

Approved by
MIT-WPU
Academic Council
8 JUN 2023

Date
08 JUN 2023
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MIT-WPU
Academic Council
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2023-2029

DEVELOPMENT

DEPARTMENT OF POLYTECHNIC AND SKILL

SCHOOL OF ENGINEERING AND TECHNOLOGY

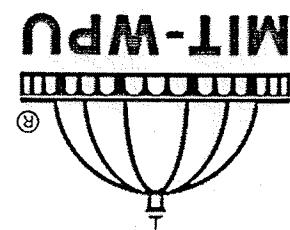
COMPUTER SCIENCE AND ENGINEERING

INTEGRATED B.TECH.

FACULTY OF ENGINEERING AND TECHNOLOGY

SYLLABUS

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



"Prestigious" 8th

Printable:

PROGRAMME STRUCTURE

There are several ways to present the canonical core of computing science. Over the years we have developed a distinctive style and method that bridges the theory-practice divide while remaining grounded in the core. Technology changes rapidly, especially in the field of computing. Those who are clear and thorough about the fundamentals can adapt to rapid changes in technology relatively easily.

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

Computer Science is a highly diversified profession with several varying specialties and job profiles. It is considered as the fastest growing discipline in the Engineering world. The majority of them are programming and software development positions available in private IT firms and enterprises.

Peace courses and Yoga activity are included as part of the syllabus. This will ensure that prospective engineers will offer unstoppable performance with a calm, constructive and sharp mind. One can find reflection of requirements of statutory bodies and international trends in the programme education.

Dr. Rohini Kale	Dr. Vrushali Kulkarni	Head, School of Computer	Department of Polytechnic	Department of Polytechnic
Mrs. Joyti Mane	Mr. S. J. Kulkarni	Program Director	Head, School of Computer	and Skill Development

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effectively in the world of work.

- PEO 3.** Solve broad-based problems individually and as a team member communicating in multi-disciplinary work environments.
- PEO 2.** Adapt state-of-the-art Computer engineering broad-based technologies to work Computer engineering related problems adapting professional ethics.
- PEO 1.** Provide socially responsible, environment friendly broad-based solutions to provide PEOs) as follows:

The Department of Computer Engineering has articulated the Program Education Objectives

Programme Educational Objectives

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

MISSION

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

VISION

Vision and Mission of the Programme

- PO1** Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex problems.
- PO2** Problem analysis: Identify, formulate, review research literature, and analyze engineering problems.
- PO3** Design/development of solutions: Design solutions for complex engineering problems with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- PO4** Conduct investigations of complex problems: Use research-based knowledge and synthesis of the information to provide valid conclusions.
- PO5** Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering activities with an understanding of the limitations.
- PO6** The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional practice.
- PO7** Environment and sustainability: Understand the impact of the professional engineering knowledge on the environment and sustainable development.
- PO8** Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- PO9** Individual and team work: Function effectively as an individual, and as a member of diverse teams, and in multidisciplinary settings.
- PO10** Communication: Communicate effectively on complex engineering activities with the engineering community and society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- PO11** Project management and finance: Demonstrate knowledge and understanding of the member and leader in a team, to manage projects and in multidisciplinary environments.
- PO12** Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.



APPROVED

- Computer Science & Engineering Graduate will be able to:
- PSO1 Computer Software and Hardware Usage: Use state-of-the-art technologies for operation and application of computer software and hardware.
- PSO2 Computer Engineering Maintenance: Maintain computer engineering related software and hardware systems.
- PSO3 Testing of Developed Software's / Programs Test, Debug and Troubleshoot developed programs to given problems.

Programme Specific Outcomes

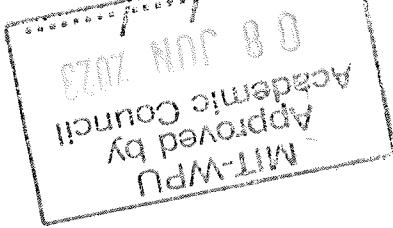
d) Credit distribution for UG Programs (Polytechnic):

(c) Credits System (As per Academic Ordinance 2023-24): A unit by which the course work assigned to the student is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one hour of supervised learning (SL) and two hours of self-learning time (SLT) per week. The supervised and unsupervised learning weightage may vary as per course requirement. Considering the self-learning requirement, peer learning and faculty facilitation, the student shall have maximum 3 hours of supervised learning and 5 hours of self-learning time every instructional day. One Credit defined as 15 hrs of Supervised Learning in Classroom/Seminar setting, 30 hrs of Self-cum supervised learning in laboratory setting. This also presumes that for one hour supervised learning at least two hours of self-learning time is spent by the student. Teaching Learning Process at MTTPU is designed to ensure this. Student will be typically taking 15-24 Credits per Semester of 15 weeks. A 3-year course will mean completing 132 credits.

(b) System followed : Semester

(a) Programme duration : Three Years (UG)

Programme Structure:



- a) 20-22 credits to be allotted per semester and 40-44 per year.
 b) The positioning of Professional Electives (total 16 credits) should be decided by the respective non-research programs.

Note:

- a) Peace Code: PC00UC01A Foundation of Peace -2 credits-Lecture (L)
 b) Yoga Code: YOG0UC02A Yoga-I credits I- Practical (P)

*Semester 2:

- a) Yoga Code: YOG0UC01A Yoga-I credits I- Practical(P)

* Semester 1:

Program Core	M. Tech. by Papers	M. Tech. by research	Total
Program electives	16	nil	32 total credits
Research Program	Break up of research credits	(4 one month)	30 total credits
University Research	Thesis	24	04
University Seminar	Seminar	02	02
University Multi-project	Multi project	02	-
University Research Methodology	Researc h Uni ver sity	04(first semester)	04(first semester)
University Peace + Yoga	Peace + Yoga	05 (02+02+01)*	05 (02+02+01)*
Total	88		88

e) Credit distribution for PG (M. Tech. programs)

MITWPU Course codes with effect from AY 2023-27

Course Code Logic

2. AAA: The first three alphabets stand for an exclusive short code of the Program/BOS owing the course. (Such as Phy for Physics, CHM for Chemistry, MST for Materials Science and MSE for Materials Science and Engineering, COS for Computer Science, CSE for Computer Science and Engineering, CHE for Chemical Engineering etc.).

1. The proposed course code is of the format **AAABCDDDE**. It has total nine characters comprising alphabets/digits.

3. B: Fourth digit stands for course level/year

a) Level 0 for Diploma/First three years of Integrated B.Tech. course

b) Level 1 for first year UG courses

c) Level 2 for second year UG courses

d) Level 3 for third year UG courses

e) Level 4 for fourth year UG courses including Honors level for three-year degree courses

f) Level 5 for fifth year UG courses (Wherever applicable, Else after UG I to 4 move to

g) Level 6 for Sixth year UG courses (Wherever applicable, Else after UG I to 4 move to 7 and 8 for PG)

h) Level 7 for first year PG courses

i) Level 8 for second year PG courses

j) Level 9 for PhD Courses

4. CC: Fifth and Sixth alphabets stand for the type of course as per Academic Ordinance 2023.

24. CC: Fifth and Sixth alphabets stand for the type of course as per Academic Ordinance 2023.

a) Program Disciplinary Foundation - PF

b) Program Major - PM

c) Program Electives - PE

d) Program Capstone Project, Problem Based Learning, Seminar and Internships - PR

e) University Core - UC

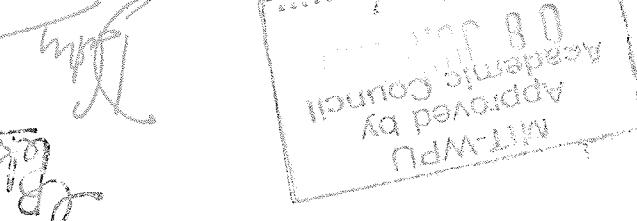
f) University Elective - UE

g) Bridge Courses - BC

6. E: Ninth digit stands for the version of the same course. For example, 'A' is the first version,

'B' is second version and so on. There will be change of version in course if the contents are modified (more than 20%) after one academic year by the BOS.

7. Note for Program Electives: The program Electives are offered in the form of tracks viz., Track 1, Track 2, etc. The course serial number for the track subjects is to be given as follows.



*There are some 6 years UG courses, therefore UG Course level/year is given from I to 6 and PG 7-8 and PhD 9.

Level	Year of Instruction	Course	Revision	serial number	Course code
Diploma	1	PM	02	A	ECE0PM02A
Diploma/ Integrated	2	PF	11	A	ECE0PF11A
Diploma/ Integrated	3	PM	20	A	ECE0PM20A
Integrated Diploma/ Diploma/ Integrated	1	PF	02	A	ECE1PF02A
UG	2	PM	03	A	ECE2PM03A
UG	3	PR	05	A	ECE3PR05A
UG	4	PM	02	A	ECE4PM02A
UG*	5	PM	02	A	ECE5PM02A
UG*	6	PM	02	A	ECE6PM02A
PG	1	PM	02	A	ECE7PM02A
PG	2	PM	02	A	ECE8PM02A
Ph.D.	1	PM	02	A	ECE9PM02A

levels is given below.

13. Example: Sample course codes for Electronics and Communication Engineering for all the

particular type.

courses serial numbers can be given serially starting from the I year through III year for a

12. Note for Diploma/Integrated B.Tech. Courses: The level for these courses will be 0. The

Programs including their course codes will be published very soon.
 Engineering will have a code CHE3UE11A. Detailed policy regarding offering of the Minor
 Thus for example, the first subject in a sequence of courses leading to a Minor in Chemical
 minor program. Their codes will be based on the lines of Program Electives given in 7 above.
 the parent program/Bos offering the elective. They will be offered as courses constituting a
 will come from all programs across the university designed for students who do not belong to
 11. Note for University Electives: University Electives will be offered from AY 2024-25. They

right now.

10. Note for University Core Courses: University core courses codes will be assigned by the
 office of Dean Academics. Mention them just as UC in appropriate places in your structure

9. on Example: For a Program Elective of Chemical Engineering for Track I whose first subject
 comes in third year, the course code will be CHE3PE11A.

8. For track I, subject 1, the course serial number should be 11, Track 1, subject 2, the course
 serial number should be 12, Track 3, subject 1, the course serial number should be 31 and so

Type of Course	Assessment Scheme	Description	L-T-P-J-C	CCAI	MTC	CCA2	LCA1	LCA2	LCA3	TE	Total Credits
Theory Courses	TTI	All Theory (L, T) Only courses with TE exams	15	30	15	-	-	-	-	40	100
Theory Courses	TT2	All Theory (L, T) only courses without TE exams	35	30	35	-	-	-	-	100	
Theory Courses with Continuous Evaluation	TT2	All Theory (L, T) only courses without TE exams	35	30	35	-	-	-	-	100	
Lab / Projects/ Internship/ Dissertation	Pj	All courses having P and J components Only	-	-	-	33.33	33.33	33.33	-	100	
Theory and Lab Course 1	TL1	2-0-2-0-4	7.5	15	7.5	10	10	10	40*	100	
Theory and Lab Course 2	TL2	1-0-3-0-4	2.5	10	2.5	15	15	15	40*	100	
Theory and Lab Course 3	TL3	3-0-1-0-4	10	25	10	5	5	5	40	100	
Theory and Lab Course 4	TL4	2-0-1-0-3	10	20	10	6.67	6.67	6.67	40	100	
Theory and Lab Course 5	TL5	1-0-2-0-3	5	10	5	13.33	13.33	13.33	40*	100	
Theory and Lab Course 6	TL6	2-1-1-0-4	10	25	10	5	5	5	40	100	
Theory and Lab Course 7	TL7	1-1-1-0-3	10	20	10	6.67	6.67	6.67	40	100	

Abbreviation	Assessment Scheme
CCAI - Class Continuous Assessment 1,	MT - Mid Term Test,
CCA2 - Class Continuous Assessment 2,	TE - Term End Exam
LCA1 - Laboratory Continuous Assessment 1,	LCA2 - Laboratory Continuous Assessment 2,
LCA3 - Laboratory Continuous Assessment 3,	LCA3 - Laboratory Continuous Assessment 3,

Assessment Scheme:

*** Assessment of Immersive Courses such as Concreteation, Rural Immersion, RIDE, NAPI will be done as per pre-approved rubrics.

** Assessment of MOOC courses including the conversion of the grade / score / percentage obtained therein will be as per the MOOC policy approved by the BOE.

3. QP will be sent along with Invigilators by DOE.
2. The time for Term End Exams will be a maximum of 3 hrs. slot.
1. All eligible students will be taking this exam in the same space and at the same time following conditions:

* Term End Exams to be conducted anywhere within the MITWPU Campus subject to the

Theory and Lab Course 8	TL8	4-0-1-0-5	11.5	25	11.5	4	4	4	40	100
Theory and Lab Course 9	TL9	3-0-2-0-5	9	24	9	6	6	6	40	100
Theory and Lab Course 10	TL10	2-0-3-0-5	7	10	7	12	12	12	40	100
Theory and Lab Course 11	TL11	1-0-4-0-5	2.5	7	2.5	16	16	16	40	100
Theory and Lab Course 12	TL12	1-0-1-0-2	7.5	15	7.5	10	10	10	40*	100
Theory and Lab Project Course without term end	Pj	Any Combination of Lab and theory credits				33.33	33.33	33.33	-	100
MOOC Courses	M**	Pre-approved MOOC courses with number of credits as given in the syllabus				-	-	-	-	100
Immersive Courses such as Concreteation, Rural Immersion, RIDE, NAPI	I***	Credits as per syllabus				-	-	-	-	100

Integrated B. Tech. Computer Science and Engineering (First Year)
(Batch 2023-2029)

Semester I

Sr. no	Course Code	Name of course	Type	Weekly Workload, Hrs				Credits	Assessment Scheme Code
				L	T	P	J		
1	MST0PF01A	Foundation of Engineering Mathematics	PF	3	1	0	0	4	TT1
2	PHY0PF01A	Physics-I	PF	3	0	2	0	4	TL3
3	CHM0PF01A	Chemistry-I	PF	2	0	2	0	3	TL4
4	CSE0PF01A	Problem Solving & Program Design Using C Language	PF	2	0	0	0	3	TL4
5	MEC0PF01A	Graphics for Engineers	PF	0	0	4	0	2	PJ
6	ENG0PF01A	English	PF	2	0	0	0	2	TT2
7	YOG0UC01A	Yoga-I	UC	0	0	2	0	1	
8	WPU0UC20A	Cocreation	UC	0	0	0	3	1	
9	WPU0UC03A	Indian Constitution	UC	1	0	0	0	1	
		Total:		13	1	12	3	21	

Weekly Teaching Hours: 29

Total Credits: First Year Integ. B. Tech Semester I: 21

**Assessment Marks are valid only if Attendance criteria are met
L-Lecture, T-Tutorial, P-Practical, J-Project.

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Academic
Coordinator


Program
Director/HoS


Associate Dean
Academics


Dean Academics
MITWPU

Registrar
MITWPU



Dr. Upasana Kariah
MIT WORLD PEACE
UNIVERSITY | PUNE
Transforming Lives Through Knowledge & Skill Development

Integrated B. Tech. Computer Science and Engineering (First Year)

(Batch 2023-2029)

Semester II

Sr.no	Course Code	Name of course	Type	Weekly Workload, Hrs				Credits	Assessment Scheme Code
				L	T	P	J		
1	MST0PF02A	Calculus and Basic Statistics	PF	3	1	0	0	4	TT1
2	PHY0PF02A	Physics-II	PF	3	0	2	0	4	TL3
3	CHM0PF02A	Chemistry-II	PF	2	0	2	0	3	TL4
4	CIV0PF01A	Basics of Mechanics	PF	2	0	2	0	3	TL4
5	ECE0PF01A	Fundamentals of Electrical & Electronics Engineering	PF	2	0	2	0	3	TL4
6	CSE0PF02A	Programming in C	PF	0	0	4	0	2	PJ
7	YOG0UC02A	Yoga-II	UC	0	0	2	0	1	
8	PCE0UC01A	Foundation of Peace	UC	2	0	0	0	2	
9	WPU0UC05A	Critical Thinking	UC	1	0	0	0	1	
10	WPU0UC01A	Learning to Learn	UC	1	0	0	0	1	
		Total:		16	1	14	0	24	

Weekly Teaching Hours: 31

Credits: First Year Integ. B. Tech Semester II: 24

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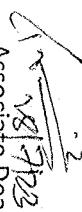
Date



Academic
Coordinator



Program
Director/HoD



Associate
Dean
Academics



Dean
Academics

Registrar
MITWPU

Integrated B. Tech. Computer Science and Engineering (Second Year)
(Batch 2023-2029)
Semester – III



Sr. no	Course Code	Name of course	Type	Weekly Workload , Hrs				Credits	Assessment Scheme
				L	T	P	J		
1	MST0PPF03A	Linear Algebra and Differential Calculus	PF	3	0	0	0	3	TT1
2	CSE0PM01A	Algorithms and Data structures Concepts	PM	3	0	4	0	5	
3	CSE0PM02A	Object Oriented Programming	PM	3	0	2	0	4	TL3
4	CSE0PM03A	Relational Database Management System Concepts	PM	3	0	0	0	4	TL3
5	CSE0PM04A	Fundamentals of AI	PM	2	0	0	0	2	TT2
6	CSE0PM05A	Skill Course-1 : JS and Angular	PM	0	0	4	0	2	PJ
7	CSE0PR01A	Problem Based Learning-1	PR	0	0	0	0	3	PJ
8	WPU0UC06A	Digital Literacy	UC	1	0	0	0	1	
		Total:		15	0	12	3	22	

Weekly Teaching Hours: 30

Total Credits: Second Year Integ. B. Tech Semester III: 22

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

L-Lecture, T-Tutorial, P-Practical, J-Project.

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Date

LB
Lekha

LB
Academic Coordinator

LB
Program Director/Hos

Academics

LB
Associate Dean

Academics

LB
Dean Academics

Registrar
MITWPU

Integrated B. Tech. Computer Science and Engineering (Second Year)

(Batch 2023-2029)

Semester – IV

Sr. no	Course Code	Name of course	Weekly Workload, Hrs					Credits	Assessment Scheme
			Type	L	T	P	J		
1	MST0PP04A	Integral Calculus	PF	3	0	0	0	3	TTI
2	CSE0PM06A	Foundations of Network Security	PM	3	0	2	0	4	TL3
3	CSE0PM07A	Competitive Programming	PM	2	0	4	0	4	TL1
4	CSE0PM08A	Digital Techniques	PM	2	0	2	0	3	TL4
5	CSE0PM09A	Python Programming	PM	3	0	2	0	4	TL3
6	CSE0PM10A	Java Programming	PM	0	0	4	0	2	PJ
7	CSE0PM11A	Skill Course-2 : Web Technology - React JS, Node.js	PM	0	0	0	2	2	PJ
8	CSE0PR02A	Problem Based Learning-2	PR	0	0	0	3	1	PJ
9	WPU0UC07A	Financial Literacy	UC	1	0	0	0	1	
		Total:		14	0	18	3	24	

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

L-Lecture, T-Tutorial, P-Practical, J-Project

Total Credits: Second Year Integ. B. Tech Semester IV: 24

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DR. R. K. Kankar

Academic Coordinator

WPS

28/07/23
Associate Dean
Academics

Deepti Jadhav
Dean Academics

MITWPU

Registrar
MITWPU

Integrated B. Tech. Computer Science and Engineering (Third Year)
(Batch 2023-2029)

Semester -V



Sr. no	Course Code	Name of course	Weekly Workload , Hrs					Credits	Assessment Scheme Code
			Type	L	T	P	J		
1	CSE0PM12A	Advanced Java Technologies	PM	1	0	4	0	3	TL5
2	CSE0PM13A	Fundamental of Computer Networks	PM	3	0	2	0	4	TL3
3	CSE0PM14A	Concepts of Operating Systems	PM	3	0	2	0	4	TL3
4	CSE0PM15A	Fundamentals of Cloud Computing	PM	2	0	2	0	3	TL4
5	CSE0PE11A	Introduction to Blockchain Technology	PE	3	0	2	0	4	TL3
6	WPU0UC23A	2.Basics of Machine Learning							
7	CSE0PR03A	National Academic Immersion Program (NAIP)	UC	0	0	4	0	2	
8	WPU0UC04A	Capstone Project Stage-I Environment and Sustainability	PR	0	0	0	3	1	PJ
		Total:		13	0	16	3	22	

Weekly Teaching Hours: 32

Total Credits: Third Year Integ. B. Tech Semester V: 22

**Assessment Marks are valid only if Attendance criteria are met
L-Lecture, T-Tutorial, P-Practical, J-Project.

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Weekly Teaching Hours: 32
Total Credits: Third Year Integ. B. Tech Semester V: 22

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Program Director/HoS

Associate Dean Academics

Dean Academics

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Integrated B. Tech. Computer Science and Engineering (Third Year)

(Batch 2023-2029)

Semester -VI



Sr. no	Course Code	Name of course	Type	Weekly Workload, Hrs				Credits	Assessment Scheme Code
				L	T	P	J		
1	CSE0PE12A	Block Chain Technology Concepts	PE	3	0	2	0	4	TL3
2	CSE0PMI6A	Applied Machine Learning	PM	3	0	2	0	4	TL3
3	CSE0PMI7A	Mobile App Development	PM	0	0	4	0	2	PJ
4	CSE0PMI18A	Skill Course-3: Spring boot	PM	0	0	4	0	2	PJ
5	CSE0PR04A	Capstone Project Stage-II	PR	0	0	0	9	3	PJ
6	CSE0PR05A	Winter Internship	PR	0	0	0	12	4	PJ
		Total:		6	0	12	21	19	

**Assessment Marks are valid only if Attendance criteria are met
L-Lecture, T-Tutorial, P-Practical, J-Project

Weekly Teaching Hours: 39
Total Credits: Third Year Integ. B. Tech Semester VI: 19

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10 JUN 2023

10 JUN 2023

Academic Coordinator

Program Director/HoS

Associate Dean Academics

Dean Academics

Registrar

MITWPU

Integrated B. Tech. (Computer Science and Engineering) (2023-29)

Professional Elective Tracks

Semester	Course Code	Name of the Course	Type
V	CSE0PE11A	Introduction to Blockchain Technology	Program Elective - I
V	CSE0PE21A	Basics of Machine Learning	Program Elective - I
VI	CSE0PE12A	Block Chain Technology Concepts	Program Elective - II
VI	CSE0PE22A	Applied Machine Learning	Program Elective - II

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08 JUN 2023
Date...../...../.....

P.B. Lakshmi.

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8 JUN 2023


Academic
Coordinator


Program
Director/HoD


Associate Dean
Academics


Dean Academics


Registrar
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English for Practical Purpose, ISBN 978-81-333-5098

315-2140-0

• English language Communication Skills-Lab Manual cum workbook by Cengage, ISBN 978-1-

• Faculty's blog: <https://english4wpupoly.blogspot.com/>

• Learning Resources: English Laboratory Linguaphone software

• English for Practical Purposes

• Comprehension

• Formal writing

• Vocabulary Building

• Grammar

Course Contents:

3. Learn to communicate precisely and write reports on various occasions
4. Comprehend any content in English
3. Communicate meaningfully and confidently in formal and informal situations
2. Communicators can make good use of vocabulary

1. Communicating Using English grammar

Course Outcomes: The theory experiences along with the relevant soft skills with this course are to be taught and implemented, so that the students demonstrate the following industry-oriented course outcomes aligned with the mentioned competency:

(iii) Developing confidence for communicating in English

(ii) Positive attitude for communicating in English

3. Attitude (i) Speaking / Listening simple English Texts including Literature and Reports

2. Skills (ii) Writing /Reading simple English Texts including Literature and Reports

(iii) Knowledge of English grammar

1. Knowledge (i) Knowledge Vocabulary

Course Objectives: The aim of this course is to help students to acquire the skills of using English language and communicate proficiently.

Assessment Scheme code: T72

Pre-requisites: Basic English language course at SSC level

Course Title	Humanities	English	Teaching Scheme and Credits	Weekly load hrs	L	T	Lab/Practical	Credits	30	--	--	2
Course Code	ENGPF01A											

COURSE STRUCTURE-2023



Dean

- Classroom interactive method
- Group Discussion
- Mock sessions for practical purposes.
- Class discussion
- Interactive Method

Pedagogy: The pedagogy for this course involves use of:

<https://npTEL.ac.in/courses/109104030/>
<https://npTEL.ac.in/courses/109106067/>

<https://www.edx.org/>
<https://www.coursera.org/>

<https://ocw.mit.edu/courses>

<https://www.youtube.com/watch?v=ltPCM8bpE2M&t=307s>

Web links: <https://english4wuppoly.blogspot.com/>

<https://www.openlearning.com/courses/english-for-test-product-description-2-0>

<https://www.futurelearn.com/courses/categories/languages-and-cultures-courses>

<https://www.edx.org/courses?subject=Language&language=English>

<https://moococ.com/courses/elementary-english-course>

<https://alison.com/courses/social-english-language-skills/content>

<http://www.talkenglish.com/>

https://www.english-chiffen.de/en/exercises_list/all_words.htm

<https://www.duolingo.com/course/en/ar/Learn-English-Online>

<http://learnenglish.britishcouncil.org/en>

Web Resources:

Reference Books:

- English for Practical Purpose, ISBN:033935098
- Mid, How to Enjoy Conversations and Build Assertiveness, ISBN:9789198569124
- Keith Colleman 2019. Communication Skills and Strategies to Effectively Speak Your

Sharma Sangita and Mishra Bindu 2009. Communication Skills for Engineers and

classrooms. Mahwah, NJ: Erlbaum. ISBN: 0-8058-3955-0.

Himki, E. ed. 2002. New perspectives on grammar teaching in second language

Sabrina Pillai/Agnia Femadez. Soft Skills and Employability Skills,

ISBN9780199457069

Kumar Sanjay and Lata Pushpa 2015. Communication Skills, Oxford University Press,

English Language Communication Skills by Chennagere Learning, ISBN978-81-315-2140-3

English Grammar and Composition by S C Gupta, ISBN13 978-935176846

Advanced English grammar by Martin Hewings ISBN13 978-8175960671

8 JUN 2023

Module No.	Contents	Theory Workload in Hrs	Lab	Assess
Grammar				
1	<ul style="list-style-type: none"> Articles Tenses Modal Auxiliaries Active Passive Voice Direct-Indirect Speech 	12hrs	-	2
2	<ul style="list-style-type: none"> Vocabulary Building Prefix - Suffix Collocation 	2hrs	-	2
3	<ul style="list-style-type: none"> English For Practical Purposes English for personal use- introducing, requesting, apologizing and thanking, English for formal purpose- Handling small talk Interview Techniques 	6hrs	-	2
4	<ul style="list-style-type: none"> Comprehension: Hearst and Hands By O. Henry The Fly By Katherine Mansfield A Child's Biography By Louisa May Alcott 	4hrs	-	2
5	<ul style="list-style-type: none"> Formal Writing Report Writing Precise Writing 	6hrs	-	2

- Demonstration Method

Date 8 JUN 2023

Approved by
MIT-WPU
Academic Council

Faculty of Engineering and Technology

DEAN

Approved by
Prof. Dr. Preeti Joshi
HOS and Associate Dean
School of Liberal Arts

Approved by
Prof. Dr. R. S. Kale
Associate Dean
Dept. of Polytechnic

Approved by
Prof. Dr. Sunil S. Karda
Head of School
Dept. of Polytechnic

Approved by
19/07/23

School of Leadership

Professor
Prof. Dr. Gopala Nayak

Faculty of English
Dr. Malayuri L. Waghamare

Verified by
19/07/23

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1. Logarithms based on definition and laws
2. Solution of simultaneous equation by Cramer's Rules and area of triangle
3. Transpose and adjoint of matrix.
4. Algebra of complex numbers

Tutorials:

Unit 5: Differential calculus

Unit 4: Co-ordinate Geometry

Unit 3: Trigonometry

Unit 2: Complex Number

Unit 1: Algebra

Course Contents:

- After completion of this course students will be able to
1. Apply the concepts of algebra to solve engineering related problems.
 2. Use the basic concepts of Complex Number to find Polar form.
 3. Utilize basic concepts of trigonometry to solve elementary engineering problems.
 4. Solve basic engineering problems under given conditions of straight lines.
 5. Apply the concepts of differentiation to solve engineering related problems and study of the equation of tangent, maxima and minima, radius of curvature

Course Outcomes:

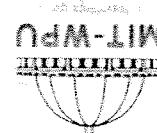
1. Knowledge
 - (i) To understand concept of angles and factorization formulae.
 - (ii) To understand concept of partial fraction.
 - (iii) To learn concepts of logarithm, Determinant, Matrices and its applications
2. Skills
 - (i) To use derivatives as a tool in engineering.
 - (ii) To interpret for suitability.
3. Attitude
 - (i) Interpreting for suitability.

Course Objectives:

Assessment scheme code - TTI

Pre-requisites: SSC or equivalent passed with first class

Course Code	MST0PF01A	Course Category	Program Discipline Foundation	Course Title	Foundational Engineering Mathematics	Teaching Scheme and Credits	Total work load hours	Assessment scheme code - TTI
						L T Laboratory Credits	3 1 0 3+1+0=4	

COURSE STRUCTURE

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- <https://www.coursera.org/browse/math-and-logic>
- www.math-magic.com

MOOCs:

- https://www.khanacademy.org/math?cl_id=CNgHubCVs4CFDjAoddHOpIg
- www.wolfram.com/mathematica - Mathematica
- www.allmathcad.com/ - MathCAD
- www.scilab.org/ ; SCILab

Web Resources:

Supplementary Reading: Notes and Assignments.

- Nirmale, V.K., "Basic mathematics", Technical publication, Pune ISBN: 9789333214759
- Academic Press 2011, ISBN:9780123846549
- Weber H.J. and Arfken G.B., "Mathematical Methods For Physicists", 6th edition, Leningrad 2015, ISBN-13: 978-1337274524
- O'Neill Peter, "Advanced Engineering Mathematics", 8th edition, Cengage
- Supplimentary Reading: ISBN-9788121903455
- Das, H.K., "Advanced Engineering Mathematics", S. Chand & Co., New Delhi, 2008, Limited 2015, ISBN-13: 978-0470458365
- Kreyszig Erwin, "Advanced Engineering Mathematics", 10th edition, Wiley Eastern ISBN: 8174091955
- Grewal, B.S., "Higher Engineering Mathematics" Khanna publications, New Delhi, 2015

Text Books/Reference Books

Learning Resources:

15. Finding equation of tangent and normal.
14. Derivatives of implicit function and parametric function.
13. Finding value of the function at different points.
12. Angle between two lines
11. Distance between two parallel lines.
10. Perpendicular distance between two lines.
9. Inverse circular trigonometric ratios.
8. Factorization and de factorization.
7. Compound and Allied, multiple, sub multiple angles.
6. De-moivre's theorem
5. Polar form of complex number

Module No.	Algebra	Logarithm: Concept and laws of logarithm Determinant value of determinant of order 3x3. Solutions of simultaneous equations in three unknowns by Cramer's rule Matrices: algebra of matrices, Transpose, Ad joint and Inverse of matrices. Solution of simultaneous equations by matrix inversion Partial fraction: Types of partial fraction based on method. nature of factors and related problems.	Complex Number	De-moivre's theorem (without proof), examples based on it. Polar form of complex number. Modulus and amplitude of complex number Algebra of complex numbers Definition of complex number De-moivre's theorem (without proof), examples based on it. Exponential form of complex number Euler form of circular functions, Hyperbolic function Relation between circular and hyperbolic function	Trigonometry	Trigonometric ratios of Compound angle Allied angle. Sub-multiple angles Multiple angles Factorization formulae, De-factorization formulae Inverse trigonometric functions Principle values
Asses	Is	Theory	Tutorial	Contents	Workload in Hrs	Modul e
10	10	02	02	01	01	2
01	01	02	02	01	01	3

Syllabus

1. Group Discussion.
 2. Think share pair.
 3. Presentation of the sub topic

Pedagogy:

Dept of Mathematics

Head of School,

Prat. Prashant Malvadkar

Vertrieben By

M.F. Sachin Gujral

VERIFIED BY

Lecture

Mr V.K. Nirmale

Prepared By

4	Co-ordinate Geometry	<ul style="list-style-type: none"> Straight line and slope of straight line. Angle between two lines. Condition of parallel and Perpendicular lines. Various forms of straight lines. Slope point form, two point form, two points Intercept form. General form. Perpendicular distance from a point on the line. Perpendicular distance between two parallel lines 	07	02
5	Differential Calculus	<ul style="list-style-type: none"> Concept of function and simple examples. Concept of limits without examples Derivatives: Rules of derivatives such as sum, product, quotient of functions. Derivative of composite functions (Chain Rule), implicit and parametric functions. Derivatives of inverse, logarithmic and exponential functions. Second order derivative without examples. Application of Derivative: Equations of tangent and normal. Maxima and Minima, Radius of curvature. 	12	02
61				

COURSE STRUCTURE

Course Code	PHYOPF01A	Course Category	Program Discipline Foundation	Course Title	Physics-I	Technique Scheme and Credits	Weekly Load hrs.
				L	T	Laboratory	Credits
				3	0	I	4

Pre-requisites:

SSC or equivalent passed with first class.
Assessment scheme code - TL3

Course Objectives:

- Course Outcomes:

 1. To establish a foundation of measurements and error estimation.
 2. To establish a foundation of properties of matter.
 3. To characterize and analyze the concept of electricity and magnetism.
 4. To develop understanding of behavior of light.
 5. To establish foundation of acoustics and sound.

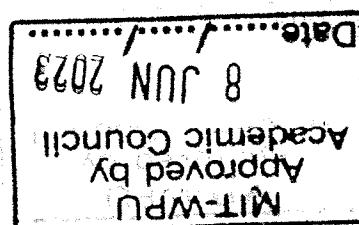
After successful completion of this course, student will be able to :

Course Outcomes:

1. Estimate errors in the measurement of physical quantities.
 2. Apply the principles of elasticity and viscoelasticity to solve engineering problems.
 3. Apply the principles of electricity to solve engineering problems.
 4. Apply the basic principles of optics in related engineering applications.
 5. Understand the concept of acoustics and sound to establish engineering applications.

Course Contents:

1. Units and Measurements
 2. Properties of Matter
 3. Electricity and Magnetism
 4. Optics
 5. Acoustics and Sound waves



- Vhanakhamde, B.B; Waghi, Snehal S "Technical publication" ISBN-9789333214995
- ISBN 81-7450-631-4 (Part I) ISBN 81-7450-671-3 (Part II)
- Class XI " National Council of Education Research and Training, New Delhi.
- Narlikar, J. V.; Joshi, A. W.; Mather, Anuradha; et al " Physics Textbook ISBN 81-7450-508-3
- Class XI " National Council of Education Research and Training, New Delhi.
- Narlikar, J. V.; Joshi, A. W.; Mather, Anuradha; et al " Physics Textbook ISBN 81-7450-631-4 (Part I) ISBN 81-7450-671-3 (Part II)
- Narlikar, J. V.; Joshi, A. W.; Mather, Anuradha; et al " Physics Textbook ISBN 81-7450-508-3

Supplementary Reading:

- Bhattacharya D.K., Bhaskaran A "Engineering Physics", Oxford higher education.
- Malik, Hitendra; A.K.Singh "Engineering Physics" Tata McGraw hill education private limited. ISBN: 9780198065425
- M N Avadhani "A Textbook of Engineering Physics", S. Chand publication ASIN: B01G6ZZPOs
- sons, Hoboken, USA, 2014 ISBN : 812650823X
- Halliday, David; Resnick, Robert and Walker, Jeal, "Fundamentals of Physics", John Wiley and Sons, India ISBN-13: 978-9352606955
- Malik, Hitendra; A.K.Singh "Engineering Physics" Tata McGraw hill education private limited. ISBN: 9780198065425
- Bhattacharya D.K., Bhaskaran A "Engineering Physics", Oxford higher education.

Reference Books:

Learning Resources:

- Use Vernier calliper to measure dimensions of given objects and estimates the errors in measurement.
- Use Screw gauge to Measure dimensions of given objects and estimate the errors in measurement.
- Determine Young's modulus of elasticity of a wire using Hooke's law of elasticity.
- Determine the coefficient of viscosity of given liquid by Stokes method.
- Verify the principle of Potentiometer.
- Determine the specific resistance of given wire.
- Use magnetic compass to draw the magnetic lines of forces of magnet of different shapes.
- Determine refractive index of prism.
- Verify principle of total internal reflection by Prism method.
- Determine velocity of sound using resonance tube.

Laboratory Exercises / Practical:

Module No.	Module Load in Hrs.	Workload in Hrs.	Contents		
			Theory	Lab	Assess
1.	7	4	2	2	2
			Units and Measurements Unit, physical quantities: fundamental and derived quantities and their units, requirements of good unit, Systems of unit, dimensions, dimensional formula, accuracy, precision, errors, types of errors, estimation of an error.		
			Properties of Matter: Deforming Force and Restoring Force, Elasticity, Plasticity, Rigidity, Stress and Strain and their types, Elastic limit and Hooke's law, types of moduli of elasticity, Stress - Strain diagram, Poisson's ratio and factors affecting elasticity. Archimedes' principle, Viscosity, velocity gradient, Newton's law of viscosity, Free fall of spherical body through viscous medium and Stokes' law. Formula of coefficient of viscosity η by Stokes' and Stokes' law. Effect of temperature and adulteration on viscosity of liquids.		
			Fluid friction, pressure, pressure-depth relation, Pascal's law, Archimedes' principle, Viscosity, velocity gradient, Newton's law of viscosity. Free fall of spherical body through viscous medium and Stokes' law. Formula of coefficient of viscosity η by Stokes' and Stokes' law. Effect of temperature and adulteration on viscosity of liquids.		
2	10	4	2	2	2
			Properties of Matter: Deforming Force and Restoring Force, Elasticity, Plasticity, Rigidity, Stress and Strain and their types, Elastic limit and Hooke's law, types of moduli of elasticity, Stress - Strain diagram, Poisson's ratio and factors affecting elasticity. Archimedes' principle, Viscosity, velocity gradient, Newton's law of viscosity, Free fall of spherical body through viscous medium and Stokes' law. Effect of temperature and adulteration on viscosity of liquids.		
3	10	6	3	3	3
			Electricity and Magnetism: Concept of charge, Coulomb's inverse square law, Electric field, Electric field intensity, Electric potential, electric flux, Magnetic field, magnetic lines of force, magnetic flux, Ohm's law, specific resistance, Wheatstone bridge, potentiometer, laws of series and parallel combination of resistances.		
4	10	4	2	2	2
			Optics: Reflection, refraction, laws of reflection, Snell's law, internal reflection, Optical fiber principle and its applications, physical significance of refractive index, Prism formula, total internal reflection to interference and polarization of light.		

Pedagogy: Chalk and talk, PPT, Experiments, Online teaching, Quizzing.

MOOCs: <https://www.mooc-list.com/course/basic-physics-open2study>

- Web links:
- a. <http://nptel.ac.in/course.php?disciplineId=115>
 - b. <http://nptel.ac.in/course.php?disciplineId=104>
 - c. <http://hyperphysics.phy-astr.gsu.edu/base/hph.html>
 - d. <http://physicsclassroom.com>
 - e. www.physics.org

Web Resources:

5	Acoustics and Sound waves: Concept and definition, Intensity and loudness of sound, echo, reverberation, standard reverberation time, Sabine's formula, Condition for good acoustics, factors affecting acoustic planning of auditorium. Sound wave, equation of progressive wave, free oscillations, forced oscillations, resonance, determination of sound velocity using resonance tube.		
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- Laboratory Exercises / Practical:**
- Structure of atom.
 - Chemical bonding and Catalysis.
 - Acids and Bases.
 - Corrosion and its preventives.
 - Study of some important organic compounds.
 - Know your chemistry lab.
 - Electronic configuration elements having atomic number 1 - 30, by using Hund's rule and Aufbau's principle.
 - Identification of cation and anion, sample solution 1.
 - Identification of cation and anion, sample solution 2.
 - Identification of cation and anion, sample solution 3.
 - Identification of cation and anion, sample solution 4.
 - Identification of cation and anion, sample solution 5.
 - Identification of cation and anion, sample solution 6.
 - To find the strength of given hydrochloric acid by using acid base titration.

Course Contents:

- Fundamental information of various organic compounds used in industries.
- Use corrosion preventive measures in industry.
- To introduce basic concepts of acid-base theories.
- Apply the principles of chemical bonding and catalysis to solve engineering problems.
- To introduce basic principles of Chemistry -atom, atomic structure.

Course Outcomes:

(ii) Demonstrate working as a leader / Team member.

3. Attitude (i) Follow ethical practices.

(iii) Handling the instruments appropriately.

2. Skills (i) Follow safety practices

(iii) Applications of the materials in different industries.

1. Knowledge (i) Fundamental information to apply basic concepts and principles of chemistry.

Course Objectives:

Assessment scheme code : TL 4

Pre-requisites: X PASSED STUDENTS WITH MINIMUM 60%.

Course Title	Teaching Scheme and Credits				Weekly load hrs.			Assessment scheme code : TL 4	
CHEMISTRY - I	CHMOPF01A	Program Diploma Foundation	Course Category	Credit	30	0	1	2+0+1=3	

COURSE STRUCTURE

Assessment Scheme:

1. Group Discussion.
2. Think share pair.
3. Presentation of the sub topic.

Pedagogy:

1. <https://www.youtube.com/watch?v=0Wky9QEyH4>
2. <https://www.youtube.com/watch?v=7Gb3sidzF0g>
3. <https://www.youtube.com/watch?v=kBqHfKgbmk>

MOOCs:

- a. www.chemistryteaching.com
- b. www.visionlearning.com
- c. www.chem1.com
- d. www.onlinelibrary.wiley.com
- e. www.rsc.org
- f. www.chemcollective.org

Web links: www.chemlogspot.com.

Supplementary Reading: Notes and Assignments.

1. Engineering Chemistry By Dara S.S ISBN:8121997658 2013.
2. Engineering Chemistry By Jain and Jain ISBN:9352160002 2015.
3. Textbook of Basic Chemistry, Technical Publication By Dr. Kashmiri A. Khamkar, V.M.Gokhale ,C.S.Raut, ISBN: 9789333214810.

Reference Books:

Learning Resources:

10. Determination of concentration/molarity of $KMnO_4$ solution by titrating it against a standard solution of oxalic acid.
11. To find the strength of given strong acid by using pH meter.
12. To find the rate of corrosion of aluminum strip in different condition medium.

Unit No.	Contents	Theory	Lab	Assess
		Workload in Hrs.		
1	Structure of atom	96	04	01
2	Chemical bonding and Catalysis	80	12	01
3	Acids and Bases	96	04	01
4	Corrosion and its Preventives	80	04	01
5	Study of some important organic compounds	04	04	01

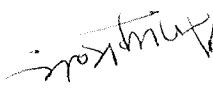
Faculty of Engineering and Technology
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8 JUN 2023

DR. KASHMIRI A. KHAMKAR

studies

Approved By 
Dr. Kashmiri A. Khambkar Lecturer
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Dr. Meghna Gote Head of School, Dept of Chemistry
Head of School, Dept of Chemistry
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BOS Chairman and Associate Dean
School of Science and Environment
Dept. of Polytechnic
Head of School
Prof. Dr. Sunil S Kared Prof. Dr. Rohini S Kale
BOS Chairman and Associate Dean
School of Science and Environment
Dept. of Polytechnic
Head of School
Associate Dean
Dept. of Polytechnic
Head of School
Prof. Dr. Anup A Kale

Approved By 
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Dr. Meghna Gote Head of School, Dept of Chemistry
Head of School, Dept of Chemistry
Prof. Dr. Rohini S Kale Associate Dean
BOS Chairman and Associate Dean
School of Science and Environment
Dept. of Polytechnic
Head of School
Prof. Dr. Sunil S Kared Prof. Dr. Rohini S Kale
BOS Chairman and Associate Dean
School of Science and Environment
Dept. of Polytechnic
Head of School
Associate Dean
Dept. of Polytechnic
Head of School
Prof. Dr. Anup A Kale

COURSE STRUCTURE

Assessment scheme Code - TTI						
Course Title		Programme Discipline Foundation		Calculus and Basic Statistics		
Course Category	MSTOPF02A	Project Title		Course Title		
Teaching Scheme and Credits	L T	Total work load hours	Credits	Pre-requisites: Primary mathematical ability	3+1+0=4	Assessment scheme Code - TTI
	1	Laboratory	0			

Course Contents:

- After completion of this course students will be able to

 - Understand the basic concept of integration using suitable methods.
 - Apply the concept of integration to find area and volume.
 - To solve the engineering related problems by using the applications of differential equations.
 - Use basic concepts of statistics to solve engineering related problems
 - Utilize concept of Permutation and Combinations to solve the relevant problem in engineering

Course Outcomes:

Course Outcomes:

- Urse Objectives:

 1. Knowledge:
 - (i) To learn concepts of integration, definite integral & its application.
 - (ii) To understand concept of first order and first degree differential equation.
 - (iii) To understand concept of first order and first degree differential equation.
 - (iv) To understand concept of Complex Number and its application.
 - (v) To use integration as a tool in engineering.
 2. Skills
 - (i) To understand and calculate definite integral & its application.
 - (ii) To understand and calculate definite integral & its application.
 - (iii) To understand and calculate definite integral & its application.
 3. Attitude
 - (i) Interpreting for suitability.

Course Objectives:

- | | | | |
|--|---|---|---|
| Total work load hours | 3 | 1 | 0 |
| Prerequisites: Primary mathematical ability | | | |

L. Howledge

- I. Knowledge:
Course Objectives:
To learn aspects of life sciences

To use integers

2. To use integration as a tool in engineering.

(i) To understand concept of first order and first degree differential equation.

(ii) To understand concept of Complex Number and its application.

(iii) To understand concept of first order and first degree differential equation.

Skills

Course Outcomes:

3. Attitude

 - (i) Interpreting for suitability.

Outline Contents:

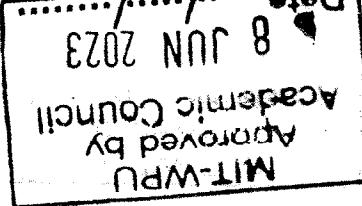
- After completion of this course students will be able to

 1. Understand the basic concept of integration using suitable methods.
 2. Apply the concept of integration to find area and volume.
 3. To solve the engineering related problems by using the applications of different
 4. Use basic concepts of statistics to solve engineering related problems
 5. Utilize concept of Permutation and Combinations to solve the relevant problem

Course Contents:

Materials:

1. Standard formuale of integration.
 2. Methods of integration by substitution and Partial fractions.
 3. Integration by parts.
 4. Properties of definite integration.
 5. Area under curve.
 6. Area between two curves and volume of revolutions.



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MOOCS:

- <https://www.coursera.org/browse/math-and-logic> www.math-magic.com

Web Resources:

Supplementary Reading: Notes and Assignments.

- Books/Reference Books**

 - Grewal, B.S. "Higher Engineering Mathematics" Khanna Publications, New Delhi, 2015 ISBN: 8174091955
 - Kreyszig, Erwin, "Advanced Engineering Mathematics", 10th edition, Wiley Eastern Limited 2013, ISBN-13: 978-0-470458365
 - Das, H.K. "Advanced Engineering Mathematics" S. Chand & Co., New Delhi, 2008, ISBN-978121903455
 - O'Neill Peter, "Advanced Engineering Mathematics", 8th edition, Cengage Learning 2015, ISBN-13: 978-1337274524
 - Weber H.J. and Arfken G.B. "Mathematical Methods For Physicists", 6th edition, Academic Press 2011, ISBN:9780123846549
 - Nirmale, V.K. "Applied Mathematics" Technical publication, Pune ISBN: 9789333214759

Text Books/Reference Books
“The Best” Books Publishing Corporation New Delhi 2015

Learning Resources

14. Permutation when all the objects are distinct
15. Properties of combination

7. Formation, order and degree of differential equations.
 8. Variable separable form and linear differential equation
 9. Rectilinear motion under constant acceleration.
 10. Range, coefficient of range and mean deviation.
 11. Mean deviation and standard deviation.
 12. Variance and comparison of two sets.
 13. Fundamental principle of Counting.

Module No.	Modul	WorkeLoad in Hrs	Integral Calculus	Contents	Theory	Tutorial	Asses
01	1	14	Definite Integral and its Applications	<ul style="list-style-type: none"> (a) Integration by substitution. (b) Integration by parts. (c) Generalized rule of integration by parts. (d) Integration by partial fractions 	<ul style="list-style-type: none"> Methods of integration Integration by trigonometric functions Integration of composite functions Integration of rational functions Rules of integration 		
01	2	10	Applications of Definite Integral	<ul style="list-style-type: none"> Area under the curve. Area between two curves. Volume of revolution 	<ul style="list-style-type: none"> Evaluation of limit of a sum Properties of definite integral Simple examples. Introduction of different shapes of curves 		
01	3	08	First Order First Degree Differential Equations and Applications	<ul style="list-style-type: none"> Solution of differential equation: Order, degree and formation of differential equation. Concept of differential equation. 			

Syllabus

- Group Discussion.
- Think share pair
- Presentation of the sub topic

Pedagogy:

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01	02	06	02	01	02	06	01

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11/08/2023
S. K. Patel

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Approved By
Prof. Dr. R.S. Kale
Associate Dean
School of Science and
BOS Chairman and Associate Dean
Head of School,
Prof. Dr. Sunil S. Karad
Verified By
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Enviromental Science
Dept. of Polytechnic

Dr. Viswanath Karad
MIT WORLD PEACE UNIVERSITY PUNE
TECHNOLOGICAL EDUCATION, SOCIAL INTEGRATION & PERSONALISATION

8 JUN 2023

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9/8/23
✓

1. Motion and mechanics	2. LASER	3. Heat and thermodynamics	4. Basics of Nanotechnology	5. Introduction to Quantum mechanics
-------------------------	----------	----------------------------	-----------------------------	--------------------------------------

Course Contents:

1. Apply the principles of motion to solve engineering problems.
2. Understand the principles of LASER to solve engineering problems.
3. Use the principles of heat in related engineering applications.
4. Understand the concept of nanotechnology in related engineering applications.
5. Understand the concept of photo electricity and x-rays to establish engineering applications.

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

Course Outcomes:

1. To establish the concept of properties of linear and angular motion.
2. To develop understanding of working principle of LASER.
3. To characterize and analyze the concept of heat and gas laws.
4. To introduce concept of nanotechnology.
5. To establish foundation of quantum mechanics.

Course Objectives:

SSC or equivalent passed with first class.
Assessment scheme code - TL3

Pre-requisites:

Course Code	Course Category	Program Disciplinary Foundation	Course Title	Teaching Scheme and Credits	Weekday load hrs.	Credits
PHYOPF02A	Physics-II	Program Disciplinary Foundation	Physics-II	1 T Laboratory	0	3 1 4

COURSE STRUCTURE

- Vanhakhande, B.B; Wagh, Snehal S "Technical publication" ISBN-9789332149955

ISBN 81-7450-631-4 (Part I) ISBN 81-7450-671-3 (Part II)

- Class XII" National Council of Education Research and Training, New Delhi.

Narlikar, J. V.; Joshi, A. W.; Matluri, Anuradha; et al " Physics Textbook

ISBN 81-7450-508-3

Class XI" National Council of Education Research and Training, New Delhi.

Narlikar, J. V.; Joshi, A. W.; Matluri, Anuradha; et al " Physics Textbook

ISBN 81-7450-508-3

Supplementary Reading:

- Bhattacharya D.K., Bhaskaran A "Engineering Physics". Oxford higher education.

ISBN: 9780198065425

- Malik, Hitenrao; A.K. Singh "Engineering Physics" Tata McGraw hill education private limited. ISBN-13: 978-9352606955

ASIN: B01G6ZZPO5

M N Avadhannlu "A Textbook of Engineering Physics", S. Chand publication

- Halliday, David; Resnick, Robert and Walker, Jerry, "Fundamentals of Physics" John Wiley and Sons, Hoboken, USA, 2014 ISBN : 812650823X

Reference Books:

Learning Resources:

- Verify the characteristics of light dependent resistor (LDR).

9. Verify the characteristics of photovoltaic cell.

8. Synthesis of nano particles by co precipitation method.

given material.

- Use Seare's thermal conductivity apparatus to find co-efficient of thermal conductivity of a

6. Use Joule's calorimeter to determine Joule's mechanical/electrical equivalent of heat.

5. Verify Boyle's law.

4. Determine the divergence of LASER beam.

3. Predict the range of the projectile from the initial launch speed and angle.

2. Determine the acceleration due to gravity using bar pendulum.

1. Determine modulus of rigidity of given wire using torsional pendulum.

Laboratory Exercises / Practical:



No.	Module	MOOCs:	https://www.mooc-list.com/course/basic-physics-open2study	Pedagogy:	Chalk and talk , PPT, Experiments, Online teaching, Quizzing.
	Workload in Hrs.	Contents	Theory Lab Assess	Workload	Motion and mechanics: Displacement, velocity, acceleration and retardation, equations of rectilinear motion, equations of rectilinear motion under gravity: Angular displacement, angular velocity, projection, time of flight and range of projectile with formulae.
1	10	LASER: Introduction to LASER, properties of laser, spontaneous emission and working of He-Ne laser, optical pumping, stimulated emission, population inversion, angle of SHM, projection of SHM, projectile motion, definition of SHM, regular acceleration, three equations of angular motion, definition of SHM, projectile motion, trajectory, angle of projection, time of flight and range of projectile with formulae.	8	2	Heat and thermodynamics - Heat, temperature, Modes of transfer of heat, good and bad conductors of heat, law of thermal conductivity, co-efficient of thermal conductivity, gas laws, general gas equation. Specific heat of gas, Mayer's relation, isothermal and adiabatic expansion, applications of thermal conductivity and gas laws in engineering.
2	10	Lasers: Introduction and working of He-Ne laser, engineering applications of laser.	8	2	Basics of Nanotechnology: Introduction to nanotechnology, concept of nano materials, synthesis of nanoparticles: ball milling method, chemical bath deposition method, applications of nanoparticles in science and engineering.
3	6	Heat and thermodynamics - Heat, temperature, Modes of transfer of heat, good and bad conductors of heat, law of thermal conductivity, co-efficient of thermal conductivity, gas laws, general gas equation. Specific heat of gas, Mayer's relation, isothermal and adiabatic expansion, applications of thermal conductivity and gas laws in engineering.	10	6	Heat and thermodynamics - Heat, temperature, Modes of transfer of heat, good and bad conductors of heat, law of thermal conductivity, co-efficient of thermal conductivity, gas laws, general gas equation. Specific heat of gas, Mayer's relation, isothermal and adiabatic expansion, applications of thermal conductivity and gas laws in engineering.
4	7	Basics of Nanotechnology: Introduction to nanotechnology, concept of nano materials, synthesis of nanoparticles: ball milling method, chemical bath deposition method, applications of nanoparticles in science and engineering.	2	1	Introduction to Quantum mechanics: Photo-electricity - Photoelectric effect, Planck's hypothesis, properties of photons, Einstein's photoelectric equation, characteristics of photoelectric effect, LDR, photocell and applications of photoelectric effect, Compton effect, De-Broglie hypothesis. Production of X-rays by Modern effect, Coolidge tube, properties and applications of X-ray.
5	4	Introduction to Quantum mechanics: Photo-electricity - Photoelectric effect, Planck's hypothesis, properties of photons, Einstein's photoelectric equation, characteristics of photoelectric effect, LDR, photocell and applications of photoelectric effect, Compton effect, De-Broglie hypothesis. Production of X-rays by Modern effect, Coolidge tube, properties and applications of X-ray.	10	2	Introduction to Quantum mechanics: Photo-electricity - Photoelectric effect, Planck's hypothesis, properties of photons, Einstein's photoelectric equation, characteristics of photoelectric effect, LDR, photocell and applications of photoelectric effect, Compton effect, De-Broglie hypothesis. Production of X-rays by Modern effect, Coolidge tube, properties and applications of X-ray.

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MIT-WPU

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Faculty of Engineering and Technology

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Head of School
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Prepared By
Dr. Prasant Ghosh
Asst. Professor
[Signature]

Mr. Snehal S Wagh
Lecturer
[Signature]

Prepared By

- Laboratory Exercises / Practical:**
1. Determine the percentage of iron present in given Hematite ore by using KMnO₄ solution.
 2. Construction and working of Daniell Cell.
 3. Determine Electrochemical equivalent (Z) by using Faraday's first law.
 4. Determine neutralization point of acidic acid (weak acid) and sodium hydroxide (strong base) by using conductometer.
 5. Determine percentage of copper in the given copper ore.
 6. Determine total hardness (temporary hardness and permanent hardness) of water sample by EDTA method.
- Course Contents:**
1. Use relevant engineering materials in industry.
 2. Select the relevant electrode and cell for the given system.
 3. Use relevant water treatment process to solve industrial problems.
 4. Use relevant fuel in relevant applications.
 5. Use relevant engineering materials in industry.
- Course Outcomes:**
1. Apply the concepts of electrochemistry to solve various real time problems.
 2. Select the relevant electrode and cell for the given system.
 3. Use relevant fuel in relevant applications.
 4. Use relevant water treatment process to solve industrial problems.
 5. Use relevant engineering materials in industry.

Course Objectives:					
1. Knowledge (i) Fundamental information to apply basic concepts and principles of chemistry.					(ii) Applications of the materials in different industries.
2. Skills (i) Follow safety practices					(ii) Handling the instruments appropriately.
3. Attitude (i) Follow ethical practices.					(ii) Demonstrating as a leader / Team member.
Assessment scheme code : TL 4					
Pre-requisites: X PASSED STUDENTS WITH MINIMUM 60%					
Teaching Scheme and Credits	L	T	Laboratory	Credit	
Course Title	CHMOPF02A	CHMISTRY - 2	Program Disciplinary foundation	30	0
Course Category	CHMOPF02A	CHMISTRY - 2	Program Disciplinary foundation	30	0
Course Code	CHMOPF02A	CHMISTRY - 2	Program Disciplinary foundation	30	0
COURSE STRUCTURE					

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1. <https://www.youtube.com/watch?v=0WKy9QEYH4>
2. <https://www.youtube.com/watch?v=7Gb3sIdZ0g>
3. <https://www.youtube.com/watch?v=kBgHPfkGbmk>

MOOCs:

Web links: www.chembllogspot.com.

f. www.chemcollective.org

e. www.rsc.org

d. www.onlinelibrary.wiley.com

c. www.chem1.com

b. www.visionlearning.com

a. www.chemistryteaching.com

Web Resources:

Supplementary Reading: Notes and Assignments.

1. Engineering Chemistry by Agarwal, Shikha ISBN- 9781107476417, 1107476410.
2. Engineering Chemistry By Jain and Jain ISBN:9352160002 2015.
3. Engineering Chemistry by Jain and Jain ISBN-13: 9789352160006.
4. Textbook of Basic Chemistry, Technical Publication By Dr. Kashmiri A. Khambekar,
5. Textbook of Applied Chemistry, Technical Publication By Dr. Kashmiri A. Khambekar,
- V.M.Gokhale, C.S.Raut, ISBN: 9789333217255.

Learning Resources:

7. To determine the total alkalinity in the given water sample.
8. Determine chloride content in the given water sample by Mohr's method.
9. Determine percentage of Sulphur in given coal sample.
10. To determine the percentage of moisture in the given coal sample.
11. To determine the percentage of ash in the given coal sample.
12. Prepare phenol formaldehyde resin used in manufacturing of Bakelite plastic.

Unit No.	Theory	Lab	Access
Workload in Hrs.	Contents		
1	Electrochemistry Theory of ionization; Arrhenius theory, strong electrolyte, weak electrolyte, metallic conduction. Mechanism of electrolysis, applications of electrolysis; electrolyplating, electro-refining construction and working of Daniel cell, Faraday's laws of electrolysis; First law and second law. Numerical on Faraday's first and second law.	06	12
2	Cells and Batteries Nature of solute nature of solvent, temperature, concentration or dilution primary and secondary cells, distinguishing between primary and secondary cell. Primary cell; construction, working and applications of Dry cell, Secondary cells: construction working of Lead acid storage cell, Lithium-ion battery. Fuel cell: Hydrogen and oxygen cell; construction, working and applications.	04	04
3	Water Hardness, classification of hardness, determination of hardness, Hardest, classification of hardness, prevention, Boiler corrosion, caustic embrittlement, priming and foaming, scales and sludges, Water softening: lime soda process (hot lime soda and cold lime soda process), zeolite process, ion exchange process, (cation process), coagulation, filtration and sterilization.	05	05
4	Fuels And Combustion Fuel: Calorific value and ignition temperature, classification, Solid fuels: Coal, Classification and composition, proximate analysis, ultimate analysis, Bomb calorimeter, Liquid fuels: Fractional distillation of crude petroleum, boiling range, composition, Knocking, cracking, octane number and cetane number, Gaseous fuels: LPG, and CNG, composition, properties and uses.	02	02
5	Polymer Introduction: Polymerization, polymers, classification of polymers on the basis of polymerization reaction, types of	05	02

3. Presentation of the sub topic.

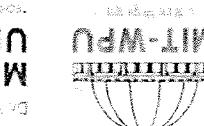
2. Think share pair.

1. Group Discussion.

Pedagogy:

Date: 13/06/2019

8 JUN 2019



JR. B.
B. S. K.

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School of Science and Environmental
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Proc. Dr. Sunil S Kared

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Dr. Meghna Gote

Prepared By
Mr. Santosh Raut

Prepared By
Dr. Kashmira A. Khamkar

monomers. Mechanism and Types, thermosetting and thermosoftening resins, Synthesis and Application of Polyethylene, PVC, Polystyrene, Phenol formaldehyde resin, nylon 6,6. Vulcanization of rubber, chemical reaction and applications.

1. Logarithms based on definition and laws
2. Solution of simultaneous equations by Cramer's Rules and area of triangle
3. Transpose and adjoint of matrix.
4. Algebra of complex numbers

Tutorials:

Unit 5: Differential calculus

Unit 4: Co-ordinate Geometry

Unit 3: Trigonometry

Unit 2: Complex Number

Unit 1: Algebra

Course Contents:

- After completion of this course students will be able to
1. Apply the concepts of algebra to solve engineering related problems.
 2. Use the basic concepts of Complex Number to find Polar form.
 3. Utilize basic concepts of trigonometry to solve elementary engineering problems.
 4. Solve basic engineering problems under given conditions of straight lines.
 5. Apply the concepts of differentiation to solve engineering related problems and study of the equation of tangent, maxima and minima, radius of curvature

Course Outcomes:

1. Knowledge (i) Interpreting for suitability.

2. Skills (ii) To use derivatives as a tool in engineering.

(iii) To understand concept of partial fraction.

(iv) To learn concepts of Logarithm, Determinant, Matrices and its applications

(v) To understand concept of partial fraction.

(vi) To understand concept of logarithm, Determinant, Matrices and its applications

3. Attitude

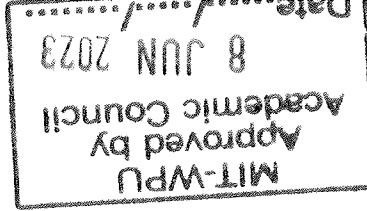
(vii) To use derivatives as a tool in engineering.

(viii) To interpret for suitability.

Pre-requisites: SSC or equivalent passed with first class
Assessment scheme code - TTI

Course Category	Course Title	Program Discipline Foundation	Foundation of Engineering Mathematics	Total work load hours	L	T	Lab/atory	Credits
	MST0FF01A			3	1	0	0	3+1+0=4

COURSE STRUCTURE



- <https://www.coursera.org/browse/math-and-logic>
- www.math-magie.com

MOOCs:

- <https://www.khanacademy.org/math?gclid=CNqHubCys4CFDQJAddH0pig>
- www.wolfram.com/mathematica/ - Mathematica
- www.allmathcad.com/ - MathCAD
- www.scilab.org/ - SciLab

Web Resources:

Supplementary Reading: Notes and Assignments.

- Nirmale, V.K., "Basic mathematics" Technical publication, Pune ISBN: 9789333214759
- Academic Press 2011, ISBN: 9780123846549
- Weber H.J. and Arfken G.B., "Mathematical Methods For Physicists", 6th edition, Learning 2015, ISBN-13: 978-1337274524
- O'Neill Peter, "Advanced Engineering Mathematics", 8th edition, Cengage

Supplementary Reading:

- ISBN-9788121903455
- Das, H.K., "Advanced Engineering Mathematics" S. Chand & Co., New Delhi; 2008, Limited 2015, ISBN-13: 978-0470458365
- Kreyzig Erwin, "Advanced Engineering Mathematics", 10th edition, Wiley Eastern ISBN: 8174091955
- Grewal, B.S., "Higher Engineering Mathematics" Khanna publications, New Delhi, 2015

Text Books/Reference Books

Learning Resources:

15. Finding equation of tangent and normal.
14. Derivatives of implicit function and parametric function.
13. Finding value of the function at different points.
12. Angle between two lines
11. Distance between two parallel lines.
10. Perpendicular distance between two lines.
9. Inverse circular trigonometric ratios.
8. Factorization and de factorization.
7. Compound and Allied, multiple, sub multiple angles.
6. De-moivre's theorem

Module No.	Syllabus	Contents			
		Workload in Hrs	Theory	Tutorial	Asses
1	Algebra Logarithm: Concept and laws of logarithm Determinant value of determinant of order 3×3 . Solutions of simultaneous equations in three unknowns by Cramer's rule Matrices: Algebra of matrices, Transpose, Ad joint and inverse of matrices. Solution of simultaneous equations by matrix inversion Partial fractions: Types of partial fraction based on method.	10	02	02	01
2	Complex Number Definition of complex number Algebra of complex numbers Modulus and amplitude of complex number Polar form of complex number Exponential form of complex number (without proof), examples based on it. Euler form of circular functions, Hyperbolic function Relation between circular and hyperbolic function	09	02	01	01
3	Trigonometry Trigonometric ratios of Compound angle Allied angle Multiple angle Sub-multiple angles Factorization formulae, De-factorization formulae Inverse Trigonometric Ratios Principle values	07	02	01	01

Syllabus

1. Group Discussion.
2. Think share pair
3. Presentation of the sub topic

Pedagogy:

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3. Attitude (i) Solve broad-based engineering problems applying basic knowledge of C language.

(ii) Logic building

2. Skills (i) Create a base to develop foundation skills of programming language.

(ii) Understand basic concept of modular programming

1. Knowledge (i) Understand basic concept of C programming

The course is basically designed to create a base to develop foundation skills of programming language. With basic concepts of C, that will help the students to apply the concepts to build programming logic. Building techniques. The contents of this course are designed for developing the skills. This course deals developing such type of applications they must know the concepts of algorithm, flowchart and logic. Computer Engineering students have to develop real life applications for various IT industries. For

Course Objectives:

Prerequisites: 10th passed

Course Code	Course Title	Teaching Scheme	Weekly Load hours	Credits	Assessment Scheme Code	Pj
CSE0PF02A	Programming in C	Lectures	0	0	Pj	
	Program Foundation	Tutorials	0	0		
		Laboratory / Practical	4	4		
		Project	0	0		
		Total	2	2		

COURSE STRUCTURE

Unit 5: Pointers

Concept and need of functions: Library functions, Math functions, String handling functions, Other miscellaneous functions like getenv(), setenv(), putenv(), perror(), error(), rand(), delay(). Writing user defined functions, Function prototypes, scope of variables, Parameter passing: call by value, call by reference, Recursion.

Unit 4: Functions

Introduction and Features of Structures, Declaration and Initialization of Structures, Accessing Structure Members, Using Typedef keyword, Nested structures, Arrays of structures, Structures containing arrays, Enumerated Data Type, Pointers and structures, Concept of Union, declaration, definition, accessing union members, Difference between structures and union.

Unit 3: Structures and Union

```
Declaration, initialization, string verses character array, Reading String, Displaying string, %s  
format specifier, gets(), puts() functions.  
String operations: string handling operations using arrays.  
String functions: strlen, strlwr,strupr, strcat, strncat, strcpy, strcmp, strncpy, strncmp, strncmp, strcmpi,  
strchr, strstr
```

Unit 2: Strings

Array: Characteristics of an array, Advantages of C Array, Types of Array: One dimensional, two dimensional and Multidimensional array. Array declaration and Initialization, Accessing Array Elements, Operations on array - insertion, deletion, searching, Sorting.

ArrayList applications - Finding maximum and minimum, Counting occurrences of particular element in an array, Matrix operations.

Unit 1: Arrays

Course Contents:

1. Implement C programs using arrays
 2. Implement C programs using Structures.
 3. Develop C programs using structures and Union.
 4. Construct and Use functions in C programs for modular programming approach.
 5. Develop C programs using Pointers.

After completion of this course students will be able to:

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	Write a program to implement basic concepts of C programming	a) Write a C program to find Ascii values of a character b) Write a C program to check whether a given number is prime or not. c) Write a C program to find LCM of two numbers.
2	Write a program to implement one dimensional arrays:	a) Program to take 5 values from the user and store them in an array b) Wrote a Program to find the average of n numbers using an array. c) Write a C Program to display the following pattern. d. @@@@@
3	Write a program to implement one dimensional arrays:	a) Write C program to Find the greatest and the smallest element in the array b) Write a C program to squaring the even positioned and cubing the odd positioned elements. c) Move all the negative elements to one side of the array d) Write a program to implement multi-dimensional arrays:
4	Write a program to implement multi-dimensional arrays:	a) Write a C Program for matrix multiplication for 3×3 matrix. b) Write a C Program to Counting positive, negative, even, odd and zeros in an array. c) Write a C Program to Generate transpose of the matrix. d) C program to store temperature of two cities of a week and display it e) Write a C Program to store and Print 12 values entered by the user using a three-dimensional array.
5	Develop a Program using String:	a) Write a program in C to input a string and print reverse string. b) Write a program in C to copy one string to another string. b) Write a program in C to copy one string to another string.

Laboratory Exercises / Practical:

Relationship between Arrays & Pointers- Pointer to array, Array of pointers, Multiple indirection (pointer to pointer) Functions and pointers- Passing pointer to function, Returning pointer from function, Function pointer.

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9	To understand programming with user defined functions:	<ul style="list-style-type: none"> a) Find Factorial of given number using recursion. b) Write a program to calculate sum of first 50 natural numbers using recursive function. c) Program to calculate the sum of array elements by passing to a function. d) Write a program in C to check whether a number is a prime number or not using the function.
8	To understand programming with Library Functions:	<ul style="list-style-type: none"> a) Write a program in C to check whether two given strings are an anagram. b) Write a program in C to check Armstrong number between 1 to 500. c) Write a program in C to check perfect numbers using the function. d) Write a program to use of few miscellaneous functions.
7	Develop a Program using array of Structure:	<ul style="list-style-type: none"> a) Create a structure company which has name, address, phone and noOfEmployee. Finally display these members' value. b) Enter the marks of 5 students in Chemistry, Mathematics and Physics (each out of 100) using a structure named Marks having elements roll no., name, chem_marks, maths_marks and phy_marks and then display the percentage of each student. c) Write a program to add two instances in inch-feet structure. The values of each student. d) Write a program to be taken from the user
6	Develop a Program using Structure:	<ul style="list-style-type: none"> a) Write a C Program to declare the structure of the student with data member book, price and pages. b) Write a C Program to Calculate Difference between Two Time Periods using structure c) Write a program that compares two given dates. To store date use a structure say date that contains three members namely date, month and year. If the dates are equal, then display the message as "Equal" otherwise "Unequal". d) Initialize and print the following union variables: 7, and 7.0 using the following structure. e) One of the names in the master list then the user is allowed to calculate the factorial of a number. Otherwise, display error message. (Initialize master list of username using array).

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- J. Brian, W. Kermighan, Ritchie Dennis, The C Programming Language, PHI Learning Private Limited, New Delhi 1990, ISBN: 978-8120305960
2. Byron Gottfried, Jitender Chhabra, Programming with C, Schaum's Outlines Series Paperback - Import, 1 Sep 1996
1. Byron Gottfried, Jitender Chhabra, Programming with C, Schaum's Outlines Series Paperback - Import, 1 Sep 1996

Reference Books:

978-1259004612

1. Balagurusamy, E., Programming in ANSI C, McGraw Hill Education, New Delhi 2012, ISBN:

Text Books:

Text Books/ Reference Books:

Learning Resources:

<p>12</p> <p>Develop any one Application (Program) of the following in group of 2-3 students. (Use Structures and other features of 'C' to develop applications)</p> <p>(a) Prepare simple mark sheet for 10 students.</p> <p>(b) Generate Salary slips of employees in an Organization.</p> <p>(c) Develop Book issue System of Library.</p> <p>(d) Develop Calendar using C.</p> <p>(e) Implement Snake Game.</p> <p>(f) Any other Program Suggested by Subject Teacher on similar line.</p>
<p>11</p> <p>Develop a Program: array using Pointers, Pointers to Structure, Pointers to Function.</p> <p>(a) Write a program in C to compute the sum of all elements in an array using pointers.</p> <p>(b) Write a program in C to print all permutations of a given string using Pointers.</p> <p>(c) Write a program in C to sort an array using Pointers.</p> <p>(d) Write a C program to access structure element using Pointer.</p> <p>(e) Write a program in C to find the factorial of a given number using Pointers.</p>
<p>10</p> <p>Develop a Program using Pointers</p> <p>(a) Write a program in C to demonstrate the use of &(address of) and *(value at address) operator.</p> <p>(b) Write a program in C to demonstrate how to handle the pointers in the program.</p> <p>(c) Write a program in C to add two numbers using Pointers.</p> <p>(d) Write a program in C to find the maximum number between two numbers using a pointer.</p> <p>(e) Write a program in C to store elements in an array and print the elements using pointer.</p>

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- Smart Board
- Active Learning methods
- Power Point Presentation, Videos
- Group activity
- Self-study material

Pedagogy:

3. <https://nptel.ac.in/courses/106101061/>
2. <https://www.coursera.org/courses?query=software%20engineering>

MOOCs: Online courses for self-learning

1. https://www.tutorialspoint.com/software_engineering/
2. <https://www.javatpoint.com/software-engineering-tutorial>
3. <https://www.w3schools.in/categories/software-testing/>
4. <http://www.rspada.com/spil/>

Weblinks: State of the art in the course

Web Resources:

Supplementary Reading:

3. Jerry R. Hall, Elliot B. Koffman, Problem Solving and Program Design in C 5th Edition, Pearson Addison Wesley, ISBN 0-321-46464-8
4. Schilit Herber, C: the Complete Reference, McGraw Hill Education India, ISBN: 9780070411838, 9780070411188

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J. R. S.

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Dear

1. Apply Software Development Method to solve the given problem statements.
2. Design algorithm, flowchart and write C program for given problem statements.
3. Use basic C, data concepts to write algorithm steps and flowchart for given problem statements.
4. Apply selection structures and loops to write C program for given problem statements.
5. Apply Array concepts for solving given problem statements.

After completion of this course students will be able to:

Course Outcomes:

- 3. Attitude** (i) Solve broad-based engineering problems applying basic knowledge of C language.

(ii) Logic building

- 2. Skills** (i) Create a base to develop foundation skills of programming language.

(ii) Understand basic concept of modular programming

- 1. Knowledge** (i) Understand basic concept of applying problem solving thinking.

Course Objectives:

Prerequisites: 10th passed

Course Code	Course Category	Course Title	Teaching Scheme	Weekly load hours	Credits	Assessment Schema Code	Prerequisites:
CSE0F01A	Program Foundation	Problem Solving & Program Design Using C Language	Lectures	2	2	TIA	10 th passed
			Tutorials	0	0		
			Laboratory / Practical	2	1		
			Project	0	0		
			Total	4	3		

COURSE STRUCTURE

Course Contents:

Unit 1: Introduction to Computers and Programming
Electronic Computers Then and Now, Computer Hardware, Introduction to 32 bit and 64 bit machines, Computer Software, Software Development, Method, Generation of programming languages, Applications of Using Algorithms: Expressing Algorithms, Benefits of Using Algorithms, Flowcharts: Advantages of Using Flowcharts, Limitations of Using Flowcharts, Flowchart Symbols & Guidelines, Introduction to C Program

Unit 2: Algorithm and Flowcharts

Unit 3: Overview of C
History of C, C Language Elements, Data Types and Variable Declarations, Operators and Control Structures, Conditions, if statements, if with compound statements, Nested if statements and switch statement, Decision steps in algorithms, Repetition in programs: While statement, Do-While statement, for statement, Declaring and referencing arrays, Array subscripts, Using for loop for sequential access

Unit 4:

Selection Structures and Loop Statements
Control Structures, Conditions, if statements, if with compound statements, Nested if statements and switch statement, Decision steps in algorithms, Repetition in programs: While statement, Do-While statement, for statement, Declaring and referencing arrays, Array subscripts, Using for loop for sequential access

Unit 5: Arrays

Characteristics of an array, Advantages of Array, Types of array-one dimensional and two dimensional and multidimensional. Array declaration and initialization, accessing array elements, Operations on array-insertion, deletion, simple algorithms of searching and sorting.
1. Specify the data requirements, formulas and algorithm for a problem statement that converts a volume from milliliter to liters. 2. Write an algorithm and draw a flowchart to calculate the simple interest. 3. Write an algorithm to demonstrate the use of various data types and operators. 4. Write a algorithm and draw a flowchart to check given number is even or odd.

Laboratory Exercises / Practical:

1. Specify the data requirements, formulas and algorithm for a problem statement that converts a volume from milliliter to liters. 2. Write an algorithm and draw a flowchart to calculate the simple interest. 3. Write an algorithm to demonstrate the use of various data types and operators. 4. Write a algorithm and draw a flowchart to check given number is even or odd.
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Dear

1. Jerry R. Hall, Elliot B. Koffman "Problem Solving and Program Design in C" 5th Edition, Pearson Addison Wesley, ISBN 0-321-46464-8.

Reference Books:

Text Books/Reference Books:

Learning Resources:

15. Write a C program to perform matrix addition of given $n \times m$ size	
14.	
13. Write a C program for Searching given element in an numeric array	
12. Write a C program to Sort a given array in ascending and descending given order	
11. Write a C program to accept and display sum of first 10 nos. in array.	
10. Write an algorithm and draw a flowchart and C program to draw the star pattern	<pre>***** * * * * * * * * * * * * * * * *</pre>
9. Write a C program and draw a flowchart to draw following the star pattern.	<pre>***** * * * * * * * *</pre>
8. Write a C program to display even numbers between 10 to 20	
7. Write a C program to find sum of digits of a given number.	
6. Write a C program that computes an employee's gross salary for given the hours worked and hourly rate.	
5. Write a algorithm and draw a flowchart to check if a given character is vowel or not	

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Dear Sir/Madam
10/06/2009

- Presentations
- Self study material,
- Face to face practical,
- Face to face lectures,

Pedagogy:

1. <https://www.coursera.org/courses?query=software%20engineering>
2. <https://npTEL.ac.in/courses/106101061/>

MOOCs: Online courses for self-learning

1. <http://archive.mu.ac.in/myweb/test/syllfybscit/C++.pdf>
2. http://www.fms.edu.my/images/Documents/PROG0101%2020Fundamentals%20of%20Programming/PROG0101_CH02.pdf
3. http://www.tmv.edu.in/pdf/distance_education/books/bca%20books/bca%20ii%20sem/bca22%20c/miming/PROG0101_CH02.pdf
4. <http://faculty.ccit.mekily.COMII150/PseudocodeBasics.pdf>
5. http://www.cosc.canterbury.ac.nz/tim.bell/d/Tutorial_Pseudocode.pdf

Web links:

Web Resources:

Supplementary Reading:

1. ISBN 10: 0136085318 ISBN 13: 9780136085317
2. Delores M. Etter, "Engineering Problem Solving with C", 4th Edition, Pearson publication,
3. Herbert Schildt "C-The Complete Reference", 4th Edition, Osborne/Mcgraw Hill, Inc, ISBN-13: 978-0072121247 ISBN-10: 9780072121247

Zener diode, Light emitting diode, Varactor diode, Tunnel diode, Photo Diode,
Symbol, Construction, working principle, characteristics and applications: PN junction diode,

Unit 2: Semiconductor Diodes

Active and Passive Electronic components, Classification, Symbol, Specification, Application
of Resistor, Capacitor and Inductor.

Unit 1: Electronics Components

Course Contents:

- Identify types of Diodes.
- Interpret the working of different types of Diodes.
- Analyse magnetic circuits
- Use single phase AC supply for industrial equipment

After completion of this course students will be able to:

- Identify types of electronic components
- Interpret the working of different types of Diodes.
- Analyse magnetic circuits
- Use single phase AC supply for industrial equipment

Course Objectives:

- Basic knowledge of Electronic components and circuits
- Understand the concepts of magnetic circuits, AC fundamentals
- Test the performance of different components and signals
- To use different electronic and electrical devices

Course Outcomes:

- Identify types of Diodes.
- Interpret the working of different types of Diodes.
- Analyse magnetic circuits
- Use single phase AC supply for industrial equipment

Prerequisites: First Semester Clear

Course Code	EC0PF01A	Course Category	Program Foundation	Course Title	Fundamentals of Electrical & Electronics Engineering	Teaching Scheme	Weeky load hours	Credits	Assessment Scheme Code	Prerequisite
							2	2	TIA	
							0	0		
							1	1		
							0	0		
							4	4		

COURSE STRUCTURE

J.R. 1/2
Learning Resources:

1. Identify active and passive components.
2. Test the performance of the given PN junction diode.
3. Test the performance of the given Zener Diode.
4. Test the performance of photo diode.
5. Convert AC signal into DC signal using Half wave rectifier.
6. Convert AC signal into DC signal using Full wave rectifier.
7. Test the performance of Bridge Rectifier using Filter.
8. Test the performance of Clipper/Clamper circuit.
9. Determine frequency, time period, peak value, rms value of a sinusoidal A.C. waveform by observing it on C.R.O.
10. Draw phasor diagram to determine power factor of R-L series circuit.
11. Draw phasor diagram to determine Power factor of R-C series circuit.
12. Determine voltage and current ratio of single-phase transformer.

Laboratory Exercises / Practical:

Magnetic flux, Electric and magnetic circuits, Faraday's laws of electromagnetic induction, Fleming's right-hand rule, Lenz's law, Dynamically and statically induced emf, self and mutual inductance. Working principle, classification of transformer, Emf equation, Voltage ratio, current ratio and transformation ratio, Working principle, classification, Auto-transformer.

Unit 5: Magnetic Circuits & Transformer

A.C. and D.C. quantity, Single phase A.C., Generation of Single phase AC, Vector representation of sinusoidal A.C., Pure resistance, Inductance and capacitance in A.C. circuit, R-L and R-C circuits, Impedance and impedance triangle, Power factor and its significance, Power, Introduction to Polyphase circuit.

Unit 4: AC Fundamentals

1. Rectifier & Filter - Half wave, full wave (Center tap and Bridge rectifier) working principle, circuit diagram and performance parameters. Need of Filters, working and CLC filter, Regulated Power supply.
2. Wave Shaping Circuits- Classification, Clipper, Clamper.

Unit 3: Applications of PN Junction Diode

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Pedagogy:

<https://www.mooc-list.com/course/introduction-electronics-course>

MOOCs: Online courses for self learning

<https://www.electronics-tutorials.ws/transformer/transformer-basics.html>

<http://www.electrical4u.com/series-circuit>

<http://www.instructables.com/class/ElectronicsClass/>

<http://www.diptel.com/http://www.electronics-tutorials>

<http://www.technologystudent.com/electronics/transistor.htm>

http://faculty.cord.edu/luther/physics225/Handouts/transistors_handout.pdf

<http://www.pitt.edu/~qiw4/Academic/ME2082/Transistor%20Basics.pdf>

<https://learn.sparkfun.com/tutorials/transistors>

Web links:

Web Resources:

Supplementary Reading:

Delhi, latest edition ISBN : 978-0-07-0088572-5

5. Mittal and Mittal "Basic Electrical Engineering second edition", TMH, publications New

edition ISBN: 9788121924405

4. Thareja, B. L." Electrical Technology Vol - I ", S. Chand publications, New Delhi, latest

edition ISBN: 9788121924504

3. Principles of Electronics Mehta, V.K., Mehta, Rohit S. Chand and Co. Ram Nagar, New

Delhi-110 055, 11th Edition, 2014, ISBN 9788121924504

2. Malvino, Alber, Electronics Principles McGraw Hill Education, New Delhi, David

R.S. Sedha, Applied Electronics, New Delhi, S. Chand 2015

Text Books/ Reference Books:

8 JUN 1999

✓ R. L.

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- Chalk and Board
- Power point presentations
- Videos
- Demonstrations

COURSE STRUCTURE						
Course Code	MECOPF01A	Course Title				
Course Category	Program Foundation	Graphics for Engineers				
Teaching Scheme	Lectures	Tutorials	Practical	Project	Total	
Weekly Load hours	0	0	4	0	4	
Assessment Scheme Code	Pj					
Credits	0	0	2	0	2	
Prerequisites:	S.S.C. or equivalent with science and mathematics as regular subjects.					
Course Objectives:	<ul style="list-style-type: none"> • Knowledge (i) Students will be able to know different drawing procedures • Skills (i) Students will be able to read engineering drawings. • Attitude (i) Students will be able to draw engineering drawings. • (ii) Students will be able to use different drawing instruments • (iii) Students will be able to draw geometric figures. • Drawing geometric figures. • Engineering curves. • Drawing isometric views of given object using principles of orthographic projection. • Use drawing codes, conventions and symbols as per IS SP-46 in engineering drawing. 					
Course Outcomes:	<p>After completion of this course students will be able to</p> <ul style="list-style-type: none"> • Draw isometric views of given component or from orthographic projection. • Draw the views of given object using principles of orthographic projection. • Draw isometric views of given component or from orthographic projection. • Use drawing codes, conventions and symbols as per IS SP-46 in engineering drawing. 					
Course Contents:	<h3>1. Basic elements of Drawing</h3> <ul style="list-style-type: none"> * Drawing Instruments and supporting material: method to use them with applications. * Convention of lines and their applications. * Scale - reduced and full size * Dimensioning techniques as per SP-46 (Latest edition) – types and applications of chain, parallel and coordinate dimensioning. * Geometrical constructions. 					
2. Engineering Curves	<ul style="list-style-type: none"> * Concept of focus, directrix, vertex and eccentricity. Conic sections. * Methods to draw an ellipse by arcs of circle method and concentric circles method. 					

1. Draw types of Lines & Redraw given objects (Any two) (do this exercise in sketch book & sheet)

2. Draw Engineering Curves. Part I

3. Draw Engineering Curves. Part II

4. Draw Engineering Curves. Part III

5. Draw a problem on orthographic projections using first angle method of projection having plain surfaces. Part I

6. Draw a problem on orthographic projections using first angle method of projection having plain surfaces. Part II

7. Draw two problems on orthographic projections using first angle method of projection having cylindrical surfaces, ribs. Part I

8. Draw two problems on orthographic projections using first angle method of projection having cylindrical surfaces, ribs. Part II

9. Draw two problems on Isometric view of simple objects having plain and slanting surface by using natural scale

10. Draw two problems on Isometric view of simple objects having plain and slanting surface by using isometric scale.

Laboratory Exercises / Practical:

3. Orthographic Projections

 - * Methods to draw a parabola by Directrix-Focus method and Rectangular method
 - * Methods to draw a hyperbola by Directrix-Focus method.
 - * Methods to draw involutes: circle and pentagon
 - * Projections - orthographic, perspective, isometric and oblique: concept and applications.
 - * Orthographic projection, First and Third angle methods, their symbols.
 - * Conventional drawing of pictorial view into Orthographic Views – objects containing plain surfaces, slanting surfaces, slots, ribs, cylindrical surfaces. (use First Angle Projection Method Only)
 - 4. Isometric Projection
 - * Isometric scale and Natural Scale.
 - * Isometric view and isometric projection.
 - * Illustriative problems related to simple objects having plain, slanting, cylindrical surfaces and slots on slanting surfaces
 - * Conversion of orthographic views into Isometric View/Projection.
 - * Free Hand Sketches of machine elements
 - * Free hand sketches of machine elements such as nuts, bolts, screws, rivet heads, riveted joints locking arrangements for nuts, threeads
 - * Foundation bolts, Coupling, Pulley, Welded joints

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11. Draw free hand sketches Part I	12. Draw free hand sketches Part II	Reference Books	Learning Resources	Supplementary Reading	Web Resources	MOOCs:	Pedagogy:	1. Audio-video techniques 2. Practicals and class tests
1. K.R.Mohan Engineering Graphics Dhanpat Rai Publishing Company 2006 ISBN - 978-93-84378-34-9 2. Bhatt, N.D. Engineering Drawing Charotar Publishing House, Anand, Gujarat 2010, ISBN: 978-93-80358-17-8 3. Bhatt, N.D.; Panchal, V. Machine Drawing Charotar Publishing House, Anand, Gujarat 2010; ISBN: 978-93-80358-11-6 4. K.Venugopal Engineering Drawing & Graphics + AutoCAD New Age International Ltd. Publishing 2005 ISBN: 81-224-1312-9 5. Joshi, D.A. Engineering Drawing, Tata McGraw Hill Edu. New Delhi, 2010, ISBN: 978-0-07-064837-1	1. Not applicable	Supplementary Reading:	• https://www.youtube.com/watch?v=dim6_n7Sgeg • https://www.youtube.com/watch?v=MQScnLXI0M • https://www.youtube.com/watch?v=3WXPaNCq9LI • https://www.youtube.com/watch?v=fVjKTPlxAUo • http://www.mech.unim.edu/courses/me2011/handouts/engine%20graphics.pdf	2. Practicals and class tests 1. Audio-video techniques	1. Practicals and class tests 2. Audio-video techniques			

5. Determine the centroid and centre of gravity of various geometrical figures.
4. To apply frictional laws and principle on various condition
3. To solve the practical problems by using laws in equilibrium
2. To know the various laws and different force system to solve the problems.
1. To enhance practical applications of moment of inertia of symmetrical and unsymmetrical structural sections.

After completion of this course students will be able to

Course Outcomes:

- (i) To develop problem solving attitude.

- (ii) Students develop positive attitude and show motivated behaviour in learning principles of mechanics.

3. Attitude

- (i) Students learn to prove various theorems experimentally and conceptually.

- (ii) To know concepts and principles of Engineering Mechanics.

1. Knowledge

Course Objectives:

Pre-requisites: 10th Passing.

Course Code	CIV0F01A	Course Title	Basics of Mechanics				
Course Category	Program Foundation	Total work load hours	Lectures	Tutorials	Laboratory	Project	Total
Teaching Scheme and		Credits	2	-	2	2	4
Assessment Scheme Code	TIA						3

COURSE STRUCTURE

Learning Resources:

1. Recognize study and write specifications of lab equipments.
2. Differential axle and wheel (wall mounted unit with the wheel of 40 cm diameter and axles are in steps of 20 cm and 10 cm reducing diameter).
3. Single Purchase Crab winch (Table mounted heavy cast iron body. The effort wheel is of C.I. material of 25 cm diameter mounted on a shaft of about 40mm dia. On the same shaft a geared wheel of 15 cm dia.
4. Double Purchase Crab winch (Having assembly same as above but with double set of gearing arrangement).
5. Weston's Differential pulley block (consisting of two pulleys; one bigger and other smaller.
6. Simple screw jack (Table mounted metallic body, screw with a pitch of 5 mm carrying a double flanged drum table of 20 cm diameter).
7. Worm and worm wheel (wall mounted unit with threaded spindle, load drum, effort wheel; with necessary slotted weights, hanger and thread).
8. Determine centroid of different geometrical plane figures
9. Determine centre of gravity different geometrical solid figures
10. Verify Law of moments
11. Verify Lami's theorem by using universal force table
12. Determine beam reactions for simply supported beam
13. Solve problems on beam reaction by analytical method
14. Determine coefficient of friction for motion on horizontal plane
15. Determine coefficient of friction for motion on inclined plane

Laboratory Exercises / Practical:

Unit 5: Centroid and centre of Gravity.

Unit 4: Friction

Unit 3: Equilibrium

Unit 2: Force System.

Unit 1: Simple Machine.

Course Contents:

Term End Examination: Marks

Laboratory Continuous Assessment (LCA): marks

Class Continuous Assessment (CCA): marks

Assessment Scheme:

Team teaching, Presentation, Interactive session, Problem based learning, Performance of practicals with necessary resources by students with assistance of staff & assistant

Pedagogy:

MOOCs:

<http://npTEL.ac.in/courses/1121031019/23>

<http://npTEL.ac.in/courses/1121031019/25>

<http://npTEL.ac.in/courses/1121031017>

Weblinks:

Web Resources:

NA

Supplementary Reading:

7. Applied Mechanics by R.S. Khurmi, S.Chand & Co, New Delhi
6. Engineering Mechanics by S.S. Bhavikatti New Age International publishers
5. Engineering Mechanics by Shame I.H., P.H. India
4. Engineering Mechanics by F.L. Simeger, Harper and Row publication
3. Engineering Mechanics: Statics & Dynamics by R.C. Hibbeler, McMillan publication. Wiley and son's publication.
2. Engineering Mechanics: Statics and Dynamics by J.L. Meriam and Craigie, John Johnson, Tata McGraw-Hill Publication.
1. Vector Mechanics for Engineers: Statics and Dynamics by F.P. Beer and E.R.

Reference Books:

Module	No.	Syllabus:	Workload in Hrs	Contents	Theory	Practical	Assess
6	6	Lifting Machine	6	Simple lifting machine, load, effort, mechanical advantage, applications and Advantages Velocity ratio, efficiency of machine, law of machine. Ideal machine, friction in machine, maximum mechanical advantage and efficiency, reversible and non-reversible condition for reversibility	• The Material Properties like stress and strain under Longitudinal & Lateral Loads. Articulate practical	2	Force System
2	2	Equilibrium	10	Analyze Composite section subjected to direct load, calculate modulus of elasticity, modulus of rigidity and axial deformation under given conditions for different materials.	• Equilibrium and Equilibrium. Free body diagram, Analytical and graphical conditions of equilibrium. Equilibrium of force systems analytically. Lami's Theorem, limitations.	3	3
4	4	Friction	8	Beam reaction for cantilever, simply supported beam with or without overhang – subjected to combination of Point load and UD load or Vertical Point load and UD load and couple. Determination of beam reaction graphically for simply supported beam subjected to vertical loads only.	• Beam reaction for cantilever, simply supported beam and inclined point load. UD load, couple), span of roller and fixed, loads acting on beam (vertical and horizontal, types of beams, supports (simple, hinged,	2	2

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15	15	45	15	15	2	5

- Friction and its relevance in engineering, types and laws of friction, limiting equilibrium, limiting friction, co-efficient of friction, angle of friction, angle of repose, relation between co-efficient of friction and angle of friction.
- Equilibrium of bodies on level surface subjected to force parallel and inclined to plane. Equilibrium of bodies on inclined plane subjected to force parallel to the plane only. FBD of ladder in friction.

Centroid and Centre of Gravity

- Centroid of geometrical plane figures (square, rectangle, triangle, circle, semi-circle, quarter circle)
- Compute the Centroid of composite figures composed of not more than three geometrical figures
- Centre of Gravity of simple solids (cylinder, sphere, hemisphere, cone, cube, block)
- Determination of Centre of Gravity of composite solids composed of not more than two simple solids

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