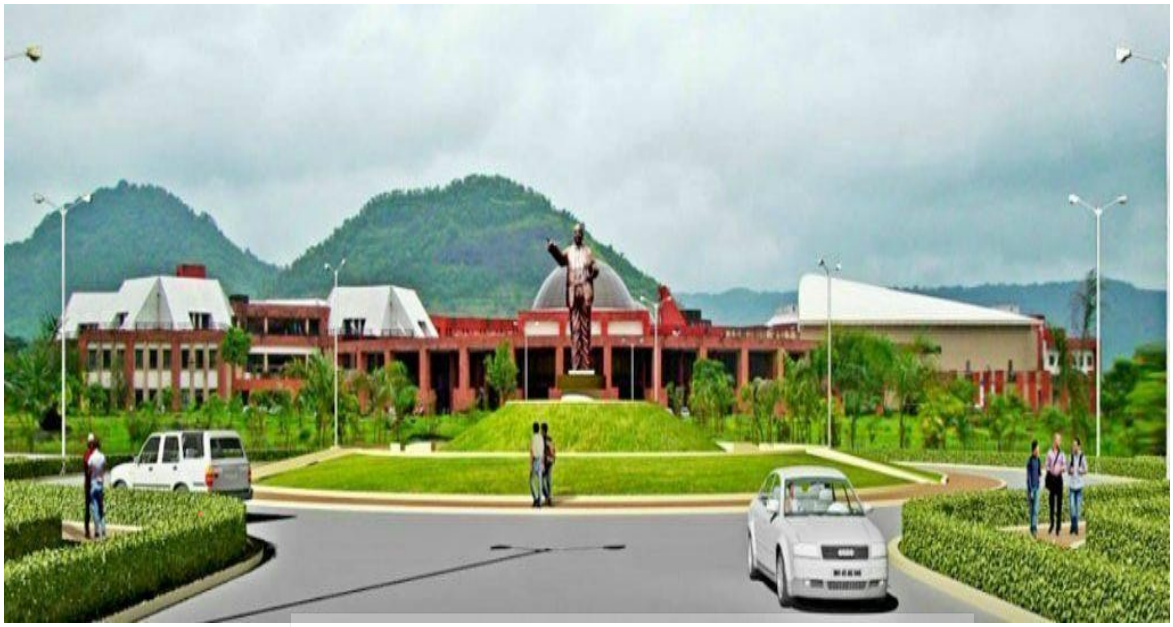
www.dbatu.ac.in

COURSE STRUCTURE AND SYLLABUS

for

Second Year B. Tech. Electrical Engineering / Electrical Engineering (Electronics and Power)/ Electrical & Electronics Engg / Electrical & Power Engineering

With effect from the Academic Year 2021-2022



Dr. Babasaheb Ambedkar Technological University, Lonere.

B.Tech (Electrical Engineering / Electrical Engineering (Electronics and Power)/ Electrical & Electronics Engg / Electrical & Power Engineering)

Basic Sciences Courses(BSC)		
BTBS101	Engineering Mathematics - I	(3-1-0)4
BTBS102	Engineering Physics	(3-1-0)4
BTBS107L	Engineering Physics Lab	(0-0-2)1
BTBS201	Engineering Mathematics - II	(3-1-0)4
BTBS202	Engineering Chemistry	(3-1-0)4
BTBS207L	Engineering Chemistry Lab	(0-0-2)1
BTBS301	Engineering Mathematics-III	(3-1-0)4
BTBS404	Analog and Digital Electronics	(3-0-0)3
BTBSL409	Analog and Digital Electronics Lab	(0-0-2)1

Engineering Sciences Courses(BSC)		
BTES103	Engineering Graphics	(2-0-0)2
BTES105	Energy and Environment Engineering	(2-0-0)2
BTES106	Basic Civil and Mechanical Engineering	(2-0-0)
BTES108L	Engineering Graphics Lab	(0-0-4)2
BTES203	Engineering Mechanics	(2-1-0)3
BTES204	Computer Programming	(3-0-0)3
BTES205	Workshop Practice	(0-0-4)2
BTES206	Basic Electrical and Electronics Engineering	(2-0-0)
BTES208L	Engineering Mechanics Lab	(0-0-2)1
BTES305	Engineering Material Science	(3-0-0)

Humanities and Social Science Including Management Courses(HSSMC)		
BTHM104	Communication Skills	(2-0-0)2
BTHM109L	Communication Skills Lab	(0-0-2)1
BTHM304	Basic Human Rights	Audit
BTHM506	Foreign Languages (A) Japanese Language (B) German Language	Audit
BTHM706	Engineering Operations and Project Management	Audit

Professional Core Course (PCC)		
BTEEC302	Electrical Machines-I	(3-1-0)4
BTEEC303	Electrical and Electronics Measurement	(3-1-0)4
BTEEL306	Electrical Machines Lab	(0-0-2)1
BTEEL307	Electrical and Electronics Measurement Lab	(0-0-2)1
BTEEC401	Network Theory	(3-1-0)4
BTEEC402	Power System	(3-1-0)4
BTEEC403	Electrical Machines-II	(3-1-0)4
BTEEL406	Network Theory Lab	(0-0-2)1
BTEEL407	Power System Lab	(0-0-2)1
BTEEL408	Electrical Machines-II Lab	(0-0-2)1
BTEEC501	Power System Analysis	(3-1-0)4
BTEEC502	Microprocessor and Microcontroller	(3-0-0)3
BTEEC503	Power Electronics	(3-1-0)4
BTEEL507	Power System Analysis Lab	(0-0-2)1
BTEEL508	Microprocessor and Microcontroller Lab	(0-0-2)1
BTEEL509	Power Electronics Lab	(0-0-2)1
BTEEC601	Switchgear Protection	(3-0-0)3
BTEEC602	Electrical Machine Design	(3-1-0)4
BTEEC603	Control System Engineering	(3-1-0)4

BTEEL606	Switchgear Protection Lab	(0-0-2)1
BTEEL607	Electrical Machine Design Lab	(0-0-2)1
BTEEL608	Control System Engineering Lab	(0-0-2)1
BTEEC701	High Voltage Engineering	(3-1-0)4
BTEEC702	Power System Operation and Control	(3-1-0)4
BTEEL707	High Voltage Engineering Lab	(0-0-2)1

Professional Elective Course (PEC)		
BTEEPE405	(A)Electromagnetic Field Theory	(3-0-0)3
	(B)Signals and System	
	©Advance Renewable Energy Sources	
	(D)Electronic Devices and Circuits	
BTEEPE504	(A)Industrial Automation	(3-0-0)3
	(B)Power Quality Issues	
	©HVDC	
BTEEPE604	**(A)Application of Power Electronics in Power System**	(3-0-0)3
	(B)Smart Grid Technology	
	©Modeling, Simulation and Control of Electric Drives	
BTEEPE703	(A)Energy Audit and Conservation	(3-0-0)3
	(B)Electrical System Design for Building	
	©Flexible AC Transmission System	
	(D)Electrical Utilization	

Open Elective Course (OEC)		
BTEEOE505	(A)Embedded System	(3-0-0)3
	(B)Electrical Safety	
	©Condition Monitoring of Electric Apparatus	
BTEEOE605	**(A)E-waste Management**	(3-0-0)3
	(B)Power Plant Engineering	
	©Sensor Technology	
	(D)Lightning Interaction with Power System	
BTEEOE704	(A)Process Control Instrumentation	(3-0-0)3
	(B)Biomedical Instrumentation	
	©Mechatronics	
BTEEOE705	(A)Testing, Maintenance and Commissioning of Electrical Equipment	(3-0-0)3
	(B)Electric and Hybrid Electric Vehicles	
	©Internet of Things (IoT)	

Seminar / Mini Project / Internship		
BTES209S	Seminar	(0-0-2)1
BTES211P	(Internship – I) Field Training / Internship/Industrial Training (minimum of 4 weeks which can be completed partially in first semester and second Semester or in at one time).	1
BTEEM308	Miniproject-I	(0-0-4)2
BTEEP410	(Internship – II)	1
BTEEM509	Miniproject-II	(0-0-2)1
BTEES609	Seminar	(0-0-4)2
BTEEP610	(Internship – III)	
BTEEM708	In house project-I / Mini project-III	(0-0-4)2

Project(MP)		
BTEEP802	In house project-I / Internship & Project in Industry	(0-0-26) 13

Dr. Babasaheb Ambedkar Technological University, Lonere.

B.Tech (Electrical Engineering / Electrical Engineering (Electronics and Power)/ Electrical & Electronics Engg / Electrical & Power Engineering)

Plan of Study:

No.of Courses								
1	I	II	III	IV	V	VI	VII	VIII
2	BTBS101	BTBS201	BTBS301	BTEEC401	BTEEC501	BTEEC601	BTEEC701	BTEEPE801
3	BTBS102	BTBS202	BTEEC302	BTEEC402	BTEEC502	BTEEC602	BTEEC702	BTEEP802
4	BTES103	BTES203	BTEEC303	BTEEC403	BTEEC503	BTEEC603	BTEEPE703	
5	BTHM104	BTES204	BTHM304	BTBS404	BTEEPLE504	BTEEPE604	BTEEOE704	
6	BTES105	BTES205	BTES305	BTEEPE405	BTEEOE505	BTEEOE605	BTEEOE705	
7	BTES106	BTES206	BTEEL306	BTEEL406	BTHM506	BTEEL606	BTHM706	
8	BTBS107L	BTBS207L	BTEEL307	BTEEL407	BTEEL507	BTEEL607	BTEEL707	
9	BTES108L	BTES208L	BTEEP308	BTEEL408	BTEEL508	BTEEM608	BTEEM708	
10	BTHM109L	BTES209S	BTES211P	BTEEL409	BTEEPE509	BTEEP609	BTEEP609	
11		BTES211		BTEEP410	BTEEP409			

YASHODA TECHNICAL CAMPUS 6757 SATARA

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B.Tech (Electrical Engineering / Electrical Engineering (Electronics and Power)/ Electrical & Electronics Engg / Electrical & Power Engineering)

A. Program Educational Objectives (PEOs)

Graduates will able to–

1.To equip graduates with a strong foundation in engineering sciences and Electrical Engineering fundamentals to become effective collaborators, researchers and real-time problem solver with technical competencies.

2.Perceive the limitation and impact of engineering solutions in social, legal, environmental, economical and multidisciplinary contexts.

3.Excel in Industry/technical profession, higher studies, and entrepreneurship exhibiting global competitiveness.

B. Program Outcomes (POs)

Engineering Graduate will be able to –

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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B.Tech (Electrical Engineering / Electrical Engineering (Electronics and Power)/ Electrical & Electronics Engg / Electrical & Power Engineering)

Curriculum of Second Year

Semester III

Course Category	Course Code	Course Title	Teaching Scheme			Evaluation Scheme				Credit
			L	T	P	CA	MSE	ESE	Total	
BSC	BTBS301	Engineering Mathematics-III	3	1	-	20	20	60	100	**4**
PCC1	BTEEC302	**Electrical Machines-I**	3	1	-	20	20	60	100	**4**
PCC2	BTEEC303	Electrical and Electronics Measurement	3	1	-	20	20	60	100	**4**
HSSMC	BTHM304	Basic Human Rights	2	-	-					**Audit**
ESC	BTES305	**Engineering Material Science**	3	-	-	20	20	60	100	**3**
LC	BTEEL306	Electrical Machines-I Lab			2	60		40	100	**1**
LC	BTEEL307	Electrical and Electronics Measurement Lab			2	60		40	100	**1**
Project	BTEEP308	Mini Project-I			4	60		40	100	**2**
Internship	BTES211P	Internship-I Evaluation						50	50	**1**
			14	3	8	260	80	410	750	**20**

Semester IV

Course Category	Course Code	Course Title	Teaching Scheme			Evaluation Scheme				Credit
			L	T	P	CA	MSE	ESE	Total	
PCC3	BTEEC401	**Network Theory**	3	1	-	20	20	60	100	**4**
PCC4	BTEEC402	**Power System**	3	1	-	20	20	60	100	**4**
PCC5	BTEEC403	Electrical Machine-II	3	1	-	20	20	60	100	**4**
BSC	BTBS404	Analog and Digital Electronics	3	-	-	20	20	60	100	**3**
PEC1	BTEEPE405	Group A	3	-	--	20	20	60	100	**3**
LC	BTEEL406	Network Theory Lab	-	-	2	30		20	50	**1**
LC	BTEEL407	Power System Lab	-	-	2	30		20	50	**1**
LC	BTEEL408	Electrical Machine-II Lab	-	-	2	30		20	50	**1**
LC	BTEEL409	Analog and Digital Electronics lab	-	-	2	30		20	50	**1**
Internship	BTEEP410	Internship-II (minimum of 4 weeks which can be completed partially in third or fourth semester or in at one time)	-	-	-	-	-	-	-	-
						220	100	380	700	**22**

Group-A

(A)Electromagnetic Field Theory

(B) **Signals and System**

(C) Advance Renewable Energy Sources

(D) **Electronic Devices and Circuits**

DIRECTOR
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Satara

Semester III

(BTBS301) ENGINEERING MATHEMATICS **04 Credits**

Unit 1: Vector Calculus **9 Hours**

Vector Algebra, Cartesian, Cylindrical and Spherical Co-ordinate System. Transformation of Variables from Cartesian to Cylindrical and Spherical Coordinate System and Vice-Versa Coulomb‘s Law, Electric Field Intensity, Field of _N‘ Point Charges, Field of Line and Sheet of Charge, Electric Flux Density, Gauss‘s Law and Its Applications, Divergence and Divergence Theorem

Unit 2: Complex Numbers **9 Hours**

Complex Numbers, geometric representation, powers and roots of complex numbers, Functions of a complex variable, Analytic functions, Cauchy-Riemann equations; elementary functions, Conformal mapping (for linear transformation); Contours and contour integration, Cauchy‘s theorem, Cauchy integral formula; Power Series and properties

Unit 3: Fourier Series **9 Hours**

Introduction, Dirichlet Conditions, Fourier Series and its Coefficients for a given range, Even, odd functions and Fourier Series, Half-range Series, problems, Parseval Identity, Complex form of Fourier Series.

Unit 4: Differential Eqns., First Order ODE, **9 Hours**

Differential Eqns., First Order ODE, y‘=f(x,y)- geometrical interpretation of solution, Eqns. reducible to separable form, Exact Eqns., integrating factor, Linear Eqns., Orthogonal trajectories,

Unit 5: Bessel functions **9 Hours**

Fourier Method for IBV problem for wave and heat equation, rectangular region, Fourier method for Laplace equation in 3 dimensions, Numerical Methods for Laplace and Poisson‘s equation. Biot-Savart, Amperes Circuital Laws and their Applications, Curl, Stoke‘s Theorem, Magnetic Flux Density, Scalar and Vector Magnetic Potential, Maxwell‘s Equations in Steady Electric and Magnetic Fields 30 ,FOURIER TRANSFORMS: Fourier Integral representation, Fourier integrals, Fourier transforms, Sine, Cosine transforms, inverse transforms, Illustrations, Properties, Parseval Identity, evaluation of certain real integrals.

Text Books :

1. Higher Engineering Mathematics by B. S. Grewal, Khanna Publishers, New Delhi.
2. Advanced Engineering Mathematics by Erwin Kreyszig, John Wiley & Sons, New York.
3. A Course in Engineering Mathematics (Vol III) by Dr. B. B. Singh, Synergy Knowledge ware, Mumbai.
4. A Text Book of Applied Mathematics (Vol I & II) by P. N. Wartikar and J. N. Wartikar, Pune Vidyarthi Griha Prakashan, Pune.
5. Higher Engineering Mathematics by H. K. Das and Er. Rajnish Verma, S. Chand & CO. Pvt. Ltd., New Delhi.

Reference Books :

1. Higher Engineering Mathematics by B. V. Ramana, Tata McGraw-Hill Publications, New Delhi.
2. A Text Book of Engineering Mathematics by Peter O‘ Neil, Thomson Asia Pte Ltd., Singapore.
3. Advanced Engineering Mathematics by C. R. Wylie & L. C. Barrett, Tata Mcgraw-Hill Publishing Company Ltd., New Delhi.

(BTEEC302)ELECTRICAL MACHINE-I **04 Credits**

Unit 1: Single Phase Transformer **7 Hours**

Transformer construction, Ideal and practical transformer, exact and approximate equivalent circuits, no load and on load operation, phasor diagrams, power and energy efficiency, voltage regulation, parallel operation, effect of load on power factor, Per Unit system, excitation phenomenon in transformers, switching transients, Auto transformers, Variable frequency transformer, voltage and current transformers, welding transformers, Pulse transformer and applications

Unit 2: Three Phase Transformers **8 Hours**

Constructional features of three phase transformers, Cooling methodology, Standard and special transformer connections, Phase conversion, Parallel operation of three phase transformers, three winding transformers and its equivalent circuit, On load tap changing of transformers, Modern trends in transformers, Type and routine tests, Standards.

Unit 3: Electromechanical Energy Conversion Principles **6 Hours**

Energy in a magnetic systems, field energy and mechanical force, energy in singly and multiply excited magnetic systems, determination of magnetic force and torque from energy and coenergy, Forces and torques in magnetic field systems, dynamic equations of electromechanical systems and analytical techniques.

Unit 4: DC Generators **9 Hours**

Construction of armature and field systems, Working, types, emf equation, Armature windings, Characteristics and applications, Building of emf, Armature reaction - Demagnetizing and Cross magnetizing mmfs and their estimation; Remedies to overcome the armature reaction; Commutation process, Causes of bad commutation and remedies: Construction of armature and field systems, Working, types, emf equation, Armature windings, Characteristics and applications, Building of emf, Armature reaction - Demagnetizing and Cross magnetizing mmfs and their estimation; Remedies to overcome the armature reaction; Commutation process, Causes of bad commutation and remedies,

Unit 5: D.C. Motors **9 Hours**

Principles of working, Significance of back emf, Torque Equation, Types, Characteristics and Selection of DC Motors, Starting of DC Motors, Speed Control, Losses and Efficiency, Condition for Maximum Efficiency, Braking of DC Motors, Effect of saturation and armature reaction on losses; Applications, Permanent Magnet DC Motors, Type and Routine test

Unit 6: Special Machines **6 Hours**

Constructional details of reluctance machine, variable-reluctance machines, basic VRM analysis, practical VRM analysis, stepper motors and their analysis, Brushless DC motors.

Text Books :

1. J. B. Gupta," Theory and Performance of Electrical Machines," S. K. Kataria& Sons, New Delhi
2. P. S .Bimbra," Electrical Machinery", Khanna Publishers
3. B. L. Theraja, A. K. Theraja," A text book of Electrical Technology," S. Chand Publishers
4. Asfaq Hussein," Electric Machines," Danpat Rai Publisher

Reference Books :

1. Bhattacharya S. K, “Electrical Machines”,(Tata McGraw Hill Publications)
2. Kothari Nagrath, “Electrical Machines”, (Tata McGraw Hill Publications)
3. M. N. Bandopadhyay, “Electrical Machines”, (Tata McGraw Hill Publications)
4. Fitzaralda, “Electrical Machines”, (Tata McGraw Hill Publications)

BTEEC303 ELECTRICAL & ELECTRONICS MEASUREMENT 04 Credits

Unit 1: Philosophy of Measurement 4 Hours

Introduction to Measurement, Methods of Measurements, Measurement System, Instruments, Classification of Instruments, Characteristics of Instruments & Measurement System, Errors in Measurement, Types of Errors, Calibration, Standards and their classifications.

Unit 2: Analog Measurement of Electrical Quantities 8 Hours

Classification of Analog Instruments, Principle of Operation, Operating Torques, Different types of Damping and Control Systems, Types of Instrument: PMMC, Extension of Range of PMMC Instruments, Moving Iron, Electro-dynamometer, Hot wire, Thermocouple, Induction, Electrostatic, Rectifier.

Power Measurement: Power measurement in AC and DC circuits, Power and Power Factor, Electrodynamometer-type Wattmeter, Induction-type Wattmeter, Power measurement in Poly-phase systems, Power measurement in Three-Phase systems, Reactive Power measurements, Power measurement with Instrument Transformers - Potentiometer and Current Transformer.

Measurement of Energy: Induction-type Energy Meter, Errors in Induction-type Energy Meters and their compensation, Testing of Energy Meters.

Unit 3: A.C. and D.C. Bridges 8 Hours

Measurement Resistance: Wheatstone Bridge, Kelvin Bridge Method, Kelvin Double Bridge Method, Ammeter-Voltmeter Method, Direct deflection method, Loss of charge method, Megohm Bridge, Megger.

Measurement of Inductance and Capacitance: Maxwell Bridge, Hays Bridge, Anderson Bridge, De-Sauty Bridge, Schering Bridge, Wien Bridge.

Localisation of Cable Faults: Murray Loop Test, Varley Loop Test.

Magnetic Measurements: Ballistic Galvanometer, Flux Meter, Maxwell's Bridge Method, AC Potentiometer Method.

Unit 4: Digital Measurement of Electrical Quantities 7 Hours

Concept of Digital Measurement, Block diagram of Digital Instrumentation System, Digital versus Analog Instrument, Digital Voltmeter, Types of Digital Voltmeter, Digital Multi-meter Digital Counter, Digital Frequency Meter, **Power Analyzer &** Harmonic Analyzer, Spectrum & Wave analyzer, Oscilloscopes, Cathode Ray Oscilloscope (CRO), Digital Storage Oscilloscopes (DSO), Signal Generator, Q-Meter.

Unit 5: Transducers 8 Hours

Definition, Classification & selection of transducers, **Characteristics, Transducers for measurement of Displacement (RVDT & LVDT), Speed, Angular Rotation, Altitude, Force, Torque, Humidity and Moisture, Pressure, Strain and Temperature (Thermocouple and RTD method), Position, Hall Effect transducer and applications. Instrumentation amplifiers,** Signal Conditioning, **Data Transmission and Telemetry,** Data Acquisition Systems.

Displays and Recorders: Different types of Display – Different types of Recorder: Graphic Recorder, Strip Chart Recorder, G**alvanometric and** Potentiometer type R**ecorders,** X-Y Recorder, Circular Chart Recorder, Magnetic Tape Recorder, D**igital Recorders,** Printer and Plotter **(Block Diagram, theory and applications only)**

Reference Books/ Text Books:

1. E.W. Golding & F.C. Widdis, "Electrical Measurement &Measuring Instrument", A.H. Wheeler & Co. India.
2. A.K. Sawhney, "Electrical & Electronic Measurement & Instrument", Dhanpat Rai & Sons.
3. Forest K. Harries, "Electrical Measurement", Willey Eastern Pvt. Ltd. India.
4. M.B. Stout, "Basic Electrical Measurement" Prentice hall of India.
5. W.D. Cooper, "Electronic Instrument & Measurement Technique", Prentice Hall International.
6. J.B. Gupta, "Electrical Measurements and Measuring Instruments", S.K. Kataria & Sons.
7. Prithwiraj Purkait, Budhaditya Biswas , Santanu Das and Chiranjib Koley, "Electrical and Electronics Measurements and Instrumentation", McGraw Hill.

BTHM304 BASIC HUMAN RIGHTS **Audit Course**

Unit 1: The Basic Concepts **6Hrs**

Individual, Group, Civil Society, State, Equality, Justice, Human Values: - Humanity, Virtues, Compassion.

Unit 2: Human Rights and Human Duties: **6 Hrs**

Origin, Civil and Political Rights, Contribution of American Bill of Rights, French Revolution, Declaration of Independence, Rights of Citizen, Rights of working and Exploited people, Fundamental Rights and Economic program, India's Charter of freedom

Unit 3: Society, Religion, Culture, and their Inter-Relationship **6 Hrs**

Impact of Social Structure on Human behaviour, Roll of Socialization in Human Values, Science and Technology, Modernization, Globalization, and Dehumanization.

Unit 4: Social Structure and Social Problems **6 Hrs**

Social and Communal Conflicts and Social Harmony, Rural Poverty, Unemployment, Bonded Labour, Migrant workers and Human Rights Violations, Human Rights of mentally and physically challenged.

Unit 5: State, Individual Liberty, Freedom and Democracy **6 Hrs**

The changing of state with special reference to developing countries, Concept of development under development and Social action, need for Collective action in developing societies and methods of Social action, NGOs and Human Rights in India: - Land, Water, Forest issues.

Unit 6: Human Rights in Indian Constitution and Law **6 Hrs**

The constitution of India:

(i) Preamble

(ii) Fundamental Rights

(iii) Directive principles of state policy

(iv) Fundamental Duties

(v) Some other provisions

Universal declaration of Human Rights and Provisions of India, Constitution and Law, National Human Rights Commission and State Human Rights Commission

Reference Books:

1. Shastry, T. S. N., India and Human rights: Reflections, Concept Publishing Company India (P Ltd.), 2005.

2. Nirmal, C.J., Human Rights in India: Historical, Social and Political Perspectives (Law in India), Oxford India.

(BTES 305) ENGINEERING MATERIAL SCIENCE **04 Credits**

Unit: 1 Electrical Conducting Materials **7 Hours**

Introduction,Crsytal structure, atomic bonding,Electronic and Ionic Conduction , Conductivity in Metals , Ohm‘s Law , Relaxation Time , Collision Time , Mean Free Path of an Electron , Electron Scattering , Resistivity of Metals , Effect of Temperature and Impurity on Conductivity , Joule‘s Law , High Conductivity And Resistivity Materials , Superconductivity and Applications Conducting materials: quantum free electron theory- Fermi-Dirac distribution - Materials for electric resistances.

Unit 2: Dielectric Materials **7 Hours**

Crystalline structure-perfection/imperfection, Dielectric as Electric Field Medium, Dielectric constant and polarizability, types of polarization,leakage currents, dielectric loss, dielectric strength,breakdown voltage,temperature and frequency dependences of Dielectric parameter, internal fields in solids, Clausius-Mosotti equation, ferroelectric, pyroelectric and piezoelectric materials, applications of dielectric materials

Unit 3: Semiconductor Materials **7 Hours**

Semiconductors: Mechanism of conduction in semiconductors. Properties of semiconductors, Silicon wafers, integration techniques, Large and very large scale integration techniques (VLSI). Properties of Semiconductors: Electron-hole concentration, Fermi level, Generation and recombination, carrier life-time, diffusion length. Scattering and mobility of carriers. Einstein relation.LASER Plain carbon steels and their applications. Alloy steels: High speed steels, stainless steels,HSLA; Non Ferrous alloys: Al alloys, Cu alloys, applications of these alloys

Unit 4: Magnetic Materials **7 Hours**

Classification of magnetic materials, spontaneous magnetization in ferromagnetic materials, Magnetostriction, diamagnetism, magnetically soft and hard materials, special purpose materials, feebly magnetic materials, Ferrites, cast and cermet permanent magnets, ageing of magnets. factors effecting permeability and hysteresis, Ferromagnetic materials, properties of ferromagnetic materials in static fields,curie point, anti-ferromagnetic materials, piezoelectric materials ,pyro electric materials Magnetic Properties of Materials: Atomic Interpretation of Diamagnetic, Paramagnetic, Anti-Ferromagnetic and Ferromagnetic Materials. Ferromagnetic Domain, Magnetic Materials for Ferromagnetic Tape And Memory Devices, Magnetic materials: magnetic materials used in electrical machines instruments.

Unit 5: Special Purpose Materials **05 Hours**

Refractory Materials, Structural Material‘s, Radioactive Materials, Galvanization and Impregnation of materials, Non Destructive Testing: Ultrasonic Radiography, X-ray diffraction- Bragg‘s law.

Text Books:

1. Material Science and Engineering – V. Raghavan

Reference Books

1. Electrical Engineering Materials – A.J. Dekker
2. Science of Engineering Materials and Carbon Nanotubes - C.M. Srivastava and C. Srinivasan
3. Solid State Physics – A.J. Dekker.

(BTEEL306)ELECTRICAL MACHINE-I LABORATORY 01 Credits

Perform Any eight experiment from given list as a part of practical submission

List of Experiments

1. To perform the polarity test on single phase transformer
2. To perform the transformation ratio test on single phase transformer
3. To perform the following three phase transformer connections:
   1) Star-star 2) Star-Delta
   3) Delta – Delta 4) Delta –Star
   5)Open Delta 6) Scott Connection
4. To perform the direct loading test on three phase transformer to calculate efficiency and regulation
5. To perform the indirect loading test on three phase transformer to calculate efficiency
6. To perform the parallel operation of two single phase transformers.
7. To study D. C. Machine
8. To draw the speed characteristics of DC shunt motor by- (1) Armature Control method (2) Field Control method
9. To perform the load test on DC Shunt motor.
10. To study the load characteristics of DC generator
    I) Cumulative compound generator.
    II) Differential compound Generator
11. To study the magnetization ,internal and External characteristics of a D. C. generator
12. To Study Starters for DC Shunt Motor.

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Yashoda Technical Campus
Satara

BTEEL307 ELECTRICAL & ELECTRONICS MEASUREMENTS LABORATORY 1 Credit

List of Experiments: (Perform minimum 8-10 experiments from following list)

1) Measurement of Low resistance by Kelvin Double bridge.
2) Measurement of High resistance and Insulation resistance using Megger.
3) Measurement of Inductance by Maxwell bridge, Hays bridge, Anderson bridge.
4) Measurement of Capacitance by De Sauty bridge, Schering bridge.
5) Measurement of Earth resistance using Earth Tester.
6) Study the extension of Voltmeter, Ammeter and Wattmeter.
7) Measurement of three phase power by Two Wattmeter and One Wattmeter method.
8) Study of types of instrument: PMMC, Moving Iron, Electro-dynamometer, Hot wire, Thermocouple, Induction, Electrostatic, Rectifier.
9) Study of Energy Meter.
10) Study of Instrument T/F and its types.
11) Characterize the temperature sensor (RTD):
    a) Static Characteristics of RTD: Study the change in resistance of RTD probe depending on the process temperature.
    b) Dynamic characteristics: Study the dynamic response of RTD probe
12) Characterize the Thermocouple:
    a) Static Characteristics of Thermocouple: Study the change in EMF of a thermocouple in response to the process temperature.
    b) Dynamic characteristics of Thermocouple: Study the dynamic response of Thermocouple.
13) Characterize of LVDT: To find the effect of various parameters like change in supply voltage, change in supply frequency on output of given LVDT
14) Characterize the strain gauge sensor:
    a) Study of Strain Gauge: To study the working principle of strain gauge.
    b) Study of effect of change in position of weight applied on Strain Gauge performance.
    c) Study of effect of change in temperature on the performance of Strain Gauge.
15) Measurement of phase difference and frequency of a sinusoidal ac voltage using C.R.O.
16) Study of storage oscilloscope and determination of transient response of RLC circuit.

BTEEP308 Miniproject-I **2 Credits**

Guidelines:

Stages	Work to be carried	Time
I	• Selection of a mini viable project idea (Hardware or Software Based) on recent trends in Electrical Engineering.	**4 hours**
II	• Study various resources and components in electrical engineering projects • Application of those components in Selected Project	**6 hours**
III	• Study of Circuit Diagram • Study datasheet of basic circuit components of a project • Study various software in building of project like SCILAB, MATLAB or other circuit Simulator	**6 hours**
IV	• Designing of PCB for selected Project once tested on breadboard	**4 hours**
V	• Verification of the results obtained of the working model or the simulation results. • Compare with desired results and take corrective action	**4 hours**
VI	• Completion of project by developing the Project Report and submitting the report to the concerned to receive the final credits.	**6 hours**

Semester IV

BTEEC401 NETWORK THEORY **04 Credits**

Unit 1:Active & Passive Circuit Element **7 Hours**

Independent & dependent voltage & current sources, R, L, C, self and mutual inductance circuit parameters, Their mathematical models, Voltage- current- power relations, Independent voltage and current sources, dependent sources, Source transformation, star-delta conversion. Classification of element: Lumped and distributed, Linear and non-linear, Unilateral and Bilateral, Time invariant and variant.

Unit 2: Network theorems **12Hours**

Kirchhoff‘s laws (KCL and KVL), Mesh analysis, nodal analysis, Solution of D.C. resistive network, writing loop equations, Node equations directly in matrices form, super node and super mesh analysis, Superposition theorem, Thevenin’s theorem, Norton‘s theorem, Reciprocity theorem, Maximum power transfer theorem, Substitution theorem, Millman‘s Theorem, Tellegen's theorem for D.C and A.C. circuits.

Graph Theory: Network topology, graph, Tree, Branches, Chords, incidence, cut set and tie set matrix using network topology, Concept of duality & dual networks.

Unit 3: Transient Response Analysis in circuit **7 Hours**

Initial and final condition of circuit, procedure for evaluating initial conditions, solution of first and Second order differential equations of series & parallel R-L, R-C, R-L-C circuits, Time constant, General & particular solutions, Particular integral & complimentary functions, Numerical

Unit 4: Application of Laplace’s Transform **7 Hours**

Standard test input signal- Unit step, Impulse & ramp functions and their Laplace transform, Solution of differential equation using Laplace transform, solve of R-L, R-C, R-L-C circuits using Laplace transform, Transient and steady state response of RL and RC circuit to various functions using Laplace transform.

Two port network: Terminals& terminal pairs, Driving points & transfer admittance, Transfer functions, Concept of poles & zeroes, Two port networks, Z, Y & the transmission parameters relationship between parameter sets.

Unit 5: Sinusoidal Steady State A. C. Circuit **7 Hours**

R-L-C series circuits, Series resonance Variation of Z with frequency, maximum value of VC & VL, Magnification, Bandwidth, Q factor. Parallel Resonance: Resonance frequency for tank circuit frequency, Locus diagram of series R-L, R-C with variable R & X.

Filter: Introduction classification, Low pass, High pass, Band pass & band reject filter, active & passive filters. Application of Fourier series, Expansion for periodic & non-sinusoidal waveforms.

Text/Reference Books:

1. N Balabanian and T.A. Bickart, “Linear Network Theory: Analysis, Properties, Design andSynthesis”, Matrix Publishers, Inc. 1981.
2. L.O. Chua, C.A. Desoer, E.S. Kuh, “Linear and Nonlinear Circuits”, McGraw – HillInternational Edition 1987.

3. Van Valkenburg, “Network Analysis”, Third Edition, 2009, Prentice Hall of India.
4. Sudhakar, A.Shyammohan, “Circuits and Network”, Third Edition, 2006, Tata McGrawHill
5. D. Roy Choudhury, “Networks and systems”.New Age International Publishers
6. Kelkar and Pandit, “Linear Network Theory”, Pratibha Publication.
7. Mahmood Nahvi, Joseph AEdminister, “Schaum's Outline of Electric Circuits”, 6th edition,Tata McGraw-Hill.

(BTEEC402) POWER SYSTEM 04 Credits

Unit 1: Electrical Power Generation 9 Hours

Evolution of Power Systems, Typical Layout of an Electrical Power System–Introduction to different sources of energy. Construction and working of thermal power plants, Hydro power station, Nuclear Power Plant with neat block diagram of main parts. Descriptive treatment of alternator exciter & excitation systems, major electrical equipments in generating stations.

Unit 2: Electrical Design of Overhead Transmission Lines 9 Hours

Line conductors, inductance and capacitance of single phase and three phase lines with symmetrical and unsymmetrical spacing, concept of GMD and GMR, Composite conductors-transposition, bundled conductors, and effect of earth on capacitance. skin effect, proximity effect, Ferranti Effect.

Corona: Introduction, Factors affecting corona loss and methods of reducing corona loss, Disadvantages of corona.

Unit 3: Mechanical Design of Transmission Lines 8 Hours

Types of conductors, Choice of conductor materials, Stranded copper & ACSR conductor, Insulation consideration, Different types of insulator, supports, distribution of voltage across the insulator string, String efficiency, Effect of wind & ice coating on transmission line, sag due to equal & unequal supports, with their derivation, Numericals.

Unit 4: Performance of Transmission Lines 8 Hours

Classification of overhead transmission lines, important terms, performance of single phase short transmission lines, three phase short transmission lines, effect of load power factor on regulation and efficiency, different types of medium transmission line, Analysis of long transmission lines, generalized constant of transmission line, determination of generalized constant of transmission lines, percentage regulation, Transmission efficiency, numerical based on above.

Unit 5: AC & DC Distribution 8 Hours

Classification of Distribution system, Requirement of distribution system, design consideration in distribution system. AC Distribution: Calculations, method of Solving AC Distribution problem, three phase unbalanced load, four wire unbalanced star connected load, ground detector, DC Distribution: types, DC distribution calculation, three wire DC system.

Text/References :

REFERENCES:

1. V.K Mehta & Rohit Mehta. " Principles of Power System" S Chand Publications
2. Gupta B. R. " Power Plant Engineering".(Eurasia publications)
3. Nag P. K. " Power Plant Engineering",(Tata McGraw Hill Publications)
4. Kothari Nagrath, "Electric Power System", (Tata McGraw Hill Publications)
5. Wadhva S. L.,"Electric Power System",(Tata McGraw Hill Publications)
6. Stevension W. B., "Power System", (English Language Book Society publications)

(BTEEC403)ELECTRICAL MACHINE-II **04 Credits**

Unit 1: Basic Concepts in A.C. Machines **5 Hours**

Classification of A.C. Machines, principle of operation and constructional features of synchronous and induction machines, rotating mmf waves in A.C. Machines

Unit 2: Constructional Armature windings **5 Hours**

Introduction, ac machine windings, winding factors, the emf equation, harmonics in generated emf, causes of harmonics and their suppressions

Unit 3: Synchronous Machines **9 Hours**

Synchronous Machines : Construction, types, armature reaction, circuit model of synchronous machine, determination of synchronous reactance, phasor diagram, power angle characteristics, parallel operation of synchronous generators, synchronizing to infinite bus bars, two axis theory, synchronous motor operation, characteristic curves, synchronous condenser, dynamics.

Unit 4: Three phase Induction (Asynchronous) Motor **9 Hours**

Types of induction motor, flux and mmf waves, development of circuit model, power across air gap, torque and power output, oc and sc tests, circle diagram, starting methods, cogging and crawling, speed control, deep bar/ double cage rotor, induction generator, induction machine dynamics, high efficiency induction motors

Unit 5: Fractional Kilowatt Motors **6 Hours**

Introduction, single phase induction motors, double revolving field theory, circuit model of single phase induction motor, determination of circuit parameters

Unit 6: Special Machines **6 Hours**

Single phase synchronous motors, permanent magnet ac motors, ac servomotors, linear induction motor

Text Books :

1. J. B. Gupta," Theory and Performance of Electrical Machines," S. K. Kataria& Sons, New Delhi
2. P. S .Bimbra," Electrical Machinery", Khanna Publishers
3. B. L. Theraja, A. K. Theraja," A text book of Electrical Technology," S. Chand Publishers
4. Asfaq Hussein," Electric Machines," Danpat Rai Publisher

Reference Books :

1. 1.Say M. G., "Design & performance of A.C. Machines", (Book Publications,3rd edition)
2. 2..Bhimra P. S., "Electric Machines", (South Ex Publications, New Delhi)
3. D. P. Kothari, I. J. Nagrath,"Electric Machines ", Tata McGraw Hill Publication, Fourth edition, reprint 2012.
4. A. F. Puchstein, T.C. Lloyd, A.G. Conrad, "Alternating current machines", John Wiley and Sons, New York 1954.
5. 5.A.E. Fitzgerald, Charles Kingsley Jr., Stephen D. Umans ,"Electric Machinery ", Tata McGraw Hill Publication, sixth edition 2002 4. Fitzaralda, "Electrical Machines", (Tata McGraw Hill Publications))

BTBS404 ANALOG AND DIGITAL ELECTRONICS 04 Hours

Unit 1: Transistor as an Amplifier 5 Hours

Load line, Small signal low frequency analysis of single stage amplifier in different configuration, High frequency equivalent circuit of transistor (hybrid pi), Cascade amplifier, High input resistance circuits-C coupled amplifier Frequency response, Definition of 3 dB bandwidth, Effect of cascading on gain & BW, Classification of amplifiers

Unit 2: operational amplifier 6 Hours

Block diagram of operational amplifier, Properties of ideal operational amplifier, Explanation of different terms appearing in OP-Amp application (offset, bias, quantities, PSRR, CMRR, Ad, AC, Slew rate etc.), Operation of circuit diagram of OP-Amp using discrete components & I.C. diagram, Different types of current of current sources in I.C. technology, frequency response of OP-Amp, OP-Amp parameters & minimization technique of temperature effect, Inverting & Non-inverting operation of Op-Amp & analysis for AG, RI, RO, Linear & non-linear circuit application of OP-Amp

Unit 3: Number Systems 6 Hours

Basic Logic Gates & Boolean Algebra: Binary Arithmetic & Radix representation of different numbers. Sign & magnitude representation, fixed point representation, complement notation, various codes & arithmetic in different codes & their inter conversion. Features of logic algebra, postulates of Boolean algebra. Theorems of Boolean algebra. Boolean function. Derived logic gates: Exclusive-OR, NAND, NOR gates, their block diagrams and truth tables. Logic diagrams from Boolean expressions and Vica-versa. Converting logic diagrams to universal logic. Positive, negative and mixed logic. Logic gate conversion.

Unit 4: Digital Logic Gate Characteristics 6 Hours

TTL logic gate characteristics: Theory & operation of TTL NAND gate circuitry. Open collector TTL. Three state output logic. TTL subfamilies. MOS & CMOS logic families. Realization of logic gates in RTL, DTL, ECL, and C-MOS & MOSFET. Interfacing logic families to one another. Sequential Systems: Latches, flip-flops, R-S, D, J-K, Master Slave flip flops. Conversions of flip-flops Counters: Synchronous & asynchronous ripple and decade counters, Modulus counter, skipping state counter, counter design, state diagrams and state reduction techniques. Ring counter. Counter applications. Registers: buffer register, shift register

Unit 5: Minimization Techniques 7 Hours

Minterm, Maxterm, Karnaugh Map, K map upto 4 variables. Simplification of logic Conversion of truth tables in POS and SOP form Incomplete specified functions. Variable mapping Quinn-McKlusky minimization techniques c functions with K-map

Unit 6: Combinational Systems 6Hours

Combinational logic circuit design, half and full adder, subtractor. Binary serial and parallel adders BCD adder Binary multiplier Decoder: Binary to Gray decoder, BCD to decimal, BCD to 7- segment decoder‘ Multiplexer, DE multiplexer, encoder. Octal to binary, BCD to excess-3 encoder. Diode Switching matrix. Design of logic circuits by multiplexers, encoders, decoders and DE multiplexers.

Text/Reference Books:

1. Mandal, Digital Electronics: Principles and Applications, TMH 2009

2. Leach, Digital Principles and Applications, ed. 7, TMH 2008

3. M. Morris Mano, Digital Logic and Computer Design, Pearson Edu. 2014

(BTEEPE405A)ELECTROMAGNETIC FIELD THEORY 03credits Credits

Unit 1: vector calculus 7 Hours

Scalars and vectors, Vector algebra, Vector components and unit vectors, Vector field Vector field Dot, cross products circular, cylindrical and spherical coordinate systems Coulomb's Law and electric field intensity Electric field due to a continuous Volume Charge Distribution field of a line charge field of a Sheet of a charge streamlines and sketches of fields

Unit 2: Electromagnetic field 1 8 Hours

Constructional Gauss's Law and its Applications: to some symmetrical charge distribution and differential volume element divergence Maxwell's first equation (electrostatics), the vector operator and the Divergence theorem Energy and Potential Energy expended in moving a point charge in an electric field line integral, potential difference potential, potential gradient, potential field of a point charge and system of charges dipole, energy density in electrostatic field

Unit 3: Electromagnetic field 2 6 Hours

Current and current density, continuity of current, metallic conductors conductor properties and boundary conditions method of images, semiconductors, nature of dielectric, boundary conditions for perfect dielectric capacitance, and capacitance of two-wire line. Poisson's and Laplace Equations Uniqueness theorem examples in rectangular, spherical and cylindrical coordinates, product solutions of Laplace equations, and solutions of Poisson's equations

Unit 4: Magneto statics 1 8 Hours

Biot-Savart's law Amperes circuital law curls strokes theorem magnetic flux and magnetic flux density scalar and vector magnetic potentials

Unit 5: Magneto statics 2 7 Hours

Force on moving charge, differential current element force between differential current element and torque on a closed circuit nature of magnetic materials, magnetization permeability, magnetic boundary conditions, magnetic circuit, potential energy and forces on magnetic materials, self and mutual inductance

Unit 6: Maxwell's equations 4 Hours

Faradays law, Maxwell's equations in point form, Maxwell's equations in integral form, Retarded potentials.

Text Books :

1) "William H. Hayt & John. A. Buck, "Engineering Electromagnetics" Mc. Graw-Hill Companies, 7th Editon.2006.
2) "Sadiku- "Electromagnetic Fields" , Oxford Publications**.**

Reference:

3) D. J. Griffiths, _Introduction to Electrodynamics', Addison Wesley, 1999.
4) D. K. Cheng, _Field and Wave Electromagnetics', Addison Wesley, 1999.
5) N. N. Rao, _Elements of Engineering Electromagnetics', Pearson Education, Inc, 2004.
6) Mathew N.O. Sadiku,Elements of Electromagnetics,Oxford Univ Press
7) N.N. Rao, Basic electromagnetic and applications, McGraw Hill

BTEEPE405BSignals and System **03 Credits**

Unit 1: Elements of Signal Space Theory **7 Hours**

Objective and overview, signal and system types and classifications, Different types of signals; Linearity, time invariance and causality; Impulse sequence, impulse functions and other singularity functions

Unit 2: Classification of System **9 Hours**

CT and DT system, basic properties of system – linear time invariant system and properties, LTI system: Causality, stability, step response, impulse response.

Unit 3: Convolution **7 Hours**

Convolution sum, convolution integral and their evaluation; Time-domain representation and analysis of LTI systems based on convolution and differential equations. Convolution for CT & DT signals and systems; Necessity of representations of Signals & Systems in Time- and Transformed-domains

Unit 4: Transform domain considerations **7 Hours**

Laplace transforms, inverse Laplace transforms and Z-transforms; Applications of transforms to discrete and continuous systems-analysis; Transfer function, block diagram representation.

Unit 5: Fourier series and Fourier Transform **7 Hours**

Sampling theorem, Discrete Fourier transform (DFT), estimating Fourier transform using DFT Analysis of discrete time signal: sampling of CT signals and aliasing, DTFT and properties.

Reference Books:

1. Signals and Linear Systems, Gabel R.A. and Robert R.A, John Wiley and Sons, New York
2. Signals and Systems , Oppenheim, Wilsky and Nawab, Prentice Hall, New Delhi
3. Systems and Signal Analysis, C.T.Chen, Oxford University Press, New Delhi
4. Probabilistic Methods of Signals and System Analysis, Cooper G.R and McGillem C.D, Oxford University Press, Cambridge.
5. Signals and Systems, Ziemer R.E., Tranter W.H., and Fannin D.R., Pearson Education Asia, Singapore

(BTEEPE405C) ADVANCED RENEWABLE ENERGY SOURCES 04 Credits

Unit 1: Introduction 7 Hours

Renewable Sources of Energy- Introduction to renewable energy, various aspects of energy conversion, principle of renewable energy systems, Grid-Supplied Electricity-Distributed Generation-Renewable Energy Economics-Calculation of Electricity Generation Costs –Demand side Management Options –Supply side Management Options-Modern Electronic Controls of Power Systems.

Fuel Cells: The Fuel Cell-Low and High Temperature Fuel Cells-Commercial and Manufacturing Issues-Constructional Features of Proton Exchange-Membrane Fuel Cells –Reformers-Electrolyzer Systems and Related Precautions-Advantages and Disadvantages of Fuel Cells-Fuel Cell Equivalent Circuit-Practical Determination of the Equivalent Model Parameters -Aspects of Hydrogen as Fuel.

Unit 2: Wind Power Plants 7 Hours

Atmospheric circulations, classification, factors influencing wind, wind shear, turbulence, windspeed monitoring, Appropriate Location -Evaluation of Wind Intensity -Topography -Purpose ofthe Energy Generated -General Classification of Wind Turbines-Rotor Turbines-Multiple-BladeTurbines -Drag Turbines -Lifting Turbines-Generators and Speed Control used in Wind PowerEnergy -Analysis of Small Generating Systems. Aerodynamics of wind turbine rotor, site selection,wind resource assessment, wind energy conversion devices: classification, characteristics, andapplications. Hybrid systems, safety and environmental aspects.

Unit 3: Photovoltaic Power Plants 7 Hours

Solar Energy-Generation of Electricity by Photovoltaic Effect -Dependence of a PV CellCharacteristic on Temperature-Solar cell Output Characteristics-Equivalent Models and Parametersfor Photovoltaic Panels-Photovoltaic Systems-Applications of Photovoltaic Solar EnergyEconomical.

Analysis of Solar Energy. environment and social implications Solar Energy: Solarradiation its measurements and prediction, solar thermal flat plate collectors, concentratingcollectors, applications, heating, cooling, desalination, power generation, drying, cooking etc,principle of photovoltaic conversion of solar energy, types of solar cells and fabrication.

Photovoltaic applications: battery charger, domestic lighting, street lighting, and water pumping,power generation schemes.

Unit 4: Bio-Energy 8 Hours

Biomass resources and their classification, chemical constituents and physicochemical characteristics of biomass, biomass conversion processes, thermo chemical conversion: direct combustion, gasification, pyrolysis and liquefaction. Biochemical conversion: anaerobic digestion, alcohol production from biomass. Chemical conversion process: hydrolysis and hydrogenation.

Biogas: generation, types of Biogas Plants, applications

Induction Generators: Principles of Operation-Representation of Steady-State Operation-Power andLosses Generated-Self-Excited Induction Generator-Magnetizing Curves and Self-Excitation Mathematical Description of the Self-Excitation Process-Interconnected and Stand-alone operation Speed and Voltage Control-Economical Aspects.

Unit 5: Storage Systems **8 Hours**

Energy Storage Parameters-Lead–Acid Batteries-Ultra Capacitors-Flywheels - SuperconductingMagnetic Storage System-Pumped Hydroelectric Energy Storage - Compressed Air Energy Storage-Storage Heat -Energy Storage as an Economic Resource.Integration of Alternative Sources of Energy: Principles of Power Injection-Instantaneous Activeand Reactive Power Control Approach-Integration of Multiple Renewable Energy SourcesIslandingandInterconnectionControl-DGControlandPowerInjection.

Interconnectionof Alternative Energy Sources with the Grid: Interconnection Technologies Standardsand Codes for Interconnection-Interconnection Considerations -InterconnectionExamples for Alternative Energy Sources.

Text/Reference Books :

1. Rao and Parulekar, Energy Technology, Khanna Publishers, New Delhi, Second reprint 2002
2. G.D Rai, Non-conventional Energy Sources,Khanna Publishers, New Delhi, tenth reprint 2002
3. C. S. Solanki, ―Solar Photovoltaics Fundamentals, Technologies and Applications‖, PHI, 2011
4. B. H. Khan,―Non-conventional Energy Resources‖,TataMcGrawhill Publishing Co.Ltd.,2006
5. S.P. Sukhatme, J.K. Nayak, ―Solar Energy-Principals of Thermal Collection and Storage,Tata Mc Graw hill Publishing Co. Ltd., New Delhi 2008
6. J. Twidell and T. Weir, ―Renewable Energy Resources‖, E & F N Spon Ltd, London, 1999
7. Thomas Ackermann, ―Wind Power in Power System‖, John Willey &Sons.

BTEEL406 NETWORK THEORY LAB 1 Credits

Any Eight Experiments from the following list

Expt. No.	Title of Experiment
1	Verification of Kirchhoff's Laws
2	Verification of Superposition Theorem
3	Verification of Thevenin's Theorem
4	Verification of Norton's Theorem
5	Verification of Maximum Power Transfer Theorem
6	Verification of Reciprocity Theorem
7	Determination of transient response of RL & RC series circuits
8	To study Resonance in RLC series Circuit.
9	To study Resonance in parallel RLC Circuit.
10	Determination of driving point and transfer functions of a two port ladder network and verifywith theoretical values
11	To calculate and verify 'Z'Parameters of a Two-Port Network.
12	To calculate and verify 'Y' parameters of Two-Port Network.

BTEEL407 : Power System Lab **1 Credit**

Sr. No	Experiment Title
1	To study the layout of a Thermal Power Plant with its components.
2	To study the layout, classification and components of a Hydro Power Plant.
3	To study the alternator excitation system
4	To study the types and properties of various Overhead insulators
5	To study the types and properties of various Overhead Conductors.
6	To study the Power cable and its various components and types.
7	To study the layout of a substation along with its components
8	To determine the ABCD parameters of a medium and long transmission line.
9	To Visit a Thermal Power plant and write a technical report on the observations

(BTEEL408)ELECTRICAL MACHINE-II LABORATORY 01 Credits

Perform Any Eight experiment from given list as a part of practical submission

List of Experiment

1. Determination of sequence impedances of salient pole synchronous machine To perform
2. Determination of Xd and Xq of a salient pole synchronous machine from slip test.
3. V and inverted V curves of a3-phasesynchronous motor 1
4. Regulation of alternator by Direct loading method (R,L,C load)
5. Regulation of alternator by synchronous impedance method
6. Regulation of alternator by MMF method
7. Parallel operation of Synchronous generator
8. To study different types of starters for three phase Squirrel cage induction motor
9. Rotor resistance starter for slip ring induction motor.
10. To conduct no load and blocked rotor test and to determine performance characteristics of three phase induction motor from circle diagram
11. Load and block rotor tests on squirrel cage induction motor
12. Brake test on slip ring induction motor
13. To control speed of wound rotor induction motor by rotor resistance control method
14. To control speed of induction motor by V/F
15. To control speed of induction motor by i) star-delta ii) autotransformer

(BTEEL409) ANALOG AND DIGITAL ELECTRONICS LAB 01 Credits

Perform Any Eight experiment from given list as a part of practical submission

List of Experiment

1. To plot input characteristics and Output characteristics of common emitter configuration.
2. To plot frequency response of RC coupled and Transformed coupled amplifier
3. To measurement of OP-AMP parameter
4. To verify the operation of op amp in Inverting & Non-inverting mode on AC input
5. Verify truth table of following basic and derived gates
    a. AND, OR, AND
    b. Ex-OR, NAND, NOR
6. Verification of truth table of flipflop
7. Design and implementation of 3-bit synchronous up/down counter
8. Design and implementation of half and full adder using logic gates
9. Design and implementation of Multiplexer and De-multiplexer and study of IC74150 and IC 74154
10. Design and implementation of code converters
    a. Binary to gray code converter
    b. BCD to Excess 3

Dr. Babasaheb Ambedkar Technological University, Lonere.

Dr. Babasaheb Ambedkar Technological University

(Established as a University of Technology in the State of Maharashtra)

(underMaharashtra Act No. XXIX of 2014)

P.O. Lonere, Dist. Raigad, Pin 402 103, Maharashtra

Telephone and Fax. : 02140 -275142

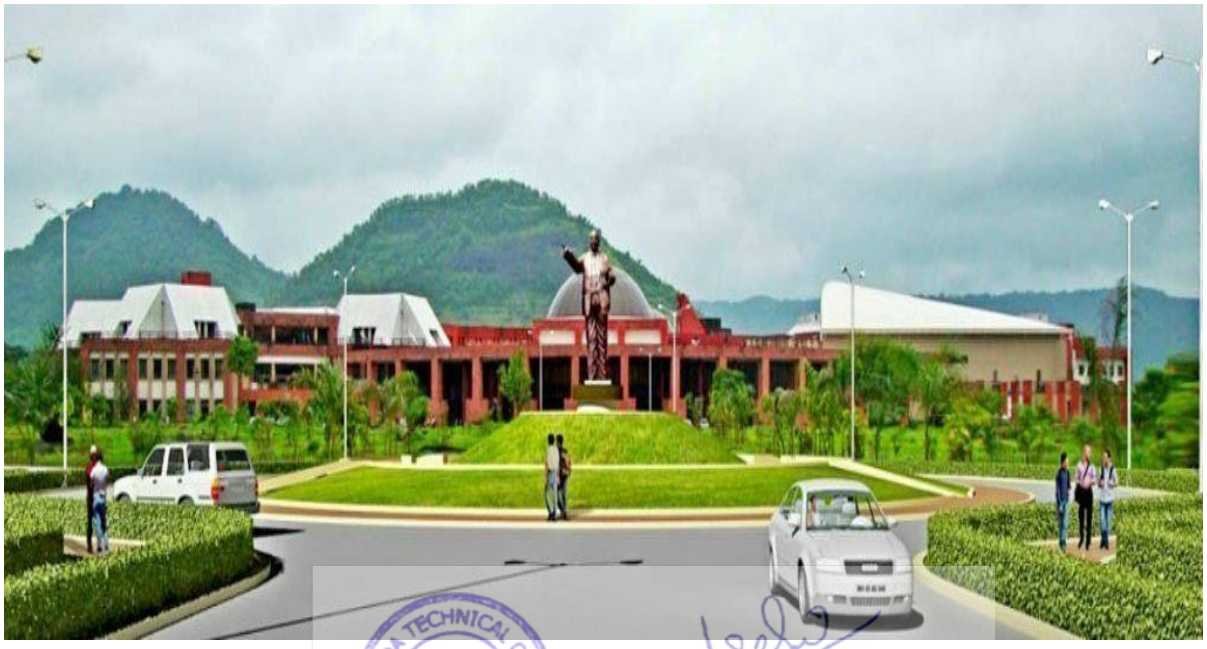
www.dbatu.ac.in

COURSE STRUCTURE AND SYLLABUS

for

Third Year B. Tech. Electrical Engineering / Electrical Engineering (Electronics and Power)/ Electrical & Electronics Engg / Electrical & Power Engineering

With effect from the Academic Year2022-2023



Dr. Babasaheb Ambedkar Technological University, Lonere.

B.Tech (Electrical Engineering / Electrical Engineering (Electronics and Power)/ Electrical & Electronics Engg / Electrical & Power Engineering)

Basic Sciences Courses(BSC)		
BTBS101	Engineering Mathematics - I	(3-1-0)4
BTBS102	Engineering Physics	(3-1-0)4
BTBS107 L	Engineering Physics Lab	(0-0-2)1
BTBS201	Engineering Mathematics - II	(3-1-0)4
BTBS202	Engineering Chemistry	(3-1-0)4
BTBS207 L	Engineering Chemistry Lab	(0-0-2)1
BTBS301	Engineering Mathematics-III	(3-1-0)4
BTBS404	Analog and Digital Electronics	(3-0-0)3
BTBSL409	Analog and Digital Electronics Lab	(0-0-2)1

Engineering Sciences Courses(BSC)		
BTES103	Engineering Graphics	(2-0-0)2
BTES105	Energy and Environment Engineering	(2-0-0)2
BTES106	Basic Civil and Mechanical Engineering	(2-0-0)
BTES108L	Engineering Graphics Lab	(0-0-4)2
BTES203	Engineering Mechanics	(2-1-0)3
BTES204	Computer Programming	(3-0-0)3
BTES205	Workshop Practice	(0-0-4)2
BTES206	Basic Electrical and Electronics Engineering	(2-0-0)
BTES208L	Engineering Mechanics Lab	(0-0-2)1
BTES305	Engineering Material Science	(3-0-0)

Humanities and Social Science Including Management Courses(HSSMC)		
BTHM104	Communication Skills	(2-0-0)2
BTHM109L	Communication Skills Lab	(0-0-2)1
BTHM304	Basic Human Rights	Audit
BTHM506	Foreign Languages (A) Japanese Language (B) German Language	Audit
BTHM706	Engineering Operations and Project Management	Audit

Professional Core Course (PCC)		
BTEEC302	Electrical Machines-I	(3-1-0)4
BTEEC303	Electrical and Electronics Measurement	(3-1-0)4
BTEEL306	Electrical Machines Lab	(0-0-2)1
BTEEL307	Electrical and Electronics Measurement Lab	(0-0-2)1
BTEEC401	Network Theory	(3-1-0)4
BTEEC402	Power System	(3-1-0)4
BTEEC403	Electrical Machines-II	(3-1-0)4
BTEEL406	Network Theory Lab	(0-0-2)1
BTEEL407	Power System Lab	(0-0-2)1
BTEEL408	Electrical Machines-II Lab	(0-0-2)1
BTEEC501	Power System Analysis	(3-1-0)4
BTEEC502	Microprocessor and Microcontroller	(3-0-0)3
BTEEC503	Power Electronics	(3-1-0)4
BTEEL507	Power System Analysis Lab	(0-0-2)1
BTEEL508	Microprocessor and Microcontroller Lab	(0-0-2)1
BTEEL509	Power Electronics Lab	(0-0-2)1
BTEEC601	Switchgear Protection	(3-0-0)3
BTEEC602	Electrical Machine Design	(3-1-0)4
BTEEC603	Control System	(3-1-0)4

	Engineering	
BTEEL606	Switchgear Protection Lab	(0-0-2)1
BTEEL607	Electrical Machine Design Lab	(0-0-2)1
BTEEL608	Control System Engineering Lab	(0-0-2)1
BTEEC701	High Voltage Engineering	(3-1-0)4
BTEEC702	Power System Operation and Control	(3-1-0)4
BTEEL707	High Voltage Engineering Lab	(0-0-2)1

Professional Elective Course (PEC)		
BTEEPE405	(A)Electromagnetic Field Theory	(3-0-0)3
	(B)Signals and System	
	©Advance Renewable Energy Sources	
	(D)Electronic Devices and Circuits	
BTEEPE504	(A)Industrial Automation	(3-0-0)3
	(B)Power Quality Issues	
	©HVDC	
BTEEPE604	(A)Application of Power Electronics in Power System	(3-0-0)3
	(B)Smart Grid Technology	
	©Modeling, Simulation and Control of Electric Drives	
BTEEPE703	(A)Energy Audit and Conservation	(3-0-0)3
	(B)Electrical System Design for Building	
	©Flexible AC Transmission System	
	(D)Electrical Utilization	

Open Elective Course (OEC)		
BTEEOE50	(A)Embedded System	(3-0-0)3
	(B)Electrical Safety	
	©Condition Monitoring of Electric Apparatus	
BTEEOE605	(A)E-waste Management	(3-0-0)3
	(B)Power Plant Engineering	
	©Sensor Technology	
	(D)Lightning Interaction with Power System	
BTEEOE704	(A)Process Control Instrumentation	(3-0-0)3
	(B)Biomedical Instrumentation	
	©Mechatronics	
BTEEOE705	(A)Testing, Maintenance and Commissioning of Electrical Equipment	(3-0-0)3
	(B)Electric and Hybrid Electric Vehicles	
	©Internet of Things (IoT)	

Seminar / Mini Project / Internship		
BTES209S	Seminar	(0-0-2)1
BTES211P	(Internship – I) Field Training / Internship/Industrial Training (minimum of 4 weeks which can be completed partially in first semester and second Semester or in at one time).	1
BTEEM308	Miniproject-I	(0-0-4)2
BTEEP410	(Internship – II)	1
BTEEM509	Miniproject-II	(0-0-2)1
BTEES609	Seminar	(0-0-4)2
BTEEP610	(Internship – III)	
BTEEM708	In house project-I / Mini project-III	(0-0-4)2

Project(MP)

BTEEP802	In house project-I / Internship & Project in Industry	(0-0-26) 13

Dr. Babasaheb Ambedkar Technological University, Lonere.

B.Tech (Electrical Engineering / Electrical Engineering (Electronics and Power)/ Electrical & Electronics Engg / Electrical & Power Engineering)

Plan of Study:

No.of Courses								
1	I	II	III	IV	V	VI	VII	VIII
2	BTBS101	BTBS201	BTBS301	BTEEC401	BTEEC501	BTEEC601	BTEEC701	BTEEPE801
3	BTBS102	BTBS202	BTEEC302	BTEEC402	BTEEC502	BTEEC602	BTEEC702	BTEEP802
4	BTES103	BTES203	BTEEC303	BTEEC403	BTEEC503	BTEEC603	BTEEPE703	
5	BTHM104	BTES204	BTHM304	BTBS404	BTEEPLE504	BTEEPE604	BTEEOE704	
6	BTES105	BTES205	BTES305	BTEEPE405	BTEEOE505	BTEEOE605	BTEEOE705	
7	BTES106	BTES206	BTEEL306	BTEEL406	BTHM506	BTEEL606	BTHM706	
8	BTBS107L	BTBS207L	BTEEL307	BTEEL407	BTEEL507	BTEEL607	BTEEL707	
9	BTES108L	BTES208L	BTEEP308	BTEEL408	BTEEL508	BTEEM608	BTEEM708	
10	BTHM109L	BTES209S	BTES211P	BTEEL409	BTEEPE509	BTEEP609	BTEEP609	
11		BTES211		BTEEP410	BTEEP409			

YASHODA TECHNICAL CAMPUS 6757 SATARA

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Yashoda Technical Campus
Satara

Dr. Babasaheb Ambedkar Technological University, Lonere.

B.Tech (Electrical Engineering / Electrical Engineering (Electronics and Power)/ Electrical & Electronics Engg / Electrical & Power Engineering)

A. Program Educational Objectives (PEOs)

Graduates will able to–

1.To equip graduates with a strong foundation in engineering sciences and Electrical Engineering fundamentals to become effective collaborators, researchers and real-time problem solver with technical competencies.

2.Perceive the limitation and impact of engineering solutions in social, legal, environmental, economical and multidisciplinary contexts.

3.Excel in Industry/technical profession, higher studies, and entrepreneurship exhibiting global competitiveness.

B. Program Outcomes (POs)

Engineering Graduate will be able to –

1. **Engineering knowledge**:Apply the knowledge of mathematics, science,engineering fundamentals, and anengineering specialization to the solution ofcomplex engineering problems.
2. **Problem analysis**:Identify, formulate, review research literature, and analyzecomplex engineering problems reaching substantiated conclusions using firstprinciples of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions**:Design solutions for complex engineeringproblems and design systemcomponents or processes that meet the specifiedneeds with appropriate consideration for the public health and safety, and thecultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:**Use research-based knowledgeand research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:**Create, select, and apply appropriate techniques, resources,and modern engineering and IT tools including prediction and modeling to complexengineering activities with an understanding of the limitations.
6. **The engineer and society:**Apply reasoning informed by the contextualknowledge to assess societal, health, safety, legal and cultural issues and theconsequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:**Understand the impact of the professionalengineering solutions in societal and environmental contexts, and demonstrate theknowledge of, and need for sustainable development.
8. **Ethics:**Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:**Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication:** Communicate effectively oncomplex engineering activities with the engineeringcommunity and with society at large, such as, being able to comprehend and write effective reports anddesign documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering andmanagement principles and apply these to one's own work, as a member and leader in a team, to manageprojects and in multidisciplinary environments.
12. **Life-long learning:**Recognize the need for, and have the preparation and ability to engage in independentand life-long learning in the broadest context of technological change.

Dr. Babasaheb Ambedkar Technological University, Lonere.

B.Tech (Electrical Engineering / Electrical Engineering (Electronics and Power)/ Electrical & Electronics Engg / Electrical & Power Engineering)

Curriculum for Semester V

Course Category	Course Code	Course Title	Teaching Scheme			Evaluation Scheme				Credit
			L	T	P	CA	MSE	ESE	Total	
PCC4	BTEEC501	Power System Analysis	3	1	-	20	20	60	100	4
PCC5	BTEEC502	Microprocessor and Microcontroller	3	-	-	20	20	60	100	3
PCC6	BTEEC503	Power Electronics	3	1	-	20	20	60	100	4
PCC2	BTEEPLE504	Group B	3	-	-	20	20	60	100	3
OEC1	BTEEOE505	Group C	3	-	-	20	20	60	100	3
HSSMC	BTHM506	Foreign Language #	-	-	-	-	-	-	-	Audit
LC	BTEEL507	Power System Analysis Lab	-	-	2	60	-	40	100	1
LC	BTEEL508	Microprocessor and Microcontroller Lab	-	-	2	60	-	40	100	1
LC	BTEEL509	Power Electronics Lab	-	-	2	60	-	40	100	1
Project	BTEEPE510	Mini project-II	-	-	2	60	-	40	100	1
Internship	BTEEP410	Internship-II Evaluation	-	-	-	-	-	50	50	1
		Total	**15**	**2**	**10**	**340**	**100**	**510**	**950**	**22**

Semester VI

PCC7	BTEEC601	Switchgear and Protection	3	-	-	20	20	60	100	3
PCC8	BTEEC602	Electrical Machine Design	3	1	-	20	20	60	100	4
PCC9	BTEEC603	Control System Engineering	3	1	-	20	20	60	100	4
PEC3	BTEEPE604	Group D	3	-	-	20	20	60	100	3
OEC2	BTEEOE605	Group E	3	-	-	20	20	60	100	3
LC	BTEEL606	Switchgear and Protection Lab	-	-	2	60		40	100	1
LC	BTEEL607	Electrical Machine Design Lab	-	-	2	60		40	100	1
LC	BTEEL608	Control System Engineering Lab	-	-	2	60		40	100	1
Seminar	BTEEM609	Seminar	-	-	4	60		40	100	2
Internship	BTEEP610	Internship-III (minimum of 4 weeks which can be completed partially in third or fourth semester or in at one time)	-	-	-	-	-	-	-	Credits to be evaluated in VII sem.
		Total	**15**	**2**	**10**	**340**	**100**	**460**	**900**	**22**

BSC= Basic Science Course, ESC= Engineering Science Course, PCC= Professional Core Course, PEC= Professional Elective Course, OEC= Open Elective Course, LC= Laboratory Course, HSSMC= Humanities and Social Science including Management Course

 # Online NPTEL Course

Semester V

BTEEPE504 Professional Elective (Group B)	BTEEOE505 Open Elective (Group C)
(A)HVDC	(A) Embedded System
(B) Power Quality Issues	(B) Electrical Safety
(C) Industrial Automation	(C) Condition Monitoring of Electric Apparatus

BTHM506 Foreign Language
(A) Japanese Language
(B)German Language

Semester VI

BTEEPE604 Professional Elective (Group D)	BTEEOE605 Open Elective (Group E)
(A) Flexible AC Transmission System	(A) E-waste Management
(B) Smart Grid Technology	(B) Power Plant Engineering
(C) Modeling, Simulation and Control of Electric Drives	(C) Sensor Technology
	(D) Lightning Interaction with Power System

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Semester V

BTEEC501 POWER SYSTEM ANALYSIS **4 Credits**

Unit 1: Modeling of Power System **7 Hours**

Complex power flow, balanced and reactance diagrams of a power system, per unit system per unit representation of transformers, synchronous machines, representation of loads. Graph theory and its applications for formation of primitive network and Z and Y matrices, incidence matrices, Y-bus and Z-bus matrices.

Unit 2: Load Flow Studies: **7 Hours**

Introduction, network model formulation, formation of Y-bus by singular transformation, load flow problem, Iterative methods of load flow such as Gauss Gauss-Seidel, Newton-Raphson method, decoupled load flow and fast decoupled load flow, Automatic Generation control.

Unit 3: Symmetrical Fault Analysis: **7 Hours**

Transients on a transmission line, short circuit of a synchronous machine on no load and on load. Short circuit current computation on no load and on load, selection of circuit breakers, Z-bus formulation, algorithm of short circuit studies.

Unit 4: Symmetrical Components: **7 Hours**

Fundamentals of symmetrical components, sequence impedance and sequence network of star connected loads, transmission lines, synchronous machines and transformer sequence network of a loaded generator.

Unit 5: Unsymmetrical Faults Analysis **7 Hours**

single line to ground (l-g), Line to line (L-L), double line to ground (L-L-G) faults analysis of above faults using bus impedance matrix, bus voltage and line current during faults. open conductor faults.

Unit 6: Security Analysis **7 Hours**

Basic Concepts, Security analysis, Load Dispatch centre, Contingency Analysis, preventive and emergency control, Electrical Power Quality, causes, affects and mitigation methods.

Text books:

1. I.J. Nagrath& D.P. Kothari, "Modern System Analysis", Tata McGraw- Hill

2. Stevenson W.D "Elements of Power System Analysis", McGraw- Hill Wadhawa C.L "Elements Power System", John Wiley & sons.

Reference Books:

1. "Power System Analysis", T.K. Nagsarkar, M.S. Sukhiya. (OXFERD U. P.)
2. Stevenson W.D. and Grainger J.J. "Power System Analysis" McGraw- Hill
3. A.R. Bergen and Vijay Vittal, Power Systems Analysis, Pearson Education Asia, 2001.
4. Stagg W.D. & EI-AbiadA.H.,"Computer Method in Power System Analysis", McGraw- Hill
5. H.Saadat "Power System analysis", McGraw- Hill
6. Elgred O.I. electrical Energy System Theory", McGraw-Hill.

7. J.D. Glover, M. Sarma and T.J. Overbye, Power System Analysis and Design, Fourth Edition, Thomson Engineering Press, 2008.

BTEEC502 MICROPROCESSOR AND MICROCONTROLLER 04 Credits

Unit 1: Microprocessor architecture 7 Hours

8085 architecture, functional block diagram, Arithmetic Logic Unit (ALU), Timing and control Unit, Registers, Data and Address bus, Interface unit, 8085 instructions, Instruction word size: one byte, two byte and three byte instructions, addressing modes of 8085, assembly language programming Timing and control signals, Fetch operations, Execution operations, Machine cycle and state, Instruction and data flow, System timing diagram– interrupts.

Unit 2: Memory interfacing 7 Hours

Types of main memories, Compatibility between memory and system BUS, Address space, Partitioning of address space, Special chips for address decoding, ROM and RAM interfacing, i/o interfacing: memory map i/o, i/o map i/o scheme. Programmable peripheral interface. Data transfer techniques and their implementation: Programmed data transfer, DMA mode of transfer, I/O port, Device polling in interrupt driven mode of data transfer, DMA controller and data transfer in DMA mode, Serial mode of data transfer

Unit 3: Applications of microprocessors 7Hours

Interfacing of A/D converters, interfacing of D/A converter, wave generator, multiplex seven segment LED display system, measurement of frequency, phase angle and power factor. Traffic light controller and stepper motor controller.

Unit 4: 8051 Microcontroller 8 Hours

Intel 8051 architecture, memory organization, flags, stack, and special function registers, I/O, ports - connecting external memory, counters and timers, serial data I/O, Interrupts. Microcontroller instructions - addressing modes, moving data, logical operations, arithmetic operations, jump and call instructions – subroutines - Interrupts and returns.

Unit 5: Microcontroller programming 8 Hours

Assembly Language Programming, timer and counter programming, connection to RS 232 and RS 485, Interrupt programming. Peripherals and interfacing - Serial and parallel I/O (8251 and 8255), Programmable DMA controller, Programmable interrupt controller, ADC/DAC interfacing.

Text/Reference Books:

1. Systems and Microprocessors, John P. Hayes, Digital McGraw-Hill I.E.
2. Microprocessor Architecture, Programming and Applications, R.S.Gaonkar, Wiley Eastern.
3. Microprocessor and Interfacing: Programming and Hardware, D.V. Hall, McGraw-Hill I.E
4. Digital Systems and Microprocessors , John P. Hayes, McGraw-Hill I.E.

BTEEC 503 POWER ELECTRONICS **04 Credits**

Unit 1: Introduction **7 Hours**

Concept of Power Electronics, Different types of power electronics devices, converter systems, areas of application, recent developments. Device characteristics, protection and operation: Terminal characteristics of major power electronics devices(SCR, BJT, MOSFET, IGBT, GTO, TRIAC,), ratings, protection, heating, cooling and mounting, series and parallel operation, firing circuits, Snubber circuits

Unit 2: Phase controlled rectifiers **7 Hours**

Analysis and design of diode rectifier circuits and controlled rectifier circuits (for R, RL, RLE load), Phase control, power factor, DC load voltage, Polyphase rectifiers, Current and voltage waveforms analysis, Applications for DC motor drives. Effect of source impedance on the performance of converters, dual converters.

Unit 3: Choppers **7 Hours**

Principle of chopper operation, Control strategies, Types of chopper circuits and steady state analysis. Commutation in chopper circuits, buck, boost and buck-boost chopper, Discontinuous current analysis, Non-ideal effects and dynamic performance, Applications for DC motor drives. PWM control and operation

Unit 4: Inverters **7 Hours**

Classification of inverters, Single-phase and three-phase Voltage source Inverters, Methods of controlling output voltage, frequency and phase, Reduction of harmonics in the inverter output voltage, Current source inverters and operations. Applications for AC motor drives, Pulse Width Modulation (PWM): Types of PWM.

Unit 5: AC Voltage Controller **10 Hours**

Types of AC voltage controllers, Single phase voltage controllers, Sequence control of ac voltage controllers, 3-phase AC voltage controller operation Application of AC-AC Phase Control, Singlephase and poly phase control circuits, Applications for AC motor drives, Cycloconverters: Principles of cycloconverter operation, Methods of controlling output voltage and frequency in cases of: Single phase to single phase, three phases to single phase, three phases to three phase operation.

Applications: Power supply applications, few applications in residential and industrial systems, Electric utility.

Reference Books:

1. Power Electronics , P C Sen, TMH
2. Power Electronics, Dubey, TMH
3. Thyristorised Power Controllers, Dubey et. al., TMH
4. Power Electronics, Rashid Mohammed, PHI

5. Power Electronics & Drives, V. Subrahmanyam, New Age

BTEEPE504A HVDC **03 Credits**

Unit 1: Introduction to HVDC transmission **7 Hours**

Development of HVDC Technology, DC versus AC Transmission, DC System components and their functions, Converter configuration, Selection of Converter Configuration, Firing angle, Current and extinction angle control, DC link power control, Reactive power control and VAR sources, MTDC system types

Unit 2: Bridge converters **7 Hours**

Rectifier and inverter operation, equivalent circuit representation, power reversal, desired features of control and actual control characteristics.

Unit 3: Basic HVDC controllers **7 Hours**

Converter faults, commutation failure, bypass action in bridges, protection issues in HVDC - DC reactors, voltage and current oscillations, DC circuit breakers and over voltage protection.

Unit 4: Harmonics in HVDC **7 Hours**

Characteristics and uncharacteristic harmonics, troubles due to harmonics, harmonic filters – active and passive filters. Introduction to Hybrid HVDC and Off-shore wind power evacuation schemes .

Unit 5: Component models for analysis of AC DC system **7 Hours**

Power flow analysis Of AC DC system, transient stability analysis, dynamic stability analysis, advances in HVDC Transmission, application in wind power generation.

Text/ Reference Books:

1. K. R. Padiyar, ―HVDC power transmission system‖, Willey eastern limited, Second edition.

2. 2. E. W. Kimbark, ―direct current transmission‖, Wiley- inter science, NewYork.

BTEEPE504B POWER QUALITY ISSUES **03 Credits**

Unit 1: Introduction **7 Hours**

Definition of Power quality, Power Quality –Voltage & Current Quality, Importance of Power Quality, Power quality Evaluation. General Classes of Power quality Problems, Transients, Long-Duration Voltage Variations, Short-Duration Voltage Variations, Voltage Imbalance, Waveform Distortion, Voltage fluctuation, Power Quality Terms, CBEMA and ITI Curves. Voltage Sags and Interruptions: Sources of Sags and Interruptions, estimating voltage Sag Performance, Fundamental Principles of Protection, Solution at the End-User Level, Motor –Starting Sags.

Unit 2: Transient over Voltages **7 Hours**

Sources of Transient Over voltages, Principles of Over voltage Protection, Devices for over voltageProtection, Utility Capacitor-Switching transients, Utility System Lightning Protection, ManagingFerro-resonance, Switching Transient Problems with Loads, Computer Tools for TransientsAnalysis.

Unit 3: Fundamentals of Harmonics **7 Hours**

Harmonic Distortion, Voltage versus Current Distortion, Harmonics versus Transients, HarmonicIndexes, Harmonic Sources from Commercial Loads, Harmonic Sources from Industrial Loads,Locating Harmonic Sources, Effects of Harmonic distortion, interharmonics, Harmonic distortionEvaluations, Principles for Controlling Harmonics, Harmonic Filter design: A Case Study,Standards of Harmonics.

Unit 4: Long-Duration Voltage Variations **7 Hours**

Principles of Regulating the Voltage, Devices for Voltage Regulation, Utility Voltage Regulatorapplication, Capacitors for Voltage Regulation, End-Users Capacitors Application, and RegulatingUtility Voltage with distributed Resources Flicker.

Unit 5: Power Quality Monitoring **7 Hours**

Monitoring considerations, Historical Perspective of Power quality Measuring Instruments, PowerQuality Measurement Equipment, Assessment of Power Quality Measurement Data, Application of intelligent Systems, Power Quality Monitoring Standards, Monitoring considerations.

References/Books:

1. Chattopadhyay, Surajit, Mitra, Electric Power Quality, Springer.
2. Haytt G. T., ―Electric Power Quality‖, Stars In Circle Publication.
3. NPTEL courses

BTEEP504C INDUSTRIAL AUTOMATION 03 Credits

Unit 1: Introduction to Industrial Automation 6 Hours

Architecture of Industrial Automation Systems, Elements of an Automated System, Functional hierarchy of an Industrial Automation system, Levels of Automation.

Unit 2: Programmable Logic Controllers 8 Hours

Introduction, Architecture of PLC, PLC Operation, **PLC Hardware Components-** Input-Output module (Discrete and Analog), **PLC Programming -** Ladder Logic, Functional Block Diagram (FBD), Ladder Logic Programming (NO-NC, Timer and Counter), PLC Communication, Application of PLCs.

Unit 3: Industrial Drives Control 7 Hours

Classification of Industrial Drives, DC Motor Drives, Induction Motor Drives, Variable Speed Drives, Servo Motor Drives, Step Motor Drives, BLDC Motor Drives, Control of Drives, Industrial Application of Drives.

Unit 4: SCADA 8 Hours

SCADA system Architecture, Elements of SCADA System, Human Machine Interface, Master Terminal Unit, Remote Terminal Unit. Alarm Handling and Trending, Access Control, Automation Logging, Archiving, Report Generation. Types of interfaces, SCADACommunication.SCADA Applications: Operation and control of interconnected power system, Automatic substation control, Electric Power Generation, Transmission and Distribution sector operation.

Unit 5: Distributed Control System 7 Hours

Introduction and Overview, System Architecture, System Elements, Difference between Centralized and Distributed Control System. Displays: Group Display, Overview Display, Detail Display, Data Highways, Field Buses, Multiplexers and Remote Sensing Terminal Units, I/O Hardware, Case study of any one DCS.

Text Books/ Reference Books:

1. C. D. Johnson, “Process Control Instrumentation Technology”, Prentice Hall of India.
2. B. G. Liptak, Instrument Engineer's Handbook, Process Control, Chilton Book Company.
3. W. Bolton, “Programmable Logic Controllers”, Elsevier.
4 Hughes, “Programmable Controllers”, ISA Publications.
5 Frank D. Petruzella, “Programmable Logic Controllers”, McGraw-Hill Book Company.
6 John W. Webb and Ronald A. Reis, “Programmable Logic Controllers”, PHI.
7 Stuart A. Boyer “Supervisors Control and Data Acquisition”, ISA.

BTEEOE505A EMBEDDED SYSTEM **03 Credits**

Unit 1: Embedded System Architectures **7 Hours**

Introduction, Components of Embedded Systems ARM processor - architectural design -memory organization -data operation-bus configurations. System on-chip, scalable bus architectures, Design example: Alarm clock, hybrid architectures.

Unit 2: Sensor and Actuator I/O 7 Hours

ADC, DAC, timers, Servos, Relays, stepper motors, H-Bridge, port.

Unit 3: Real time operating systems (RTOS) **7 Hours**

real time kernel – OS tasks – task states – task scheduling –interrupt processing – clocking communication and synchronization – control blocks – memory requirements and control – kernel services.

Unit 4: Embedded Networks **7 Hours**

Distributed Embedded Architecture – Hardware and Software Architectures, Networks for embedded systems– I2C, CAN Bus, Ethernet, Internet, Network-based design–Communication Analysis, system performance Analysis, Hardware platform design, Allocation and scheduling, Design Example: Elevator Controller.

Unit 5: System Design **7 Hours**

Specification, Requirements and Architectural design of PBX systems, Set-top box, Ink-jet printer, Laser printer, Personal digital Assistants.

Embedded Hardware : memory map, i/o map, interrupt map, processor family, external peripherals, memory- RAM , ROM, types of RAM and ROM, memory Testing, CRC, Flash memory.

Text/ References Books:

1. Sloss Andrew N, Symes Dominic, Wright Chris, ―ARM System Developer's Guide: Designing and Optimizing‖, Morgan Kaufman Publication,2004.
2. Raj Kamal,―Embedded Systems – Architecture: Programming and Design‖, Tata McGraw-Hill Education, 3rded.,2003.

BTEEOE505B ELECTRICAL SAFETY **03 Credits**

Unit 1: Primary and secondary hazards arc **7 Hours**

blast, shocks-causes and effects-safety equipment- flash and thermal protection, head and eyeprotection-rubber insulating equipment, hot sticks, insulated tools, barriersandsigns,safety tags,locking devices- voltage measuring instruments- proximity and contact testers-safety electricalone-line diagram- electrician ‘s safety kit.

Unit 2: General requirements for grounding and bonding **9 Hours**

definitions-grounding of electrical equipment bonding of electrically conducting materials andother equipment-connection of grounding and bonding equipment- system grounding- purpose ofsystem grounding- grounding electrode system grounding conductor connection to electrodes-useof grounded circuit conductor for grounding equipment- grounding of low voltage and highvoltage systems

The six step safety methods- pre job briefings - hot-work decision tree-safe switching of power system-lockout-tag out- flash hazard calculation and approach distances- calculating there required level of arc protection-safetyequipment, procedure for low, medium and high voltagesystems- the one-minute safety audit.

Unit 3: Electrical safety programmer structure **7 Hours**

development- company safety team- safety policy programme implementation- employee electrical safety teams-safety meetings- safety audit accident prevention- first aid- rescuetechniquesaccident investigation.

Unit 4: Safety related case for electrical maintenance **6 Hours**

reliability cantered maintenance (RCM) -eight step maintenance programme- frequency of maintenance- maintenance requirement for specific equipment and location.

Unit 5: Regulatory bodies **6 Hours**

National electrical safety code- standard for electrical safety in work place- occupational safety and health administration standards, Indian Electricity Acts related to Electrical Safety.

Text / Reference Books:

1. John Cadick, Mary Capelli-Schellpfeffer, Dennis Neitzel, Al Winfield, =Electrical SafetyHandbook ‘, McGraw-Hill Education, 4th Edition, 2012.
2. Maxwell Adams.J, =Electrical Safety- a guide to the causes and prevention of electrichazards ‘, The Institution of Electric Engineers, IET 1994.
3. Ray A. Jones, Jane G. Jones, =Electrical Safety in the Workplace ‘, Jones & BartlettLearning, 2000

BTEEOE505C CONDITION MONITORING OF ELECTRICAL APPARATUS 3 Credits

Course Outcomes:

By the end of the course, students will be able to

1. Understand the necessity of condition monitoring and reliability.
2. Have knowledge about the conventional and modern methodologies/techniques.
3. Develop basic functional models for condition monitoring system to different kind of power apparatus.
4. Determine life expectancy of the equipment

Unit 1: Basic Considerations and Maintenance 07 Hours

Basic definitions, terminologies, symbolic representation, Necessity from technical social, financial aspect, types of faults in electrical equipments {Electrical equipments such as transformer, CT/PT and rotating electrical machines, CBs, etc.}, maintenance strategies, breakdown maintenance, planned, preventative and condition based maintenance

Unit 2: Testing of Electrical Equipments 6 Hours

Cables, Transformers, Induction motor, Capacitor banks, conventional methods, Measurement of insulation resistance, Diagnostic Testing: Routine tests, type tests, special tests, offline tests, Causes of failure and remedies.

Unit 3: Analysis tools 6 Hours

Recent methods (offline), Dissolved Gas Analysis (DGA), Dissipation Factor (tan δ), Sweep Frequency Response Analysis (SFRA), Partial Discharge (PD), Time Domain Dielectric Response (TDDR), Frequency Domain Spectroscopy (FDS), Chemical analysis. Image processing techniques

Unit 4: Online condition monitoring and instrumentation 6 Hours

Recent methods (online), vibration, chemical and temperature monitoring, sensor and data acquisition system, Modern algorithms, GA, and signal processing techniques. Application to various equipments such as transformer, induction motor, synchronous generator and motor, DC motor, CT and PT, case studies.

Unit 5: Current, Flux and Power Analysis 6 Hours

Discrete time Fourier series and its convergence, discrete time Fourier Transform, its properties, frequency response. Introduction to DFT in time domain and frequency domain, Derivation of DFT from DTFT, Inverse DFT, Convolution using DFT, Computational Complexity of the DFT, Decimation-in-time FFT Algorithm, Decimation In Frequency FFT Algorithm, Wavelet transform, Lab view platform.

Unit 6: Reliability and failure rate Assessment 8 Hours

Comparison of DIT AND DIF algorithms. Introduction to FIR and IIR Filter Design. Calculation of Power Equipment Reliability for Condition-based Maintenance Decision-making, Optimum

Reliability- Centered Maintenance, Cost Related Reliability Measures for Power System Equipment, Reliability based replacement refurbishment/planning

Text Books:

1. P. Vas, “Parameter estimation, condition monitoring and diagnosis of electrical machines”, Clarendon Press Oxford, 1993.
2. P. Tavner, Li Ran, J. Penman and H. Sedding, “Condition monitoring of rotating electrical machines”, IET press, 2008.

Reference Books:

1. Xose M Lo´pez, Ferna´ndez, H Bu¨lentErtan, J Turowski, “Transformers analysis, design, and measurement”, CRC Press, 2012
2. S.V. Kulkarni and S. A. Khaparde, “Transformer Engineering: Design, Technology and Diagnostics”, Second edition, CRC Press, 2013
3. R. Billinton and R. N. Allan, “ Reliability Evaluation of Power Systems, 2nd ed. New York”, NY, USA: Plenum, 1996.
4. Videos on Transformer condition evaluation with ABBs Mature Transformer Management Program
5. Induction motor condition monitoring with ABBs, Siemens, General Electricals (source You Tube

BTEEL507 POWER SYSTEM ANALYSIS LAB **1 Credit**

Any Eight Experiments from the following list.(Any Experiment from the following list can be performed either SCILAB/MATLAB/Any Other Software.)

1. Write a program to draw the per unit reactance diagram of a given power system.
2. Solution of building the Bus Admittance matrix for given power system network.
3. Solution of power flow problem of a given power system using Gauss-Siedel method.
4. Solution of power flow problem of a given power system using Newton Raphson Method.
5. Solution of power flow problem of a given power system using Fast Decoupled method.
6. Single Line to Ground Fault (L-G) analysis of a Three Phase Transmission Line at no load and light load conditions.
7. Line to Line Fault (L-L) analysis of Three Phase Transmission Line at No load and Light load conditions.
8. Double Line to Ground Fault (LLG) analysis of Three Phase Transmission Line at No load and Light load conditions.
9. Symmetrical L-L-L Fault analysis of Three Phase Transmission Line at No load and Light load conditions.

BTEEL508 MICROPROCESSOR AND MICROCONTROLLER LAB 01 Credit

1	Study of Architecture of 8085
2	Assembly language program for addition and subtraction of 8 bit &16 bit numbers based on 8085 microprocessor
3	Assembly language program for multiplication of two numbers based on 8085 microprocessor
4	Assembly language program for Multiplication and division of two numbers based on 8085 microprocessor
5	Assembly language program for determination of smaller and larger no based on 8085 microprocessor
6	Assembly language program for ascending and descending order based on 8085 microprocessor
7	Assembly language program for rolling/flash LED based on 8085 microprocessor
8	Interfacing of 7 segment LED to 8085 microprocessor
9	Interfacing of Stepper motor with microprocessor
10	Programs based on arithmetic instructions for 8051 microcontroller
11	Interfacing of stepper motor to 8051 microcontroller
12	Interfacing of DC motor to 8051 microcontroller
13	Interfacing of converters ADC 0808/0809 and DAC 0808
14	Generate Delay using Timer section of 8051 microcontroller.

Conduct any 4 practicals fro 1 to 7 and 4 practicals from 8 to 14.

BTEEL509 POWER ELECTRONICS LAB **01 CREDIT**

1.V-I characteristics of various power electronics devices.(At least two devices SCR/MOSFET/IGBT/TRIAC/GTO)

Group A (minimum four)

2.Experimental analysis of single phase uncontrolled converter

3.Experimental analysis of single phase Half controlled converter

4.Experimental analysis of single phase fully controlled converter

5.Experimental analysis of three phase bridge inverter.

6.Experimental analysis of BUCK /BOOST/BUCK -BOOST converter

Group B

7.Simulation of Single phase Semi controlled converter

8.Simulation of Single phase Fully controlled converter

9.Simulation of Single phase inverter

BTEEPE510 MINI PROJECT II **01 Credits**

Guidelines:

Stage	Work to be carried
I	• Selection of a project (Hardware or Software Based) on recent trends in Electrical Engineering. • Planning the outcome of the project and listing out the expected outcome of the project. • Literature Survey
II	• Development of Project Idea in the form of working model (Hardware based projects) or production of appropriate simulation results of the proposed idea (Software based projects).
III	• Verification of the results obtained of the working model or the simulation results. • Comparing if the outcomes as defined in Phase I are met and taking corrective action.
IV	• Completion of project by developing the Project Report and submitting the report to the concerned to receive the final credits.

DIRECTOR
Yashoda Technical Campus
Satara

Semester VI

BTEEC601 SWITCHGEAR AND PROTECTION **04 Credits**

Unit 1: Introduction to Switchgear and Protection **7 Hours**

Introduction, Need for power system protection, effects of faults, Requirement of Relays, Relays Terminology, basic circuit, relay connection with trip circuit and circuit breaker, types of relay, Protective Devices: Philosophy of protection, zones of protection, primary and backup protection, Methods of earthing and their effect on fault conditions. Different types of relays: attracted armature type, balanced beam type, induction type.

Unit 2: Static and Numerical Relays **7 Hours**

Amplitude and phase comparator techniques, Differential relays, directional relay, impedance relay, admittance relay, MHO relay, description of numerical relays, relaying algorithms, use of numerical relays as fault locator and disturbance recorder. Microprocessor Based Relays: Advantages, over current relays, directional relays, distance relays.

Unit 3: Circuit Breakers and Fuses **7 Hours**

Introduction, arcing in circuit breakers, arc interruption, re-striking and recovery voltage, current chopping, resistance switch, Air blast circuit breakers, minimum and bulk oil circuit breakers, SF6 and Vacuum Circuit breakers, circuit breakers rating, testing of CB, point on wave switching, Definitions of terms in fuses, HRC fuses. Introduction, fuse characteristics, types of fuses, application of HRC fuses. Selection of circuit breakers, high voltage d.c. breakers.

Unit 4: Protection of Transmission Lines **7 Hours**

Over current protection, construction and operation of instantaneous over current relay. Directional Over current relay , distance protection, unit protection schemes, carrier aided distance protection, protection of feeders, protection of ring main and parallel feeders, protection of radial feeders by over current relays, distance relays and carrier current protection scheme. Protection of induction motor‘s against overload, short-circuits, thermal release, miniature circuit breaker

Unit 5: Protection of Alternators & Transformers **7 Hours**

Differential protection of alternator, protection of stator against phases to ground fault, phase to phase faults, inter turn fault, protection against unbalanced loading, protection of rotor against ground fault, field failure, reverse power, back up protection, field suppression, protection of bus bars, frame leakage protection. Differential protection of transformer for different winding configurations, difficulties encountered in differential protection and their remedies. Standards and specifications related to switch gear and protection

Text/References Books:

1. Power system protection and switchgear, Ravindranath and Chander, TMH

2. Fundamentals of power system protection‖, Paithankar and Bhide, PHI
3. J. L. Blackburn and T. J. Domin, Protective Relaying: Principles & Applications, CRC Press, 2006.
4. Electrical power system‖, Wadhwa, New Age. 2. ―Power system protection‖, Badri Ram, TMH.

BTEEC602 ELECTRICAL MACHINE DESIGN 04 Credits

Unit I: Principles of Electrical Machine Design: 6 Hours

Principles of design, design factors, limitations, Ratings, Specifications, Standards, Performance and other criteria to be considered, Brief study of magnetic, electric, dielectric and other materials, Introduction and advantages of various approaches of Computer Aided Designing.

Unit II: Design of Simple Electrical Apparatus& AC and DC Windings: 6 Hours

Detailed design of heating coils, starters, chokes and lifting magnets, Numerical examples.

AC & DC Windings: Constructional features, types of ac windings, Choice and design of simple/ duplex lap and wave winding, Concept of multiplex windings and reasons for choosing them, Single and double layer three phase AC winding (mush) with integral slots

Unit III: Design of Induction Motor (Stator): 10 Hours

Calculation of Ampere-Turns for flux distribution in rotating machines, Calculation of Ampere-Turns for flux distribution in rotating machines, output equation of three phase IM, specific electrical and magnetic loadings, ranges of specific loadings, turns per phase, number of stator slots, calculations for main dimensions, stator design parameters, Numerical examples.

Unit IV: Design of Induction Motor (Rotor): 6 Hours

Selection of length of air gap, factors affecting length of air gap, design of rotor, Unbalanced magnetic pull and its estimation, harmonic field effect on the performance of3-phase induction motor, Design of squirrel cage and wound rotor

Unit V: Heating and Ventilation of Electrical Machines: 6 Hours

Study of different modes of heat generation, Temperature rise and heat dissipation, Heating and Cooling cycles, heating and cooling time constants, their estimation, dependence and applications, Methods of cooling / ventilation of electrical apparatus, Thermal resistance, radiated heat quantity of cooling medium (Coolant) Numerical examples.

Unit VI: Design of Transformer: 10 Hours

Design of Transformer: Design of distribution and power transformers, Types, Classification and specifications, Design and main dimensions of core, yoke, winding, tank (with and without cooling tubes), Estimation of leakage reactance, resistance of winding, No load current, Losses, Mechanical force developed during short circuits, their estimation and measures to reduce them, Numerical examples.

Textbooks:

1. Sawhaney. A. K– A Course in Electrical Machine Design (DhanpatRai).

Reference Books:

1. .Deshpande. M. V- A Course in Electrical Machine Design (Prentice Hall Of India).

2. Siskind – Electrical Machine Design (Mcgraw Hill).

BTEEC603 CONTROL SYSTEM ENGINEERING 04 Credits

Unit 1: Introduction 10 Hours

Concept of open & closed loop control system, Transfer Function: Concept of system: Physical system, Physical model, Linear and Nonlinear systems, Time variant and Time invariant system. Equations of physical systems (Mass-Spring-Dashpot system, R-L-C series & parallel circuit) Transfer Function, Procedure of obtaining transfer function.

Block diagrams and Signal flow graphs: a) Block diagram, Block Diagram reduction, and Numerical examples. b) Signal flow graph; Masons gain formula for deriving overall transfer function of systems. Feedback characteristics of control system: Concept of Negative and Positive feedback, Sensitivity of the system to parameter variation and with negative and positive feedback.

Unit 2: Time Domain Analysis 7 Hours

Typical test signals, Time domain specifications, Steady state response, Types of system, Steady State Error constants and Steady State Error, Transient Response, Concept of stability, Determination of stability by Routh - Hurwitz criterion.

Unit 3: Frequency Domain Analysis 10 Hours

Introduction to Frequency Domain Analysis, Polar plots,Bode plots, Nyquist criterion, Relative stability from Nyquistcriterion. Root Locus, Construction of Root Locus, and Stability from Root Locus plots, Effect of addition of poles & zeros on Root Locus plots, Compensation network: Lag, Lead & Lag-Lead.

Unit 4: PID Controllers 4 Hours

Introduction to Proportional (P), Integral (I) & Derivative (D) controller, individual effect on overall system performance, P-PI & PID control and effect on overall system performance.

Unit 5: State Variable Technique 8 Hours

Concept of State, State Variable & State Vector, State Variable Analysis: Different forms of state variable representations (Phase, Physical & Canonical form), Concept of Diagonalization, Obtaining StateEquations from Transfer Function representation and vice versa, Solution of State Equations, StateTransition Matrix (STM), Methods of finding STM, Power Series Method, Laplace Transform Method, Calay Hamilton Method, Controllability & Observability of linear system, Kalman‘s test.

Text Books/ReferenceBooks:

1. Ogata K., “Modem Control Engineering”, Prentice Hall of India.
2. Kuo B. C., “Automatic Control System”, Prentice Hall of India.
3. Nagarath I. J. and Gopal M., “Control System Engineering”, Willey Eastern.
4. Norman S. Nice, “Control System Engineering”, Wiley.

5. Smarajit Ghosh, “Control Systems Theory & Applications”, Pearson.
6. Gopal M., “Control System”, Prentice Hall of India.

BTEEPE604A FLEXIBLE AC TRANSMISSION SYSTEM 3 Credits

Unit 1: Transmission Interconnection **7 Hours**

Flow of power in the AC system, factors affecting loading capability, power flow and dynamicstability consideration of a Transmission interconnection, Description and application of HVDCtransmission, DC System components and their functions, Converter configuration, Principles ofDC Link control and Converter control characteristics, Firing angle, Current and extinction anglecontrol, DC link power control

Unit 2: Flexible AC Transmission **7 Hours**

Benefits of FACTS, Basic Realities & Roles, Types of FACTS Controller, Principles of Series and Shunt Compensation. Introduction to Voltage source and Current source converter. Shunt compensation (SVC): Objectives of shunt compensation, Midpoint voltage regulation for long transmission line, voltage instability prevention, improvement of transient stability

Unit 3: Reactive power control and VAR sources **7 Hours**

Reactive power control and VAR sources Methods of controllable VAR generation, Description ofStatic VAR Compensators (SVC), Variable impedance type VAR generators. Thyristor controlledreactor (TCR), Thyristor Switched Capacitor (TSC), TSC-TCR, Fixed capacitor TCR (FC-TCR).Shunt compensation

Unit 4: Variable impedance type series compensator **7 Hours**

Thyristor Switches Series Capacitor (TSSC), Thyristor Controlled Series Compensators (TCSC). Switching Converter type Series Compensator. Introduction to interline power flow controller, Special purpose FACTS controllers, Thyristor controlled voltage limiter and voltage regulator, Thyristor controlled braking resistor and current limiter.

Unit 5: (STATCOM) **7 Hours**

Switching type VAR generator, Static Synchronous Compensator (STATCOM), Basic operatingprinciple, Configuration. Basic control approach, Comparison between SVC and STATCOM.Series Compensator: Objectives of series compensation, improvement of transient stabilitySynchronous Series Compensator: (SSSC) and Controller for SSSC, Basic configuration andworking of Unified Power Flow Controller (UPFC). Unified Power Flow Controller, CircuitArrangement, Basic Principle of P and Q Control, independent real and reactive power flow control, Applications GCSC, TSSC, TCSC & SSSC

Text Books/Reference Books:

1. N.G Hingorani, L. Gyugyi, ―Understanding FACTS: Concepts and Technology of FlexibleAC Transmission Systems‖, IEEEPress Book, Standard Publishers and Distributors, Delhi,2001.
2. Padiyar K.R., ―HVDC Power Transmission System‖, Wiely Eastern PVT Limited.

3. Thyristor Based FACTS Controllers for Electrical Transmission System, R.M. Mathur, and R. K.Verma
4. FACTS: Controller in Power Transmission & Distribution, K. R. Padiyar, New AgeInternational.
5. HVDC and F ACTS controllers, Application of Static converter in Power System, V.K. Sood
6. E.W. Kimbark ―Direct Current transmission‖, Vol.1, John Wielly, New York
7. T,J.E Miller, ―Reactive Power Control in Electric Systems‖, John Wiley & Sons.

BTEEPE604B SMART GRID TECHNOLOGY **03 Credits**

Unit 1: Introduction to Smart Grid **9 Hours**

Introduction, working definitions of Smart Grid, Need of Smart Grid, Present development & International policies in Smart Grid. Introduction to Smart Meters, Real Time Pricing, Smart Appliances, Automatic Meter Reading(AMR), Outage Management System(OMS), Vehicle to Grid, Smart Sensors, Home & Building Automation Smart Substations, Substation Automation, Feeder Automation. Geographic Information System(GIS), Intelligent Electronic Devices(IED) & their application for monitoring & protection, Smart storage like Battery, SMES, Pumped Hydro, Compressed Air Energy Storage**,**Indian Smart Grid –Key Challenges for Smart Grid. Application and standards, Impacts of Smart Grid on reliability, Impacts of Smart Grid on air pollutant emissions reduction.

Unit 2: Smart Grid Architecture **6 Hours**

Components and Architecture of Smart Grid Design –Review of the proposed architectures for Smart Grid. The fundamental components of Smart Grid designs –Transmission Automation – Distribution Automation –Renewable Integration Tools and Techniques for Smart Grid: Computational Techniques –Static and Dynamic Optimization Techniques –Computational Intelligence Techniques –Evolutionary Algorithms – Artificial Intelligence techniques

Unit 3: Distribution Generation Technologies **6 Hours**

Introduction to Renewable Energy Technologies –Micro grids –Electric Vehicles and plug–in hybrids –Environmental impact and Climate Change –Economic Issues

Unit 4: Communication Technologies and Smart Grid **7 Hours**

Introduction to Communication Technology – Advanced Metering Infrastructure (AMI), Home Area Network (HAN), Neighborhood Area Network (NAN), Wide Area Network (WAN). Bluetooth, ZigBee, GPS, Wi-Fi, Wi-Max based communication, Synchro Phasor Measurement Units (PMUs) –Wide Area Measurement Systems (WAMS). Two-way Digital Communications Paradigm, Network Architectures, IP- based Systems Power Line Communications.

Unit 5: Control of Smart Power Grid System **7 Hours**

Load Frequency Control (LFC) in Micro Grid System –Voltage Control in Micro Grid System – Reactive Power Control in Smart Grid. Case Studies and Test beds for the Smart Grids. Security and Privacy: Cyber Security Challenges in Smart Grid, Load Altering Attacks, False Data Injection Attacks, Defense Mechanisms, Privacy Challenges.

Reference Books:

1. James Momoh, ―Smart Grid Fundamentals of Design and Analysis, Wiley, 2012

2. Keyhani, ―Smart Power Grid Renewable Energy Systems, Wiley 2011
3. Janaka Ekanayake, Nick Jenkins, Kithsiri Liyanage, ―Smart Grid: Technology and Applications, Wiley 2012.
4. Jean Claude Sabonnadiere, NouredineHadjsaid, ―Smart Grids‖, Wiley ISTE 2012.

BTEEPE604C MODELING, SIMULATION AND CONTROL OF ELCTRICAL DRIVES

3 Credits

Unit 1: Introduction **7 Hours**

Introduction to Electric drives: Advantages of Electrical Drives, Parts of Electrical drive. Choice of Electric drives. Dynamics of Electrical drives: fundamental torque equations, multiquadrant operation Classes of motor duty & criteria for selection of motor.Load equalization, stability of electrical drives, sensors in drive systems.

Unit 2: DC motor drives: **6 Hours**

Review of basic characteristics of DC motors, Single phase andThree phase rectifier controlled drives.DC-DC converter drives:Principle of Rheostatic and regenerative braking control, combined control, two and four quadrant DC-DC converter fed drives.

Unit 3: AC Drives: **8 Hours**

Speed control of three phase induction motors, Stator voltage control, Rotor voltage control, frequency control, Voltage and frequency control.Principle of Scalar andVector control of Induction motor, Static rotor resistance control method, static slip power recovery control.Direct torque control of Induction motor, direct torque control of PM synchronous motor drives

Unit 4: Sensor less control of IM drives **7 Hours**

Sensor less control of PMSM drives, Predictive torque control of induction motor drive, Multiphase machine drives, Fractional-slot concentrated winding machines and drives.

Unit 5:Machine Modeling **7 Hours**

DC, induction motor and synchronous machines; simulation of transients; simulation tools: SABER, PSPICE, and MATLAB-SIMULINK; Simulations of converters, inverters and cyclo-converters etc.

Text/References Books:

1. Dubey G. K., “Fundamentals of Electrical Drives”, Narosa Publishing house
2. De N. K., Sen P. K., “Electric Drives”, Prentice Hall of India
3. VedamSubramanyam, “Electrical Drives and Control”, TMH Publications
4. Mohammed Fazlur Rahman, ―Modeling, Simulation And Control Of Electrical Drives‖, Institution of Engineering And Technology Publication

BTEEOE605A E-WASTE MANAGEMENT **03 Credits**

Unit 1: Sources **7 Hours**

Composition and characteristic of hazardous waste, Hazardous Waste (Management and Handling) Rules, 1989 and amendments, Federal Hazardous Waste Regulations under RCRA, Superfund, CERCLA and SARA. Toxicology, public health impact, Protocols, issues and challenges in transportation of hazardous waste.

Unit 2: E-waste **7 Hours**

Introduction, toxicity due to hazardous substances in e-waste and their impacts, domestic e-waste disposal, e-waste management, technologies for recovery of resource from electronic waste.

Unit 3: Guidelines for environmentally sound management of e-waste **7 Hours**

Occupational perspectives of recycling e-waste in India, Environmental health perspectives of recycling e-waste.

Unit 4: Hazardous substances waste Electrical and Electronic Equipment **7 Hours**

Characteristics of pollutants, batteries, electrical and electronic components, plastic and flame retardants, circuit boards, pollutants in waste electrical and electronic equipment.

Unit 5: E-Waste Recycling **7 Hours**

Technologies for recovery of resources from electronic waste, resource recovery potential of e-waste, steps in recycling and recovery of materials-mechanical processing, technologies for recovery of materials.

Text/References Books:

1. New Delhi. Johri R., ―E-waste: implications, regulations, and management in India and current global best practices‖, TERI Press, New Delhi.

2. E-Waste Managing the Digital Dump Yard, Edited by Vishakha Munshi, ICFAI University Press

3. E-Waste Managing the Digital Dump Yard, Edited by Vishakha Munshi, ICFAI University Press

4. Tchobanoglous G., Theisen H., Viquel S.A., ―Integrated Solid Waste Management: Engineering, Principles and Management issues‖, Tata McGraw Hill Publishing Company Ltd

BTEEOE605B POWER PLANT ENGINEERING 3 Credits

Unit 1: Power Generation from conventional sources 7 Hours

Introduction to conventional energy sources, Thermal, hydro, nuclear and gas power plants - their functions and control; types of prime movers, generators and excitation systems;

Alternate sources of power generation - solar, wind, geo-thermal, ocean-thermal, tidal, wave and MHD. Economic considerations in power systems-Load and Energy survey, load duration curve, plant factor and plant economics,

Unit 2: Thermal and Hydro Power Plants 7 Hours

Thermal Steam and Hydro Power Plants: Selection of site, elements and operational circuits of the power plant, turbo-alternators, plant layout, steam turbines, controls and auxiliaries.

Hydro-electric Power Plants – selection of site, elements of power plant, classification, water turbines, governor action, hydro-electric generator, plant layout, pumped storage plants.

Unit 3: Nuclear Power Plants 7 Hours

selection of site, nuclear reaction – fission process and chain reaction, constituents of power plant and layout, nuclear reactor – working, classification, control, shielding and waste disposal.

Diesel and Gas Power Plants: Advantage and limitations, types of diesel plants, general layout, and applications. Components of gas power plant, gas turbine, fuels, materials, working and applications.

Unit 4: Renewable power plants 7 Hours

Solar power generation – Photo-voltaic and solar thermal generation – solar concentrators,

Wind power generation – types of wind mills, wind generators, tidal, biomass, geothermal and magneto hydro dynamic power generation, micro-hydel power plants, fuel cells

5: Combined operation of power plants 7 Hours

Plant selection, choice of size and number of generator units, Concept of parallel operation of various generating sources and load sharing, interconnected systems, concept of

Grid, real and reactive power exchange among interconnected systems. Major electrical equipment in power plants, DC systems in power plants, station control - switch yard and control room. Economic considerations – types of costs, tariff and consumers.

Text/Reference Books:

1. Wadhwa, C.L.,"Generation Distribution and Utilisation of Electrical Energy", New Age International Publishers, 3rd Edition, 2010.
2. J.B.Gupta, "A Course in Power Systems", S.K.Kataria and Sons, Reprint 2010-2011.
3. M. M. El-Wakil, "Power Plant Technology", Mcgraw Hill, Digitized on Dec 2000
4. B. G. A. Skrotzki& W. A. Vopat, "Power Station Engineering & Economy", McGraw Hill, Digitized on Dec 2007.

5. Chakrabarti A., Soni M.L., Gupta P.V., and Bhatnagar U.S., "A Text Book on Power Systems Engg", DhanpatRai and Sons, New Delhi, 2nd Revised Edition, 2010.
6. Nag P. K., "Power Plant Engineering", Tata McGraw Hill Publications
7. R. K. Rajput, "Power Plant Engineering", Shree Laxmi Publications

BTEEOE605C SENSOR TECHNOLOGY 03 Credits

Unit 1: Measurement and Characteristics **7 Hours**

Elements of a Measurement System; Classification of Instruments; Static Performance Parameters; Loading and Impedance Matching; Errors and Uncertainties in Measurement; Process and Standards of Calibration; Dynamic Characteristics Transfer Function Representation of a Measurement System, Impulse and Step Responses of First and Second Order Systems, Frequency Response of First and Second Order Systems.

Unit 2: Mechanical Transducers **7 Hours**

Temperature- Bimetallic Element and Fluid Expansion type Thermometers; Pressure- Manometers and Bourdon Gauges; Force- Balances, Helical Spiral Springs, Load Cells and Elastic Force Devices; Torque- Torsion Bars and Flat Spiral Springs; Liquid Level- Float Systems and Level to Pressure Converters; Flow- Pitot Static Tubes and Turbine type Flow Meters. Hot Wire Anemometer. Proximity Sensors- Reed Sensors, Inductive proximity sensor, capacitive proximity sensor, Optical sensor with through beam, Ultrasonic sensors.

Unit 3: Electrical Transducers **7 Hours**

Resistance Thermometers; Interfacing Resistive Transducers to Electronic Circuits; Thermistors-Measurement of Temperature and Thermal Conductivity, Temperature Control; Resistance Strain Gauges- Gauge Factor, Bonded and Unbonded Strain Gauges; Self Generating and Non Self Generating Inductive Transducers; Linear Variable Differential Transformers; Capacitive Transducers – Potentiometric Transducers; Thermoelectric Transducers and Sources of Errors in Thermocouples; Piezoelectric Transducers

Unit 4: Basic Signal Conditioning Elements **7 Hours**

Amplifiers- Non Electrical and Electrical types; Op Amps Inverting, Non Inverting, Summing, Differential, and Charge Amplifiers; Differentiating and Integrating Elements; Filters;

Data Transmission Elements- Electrical, Pneumatic, Position and Radio Frequency Transmission types; Compensation Elements for First and Second Order Systems – Basic Indicating, Recording, and Display Elements .

Unit 5: Feedback in Instruments **7 Hours**

Principles of Feedback and Advantages & Disadvantages of Feedback; Digital Voltmeters-Ramp and Dual Slope types; Servo type Potentiometric and Magnetic Tape Recorders; Digital Recorders of Memory type; Data Displays-Analog and Digital types.

Text/References Books:

1. Electronic Measurements and Instrumentation, K. Lal Kishore, Pearson Education Publications
2. Electronic Instrumentation, H. S. Kalsi-TMH Publications

3. Albert D Helfrick and William D Cooper; Modern Electronic Instrumentation and Measurement Techniques; 2004, PHI
4. BC Nakra, and Chaudhry; Instrumentation, Measurement and Analysis; 2004, Tata McGrawHill.
5. DVS Murthy; Transducers and Instrumentation; 2003, PHI.
6. CS Rangan, GR Sarma, and VSV Mani; Instrumentation Devices and Systems; Tata McGraw-Hill
7. Doeblin and Ernest; Measurement Systems Application and Design; 2004, Tata McGraw-Hill.
8. Tilak Thakur ― Mechatronics ‖ Oxford University Press 2016

BTEEOE605D Lightning Interaction with Power System 03 Credits

Unit 1: Lightning and Climate Change 7 Hours

Lightning Phenomenon and Parameters for Engineering Applications, Lightning Return stroke models for electromagnetic field calculations, Lightning Interaction with Power Substations, Lightning Interaction with Power Transmission Lines

Unit 2: Lightning Interaction with Medium 7 Hours

Voltage Overhead Power Distribution Systems, Flash collection rate, Effects of various parameters on lightning overvoltage, Lightning protection of MV systems, Lightning performance of overhead distribution lines, Lightning Interaction with Low-Voltage Overhead Power Distribution Networks, Typical configurations of LV networks, Lightning surges on LV power systems, Lightning protection of LV networks,

Unit 3: Lightning Protection of Structures and system inside of buildings 7 Hours

Lightning currents, Lightning protection of buildings, Volume protected against direct lightning strike, Air-termination and down-conductor system, Earth-termination system, Lightning equipotential bonding, Separation distance, Currents and voltages on lines, Grid-like spatial shield, Smart Grid functions and technologies, Lightning and digital recording technology, Lightning protection of Smart Grid sensors..

Unit 4: Impact on Renewable Energy Systems 7 Hours

Wind turbine components and overview of the lightning protection system, Lightning phenomenology and wind turbines, Lightning damage to wind turbines due to direct impacts, Lightning protection of wind turbine components, Overvoltages in wind farms, Solar energy: solar radiation, parameters, hourly and daily parameters, PV systems: off-grid and grid-connected, considerations of the grid connection, Internal and overvoltage lightning protection, External lightning protection

Unit 5: Measurement of Lightning Currents and Voltages 7 Hours

Lightning current measurements, Measurement method of lightning voltage, Application of various lightning overvoltage sensors in power systems, Application of the FDTD Method to Lightning Studies, Fundamentals, Representations of lightning source, Applications, Software Tools for the Lightning Performance Assessment, FLASH program, Lightning-induced overvoltages–electromagnetic transients program.

Text/References Books:

1. Alexandre Piantini, ―Lightning Interaction with Power Systems- volume 1, Institution of Engineering and Technology

2. Alexandre Piantini, ―Lightning Interaction with Power Systems- volume 2, Institution of Engineering and Technology

3. Vernan Cooray. ” Lightning Protection”.Power and Energy services, IET.

BTEEL606 SWITCHGEAR AND PROTECTION LAB 01 CREDITS

Conduct any 8practicals from given list

1. To verify characteristics of Static Overcurrent Relay.
2. To verify the characteristics Static over Voltage Relay.
3. To verify the characteristics of IDMT Relay.
4. To verify the characteristics of Reverse Power Overcurrent Relay/ Negative Sequence Relay.
5. To demonstrate working of Distance Protection Scheme for long transmission line.
6. To demonstrate working of Differential Protection of Transformer and sketch the schematic diagram for protection scheme.
7. To demonstrate working of Differential Protection of Alternator and sketch the schematic diagram for protection scheme.
8. Identify the components of different types of circuit breakers with their specifications (through visits/ videos/models)
9. To verify the characteristics of MCB, ELCB and HRC fuses.

BTEEL 607 ELECTRICAL MACHINE DESIGN LAB 01 Credit

Conduct any eight practical from given list

1 Symbols used in Electrical Engineering

2 Design and assembly of Choke with design report.

3 Design and assembly of Starter with design report.

4 Design and layout of simplex lap winding (Detailed Drawing Sheet)

5 Design and layout of wave winding (Detailed Drawing Sheet)

6 Design and layout of ac lap winding (Detailed Drawing Sheet)

7 Design and assembly of transformer with design report. (Detailed Sheet for General Assembly of transformer)

8 Design and assembly of three phase induction Motor with design report.(Detailed Sheet for General Assembly of Induction Motor)

9 Complete any two drawings sheets with the help of Computer Aided Design Software like AUTOCAD)

BTEEL608 CONTROL SYSTEM ENGINEERING LAB **01 Credit**

Any Eight Experiments from the following list.

1. Write a program to obtain: i) pole, zero and gain values from a given transfer functionii)Transfer function model from pole, zero, gain values.
2. Write a program to determine of step & impulse response for a first order unity feedback system
3. Write a program to generate various standard test signals.
4. Write a program to plot the root locus for a given transfer function of the system using MATLAB.
5. Write a program to plot the Bode Plot for a given system using MATLAB.
6. Write a program to plot the Nyquist Plot for a given system using MATLAB.
7. Write a program to design Proportional, Proportional + Integral, Proportional+ Derivative and P-I-D Controller for second order system.
8. Write a program to determine of step & impulse response for a second order unity feedback system
9. Write a program to determine state space model from transfer function model & vice versa.
10. Write a program to determine state space model from transfer function model & vice versa

BTEEM609 SEMINAR **02 credit**

mmmm

Dr. Babasaheb Ambedkar Technological University, Lonere.

Dr. Babasaheb Ambedkar Technological University
(Established as a University of Technology in the State of Maharashtra)
(under Maharashtra Act No. XXIX of 2014)
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COURSE STRUCTURE AND SYLLABUS

For

Final Year B. Tech. Electrical Engineering / Electrical Engineering (Electronics and Power)/ Electrical & Electronics Engg / Electrical & Power Engineering

With effect from the Academic Year 2020-2021(Final Year)

Dr. Babasaheb Ambedkar Technological University, Lonere.

B.Tech (Electrical Engineering / Electrical Engineering (Electronics and Power)/ Electrical & Electronics Engg / Electrical & Power Engineering)

Curriculum for Semester VII [Final Year]

Sr. No.	Course Code	Type of Course	Course Title	Hours per week			Evaluation Scheme			Total Marks	Credits
				L	T	P	MSE	CA	ESE		
1	BTEEC701	PCC1	Power System Operation & Control	3	0	0	20	20	60	100	3
2	BTEEC702	PCC2	High Voltage Engineering	3	0	0	20	20	60	100	3
3	BTEEC703	PCC3	Electrical Drives	3	0	0	20	20	60	100	3
4	BTEEE704	PEC1	Elective-IX	3	0	0	20	20	60	100	3
5	BTEEE705	PEC2	Elective-X	3	0	0	20	20	60	100	3
6	BTEEL706	Lab	Power System Operation & Control Lab	0	0	2	--	30	20	50	1
7	BTEEL707	Lab	High Voltage Engineering Lab	0	0	2	--	30	20	50	1
8	BTEEL708	Lab	Electrical Drives Lab	0	0	2	--	30	20	50	1
9	BTEES709	Seminar	Seminar	0	0	2	--	30	20	50	1
10	BTEEP710	Project	Project Part-I	0	0	6	--	30	20	50	3
11	BTEEF711	--	Field Training /Internship/Industrial Training III	--	--	--	--	--	50	50	1
			Total	**15**	**0**	**14**	**100**	**250**	**450**	**800**	**23**

Elective-IX	Elective-X
A) Special Purpose Electrical Machines	A) Digital Signal Processing
B) Electrical Traction and Utilization	B) Energy Audit and Conservation
C) Engineering System Design and Optimization	C) Electrical Power Quality
D) Financial Management	D) HVDC Transmission and FACTS

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B.Tech (Electrical Engineering / Electrical Engineering (Electronics and Power)/ Electrical & Electronics Engg / Electrical & Power Engineering)

Curriculum for Semester VIII [Final Year]

Sr. No.	Course Code	Course Title	Hours per week			Evaluation Scheme			Total Marks	Credits
			L	T	P	MSE	CA	ESE		
	1.Power Management Integrated Circuits 2.DC Power Transmission Systems 3.High Power Multilevel Converters 4.Fuzzy Sets, Logic and Systems & Applications 5.The Joy of Computing using Python 6.Introduction to Industry 4.0 and Industrial Internet of Things 7.Entrepreneurship Essentials **# Student to opt any two subjects from above list**		3	0	0	20*	20*	60*	100	3
			3	0	0	20*	20*	60*	100	3
6	BTEEP803	Project - II	0	0	30	--	100	150	250	15
		Total	**6**	**0**	**30**	**40**	**240**	**270**	**450**	**21**

** Six months of Internship in the industry*

**Students doing project at institute will have to appear for CA/MSE/ESE*

** Student doing project at Industry will give NPTEL examination / Examination conducted byuniversity i.e. CA/MSE/ESE*

 # These subjects are to be studied on self –study mode using SWAYAM/NPTEL/Any other source

 # Teacher who work as a facilitator for the course should be allotted 3 hrs/week load.

 # Project Load: 2hrs/week/project.

Mapping of Courses with MOOCs Platform SWYAM / NPTEL

S.N.	Course Name	Duration	Name of Professor	Institute offering Course
1	Power Management Integrated Circuits	12 Weeks	Prof. Qadeer Ahmad Khan	IITM
2	DC Power Transmission Systems	12 Weeks	Prof. Krishna S	IITM
3	High Power Multilevel Converters	12 Weeks	Prof. Anandarup Das	IITD
4	Fuzzy Sets, Logic and Systems & Applications	12 Weeks	Prof. Nishchal Kumar Verma	IITK
5	The Joy of Computing using Python	12 Weeks	Prof. Sudarshan Iyengar Prof. Yayati Gupta	IIT Ropar
6	Introduction to Industry 4.0 and Industrial Internet of Things	12 Weeks	Prof. Sudip Misra	IIT KGP
7	Entrepreneurship Essentials	12 Weeks	Prof. Manoj Kumar Mondal	IIT KGP

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BTEEC701: POWER SYSTEM OPERATION AND CONTROL	
Teaching Scheme:	Examination Scheme:
Theory: 3hr	Mid-term Test: 20 Marks
Tutorial: 0	Internal Assessment: 20 Marks
Total Credits: 3	End Term Exam: 60 Marks

Prerequisite:

1. Power System-II

Course Objectives:

1. To understand the fundamental concepts of power system.
2. To obtain mathematical model of Synchronous machine, excitation and speed governing system.
3. To analyze the transient stability of power system.
4. To understand the economic operation of power system.
5. To explain various techniques of reactive power and voltage Control

Course Outcome:

1. Explain the fundamental concept of power system.
2. Design the mathematical model of synchronous machine.
3. Design the mathematical model Excitation system and speed governing system.
4. Analyze the transient stability of power system using swing equation and equal area criteria.
5. Analyze the economic operation of power system.
6. Explain the methods of Voltage control.

UNIT I. FUNDAMENTALS OF POWER SYSTEM: (6hr)

Concepts of real and reactive powers, complex power, per-unit representation of power system, Transmission capacity, load characteristics, real power balance and its effect on system frequency, load frequency mechanism, reactive power, balance and its effect, on-load tap changing transformer and regulating transformer

UNIT II. SYNCHRONOUS MACHINE MODELLING (8hr)

Schematic diagram, Physical description: armature and field structure, machines with multiple pole pairs, MMF waveforms, direct and quadrature axes, Mathematical Description of a Synchronous Machine: Basic equations of a synchronous machine: stator circuit equations, stator self, stator mutual and stator to rotor mutual inductances, dq0 Transformation: flux linkage and voltage equations for stator and rotor in dq0 coordinates, electrical power and torque, physical interpretation of dq0 transformation

UNIT III. MODELLING OF EXCITATION AND SPEED GOVERNING SYSTEM (8hr)

Elements of an Excitation System; Types of Excitation System; Control and protective functions; Functional Block Diagram of Power Generation and Control, Schematic of a hydroelectric plant, classical transfer function of a hydraulic turbine, special characteristic of hydraulic turbine, electrical analogue of hydraulic turbine, Governor for Hydraulic Turbine: Requirement for a transient droop, Block diagram of governor with transient droop compensation, Steam turbine modelling: Single reheat tandem compounded type and cross compound type.

UNIT IV. TRANSIENT STABILITY: (6hr)

Solution of Swing equation using classical model, application of equal area creation on point by point solution

UNIT V. ECONOMIC OPERATION OF POWER SYSTEM: **(6hr)**

Distribution of load between units within a plant, transmission loss as function of plant generation, calculation of loss-coefficient, distribution of loads between plants with special reference to steam and hydro plants, automatic load dispatching, Unit commitment, constraints on unit commitment – spinning reserve, thermal and hydro constraints, methods of unit commitment – priority list and dynamic programming.

UNIT VI. REACTIVE POWER AND VOLTAGE CONTROL: (6hr)

Production and absorption of reactive power- Methods of Voltage Control – Shunt reactors – Shunt Capacitors – Series Capacitors – Synchronous condensers – Static Var systems – Principles of Transmission system compensation – Modeling of reactive compensating devices

Reference Books:

1. P. Kundur, “Power System Stability and Control”, McGraw-Hill, 1993.
2. Gross C. A., ‘Power System Analysis’ McGraw Hill
3. Arrilaga J., ‘Computerised Power system Analysis’ McGraw Hill
4. Foud Anderson, ‘Power system control dynamics’ McGraw Hill
5. Kaushik, ‘Computerised Power system Analysis’ McGraw Hill
6. Padiyar K. R., ‘Power system dynamics, ‘ New Age International

BTEEC702: HIGH VOLTAGE ENGINEERING	
Teaching Scheme:	Examination Scheme:
Theory: 3hr	Mid-term Test: 20 Marks
Tutorial: 0	Internal Assessment: 20 Marks
Total Credits: 3	End Term Exam: 60 Marks

Pre-requisite: Electrical Engineering Materials,Power systems I, Power Systems II

Course Objectives:

1. To study conduction and breakdown in gases, liquids and solids.
2. To understand the methods and measurement of high voltage generation and measurement
3. To explain the lightening phenomenon and insulation co-ordination.
4. To know different non-destructive testing and standards in HV.

Course Outcomes:

1. Illustrate the concept of electric field stresses, applications of insulating materials and methods for Non-destructive testing of equipment like transformers, insulators, isolators, bushings, lightning arrestors, cables, circuit breakers and surge diverters.
2. Explain the breakdown process in solid, liquid, and gaseous materials
3. Analyze methods for generation and measurement of High Voltages and Currents (both ac and dc)
4. Describe the phenomenon of over-voltage and choose appropriate insulation co-ordination levels based on IS & IEC Standards.

UNIT I: INTRODUCTION TO HIGH VOLTAGE ENGINEERING (2hr)

Electric Field Stresses,Poisson's equation, Estimation and Control of Electric Stress, Surge Voltages, their distribution and control.

UNIT II:CONDUCTION & BREAKDOWN IN GASES: (6hr)

Gases as insulation media, ionization processes, Townsend's current growth equation, current growth in presence of secondary processes, Townsend's criterion for breakdown in electronegative gases, time lags for breakdown, Streamers theory, Paschen's law, breakdown in non-uniform fields and corona discharge, corona under positive & negative polarities, glow & arc discharge, considerations in using gases for insulation purpose.

UNIT III: BREAKDOWN IN DIELECTRIC MATERIALS: (8hr)

Conduction & breakdown in liquid dielectrics: Pure and commercial liquids, breakdown in pure and commercial liquids, theories of breakdown in liquids. Breakdown in solid dielectrics: Intrinsic, electromechanical& thermal breakdown, chemical, electrochemical deterioration, treeing, tracking, internal discharges, breakdown in composite insulation, properties of solid insulators & other materials used in practice. Insulating materials: In power transformers, rotating machines, circuit breakers, cables, power capacitors & other equipment.

UNIT IV: OVER VOLTAGE DUE TO LIGHTENING PHENOMENON: (8hr)

Natural causes for over voltages – Lightning phenomenon, Overvoltage due to switching surges, system faults and other abnormal conditions, propagation of lightning voltage & current waves on transmission lines, reflection & transmission of traveling wave at junction, system control of over voltage due to switching protection of transmission lines against over voltage. Insulation co-ordination, surge diverters, equipment insulation level & co-ordination of substations.

UNIT V:GENERATION & MEASUREMENT OF HIGH VOLTAGES & CURRENTS: (10hr)

Generation of a) high d. c voltage b) power frequency high alternating voltage c) high frequency a. c. d) impulse voltages Standard impulse waves shapes and it's equation, multistage impulse generator, matrix circuit, generation of switching surges, tripping & control of impulse generators, generation of impulse currents.

Measurement of High Direct Current voltages, Abraham Voltmeter Measurement of High Voltages alternating and impulse, Measurement of High Currents-direct, alternating and Impulse, Oscilloscope for impulse voltage and current measurements

UNIT VI:NON DESTRUCTIVE TESTING: (6hr)

I.E.C. & IS codes for high voltage tests on electrical appliances & power apparatus &electrical motors, non- destructive testing, testing of insulators, bushings, isolators, circuit breakers, cables, transformers, surge diverter, layout of high voltage laboratories & test facilities.

Reference Books:

1) High Voltage Engineering: Fundamentals by E.Kuffel, W.S.Zaengl, J.Kuffel by Elsevier, 2nd Edition
2) High Voltage Insulation Engineering by Ravindra Arora, Wolfgang Mosch, New Age International (P) Limited, 1995.
3) High Voltage Engineering, Theory and Practice by Mazen Abdel Salam, Hussein Anis, Ahdan El-Morshedy, RoshdyRadwan, Marcel Dekker

Text Books:

1. Kamaraju V. & Naidu M. S., 'High Voltage Engineering', Tata-McGraw Hill
2. C. L. Wadhwa, "High Voltage Engineering", New Age International Pvt. Ltd

BTEEC703: ELECTRICAL DRIVES	
Teaching Scheme:	Examination Scheme:
Theory: 3hr	Mid-term Test: 20 Marks
Tutorial: 0	Internal Assessment: 20 Marks
Total Credits: 3	End Term Exam: 60 Marks

Pre requisite : Electrical machine-II, Power Electronics

Course objective :

Students will be able to understand the dynamics of drive system.
Students will be able to use various methods of speed control of AC and DC Drive.
Students will be have the ability to analyze the drive system
Students will be able to select proficiently and the proper drive system for particular application.
Students will be able to have basic knowledge of recent advancement in Electric Drive.

Course outcomes:

Analyze the dynamics of Electrical Drives system.
Use various control techniques for controlling the speed of AC and DC motors.
Analyze the AC and DC drives.
To Select/recommend the appropriate Drive according to the particular applications.
State the recent technology of AC and DC drive

UNIT I: . INTRODUCTION (8hr)

Advantages of Electrical Drives, Parts of Electrical drive, Choice of Electric drives Dynamics of Electrical drives: fundamental torque equations, multiquadrant operation, nature and classification of load torques, steady state stability, concept of load equalization in drives

UNIT II. .CONTROL OF ELECTRICAL DRIVES (6hr)

Modes of operation: Steady state, Acceleration, Deceleration, Drive classification. Closed loop control of drives : Current limit control, torque control, speed control, position control, Control of multi motor drives, speed sensing, current sensing, Classes of motor duty & criteria for selection of motor.

UNIT III. DC MOTOR DRIVES (7hr)

Review of basic characteristics of DC motors, Single phase drives : Single phase half wave converter drives, semi converter drives, Full converter drives, Dual converter drives. Three phase drives : Three phase half wave drives, semi-converter drives, full converter drives, dual-converter drives,

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DC-DC converter drives: Principle of Rheostatic and regenerative braking control, combined control, two and four quadrant DC-DC converter fed drives. Introduction to closed loop control of DC drives.

UNIT IV: INDUCTION MOTOR DRIVES (7hr)

Review of starting, braking and speed control of three phase induction motors, Stator voltage control, Rotor voltage control, frequency control, Voltage and frequency control, Current control, Closed loop control of Induction motors, Principle of Scalar and Vector control of Induction motor, Multiquadrant operation of induction motor drives fed from Voltage Source Inverters. Static rotor resistance control method, static slip power recovery control-Static Scherbius drive and StaticKramer drive.

UNIT V: SYNCHRONOUS MOTOR DRIVES (6hr)

Review of starting, pull in and braking of Synchronous motor,Static variable frequency control for Synchronous motors,Load commutated inverter fed Synchronous motor drive, Introduction to closed loop control of Load commutated inverter fed Synchronous motor drive.

UNIT VI: DRIVES FOR SPECIFIC APPLICATIONS (6hr)

Textile Mill: various stages and drive requirements control of ac motors for controlling torque. Steel Rolling Mill : reversing and continuous hot and cold rolling mills, Drive requirements, motors for mill drive. Cement mill : Stages in cement production, requirements of mill motors, Kiln drives, crusher drives, fan/blower drives, compressor drive. Sugar Mill : Requirements for various drive motors, selection of motors for various processes

Ref Books:

1. Dubey G. K., “Fundamentals of Electrical Drives”, Narosa Publishing house
2. De N. K., Sen P. K., “Electric Drives”, Prentice Hall of India
3. VedamSubramanyam, “Electrical Drives and Control”, TMH Publications

BTEEE704A: SPECIAL PURPOSE ELECTRICAL MACHINES	
Teaching Scheme:	Examination Scheme:
Theory: 3hr	Mid-term Test: 20 Marks
Tutorial: 0	Internal Assessment: 20 Marks
Total Credits: 3	End Term Exam: 60 Marks

Prerequisite:

AC Machines and DC Machines

Course Objectives:

To impart knowledge on Construction, principle of operation and performance of synchronous reluctance motors, stepping motors, switched reluctance motors, Permanent magnet brushless D.C. motors , Permanent magnet synchronous motors.

Course Outcome:

After Completion of this Course, student will be able

1. Demonstrate construction, working principle, and application of various types of special purpose electrical machines
2. Select a special Machine for a particular application
3. Demonstrate behaviour of induction generator and induction machine.

UNIT I. SYNCHRONOUS RELUCTANCE MOTORS (6hr)

Constructional features , Types – Axial and radial air gap motors – Operating principle – Reluctance – Phasor diagram - Characteristics – Vernier motor.

UNIT II. STEPPING MOTORS (6hr)

Constructional features – Principle of operation – Variable reluctance motor – Hybrid motor – Single and multi stack configurations – Theory of torque predictions – Linear and non-linear analysis – Characteristics – Drive circuits.

UNIT III. SWITCHED RELUCTANCE MOTORS (6hr)

Constructional features – Principle of operation – Torque prediction – Power controllers – Non-linear analysis – Microprocessor based control - Characteristics – Computer control.

UNIT IV. PERMANENT MAGNET BRUSHLESS D.C. MOTORS (8hr)

Principle of operation – Types – Magnetic circuit analysis – EMF and torque equations – Power controllers – Motor characteristics and control.

UNIT V. PERMANENT MAGNET SYNCHRONOUS MOTORS (8hr)

Principle of operation – EMF and torque equations – Reactance – Phasor diagram – Power controllers - Converter - Volt-ampere requirements – Torque speed characteristics - Microprocessor based control.

UNIT VI. INDUCTION MACHINES **(6hr)**

Induction generator–self excitation requirement – voltage regulation – different methods of voltage control –doubly fed induction machine – generation operating mode– linear Induction Motor

Text Books:

1. K.Venkataratnam, Special Electrical Machines, Universities Press (India) Private Limited, 2008.
2. T. Kenjo, Stepping Motors and Their Microprocessor Controls, Clarendon Press London, 1984
3. E.G. Janardanan, Special electrical machines, PHI learning Private Limited, Delhi, 2014.

References:

1. R.Krishnan, Switched Reluctance Motor Drives – Modeling, Simulation, Analysis, Design and Application, CRC Press, New York, 2001.
2. T. Kenjo and S. Nagamori, Permanent Magnet and Brushless DC Motors, Clarendon Press, London, 1988.
3. T.J.E.Miller,Brushless Permanent-Magnet and Reluctance Motor Drives, Oxford University Press, 1989.
4. R.Srinivasan, Special Electrical Machines, Lakshmi Publications, 2013.

BTEEE704B: ELECTRIC TRACTION & UTILIZATION	
Teaching Scheme:	Examination Scheme:
Theory: 3hr	Mid-term Test: 20 Marks
Tutorial:	Internal Assessment: 20 Marks
Total Credits:3	End Term Exam: 60 Marks

Prerequisite:

- Basics of Electrical Engineering and Electrical Machine-II.

Course Objectives:

1. To possess knowledge of advanced and emerging topics in traction mechanism and illumination engineering and their applications in the field.
2. An ability to design a traction system, a component, to meet desired needs of locomotive industry within realistic constraints and confirms manufacturability, and sustainability.
3. To mold students professionally to possess in-depth and advanced knowledge by course contents along with emerging topics.

Course Outcomes:

After Completion of this Course, student will be able to

1. Identify types of Traction System.
2. Interprete Various Power supply in Electric Traction.
3. Analyze Various Traction Motors.
4. Define methods of Traction motor Control.
5. Elobrate Train movement & Breaking in Traction system.
6. Classify the indoor and outdoor Illumination system.

UNIT I: ELECTRIC TRACTION SYSTEM: (8hr)

Electrical transmission: Electrical transmission system employing D.C. generator D.C. series motor, Electrical transmission system employing 3 phase alternator supplying D.C. traction motors, electrical transmission employing 3 phase alternator supplying induction motors, Choice of traction system-battery drive, hybrid drive, flywheel drive, tramways, trolley bus. Track electrification: D.C. System, single phase low frequency A.C. system, single phase high frequency A.C. system, 3 phase A.C. system and composite system.

UNIT II: POWER SUPPLY FOR ELECTRIC TRACTION: (6hr)

Current collection system, current collectors for Over Head Systems, Overhead construction for Tramways and trolley buses and railways, Sag and Tension calculation for a trolley wire, Traction substations, location of substations, feeding and distributing system, substation

equipment's. Block Diagram of AC Electric locomotive, Signaling interference in tele-communication circuits.

UNIT III: TRACTION MOTORS: (6hr)

Characteristics of traction motors, straight D.C. series motor, suitability of series motor for traction duty, constructional details of D.C. Traction Motors, Series motor using undulating D.C, suitability of shunt motor for traction duty, single phase series motors, Repulsion motor, compensated repulsion motor, Induction motor with variable frequency with SCR, Linear Induction motor.

UNIT IV: TRACTION CONTROL: (6hr)

Traction control: Duty cycle, Methods of traction motor control, series-Parallel and other types of controllers, use of interlocks, run back prevented, multiple unit control, Master controllers, Reverses, Dead man's handle, use of Metaldyne and Megavolt.

UNIT V: TRAIN MOVEMENT AND BRAKING: (8hr)

Speed time curve, its analysis and construction, schedule speed and factors affecting it, train resistance and its components. Tractive effort calculations, average acceleration and speed, energy output and consumption.

Braking: Mechanical versus electric breaking, rheostatic braking, Regenerative braking, method and energy saved in the process, Magnetic track brakes.

UNIT VI: ILLUMINATION: (6hr)

Requirement of good lighting, Classification of light fitting & luminaries, factors to be considered for design of indoor & outdoor lighting scheme, Design Procedure for factory lighting, street lighting.

Reference Books:

1) Utilization of Electrical Power and Electic Traction by J.B. Gupta. (Katson Book publisher)
2) H. Partab: Modern Electric Traction, Dhanpat Rai & sons.
3) Upadhayay J. & Mahindra S.N., Electric Traction, Allied Publishers Ltd., 1st Ed.
4) Rao P.S., Principle of 25 KV Overhead Equipments. R. (Nasik) Printpack Pvt Ltd,, 1st Ed.
5) Electric Traction for Railway Trains, by Edward P. Burch. McGraw Hill Book Co. Inc.
6) C.L.Wadhwa, "Generation, Distribution and Utilization of Electrical Energy", New Age International Publishers.

BTEEE704C: ENGINEERING SYSTEM DESIGN OPTIMIZATION	
Teaching Scheme:	Examination Scheme:
Theory: 3hr	Mid-term Test: 20 Marks
Tutorial:	Internal Assessment: 20 Marks
Total Credits: 3	End Term Exam: 60 Marks

Pre requisite: Linear Algebra, Non-linear Problems

Course Outcome:

1. To understand different level optimization problem formulation.
2. To study novel methods in optimization.
3. To understand and develop genetic algorithm for engineering problems.

UNIT I: INTRODUCTION (8hr)

Introduction to Optimization problem formulation, optimization algorithms, applications and examples, different optimization methods available

UNIT II: SINGLE VARIABLE OPTIMIZATION (6hr)

Optimization criteria, bracketing methods– Exhaustive search method, bound phase method, Region Elimination methods– Fibonacci search method, Golden search method, Gradient based methods– Newton Raphson method, Bisection method, Root finding using optimization technique

UNIT III: MULTI OBJECTIVE OPTIMIZATION (6hr)

Optimization criteria, Different search methods, Unidirectional search, Direct search method – Evolutionary optimization method, Powell's conjugate direction method, Gradient based methods– Newton's method and Variable metric method.

UNIT IV: SPECIALIZED METHODS (6hr)

Integer programming, Geometric programming, simulated annealing, Global optimization using - steep descent method, simulated annealing.

UNIT V: GENETIC ALGORITHMS AND EVOLUTIONARY APPROACHES (6hr)

Differences and similarities between genetic algorithms and traditional techniques, operators of GA's, Computer program for simulated annealing, Newton Raphson method, Evolutionary optimization method.

References

1. Kalyanmoy Deb, "Optimization for Engineering design", Prentice Hall,India, 2005.
2. Kalyanmoy Deb, "Multi objective optimization using Evolutionaryalgorithms", John Wiley,2001

BTEEE704D: FINANCIAL MANAGEMENT	
Teaching Scheme:	Examination Scheme:
Theory: 3hr	Mid-term Test: 20 Marks
Tutorial:	Internal Assessment: 20 Marks
Total Credits:3	End Term Exam: 60 Marks

Course Objectives:

• To help the students to develop cognizance of the importance of Financial Management in corporate valuation

• To enable students to describe how people analyze the corporate leverage under different conditions and understand why people valuate different corporates in different manner.

• To provide the students to analyze specific characteristics of Supply Chain Industry and their future action for cash flow

• To enable students to synthesize related information and evaluate options for most logical and optimal solution such that they would be able to predict and control Debt Equity incurrence and improve results.

Course Outcomes: At the end of this course students will demonstrate the ability to

1. The students would be able to understand and define basic terminology used in finance and accounts
2. The students would be able to prepare& appraise Financial Statements and evaluate a company in the light of different measurement systems.
3. The students would be able to analyze the risk and return of alternative sources of financing.
4. Estimate cash flows from a project, including operating, net working capital, and capital spending.
5. To estimate the required return on projects of differing risk ,to estimate the cash flows from an investment project, calculate the appropriate discount rate, determine the value added from the project, and make a recommendation to accept or reject the project
6. To describe and illustrate the important elements in project finance Using financial calculator and Excel in a variety of problems.

UNIT I: INTRODUCTION

Introduction to Financial Accounting, Book keeping & Recording: Meaning, Scope and importance of Financial Accounting. Financial Accounting - concepts and conventions, classification of accounts, Rules and principles governing Double Entry Book-keeping system, Meaning, Preparation of Journal, Ledger , Cash book & Trial balance.

UNIT II: FINANCIAL STATEMENT PREPARATION, ANALYSIS & INTERPRETATION

Preparation of financial statement and Profit & Loss Account, Balance Sheet. , Ratio Analysis - classification of various ratios.

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UNIT III: INTRODUCTION TO FINANCIAL MANAGEMENT

Concept of business finance, Goals & objectives of financial management, Sources of financing, Long Term financing- shares, debentures, term loans, lease & hire purchase, retained earnings, public deposits, bonds (Types, features & utility). Short Term Financing- bank finance, commercial paper, trade credit

UNIT IV: WORKING CAPITAL MANAGEMENT

Concept of working Capital, significance, types. Adequacy of working capital, Factors affecting working capital needs, financing approaches for working capital, Methods of forecasting working capital requirements, Methods of Forecasting.

UNIT V: TIME VALUE OF MONEY & CAPITAL BUDGETING

Concept of time value of money, Compounding & discounting; Future value of single amount & annuity, present value of single amount & annuity; Practical application of time value technique. Capital budgeting - Nature and significance, techniques of capital budgeting –Pay Back Method, Accounting rate of return, Internal Rate of Return, DCF, Net Present Value and profitability index.

UNIT VI: PROJECT FINANCING

Details of the company, its promoters and project finances required, profitability etc., Loan documentation-Appraisal of terms loans by financial institutions. Basic components of project finance.

TEXT & REFERENCE BOOKS:

1. Financial Management by Khan & Jain, Text, Problem & Cases, Tata McGraw Hill Publication 5th Edition.
2. Tulsian Financial Management by Dr. P.C.Tulsian, S Chand Publication 5th Edition.
3. Taxman's Financial Management by Ravi M. Kishore, Taxmann 2017 Edition.
4. A Textbook of Financial , Cost & Management Accounting by Dr.P.Pariasamy, Himalaya Publishing House
5. Fundamentals of financial Management by Bhabhtosh Banerjee, PHI publication, 2nd Edition.

BTEEE705A: DIGITAL SIGNAL PROCESSING	
Teaching Scheme:	Examination Scheme:
Theory: 3hr	Mid-term Test: 20 Marks
Tutorial:	Internal Assessment: 20 Marks
Total Credits:3	End Term Exam: 60 Marks

Prerequisite:

Digital Systems, Interfacing, Z-Transform, Fourier Transform

Course Objectives:

To understand the design and implementation of digital Signal processing systems

Course Outcomes:

After Completion of this Course, student will be able to

1. Represent signals, systems and digital processing of analog signals.
2. Represent discrete time signals, systems and analysis of Discrete-Time Linear Time-Invariant Systems.
3. Apply digital signal processing techniques to analyze discrete time signals in time domain.
4. Apply digital signal processing techniques to analyze discrete time signals in frequency domain.
5. Design different filter structure
6. Validate system functionality and evaluate results.

UNIT I: INTRODUCTION TO DIGITAL SIGNAL PROCESSING (8 hr)

Signals, Systems and Signal Processing: Basic Elements of a Digital Signal Processing System, Advantages of Digital over Analog Signal Processing.

Classification of Signals: Multichannel and Multidimensional Signals, Continuous-Time versus Discrete-Time Signals, Continuous-Valued Versus Discrete-Valued Signals, Deterministic Versus Random Signals.

The Concept of Frequency in Continuous-Time and Discrete-Time Signals: Continuous-Time Sinusoidal Signals, Discrete-Time Sinusoidal Signals, Harmonically Related Complex Exponentials.

Analog-to-Digital and Digital-to-Analog Conversion: Sampling of Analog Signals, the Sampling Theorem, Quantization of Continuous-Amplitude Signals, Quantization of Sinusoidal Signals, Coding of Quantized Samples, Digital-to-Analog Conversion, Analysis of Digital Signals and Systems versus Discrete-Time Signals and Systems.

UNIT II: DISCRETE-TIME SIGNALS AND SYSTEMS (8 hr)

Discrete-Time Signals: Some Elementary Discrete-Time Signals, Classification of Discrete-Time Signals, Simple Manipulations of Discrete-Time Signals.

Discrete-Time Systems: Input-Output Description of Systems, Block Diagram Representation of Discrete-Time Systems, Classification of Discrete-Time Systems, Interconnection of Discrete-Time Systems.

Analysis of Discrete-Time Linear Time-Invariant Systems: Techniques for the Analysis of Linear Systems, Resolution of a Discrete-Time Signal into Impulses, Response of LTI Systems to Arbitrary Inputs: The Convolution Sum, Properties of Convolution and the Interconnection of LTI Systems, Causal Linear Time-Invariant Systems, Stability of Linear Time-Invariant Systems, Systems with Finite-Duration and infinite-Duration Impulse Response.

Discrete-Time Systems Described by Difference Equations: Recursive and Nonrecursive Discrete-Time Systems, Linear Time-Invariant Systems Characterized by Constant-Coefficient Difference Equations, Solution of Linear Constant-Coefficient Difference Equations, The Impulse Response of a Linear Time-Invariant Recursive System

UNIT III: Z-TRANSFORM AND ITS APPLICATION TO THE ANALYSIS OF LTI SYSTEMS (6 hr)

Z-Transform: Direct z-Transform, Inverse z-Transform. Properties of z-transform. Rational z-Transforms: Poles and Zeros. Pole Location and Time-Domain Behavior for Causal Signals, System Function of a Linear Time-Invariant System. Inversion of the z-Transform: Inverse z-Transform by Contour Integration, Inverse z-Transform by Power Series Expansion, Inverse z-Transform by Partial-Fraction Expansion, Decomposition of Rational z-Transforms, One-sided z-Transform: Definition and Properties, Solution of Difference Equations.

UNIT IV: FREQUENCY ANALYSIS OF SIGNALS AND SYSTEMS (4 hr)

Properties of the Fourier Transform for Discrete-Time Signals: Symmetry Properties of the Fourier Transform, Fourier Transform Theorems and Properties.

UNITV:DISCRETE FOURIER TRANSFORM: PROPERTIES AND APPLICATIONS (8 hr)

Frequency Domain Sampling: The Discrete Fourier Transform: Frequency-Domain Sampling and Reconstruction of Discrete-Time Signals, Discrete Fourier Transform (DFT), DFT as a Linear Transformation, Relationship of the DFT to Other Transforms. Properties of the DlT: Periodicity. Linearity and Symmetry Properties, Multiplication of Two DFTs and Circular Convolution, Additional DFT Properties.

UNIT VI: IMPLEMENTATION OF DISCRETE- TIME SYSTEMS (6 hr)

Structures for the Realization of Discrete-Time Systems. Structures for FIR Systems: Direct-Form Structure, Cascade-Form Structures, Frequency-Sampling Structures, Lattice Structure.

Structures for IIR Systems: Direct-Form Structures, Signal Flow Graphs and Transposed Structures, Cascade-Form Structures, Parallel-Form Structures, Latticc and Lattice-Ladder Structures for IIR Systems.

Reference Book:

1) John G. Proakis, Dimitris G.Manolakis, “Digital Signal Processing”.
2) Shalivahanan, Vallavaraj and Gnanapriya, “Digital Signal Processing”

Text Book:

1) N.G.Palan, “Digital Signal Processing”
2) Ramesh Babu, “Digital Signal Processing”
3) Alon V. Oppenhelm, “Digitsl Signal Processing”, PHI Pub.
4) S.K.Mitra, “Digital Signal Processing”, TMH Pub.

BTEEE705B: ENERGY AUDIT AND CONSERVATION	
Teaching Scheme:	Examination Scheme:
Theory: 3hr	Mid-term Test: 20 Marks
Tutorial:	Internal Assessment: 20 Marks
Total Credits:3	End Term Exam: 60 Marks

Pre Requisite:

Basics of Electrical Machines, Power Plant Engineering

Course Objectives:

1. To understand the basic process involved in the energy audit and the terminologies associated in the process.
2. To be able to develop audit reports of any firm including large and small scale industries, residential and commercial establishments.
3. To select and comment on the appropriate method for the planning and monitoring of any energy conservation project.

Course Outcomes:

After Completion of this Course, student will be able

1. To recognize Global Environmental Issues and Role of Renewable & non-conventional energy sources
2. To estimate Energy efficiency opportunities in Thermal- Mechanical Systems and Electrical System.
3. To analyze Energy Conservation Proposals economically and prepare audit reports.

UNIT I: SOURCES OF ENERGY: (6hr)

Energy resources, Stored & running resources, Environmental Concerns – Global Warning , Depletion of Ozone layer, Kyoto Protocol, UNFCCC, CDM, Carbon Emissions, Role of Renewable Energy Sources

UNIT II: (7hr)

Energy Conservation Act 2001, Designated Consumers, Energy Policy, BEE and its role in Energy Conservation, Energy Audit – Need, Types , Methodology, Steps involved in Energy Audit, Energy Costs and Benchmarking , Measurements for Energy Audit, Energy Management Duties and Responsibilities.

UNIT III: THERMAL MECHANICAL SYSTEMS (8hr)

Boiler Efficiency by direct and indirect methods, Energy efficiency opportunities in boilers, HVAC, and refrigeration systems, compressed air systems, pumps, cooling towers, fans and blowers, Cogeneration – Need and Principle , Prime movers for cogeneration, Waste heat recovery systems – Recuperators, economizer heat recovery boilers.

UNIT IV: ELECTRICAL SYSTEMS **(7hr)**

Utilities: Energy conservation in generation, transmission,distribution & utilization, Electrical billing , load management ,maximum demand control, APFC Panel , PF improvement and benefits , Energy Efficient motors and starter, lightning systems, Electronic Ballast

UNIT V: **(6hr)**

Planning, Implementation & monitoring of energy conservation project, Time Value of money, Financial Investment – Simple payback period, ROI (Return on Investment), Net Present value, Internal rate of return, profitability index. All calculations and numerical interpretation.

UNIT VI: **(6hr)**

Case studies on various industrial sectors like Steel Plant, Thermal Plant, Industries Building and Commercial Establishments and preparing audit reports

Text Books:

1. "Industrial Energy Conservation" Charles M Gottschalk ,John Willey and Sons
2. "Energy Management" Paul O Callagham, Tata Mc Grawhill
3. "Energy Technology" – S Rao and B Parulekar , Khanna Publisher

References:

1. "Energy Management Handbook" – Wayne C Turner

BTEEE705C: ELECTRICAL POWER QUALITY	
Teaching Scheme:	Examination Scheme:
Theory: 3hr	Mid-term Test: 20 Marks
Tutorial:	Internal Assessment: 20 Marks
Total Credits:3	End Term Exam: 60 Marks

Prerequisite:

1. Basic Electrical concepts
2. Power Electronics concepts
3. Power system concepts

Course Objectives:

1. To study the various power quality issues, their production, monitoring and mitigation.
2. To study the various power quality standards.
3. To study various power quality monitoring methods.
4. To apply appropriate solution techniques for power quality Problems.

Course Outcome:

After Completion of this Course….

1. Student will be able to get the in-depth understanding of power quality issues & standards.
2. Students will be able to understand working of power quality improving Equipment's.

UNIT I: INTRODUCTION (7hr)

Understanding Power quality, definitions, growing concerns to Power Quality, Evaluation Procedure,General Classes of Power Qualitydisturbances, causes and effects of Power Quality disturbances

UNIT II: TRANSIENT OVER VOLTAGES (7hr)

Sources, causes and effects, Principle of Overvoltage protection and solutions. VoltageSag and Interruptions: causes and effects, estimation of voltage sag performance, principle ofprotection and solutions.

UNIT III: LONG-DURATION VOLTAGE VARIATIONS (7hr)

Long Duration Voltage variations, principles of regulating voltage Devices for voltage regulation, flickers, flicker sources and mitigation, quantifying flicker.

UNIT IV: FUNDAMENTALS OF HARMONICS **(7hr)**

Harmonic distortion, sources of harmonics, effects of harmonic distortion, Voltage Vs Current Harmonics,Active, Reactive, Volt-Amp power under non sinusoidal conditions, Harmonic Indices (THD and TDD),principles of harmonic control, mitigating devices, interharmonics, IEEE standard 519.

UNIT V: WIRING AND GROUNDING **(4hr)**

Reasons for Grounding, wiring and grounding problems and solutions

UNIT VI: POWER QUALITY MONITORING **(7hr)**

Monitoring Considerations, site survey, Monitoring Quality, monitoring location, PQ measuringinstruments, assessment of power quality measurement data, IEEE 1159 Standard. Impact of poor power quality on Reliability Indices.

References/Books:

1.Chattopadhyay, Surajit, Mitra, Electric Power Quality, Springer.
2.Haytt G. T., ―Electric Power Quality‖, Stars In Circle Publication.
3. NPTEL courses
a) NOC:Power Quality Improvement Technique, IIT Roorkee by Avik Bhattacharyya.
b) Power Quality in Power Distribution Systems, IIT Madras by Dr. Mahesh Kumar.

BTEEE705D: HVDC TRANSMISSION AND FACTS	
Teaching Scheme:	Examination Scheme:
Theory: 3hr	Mid-term Test: 20 Marks
Tutorial:	Internal Assessment: 20 Marks
Total Credits: 3	End Term Exam: 60 Marks

Pre requisite: Power System-II, Power Electronics

Course Outcome:

1. To understand importance, configuration and types of HVDC transmission.
2. To analyst the operation of HVDC converter, system control and protection.
3. To understand the concept of FACTS, their role, type and functionality.
4. To analyze the operation of static series and shunt compensator.

UNIT I: DC POWER TRANSMISSION FUNDAMENTALS (8hr)

Introduction, Economics of Dc Power transmission, comparison with AC system, Types of DC links, major components of converter station, planning of HVDC system.

UNIT II: HVDC CONVERTER (6hr)

Choice of converter configuration, analysis of Gratz circuit with and without overlap, working of converter as rectifier and inverter, equivalent circuit for HVDC link

UNIT III: HVDC SYSTEM CONTROL (6hr)

HVDC System Control: Principles of DC link control, converter control characteristics, firing angle control, current and extinction angle control, Starting and stopping of HVDC link

UNIT IV: CONVERTER FAULTS AND PROTECTION (6hr)

Converter Faults and Protection: Types of faults-commutation failure, Arc through, Misfire, short circuit in bridge, Over current and over voltage protection, Detection of line faults, Principle of DC circuit interruption, DC breakers, Types and characteristics of DC breakers, effects of proximity of AC and DC transmission lines.

UNIT V: FACTS CONCEPT AND GENERAL SYSTEM CONSIDERATIONS (6hr)

Transmission Interconnections, Flow of Power in an AC System, Loading Capability limits, Power Flow and Dynamic Stability Considerations of a Transmission Interconnection, Relative Importance of Controllable Parameters, Basic types of FACTS Controllers, Description and Definitions of FACTS Controllers, Benefits from FACTS Technology, Comparison between HVDC & FACTS.

UNIT VI: STATIC SHUNT COMPENSATORS (6hr)

Static Shunt Compensators: Objective of shunt compensation, Methods of Controllable VAR Generation, Static VAR Compensators: SVC and STATCOM, Comparison of SVC and

STATCOM, Static VAR Systems (SVS)Static Series Compensation: Objective of series compensation, Variable Impedance Type Series Compensators, Switching Converter Type Series Compensators

References

1. Padiyar K. R., “HVDC Power Transmission Systems”, New Age International.
2. Kimbark, “ HVDC Transmission”, John Willey AndSons.
3. Hingorani N. G., “ Understanding FACTS”, IEEE Press2001
4. Yong Hua Song, ‘ Flexible AC transmission systems(FACTS)’IEEE

BTEEL706: POWER SYSTEM OPERATION AND CONTROL LAB	
Teaching Scheme:	Examination Scheme:
Practical: 2hr	Continuous Assessment: 30 Marks
Total Credits: 1	End Term Exam: 20 Marks

Sr. No.	List of the Experiment
1	Write a program for economic dispatch in power systems using
2	Simulation of Automatic voltage regulator using MATLAB.
3	Write a program to compute the voltage and power factor for a given system using MATLAB.
4	Write a program to solve Swing Equation by Classical Method.
5	Write a program to plot power angle curve of synchronous machine using MATLAB.
6	Write a program to solve the given Equal Area Criteria problem using MATLAB.
7	To demonstrate the Excitation System for Synchronous machine using MATLAB
8	Simulation of single area load frequency control using MATLAB.

BTEEL707: HIGH VOLTAGE ENGINEERING LAB	
Teaching Scheme:	Examination Scheme:
Practical: 2hr	Continuous Assessment: 30 Marks
Total Credits: 1	End Term Exam: 20 Marks

Sr. No.	List of Experiment
1	Study of Faraday Cage for HV labs.
2	Study of Standard HV Laboratory layouts.
3	One min. (1-min.) DC high voltage withstand test on Equipment. (Max. up to 10 KV).
4	Effect of gap length on liquid insulating material.
5	Breakdown Strength of composite dielectric material.
6	Study of impulse generator.
7	High voltage withstand test on cables/safety gloves/shoes, as per IS. (Max. 2.25 KV DC)
8	Horn gap arrangement as surge diverter.
9	Measurement audible and visible corona inception and extinction voltage
10	Development of tracks and trees on polymeric insulation.
11	Study of Effect of EHV field on Human, Animals & Plants.

BTEEL708: ELECTRICAL DRIVES LAB	
Teaching Scheme:	Examination Scheme:
Practical: 2hr	Continuous Assessment: 30 Marks
Total Credits: 1	End Term Exam: 20 Marks

Pre requisite	Basic electronics engineering, basic electronics engineering Course
Course Outcome	• Efficiently use various AC and DC drive. • Simulate various drive system
Sr.No	List of Experiments
1	Study the ramp comparator firing circuit.
2	Study of single phase half wave converter and semi converter DC Drive .
3	Study of single phase full controlled converter (Bridge converter) DC Drive.
4	Speed control of DC motor using chopper.
5	Simulation of single phase half wave and semiconductor controlled DC drive.
6	Simulation of chopper fed DC Drive .
7	Study of AC Drive .
8	Study of V/f control of AC drive
9	Study the inverter fed induction motor drive.
10	Simulation of AC drive .

BTEES709: SEMINAR	
Teaching Scheme:	Examination Scheme:
Practical: 2hr	Continuous Assessment: 30 Marks
Total Credits: 1	End Term Exam: 20 Marks

Student shall choose a topic of his/her interest in consultation with faculty in the department. The topic for seminar may be related to Recent Developments in Instrumentation Engineering area and/or interdisciplinary area. Student shall attempt to collect necessary information and present a summary indicating comprehension of the topic and acquired depth of knowledge. A brief report on topic of seminar shall be submitted. Evaluation shall be based on report and power point presentation.

BTEEP710: PROJECT PART-I	
Teaching Scheme:	Examination Scheme:
Practical: 6hr	Continuous Assessment: 30 Marks
Total Credits: 3	End Term Exam: 20 Marks

Term work shall consist of detailed report for chosen topic and output of final working proposed. Report shall summarize the literature survey, spell out the scope of work, methodology and results. Viva-voce Examination shall be based on work carried out by the student. In case of students opting for Internship in the eighth semester, the Project may be industry-based.

BTEEF711: FIELD TRAINING/INTERNSHIP/INDUSTRIAL TRAINING III	
Teaching Scheme:	Examination Scheme:
Practical: --	Continuous Assessment: --
Total Credits: 1	End Term Exam: 50 Marks

Students are expected to undergo industrial training for at least four weeks at factory / design offices or in combination of these after VI semester. Training session shall be guided and certified by qualified engineer / industry expert. A neat detailed report on activities carried out during training is expected. Students should undergo training in Summer Vacation after Semester VI and appear at examination in Semester VII. A brief report of industrial training shall be submitted. Evaluation shall be based on report and power point presentation.

POWER MANAGEMENT INTEGRATED CIRCUITS	
Teaching Scheme:	Examination Scheme:
Theory: 3hr	Mid-term Test: 20* Marks
Total Credits: 3	Internal Assessment: 20* Marks
	End Term Exam: 60* Marks

Prof. Qadeer Ahmad Khan | IIT Madras

Course Duration: 12 weeks

CourseOutline:

This course is intended to develop understanding of why power management circuits are needed in a VLSI system, what are the different components of a power management system with focus on voltage regulators. By the end of this course, students should be able to understand the concept behind power management circuits and design a linear (LDO) and switching regulator (dc-dc converter) for a given specifications using behavioral and circuit level simulators.

Course Plan:

Week 1 : Introduction to Power Management - Application, Need, Discrete vs. Integrated PMIC; DC-DC Converters, Types of DC-DC Converters, Linear versus Switching Regulator, Choosing between Linear and Switching Regulators, Choosing the Type of Regulator in a Multi-Chip System; Performance Parameters - Efficiency, Accuracy, Line and Load Regulation, Line and Load Transient, PSRR; Remote versus Local Feedback, Point-of-Load Regulator, Kelvin Sensing, Droop Compensation; Current Regulators and their Applications; Bandgap Voltage Reference - Designing a Bandgap Reference using PTAT and CTAT Voltage References, Brokaw Bandgap Circuit.

Week 2: Sub-1-volt Bandgap Reference; Introduction to Linear Regulator, Applications of Linear Regulator; Review of Feedback Systems and Bode Plots, Loop Gain AC Analysis, Stability Criterion and Phase Margin, Review of First-Order and Second-Order Systems, Relationship between Damping Factor and Phase Margin; Parasitic Capacitances in a MOS transistor, Finding the Poles of the Error Amplifier; Stabilising a Linear Regulator - Frequency Compensation Techniques, Dominant Pole Compensation.

Week 3 : Miller Compensation, R.H.P. zero due to Miller Compensation, Intuitive Methods of Determining Poles and Zeros after Miller Compensation, Pole Splitting due to Miller Compensation, Reducing the Effect of R.H.P. zero; LDO with NMOS Pass Element; Load Regulation and Output Impedance of LDO; Line Regulation and PSRR of LDO; Sources of Error in a Regulator, Static Offset Correction, Dynamic Offset Cancellation.

Week 4 : Digital LDO, Avoidance of Limit-Cycle Oscillations in a Digital LDO, Hybrid LDO; Short-Circuit Protection and Foldback Current Limit in an LDO; Basic Concept of a Switching Regulator, Inductor volt-second Balance, Power Stage of a Buck Converter and Calculation of Duty Cycle; Transformer Model of a Buck Converter, Resistive Losses, Efficiency of a Switching Regulator, Efficiency considering only Conduction Losses; Synchronous and Non-Synchronous Switching Converters; PWM Control Techniques (Voltage-Mode and Current-

Mode Control); Losses in Switching DC-DC Converter- Conduction Loss, Gate-Driver Switching Loss, Segmented Power FETs, Dead-Time Switching Loss.

Week 5 : Hard Switching Loss, Magnetic Loss, Relative Significance of Losses as a Function of the Load Current; Inductor Current Ripple and Output Voltage Ripple in a DC-DC Converter, Ripple Voltage versus Duty Cycle, Ripple Voltage versus Input Supply Voltage; Choosing the Inductor and Capacitor of a Buck Converter; Continuous and Discontinuous Conduction Modes - Boundary Condition, Voltage Conversion Ratio in DCM; Concept of Pulse Frequency Modulation (PFM); Classification of Pulse Width Modulators -- Trailing, Leading and Dual-Edge PW Modulators; Control Techniques for DC-DC Converters; Voltage Mode Control, Small-Signal Modeling of a DC-DC Converter, Loop Gain and Stability Analysis using Continuous-Time Model.

Week 6 : Compensating a Voltage-Mode-Controlled Buck Converter; Designing Type-I (Integral), Type-II (PI) and Type-III (PID) Compensators; Implementation of Compensators using Op Amp-RC and Gm-C Architectures, Finding Compensation Parameters; Design Examples with Simulation Demonstrations.

Week 7 : Designing Type-III Compensator using Gm-C Architecture and Design Example; Ramp Generator with Feed-Forward Line Compensation, Loop Gain Compensation via Gm-modulation; Designing a Buck Converter - Power Loss Budgeting, Sizing of Power FETs, Estimation of Switching Losses and Choice of Switching Frequency, Choosing the External Passive Components (L and C); Choice of C in Relation to Factors that Limit the Load Transient Response; Inductor and Capacitor Characteristics, Reducing the Effect of Capacitor ESL.

Week 8 : Designing the Gate-Driver (Gate Buffer and Non-Overlap Clock Generator), Designing the Ramp Generator in a Pulse-Width Modulator, Design Considerations of the Error Amplifier; Delays Associated with Pulse-Width Modulators; PFM/PSM for Light Load, Using PSM in CCM to Avoid Duty Cycle Saturation; DCM Operation using an NFET; Designing a Zero-Cross Detector/Comparator; Introduction to Current Mode Control; Peak, Valley and Average CMC; Sub-Harmonic Oscillations, Avoiding Current Loop Instability via Slope Compensation in a Current-Mode-Controlled Buck Converter.

Week 9 : Non-Linear Control Techniques for DC-DC Converters; Hysteretic Control - Stability Issues due to Phase Shift between Inductor Current and Capacitor Voltage; Voltage-Mode versus Current-Mode Hysteretic Control, Stabilising a Voltage-Mode-Controlled Hysteretic Converter using R_esr, Relation between Hysteresis Window and Switching Frequency, Using R-C Circuit as Ripple Generator in a Current-Mode-Controlled Hysteretic Converter, Hybrid Voltage-Mode and Current-Mode Hysteretic Control, Fixed-Frequency Hysteretic Control, Effect of Loop Delay, Frequency-Regulation and Voltage-Regulation Loops in a Fixed-Frequency Hysteretic Converter; Constant ON/OFF-Time Control; Basic Concept of a Boost Converter, RHP zero in a Boost Converter.

Week 10 : Introduction to the Buck-Boost Converter, Tri-Mode Buck-Boost Converter, Boundary Conditions for Mode Transition in a Tri-Mode Buck-Boost Converter, Generation of Buck and Boost Duty Cycles; Introduction to Switched-Capacitor DC-DC Converters,

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Applications of SC DC-DC Converters in Open-Loop, Output Regulation in SC DC-DC Converters using Feedback Control, H-Bridge SC DC-DC Converter, Multiple Gain Settings in SC DC-DC Converters; Current-Sensing Techniques in DC-DC converters.

Week 11 : Selecting the Process Node for a PMIC, Chip-Level Layout and Placement Guidelines, Board-Level Layout Guidelines, EMI Considerations; Introduction to Advanced Topics in Power Management --- Digitally-Controlled DC-DC Converters, Adaptive Compensation Techniques, Limitations of Analogue and Digital Controllers, Time-Based Control Techniques and their Drawbacks, Multi-Phase DC-DC Converters; Dynamic Voltage and Frequency Scaling (DVFS); Single-Inductor Multiple-Output (SIMO) DC-DC Converters.

Week 12 : Introduction to Advanced Topics in Power Management (continued) - DC-DC Converters for LED Lighting, LCD/AMOLED Display Drivers, LED Drivers for Camera Flash, Lithium-ion Battery and its Charging Phases, Battery Charger ICs.

DC POWER TRANSMISSION SYSTEM	
Teaching Scheme:	Examination Scheme:
Theory: 03	Mid-term Test: 20* Marks
Tutorial: 00	Internal Assessment: 20* Marks
Total Credits: 3	End Term Exam: 60* Marks

Prof. Krishna S, IIT Madras

Course Duration: 12 weeks

CourseOutline:

This course gives an introduction to the DC power transmission system using the conventional line commutated converters. The topics covered include a detailed analysis of the 6 pulse line commutated converter (LCC), 12 pulse LCC, capacitor commutated converter, DC link control, and design of single tuned filter.

Course Plan:

Week 1: Introduction, choice of converter configuration

Week 2: Converter configuration for pulse number equal to 6, analysis of 6 pulse LCC neglecting overlap

Week 3: Fourier series, analysis of 6 pulse LCC neglecting overlap

Week 4: 2 and 3 valve conduction mode of 6 pulse LCC

Week 5: Extinction angle, 3 and 4 valve conduction mode and 3 valve conduction mode of 6 pulse LCC

Week 6: Commutation margin angle, normalization, characteristics of 6 pulse LCC, steady state analysis of a general LCC

Week 7: 6 pulse LCC with other circuits on the AC and DC sides

Week 8: Capacitor commutated converter, 12 pulse LCC

Week 9: Mode of operation of 12 pulse LCC, purposes of transformer, applications of DC transmission, types of DC link, DC link control

Week 10: Converter control characteristics, MTDC systems, non-characteristic harmonics

Week 11: Design of single tuned filter

Week 12: Double tuned and damped filters, reactive power requirement, comparison of AC and DC transmission

HIGH POWER MULTILEVEL CONVERTERS	
Teaching Scheme:	Examination Scheme:
Theory: 3hr	Mid-term Test: 20* Marks
Tutorial:	Internal Assessment: 20* Marks
Total Credits: 3	End Term Exam: 60* Marks

Prof. Anandarup Das, IIT Delhi

Course Duration: 12 weeks

CourseOutline:

The course covers different types of high power converters used in the industry for applications in HVDC, FACTS, Motor Drives, Power quality improvement. Traditional converters like NPC and emerging converters like modular multilevel converters will be covered. Operational issues and design considerations for these medium/high voltage high power converters will be covered. The course will discuss many practical issues faced in the industry while designing and operation of these converters.

Course Plan:

Week 1 : (a) Half bridge, Full bridge and three phase converters, sinusoidal PWM

Week 2 : (a) 3rd harmonic addition, space vector PWM

Week 3 : (a) Different types of multilevel converters
(b) Cascaded H-Bridge converter – Basic operation

Week 4 : (a)PWM Techniques for CHB converter
(b) Fault tolerant operation of CHB converter

Week 5 : (a) Modular Multilevel converter- Topology, operation and PWM

Week 6 : (a) Capacitor voltage balancing in MMC
(b) Design of components of MMC

Week 7 : (a) NPC converter – Basic operation
(b) NPC (3 level) Space vector diagram

Week 8 : NPC - PWM technique and midpoint balancing

Week 9 : (a) Case study of High Power converters for Motor drive and HVDC application

Week 10 : (a) Multi –pulse transformers

Week 11 : (a) Gate Drive circuit designing, protection and condition monitoring in high power converters

Week 12 : (a) Other topologies : conclusion

FUZZY SETS, LOGIC AND SYSTEMS & APPLICATIONS	
Teaching Scheme:	**Examination Scheme:**
Theory: 3hr	Mid-term Test: 20* Marks
Tutorial:	Internal Assessment: 20* Marks
Total Credits: 3	End Term Exam: 60* Marks

Prof. Nishchal Kumar Verma, IIT Kanpur

Course Duration: 12 weeks

CourseOutline:

The course is designed to give a solid grounding of fundamental concepts of fuzzy logic and its applications. The level of the course is chosen to be such that all students aspiring to be a part of computational intelligence directly or indirectly in near future should get these concepts.

Course Plan:

Week 1 : Introduction and Fuzzy Sets Theory

Week 2: Membership Functions

Week 3: Set Theoretic Operations

Week 4: Fuzzy Arithmetic

Week 5: Fuzzy Relations

Week 6: Fuzzy Inference Systems I

Week 7: Fuzzy Inference Systems II

Week 8: Wang and Mendel Model

Week 9: TSK Model

Week 10: Fuzzifiers and Defuzzifiers

Week 11: ANFIS Architecture

Week 12: Fuzzy Systems and Machine Learning

THE JOY OF COMPUTING USING PYTHON	
Teaching Scheme:	Examination Scheme:
Theory: 3hr	Mid-term Test: 20* Marks
Tutorial: 1hr	Internal Assessment: 20* Marks
Total Credits: 3	End Term Exam: 60* Marks

Prof.Sudarshan Iyengar, Department of Computer Science and Engineering, IIT Ropar

Course Duration: 12 weeks

CourseOutline:

ThisisamostfundamentalDigitalCircuitDesigncourseforpursingamajorinVLSI. We do not deal with any Verilog coding during this course and instead discuss transistor level circuit design concepts in greatdetail.

Learning objectives of this course are:

- Characterize the key delay quantities of a standardcell
- Evaluate power dissipated in a circuit (dynamic andleakage)
- Design a circuit to perform a certain functionality with specifiedspeed
- Identify the critical path of a combinationalcircuit
- Convert the combinational block to pipelinedcircuit
- Calculate the maximum (worst case) operating frequency of the designedcircuit

Course Plan:

Motivation for Computing
Variables and Expressions: Design your own calculator
Loops and Conditionals: Hopscotch once again
Lists, Tuples and Conditionals: Let’s go on a trip
Abstraction Everywhere: Apps in your phone
Counting Candies: Crowd to the rescue
Birthday Paradox: Find your twin
Google Translate: Speak in any Language
Currency Converter: Count your foreign trip expenses
Monte Hall: 3 doors and a twist
Sorting: Arrange the books
Searching: Find in seconds
Substitution Cipher: What’s the secret !!
Sentiment Analysis: Analyse your Facebook data
20 questions game: I can read your mind
Permutations: Jumbled Words
Spot the similarities: Dobble game
Count the words: Hundreds, Thousands or Millions.
Rock, Paper and Scissor: Cheating not allowed !!
Lie detector: No lies, only TRUTH

Calculation of the Area: Don’t measure.
Six degrees of separation: Meet your favourites
Image Processing: Fun with images
Tic tac toe: Let’s play
Snakes and Ladders: Down the memory lane.
Recursion: Tower of Hanoi
Page Rank: How Google Works !!

INTRODUCTION TO INDUSTRY 4.0 AND INDUSTRIAL INTERNET OF THINGS	
Teaching Scheme:	**Examination Scheme:**
Theory: 3hr	Mid-term Test: 20* Marks
Tutorial:	Internal Assessment: 20* Marks
Total Credits: 3	End Term Exam: 60* Marks

Prof. SudipMisra, IIT Kharagpur

Course Duration: 12 weeks

CourseOutline:

Industry 4.0 concerns the transformation of industrial processes through the integration of modern technologies such as sensors, communication, and computational processing. Technologies such as Cyber Physical Systems (CPS), Internet of Things (IoT), Cloud Computing, Machine Learning, and Data Analytics are considered to be the different drivers necessary for the transformation. Industrial Internet of Things (IIoT) is an application of IoT in industries to modify the various existing industrial systems. IIoT links the automation system with enterprise, planning and product lifecycle.

Course Plan:

Week 1 : Introduction: Sensing & actuation, Communication-Part I, Part II, Networking-Part I, Part II

Week 2 : Industry 4.0: Globalization and Emerging Issues, The Fourth Revolution, LEAN Production Systems, Smart and Connected Business Perspective, Smart Factories

Week 3 : Industry 4.0: Cyber Physical Systems and Next Generation Sensors, Collaborative Platform and Product Lifecycle Management, Augmented Reality and Virtual Reality, Artifical Intelligence, Big Data and Advanced Analysis

Week 4 : Cybersecurity in Industry 4.0, Basics of Industrial IoT: Industrial Processes-Part I, Part II, Industrial Sensing & Actuation, Industrial Internet Systems.

Week 5 :IIoT-Introduction, Industrial IoT: Business Model and RefereceArchiterture: IIoT-Business Models-Part I, Part II, IIoT Reference Architecture-Part I, Part II.

Week 6 : Industrial IoT- Layers: IIoT Sensing-Part I, Part II, IIoT Processing-Part I, Part II, IIoT Communication-Part I.

Week 7 : Industrial IoT- Layers: IIoT Communication-Part II, Part III, IIoT Networking-Part I, Part II, Part III.

Week 8 : Industrial IoT: Big Data Analytics and Software Defined Networks: IIoT Analytics - Introduction, Machine Learning and Data Science - Part I, Part II, R and Julia Programming, Data Management with Hadoop.

Week 9 : Industrial IoT: Big Data Analytics and Software Defined Networks: SDN in IIoT-Part I, Part II, Data Center Networks, Industrial IoT: Security and Fog Computing: Cloud Computing in IIoT-Part I, Part II.

Week 10 : Industrial IoT: Security and Fog Computing - Fog Computing in IIoT, Security in IIoT-Part I, Part II, Industrial IoT- Application Domains: Factories and Assembly Line, Food Industry.

Week 11 : Industrial IoT- Application Domains: Healthcare, Power Plants, Inventory

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Management & Quality Control, Plant Safety and Security (Including AR and VR safety applications), Facility Management.

Week 12 : Industrial IoT- Application Domains: Oil, chemical and pharmaceutical industry, Applications of UAVs in Industries, Real case studies :

Case study - I : Milk Processing and Packaging Industries
Case study - II: Manufacturing Industries - Part I
Case study - III : Manufacturing Industries - Part II
Case study - IV : Student Projects - Part I
Case study - V : Student Projects - Part II
Case study - VI : Virtual Reality Lab
Case study - VII : Steel Technology Lab

ENTREPRENEURSHIP ESSENTIALS	
Teaching Scheme:	Examination Scheme:
Theory: 3hr	Mid-term Test: 20* Marks
	Internal Assessment: 20* Marks
Total Credits: 3	End Term Exam: 60* Marks

Prof. Manoj Kumar Mondal, IITKharagpur

Course Duration: 12 weeks

CourseOutline:

The course provides foundational knowledge on various aspects of entrepreneurial venture creation and management during its life-cycle. It has been designed to address multidisciplinary audiences. The objective of the course is to teach key issues faced by entrepreneurs and managers at different stages of the life-cycle of an enterprise and is relevant both for aspiring entrepreneurs and for decision makers in established enterprises. Topics can be classified in some major themes such as : Making a choice to create an entrepreneurial venture, current trend of technology entrepreneurship, how to start a start-up, identifying opportunities, factors driving competitive advantages, organizational structure, basic knowledge of financial statements and project report,introductory knowledge on marketing management, human resource management, & strategic management, risk analysis, legal aspect of business, how to raise fund during life-cycle of a new ventures.

Course Plan:

Week 1 : Introduction
DhirubhaiAmbani& Sofia
Myths & Realities about entrepreneurship
entrepreneurial qualities
Why start-ups fail?

Week 2: Mission, vision, entrepreneurial qualities – I
Mission, vision, entrepreneurial qualities – II
Value proposition
Business Model canvas
Business model generation

Week 3: Competitive advantage
Lean start-up – 1
Lean start-up – 2
Team and early recruit
Legal forms of business

Week 4: Marketing management 1
Marketing management 2
Market research –I
Market research –II
Market research –Example

Week 5: Introduction to financial statements
Profit & Loss statement
Balance sheet

Cash flow
Example – 1
Example – 2
Cost-volume-profit & Bread-Even analysis
Capital budgeting

Week 6: Business plan-I
Business plan-II
Pitching
Go-to-market strategies
Does & Don'ts

Week 7: How to innovate
Design Thinking
Design-Driven Innovation, Systems thinking
Open innovation, TRIZ
How to start a start-up?

Week 8: Government incentives for entrepreneurship (1 lecture)
Incubation, acceleration
Funding new ventures – bootstrapping, crowd sourcing, angel investors, VCs, debt financing (3), due diligence
Legal aspects of business (IPR, GST, Labour law)

Week 9: Cost, volume, profit and break-even analysis
Margin of safety and degree of operating leverage
Capital budgeting for comparing projects or opportunities
Product costing
Product pricing

Week 10: Funding new ventures – bootstrapping, crowd sourcing,
Angel investors, VCs, debt financing (3), and due diligence
Incubation and acceleration
Government incentives for entrepreneurship
Project cost and Financial Closure

Week 11: Dos &Donts in entrepreneurship
Growth Hacking
Growth Strategy
Legal aspects of business (IPR, GST, Labor law)
Negotiation skill

Week 12: Human Resource management in startups
Pivoting
Entrepreneurial cases
Risk assessment and analysis
Strategy management for entrepreneurial ventures
Factors driving success and failure of ventures
Concluding remarks

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BTEEP803: PROJECT-II	
Teaching Scheme:	Examination Scheme:
Practical: 30hr	Continuous Assessment: 100 Marks
Total Credits: 15	End Term Exam: 150 Marks

Since Project Stage II is in continuation to Project Stage I, the students are expected to complete the total project by the end of semester VIII. After completion of project work, they are expected to submit the consolidated report including the work done in stage I and stage II.

The report shall be comprehensive and presented typed on A4 size sheets and bound. The number of copies to be submitted is number of students plus two. The assessment would be carried out by the panel of examiners for both, term work and oral examinations.