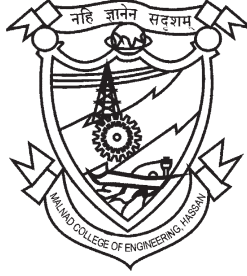# MALNAD COLLEGE OF ENGINEERING

(An Autonomous Institution affiliated to VTU, Belagavi)

P. B. NO. 21, HASSAN-573202, KARNATAKA, INDIA

STD: 08172-245317, FAX: 245683

www.mcehassan.ac.in | email:office@mcehassan.ac.in

HAND BOOK 2021-22

Name (Student/ Staff) :

USN / Designation :

Department/ Program :

Mobile No.	:	
Aadhar No.	:	
PAN No.	:	
Driving License No.	:	
Bank Account Number	:	
IFSC Code	:	
Membership No.	:	
Blood Group	:	
Local address for Communication	:	

NOTE : This book contains information for the batch admitted during the academic year 2021-22

CONTENTS

MALNAD COLLEGE OF ENGINEERING, HASSAN

ACADEMIC SCHEDULE AND CALENDER OF EVENTS FOR
ODD-SEMESTER : 2021-22
(I Semester B.E. - Autonomous Programs)

Sl. No.	Event Particulars	Scheduled Dates
1.	Online Orientation Program	Dec 20, 2021
2.	Students Induction Program	Dec 21- Jan 14, 2022
3.	Registration of courses	Jan 24-25, 2022
4.	Registration of Backlog courses	Feb 2, 2022
5.	CIE – 1	Feb 21-23, 2022
6.	Mid-term Feedback	Feb 24-25, 2022
7.	CIE – 2	Mar 21-23, 2022
8.	Withdrawal of Course/s by eligible students	Mar 24-25 2022
9.	CIE – 3	April 21-23, 2022
10.	Faculty Evaluation by Students	Apr 25-27, 2022
11.	Freezing of IA Marks	Apr 30, 2022
12.	Last Working Day for students	Apr 30, 2022
13.	Submission & announcement of names of students at Department Notice boards with CIE < 20 Marks & Attendance < 85%	Apr 30, 2022
14.	Examination Preparation Holidays	May 1-10, 2022
15.	College Level GRC Meeting(Attendance & other academic issues)	May 5, 2022
16.	SEE Examinations	May 11-25, 2022
17.	Practical Examinations	May 26 - June 2, 2022
18.	Declaration of Results of Odd Semester Examinations 2021-22	June 6, 2022
19.	Paper seeing for Odd semester 2021-21 SEE Exam	June 8, 2022
20.	Makeup SEE Examination for students with CIE >=45	June 13, 2022
21.	Even Semester Term	June 13, 2022

EXECUTIVE COUNCIL OF
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@ Puttaraju, Vice-Chairman of MCE, Director, MTES®, MIG-48, Kuvempunagar, Hassan - 573 201.</td>
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MALNAD TECHNICAL EDUCATION SOCIETY ®
HASSAN – 573202

VISION

To establish institutions of excellence and produce the best citizens who can contribute to global peace and prosperity

MISSION

- To contribute to the qualified manpower of the nation.

- To provide the best infrastructure and environment for quality education.

- To recruit and retain the finest faculty.

- To ensure enriching rewards to all stake-holders.

- To fulfill social obligations in all possible ways.

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MALNAD COLLEGE OF ENGINEERING
HASSAN – 573202

VISION

To be an Institute of Excellence in Engineering Education and Research, producing socially responsible Professionals.

MISSION

- Create conducive environment for learning & research

- Establish industry and academia collaborations

- Ensure professional and ethical values in all institutional endeavors

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TECHNICAL AND ADMINISTRATIVE STAFF

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5	Sri. N. Shivanna	Helper/Driver	nsh@mcehassan.ac.in	2155	8762884489

DEPARTMENT OF CHEMISTRY

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3	Mr. K N Krishnakumar	Associate Professor	knk@mcehassan.ac.in	2203	9480264142
4	Mr. B C Ravi	Associate Professor	bcr@mcehassan.ac.in	2204	7019457116
5	Dr. Pradeep kumar C B	Assistant Professor	cbp@mcehassan.ac.in	2205	9844619138
6	Dr. C S Kavitha	Assistant Professor	csk@mcehassan.ac.in	2206	8660253965

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3	Mr. B. N. Ramachandra	Helper	bnr@mcehassan.ac.in	2253	9972797901
4	Mr.Keshavmurthy D T	Helper			9113920440
5	Ms. T.H. Rajeshwari	Attender			9900867700

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3	Mr. H Raghu	Associate Professor	hr@mcehassan.ac.in	2303	9449007119
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11	Dr. Shashikumar N.S.	Assistant Professor	nss@mcehassan.ac.in	2310	9481403313
12	Mr. Pradyumna R	Assistant Professor			
13	Mrs. Niharika Hegde	Assistant Professor			
14	Mrs. Shwetha R	Assistant Professor			

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TECHNICAL AND ADMINISTRATIVE STAFF

Sl. No.	Name	Designation	e-mail id	VoIP	Contact no.
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DEPARTMENT OF HUMANITIES

Sl. No.	Name	Visiting Faculty	e-mail id	VoIP	Contact no.
	Communication Skills				
1	Manjunath Achar				9448382630
	Kannada				
1	Sri. Dumme Gowda				9845704884
2	Sri. Ramachandra				9448706818
	Constitution of India & Professional Ethics				
1	Smt. Thanuja				8073252662

DEPARTMENT OF PHYSICAL EDUCATION

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1	Sri. Somashekar D L	Asst Director of Physical Education			9480576684
2	Sri. Praveen Dsouza	Fitness Instructor			9740585223

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1	Sri. Nagaraj S.T	Life Guard			9482974415
2	Sri. Devaraju	Helper			9844783404
3	Sri. Rangaswamy	Peon			9741621659
4	Sri. Shivanna I L	Attender			948703564
5	Sri. Ganesh T. H	Peon	Ganeshgayathri497@gmail.com		9741626341
6	Sri. Sandeep	Daily wages			7411166729

LIBRARY ADMINISTRATIVE STAFF

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4	Mr. Jayashankar	S.D.A			9964934565
5	Ms. H.S. Bharathi	S.D.A			8105223582
6	Mr. Prathap H A	S.D.A.			9986025588
7	Mr. H.S. Deepak	Helper			9591618567
8	Ms.M.D. Rajani	Attender/ Helper			8453940030
9	Mrs. M D Sumithra	Helper			
10	Mr. Ashok Kumar C.S	Peon			9972470440
11	Mr. Kallaiah	Peon			
12	Nagarathna	Peon			8197926822
13	Smt. Rajeshwari T.H.	Office Assistant			9900867700

OFFICE STAFF

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3	Smt. Kumuda H.R	F.D.A.	hrk@mcehassan.ac.in	2401	8792777315
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8	Mr. R. Raghu Prasad,	Superintendent	rrp@mcehassan.ac.in	2409	9844046197
9	Mr. Shiva Kumar Swamy	Superintendent	sks@mcehassan.ac.in	2410	9448220850
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13	Smt. M.H. Pallavi	SDA		2404	9632315013
14	Mr.H V Pradeep	SDA		2456	9743237608
15	Mr. B.R. Divakar	SDA		2415	9901848282

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19	Mr. H.M. Madakarinayaka	SDA		9448048485
20	Smt. Indira	SDA		8710907163
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24	Smt. Sumithra	Sr. Typist	sra@mcehassan.ac.in	7259123464
25	Smt. Shaheeda Begum	FDA		8892678968
26	Smt. S. Madhu	FDA	sm@mcehassan.ac.in	9481114849
27	Smt. R.T Vani	Operator		9845247796
28	Smt. Sujatha M.R	SDA		9482493575
29	Smt. Geetha H.M.	SDA	hmg@mcehassan.ac.in	8746868739
30	Mr. Nagendra D N	Asst. Instructor		9844393487
31	Mr. B.M. Ravikumar	Mechanic		9632780299
32	Mr. Ramesh H.C	Mechanic		9964037120
33	Mr. H.J.Chandrashekar	Mechanic	hjc@mcehassan.ac.in	8073411513

34	Smt. Chandrakala	Helper	cla@mcehassan.ac.in	2424	9483689391
35	Mr. H.C. Jayarama	Helper/Driver			-
36	Mr. Kiran M B	Helper	mbk@mcehassan.ac.in	2421	7259979886
37	Mr.K L Jayaramegowda	Driver			9535563191
38	Mr. K. Mahesha	Attender		2462	9886960520
39	Smt. P. Kanthammal	Peon		2425	8904095505
40	Mr.K.Manjunath	Peon			9972149844
41	Mr. Kale Gowda	Peon			8971615859
42	Mr. Rangaswamy S.R	Driver			9663578538
43	Smt. Bindu G.N	Attender		2422	7353973926
44	Mr. H N Sathish Kumar	Helper	shn@mcehassan.ac.in	2423	

TEQIP

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2	Mrs. Jayanthi K N	SDA		2506	9141431338

TRAINING AND PLACEMENT

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ADMINISTRATIVE STAFF

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NETWORK CONTROL CENTRE

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3	Mr. Kumarswamy B R	Technical helper	brk@mcehassan.ac.in	2503	9844994383
4	Mr. Suresh	System Technician	ssa@mcehassan.ac.in	2504	9945633392

GARDEN COMMITTEE

Sl. No.	Name	Designation	e-mail id	VoIP	Contact no.
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SUPPORTING STAFF

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5	Smt. Chitra. K	Attender	--		--
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18	Smt. Pallavi	Peon	pal@mcehassan.ac.in		9535625804
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33	Mr. Manojkumar H M	Peon	--		9110468024
34	Mr.Kiran R	Peon	--		7259979886
35	Mr. Keshavamurthy D T	Peon	--		9113920440
36	Mr. Murthy A N	Peon	--		9845507950
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40	Smt. Rukmani S S	Peon	--		7829826701
41	Smt. S M Uma	Peon	--		9008759682
42	Smt. Yashodha K R	Peon	--		8861388756
43	Mr. Dhananjaya D V	Peon	--		9353026856

DEFINITIONS
(Unless The Context Otherwise Requires)

MCE	Malnad College of Engineering(Hassan, Karnataka, India)
BoG	Board of Governors
AC	Academic Council of the college
BoS	Board of Studies
BoE	Board of Examiners
MEC	Malpractice Enquiry Committee
GRC	Grievance Redressal Committee
SDAC	Standing Disciplinary Action Committee
IQAC	Internal Quality Assurance Cell
Principal	Principal of the College
Dean - AA	Dean Academic Affairs
Dean - SA	Dean Student Affairs
DEAN -EXAMS	Dean Examinations
CET	Common Entrance Test(conducted by Government of Karnataka)
Course	A specific subject identified by its course-code and course-title with a specified syllabus along with a set of references offered during a specific academic-session/semester
Curriculum	The set of academic regulations, course-structure and course contents
HoD	Head of the Department
IAB	Industry Advisory Board
DAC	Department Academic Committee/Internal BoS
FA	Faculty Adviser
CF	Course Faculty
CC	Course Coordinator
FM	Faculty Mentor

Department/ Program	Department that offers the degree program the student has enrolled for
ProjectGuide	Faculty who guides the project of the student(s)
Regulations	Set of governing rules
VTU	Visvesvaraya Technological University , Belagavi
CGPA	Cumulative Grade Point Average
SGPA	Semester Grade Point Average
CIE	Continuous Internal Evaluation
SEE	Semester End Examination
EC	Equivalence Committee
PDC	Provisional Degree Certificate
CDC	Campus Disciplinary Committee
PRC	Parents Relations Centre
CSE	Chief Superintendent of Examination
Dy. CSE	Deputy Chief Superintendent of Examination
SGRC	Special Grievance Redressal Committee
CICC	College Internal Complaints Committee

1. GOVERNANCE RULES & REGULATIONS
1.1 Board of Governors (BoG)
(Constituted as per the norms stipulated by the University)

Meetings : The member secretary shall, with the approval of the Chairman convene the meeting of the BoG at least once a year and such other occasions as may be necessary. The member secretary shall, with the approval of the Chairman prepare the agenda for the meeting. Quorum for the meeting shall be seven members. However, if there is no quorum for the meeting convened up to half an hour, then the meeting shall stand adjourned to the next convenient day fixed. In the adjourned meeting, if there is no quorum upto half an hour, the members present shall themselves constitute the quorum and conduct the meeting.

Term of the members : Two years, except for the Commission/ Council nominees. When a vacancy arises, the Chairperson of the Governing Council can appoint a new member.

The functions of BoG are to:

- Adopt the fee/other charges payable by students of the college as fixed by the Government/ University from time to time.

- Accept endowments, institute scholarships, fellowships, studentships, medals, prizes and certificates on the recommendation of Academic Council.

- Approve the institution of new programmes of study in the College with the concurrence of University leading to degrees and/or diplomas.

- Lay down service conditions, emoluments as per the council norms, traveling allowances for teaching and non-teaching staff in the college, consistent with the University statutes/ ordinances/ regulations/ rules and State Government provisions.

- Lay down procedures for selection/ recruitment of teaching, non-teaching staff and to appoint the same in the college, consistent with University/ Council statutes/ ordinances/ regulations/ rules and State Government provisions.

- Regulate and enforce discipline among members of teaching and non-teaching staff in accordance with the rules/ procedure laid down in this regard.

- Invest (any money belonging to the College) in approved securities, as it shall from time to time, think fit or in the purchase of immovable property.

- Transfer or accept transfer of any movable or immovable property of the College.

- Entertain, adjudicate upon and if thought fit, constitute a committee to advise and/or to recommend Redressal of the Grievances of the members/ staff of the College.

- Delegate administrative and financial powers to the Principal and other functionaries in the College for smooth functioning.

- Approve the Annual Report of the College, perform such other functions, constitute committees as may be necessary and deemed fit for the proper development and fulfill objectives for which the College has been established.

1.2 Academic Council (AC)
(Constituted as per the norms stipulated by the University)

Constitution of Academic Council (AC)

Chairman : Principal

Members : All Heads of the Department, four teachers of College representing different levels of teaching staff by rotation on the basis of seniority of service in the college to be nominated by the Principal, not less than four experts from outside the college representing such areas as industry, research & development laboratories, and technical education to be nominated by the BoG, three nominees of the University.

Meetings : The member secretary shall, with the approval of the Principal, prepare the agenda and convene the meeting of the AC, at least twice a year and on such other occasions as may be necessary. One half of the members shall constitute the quorum. However, if there is no quorum for the meeting convened upto half an hour, then the meeting shall stand adjourned to a next convenient day fixed. In the adjourned meeting, if there is no quorum upto half an hour, the members present shall themselves constitute the quorum and conduct the meeting.

The functions of Academic Council :

- Scrutinize and approve the proposals of the Boards of Studies with regard to programs of studies, academic regulations, curricula, scheme, syllabi and modifications there of, instructional and evaluation arrangements, methods, procedure relevant thereto etc. If AC differs on any proposal, it shall have the right to return the matter for reconsideration to the Board of Studies concerned or reject it, after giving reasons to do so.

- Adopt regulations regarding the admission of students consistent with the University/Government norms for different programs of study in the College.

- Frame regulations consistent with the University norms to conduct examinations and initiate measures for improving the quality of teaching, students' evaluation and students' advisory system in the College.

- Approve the list of successful candidates for the award of degree certificate.

- Make regulations for sports, extracurricular activities and proper maintenance of the playgrounds and hostels.

- Recommend to the BoG the proposal for instituting new program(s) of study.
- Make recommendations to BoG regarding the institution of scholarships, studentships, fellowships, prizes and medals and to frame regulations for the award of the same.
- Make recommendations to the BoG on issues related to academic affairs.
- Encourage faculty members to undertake sponsored research, industrial consultancy, continuing education and related activities.
- Perform such other functions as may be assigned to it by the BoG of the institute.

1.3 Dean -Academic Affairs

The functions of Dean -AA:
- Implementation of all decisions taken on academic matters by AC.
- Registration of students, and maintenance of academic records of students.
- Be responsible for all the matters connected to students' academic activities.
- To receive, process and maintain all records pertaining to undergraduate program including curricula, courses offered, academic calendar, registration, records of long leave and examinations.
- Disseminate information related to all academic matters by issuing necessary circulars.
- To act as a channel of communication between students, faculty, departments and DAC.
- To conduct faculty appraisal by the students and report the results to the Principal for follow-up action.

1.4 Dean -Student Affairs

The functions of Dean -SA :
- Monitoring the proctorial system.
- Issuing ID cards, authorize Railway/Bus concession certificates to the students.
- Having liaison with the University regarding the issue of migration and other certificates.
- Taking care of the general welfare of students.
- Addressing all students related problems and disciplinary matters.

1.5 Dean -Examinations

The functions of Dean -Exams:

- Monitoring all matters pertaining to conduct of CIEs, SEEs, evaluations and grading, publication of results and printing of grade cards (CIEs for first year students to be centrally conducted by DEAN- EXAMS and for senior classes, CIEs to be conducted by HoDs as per the time table announced by the DEAN -AA /DEAN-EXAMS.

- Preparing timetable for all SEEs, in consultation with Dean -AA.

- Maintaining the examination records of students.

- Corresponding with VTU regarding award of degree to students.

- Issue transcripts to the students

1.6 Malpractice Enquiry Committee (MEC)

Constitution of Malpractice Enquiry Committee :

Chairman	Chief Superintendent of Examination or his Nominee
Convener	Dean -Exams
Members	Dean-AA, Dean-SA, Concerned HoD, and Faculty nominated by Chairman

The functions of MEC:

- Conduct enquiry of students involved in malpractice.

- Deliberate and decide on the quantum of punishment depending upon the gravity of the offence (The general punishment for all cases of malpractice, in SEE's - theory or practical examinations, shall be: awarding of F grade in the corresponding course, denial of permission to take up the immediate make up SEE, allowing the student to re-register for the same course only during the next year, i.e., after a break of one year, etc.).

1.7 Grievance Redressal Committee (GRC)

Constitution of GRC :

Chairman	Principal or his Nominee
Convener	Dean -AA
Members	Dean -Exams, Dean -SA, and Concerned HoD

The functions of GRC :

- Receive written requests/complaints from students regarding any kind of academic grievances, deliberate and suggest appropriate remedies in genuine cases.

- Recommend for implementation, modification of grades, if any, through proper mechanism.

- Conduct enquiry of students involved in malpractice in CIE/SEEs, deliberate and decide on the quantum of punishment.

1.8 Equivalence Committee (EC)

Chairman	Principal or his Nominee.
Members	Dean -AA, HoD, Senior faculty nominated by the Principal

EC shall decide the number of credits and grade points to be awarded, for the courses studied earlier, to the students from non-autonomous programs.

1.9 Standing Disciplinary Action Committee (SDAC)

Chairman	Principal or his Nominee.
Members	Dean - SA, Concerned HOD, Two Faculty / Officials nominated by the Chairman

SDAC shall investigate the details of the violation of discipline including ragging and recommend suitable disciplinary action.

1.10 Campus Disciplinary Committee (CDC)

Chairman	Principal or his Nominee.
Members	Dean-SA, Concerned HoD, Faculty/Officials nominated by the Chairman

CDC shall investigate the details of the violation of campus discipline and recommend suitable disciplinary action.

1.11 Internal Quality Assurance Cell (IQAC)

An internal mechanism for sustenance, assurance and enhancement of the quality culture of education imparted by the institution is essential. MCE has established the Internal Quality Assurance Cell (IQAC) as a post accreditation quality sustenance activity as per the guidelines of UGC. The IQAC is meant for planning, guiding and monitoring quality assurance and quality enhancement activities of the college. It will channelize and systematize the efforts and measures of the institution towards academic excellence. The IQAC is constituted under the chairmanship of Principal with a senior faculty as a Director/Coordinator. It consists of eminent persons from industry & academia along with faculty & staff from MCE nominated by the Principal. The composition of MCE-IQAC is as follows:

SL.No.	Name	Designation and Affiliation
Chairman		
1.	Dr. C.V.Venkatesh	Principal
Industry/External Members		
2.	Dr. Guruprasad	Professor, BMSCE, Bangalore
3.	Sri. Hamsaraj H.J	Industrialist, Hamshine
4.	Dr. Jagadeesh Patil	CEO, Nagbridge Technology India Pvt. Ltd., Bangalore.
Internal Members(Academic)		
5.	Dr. P.C Srikanth	Dean-P&D
6.	Dr. B. Uma	Dean-AA
7.	Dr. S. Pradeep	Dean-Exam
8.	Dr. Ravikumar. K.P	Dean-SA
9.	Dr. G. Shivakumar	Dean-Research
10.	Prof. B.B. Neelakantappa	T&P Officer
11.	Dr. H.S. Narasimhan	Associate Dean-Exams
12.	Dr. A.J. Krishnaiah	Dean-PG Programs
13.	Dr. Mohankumar Chavan	Professor & Head, Dept. of Civil Engg.
14.	Dr .L. Laxmana Naik	Professor and Head, Dept. of Mechanical Engg.
15.	Dr. N.S. Jyothi,	Professor and Head, Dept. of E&E Engg.,
16.	Dr. A .N. Basavaraju	Professor and Head, Dept. of Auto Engg.,
17.	Dr. M.S. Srinath	Professor and Head, Dept. of I&P Engg.
18.	Dr. A. Geetha Kiran,	Professor and Head, Dept. of CS& Engg.
19.	Dr. M.R. Rangaraju	First Year HoD, Professor & Head, Dept. of Physics
20.	Dr. M.B. Jagadeesha	Professor & Head, Dept. of Chemistry
21.	Dr. M.K. Partha	Professor & Head, Dept. of Mathematics
22.	Dr. Y.M. Shashidhara	Professor, Co-ordinator-IQAC

1.12 Parents Relations Centre (PRC)

As per the notification of the Visvesvaraya Technological University, Ref. VTU/ ACA-Circulars/ 2014-2015/8009 dated 21st Oct. 2014, Parent Relation Centre has been established in the institution. The objectives of this centre is to find out the problems faced by the students and to strengthen the student support system by organizing Parents meet as part of Parents-Institution Interactions. In this regard the role of the parent is very important in guiding and monitoring the progress of their wards.

The purview of the Parents meet shall be pertaining to the academic issues, ways and means to lower the dropout rate, to incorporate parents views and suggestions in relevant matters like facilities in the campus and hostels and to deliberate on important issues pertaining to the welfare of the students. The Parents meet will be conducted once in every semester.

The Conveners are –

Sl. No.	Name	Designation
1	Dr.Y. Arun Kumar	Professor, Dept. of I &P Engg.
2	Mrs.Sumana Jayaprakash	Asst. Professor, Dept. of Civil Engg.

1.13 Internal BoS /Department Academic Committee (DAC)

Constitution of DAC:

Chairman	Head of the Department
Members	Minimum four faculty members at different levels nominated by the HoD

The functions of Internal BoS /DAC :

- Monitor conduct of courses offered by the department
- Ensure academic standards and excellence of the courses offered by the department
- Oversee evaluation of each course offered
- Recommend modifications in the curriculum to the BoS
- Help Dean -AA in the registration of all departmental courses and preparation of academic calendar.

1.14 Board of Studies (BoS)

Functions of BoS:

- Prepare syllabi for various courses keeping in view the Vision & Mission of the College, interest of the stakeholders, and State/National requirements for the considerations and approval of the AC.

- Suggest methodologies for innovative teaching and evaluation techniques

- Suggest panel of experts to AC for appointment of examiners

- Coordinate research, teaching, extension and other academic activities in the departments.

- Any other function that may be assigned by the AC.

Constitution of BoS

Chairman	*Head of the Department*
Members	1. At least five faculty members at different levels covering different specializations.
	2. Two experts in the programme from outside the college, to be nominated by Academic Council.
	3. One expert from outside the college nominated by the Vice Chancellor from a panel of six recommended by Principal.
	4. One representative from industry/corporate sector/allied area relating to placement to be nominated by the AC.
	5. One postgraduate meritorious alumnus to be nominated by Principal as member.
Co-opted members	*Chairman co-opts the following members:*
	1. Experts from outside the college whenever special subjects of studies are to be formulated.
	2. Other members of the faculty of the same department

1.15 Board of Examiners (BoE)

Constitution of BoE

Chairman	*Nominated by the HoD and approved by the Principals*
Members	All the members of DAC and two experts from other Institutions.

The functions of BoE:

- Scrutinize the question papers.

- Forward the panel of examiners for each course to the Dean -Exams in consultation with the Principal.

- Plan and conduct the CIEs and course activities.

- Assists Dean -Exams in conducting the SEEs.

1.16 Faculty Advisors (FA)

To effectively guide students in academic, co-curricular and extra-curricular activities and achieve career goals, each student shall be assigned a **Faculty Advisor**. Each Faculty Advisor may be assigned up to twenty students. The FA shall continuously interact with the students through scheduled and informal meetings. The FA shall:

- Assist, mentor, guide, advise and counsel the students in matters relating to academics, co-curricular and extra-curricular activities, career planning and personality development,

- Monitor the students' performance and progress,

- Based on available data, identify students' strengths and weaknesses and work with them to overcome their weaknesses and reinforce their strengths.

- Communicate with the parents/ guardians regarding the performance and progress of the students.

1.17 Course Faculty (CF)

The Course Faculty shall perform the following functions:

- Follow all regulations relating to teaching of a course and evaluation of students.

- Be responsible for all records such as course registration, answer books, attendance of the students registered for the course taught.

- Conduct classes/ Laboratories/ Practicals as prescribed in the academic calendar and Time Table.

- Share the Lesson Plan, Evaluation Plan together with the objectives of the course and reference materials at the beginning of the course

- Conduct the CIEs for the course activities like quiz & assignments.

- Document the students' performance and announce the results of CIE as stipulated in the regulations.

- Report to the HoD on a regular basis the progress of the course and the cases of poor performance and low attendance that may result in an "F" grade at the end of the course.

- The Course Faculty may also advise/counsel such students and assist them in improving their performance and avail the facilities such as withdrawal from the course.

1.18 Course Coordinator (CC)

Courses which are taught by more than one Course Faculty and courses which are taught to more than one class/ section shall have a Course Coordinator appointed by the HoD of the teaching department. The CC shall have the following responsibilities:

- Coordinate amongst all the CFs teaching the course regarding progress of classes, synchronize coverage of topics and set or arrange to set question papers for CIEs.
- Coordinate with CFs to decide the scheme of evaluation of CIEs.

1.19 Faculty Mentor (FM)

Faculty Mentor (FM): Each Faculty mentor may be assigned up to twenty students. He/She shall continuously interact with the students through scheduled and informal meetings. The FM shall assist, mentor, guide, advice and counsel the students in matters relating to academics, co-curricular and extra-curricular activities, career planning and personality development. Monitor the students' performance and progress based on available data. Identify students' strengths and weaknesses and work with them to overcome their weaknesses and reinforce their strengths. Communicate with the parents/ guardians regarding the performance and progress of the students. Responsible to award activity points to the student. FA will also be a faculty mentor for a batch of students in the class and also the co-ordinator for all faculty mentors of that class. He/She serves as a SPOC between students and department Head.

2. TITLE AND DURATION OF THE PROGRAM

2.1 The Program : shall be called a Degree Course in Bachelor of Engineering (B.E.).

2.2 The normal duration of the program : shall be four academic years. However, the maximum duration for the B.E. program shall be eight years from the date of first registration, which includes the period of withdrawal, absence and different kinds of leave permissible to a student.

An academic year of 52 weeks consists of two semesters each of 22 weeks duration excluding 4 weeks of vacation in both semesters.

2.3 Academic Calendar: The Academic calendar for each year, which clearly indicates the dates of registration, CIE, SEE, semester vacation, etc. be prepared by the Dean -AA and it shall consist of the schedule of academic activities of one complete academic year and shall be notified at least two weeks before the commencement of the academic year. The calendar of events in respect of each academic session shall be fixed by the college from time to time.

Activities in each semester include course registration, Continuous Internal Evaluation (CIE) consisting of quizzes, tests, seminars/ assignments/ term-papers/ mini-projects, Semester End Examination (SEE), evaluation, finalization of grades and end semester vacation.

The overall schedule of an academic year, in general, shall be as follows:

Odd Semester	20 weeks
Vacation	02 weeks
Even Semester	20 weeks
Vacation	02 weeks
Supplementary Semester / Vacation	08 weeks
Total:	**52 weeks**

2.3.1 Odd and Even Semesters: The schedule for the Odd and Even semesters shall be as follows:

Registration …………..…..… First 3 days of the semester

Course Work …………………….………….. 14 weeks

Exam Preparation, Examinations………..……..4 weeks

Evaluation & Declaration of Results   ……..…….… 2 weeks

Total   20 weeks

2.3.2 Supplementary Semester: The supplementary semester is conducted once at the end of even semesters during each academic year. The registrants of supplementary term shall fulfill CIE criteria afresh and attendance criteria if not satisfied earlier for taking SEE. The schedule of supplementary semester shall be as under:

• Registration …………..…..… First day of the supplementary semester

• Course Work …………………….…………..6 ½ weeks

• Exam Preparation, Examinations Declaration of Results.…1½ weeks

Total 08 weeks

2.4   Co-curricular and extra-curricular activities shall not affect the activities stipulated in the Academic Calendar.

2.5   Under circumstances where teaching days are declared as holidays or when classes get suspended, for whatever reasons, make-up classes for such lost days shall be held on Saturdays/ Sundays with prior announcements.

3. REGISTRATION

3.1 Registration :

A student shall register in person at the beginning of each semester on the prescribed dates as per the norms. The student shall consult the concerned Faculty Advisor/Mentor in choosing the courses to be registered.

3.2 Late Registration :

Late registration after the announced registration dates may be permitted only for valid reasons and on payment of a late registration fee. In any case, registration must be completed before the prescribed last date for late registration. These dates shall be mentioned in the academic calendar.

3.3 Registration in Absentia :

Registration in absentia may be allowed only in rare cases at the discretion of the Dean -AA, in case of illness or other contingencies.

3.4 Eligibility for Registration :

To be eligible to register for a higher semester, the student must have earned the required number of credits and CGPA as stipulated for vertical movement, as per rule 6.3.2 given next.

3.5 Minimum and Maximum Number of Credits :

A student shall register for a minimum of 16 credits and a maximum of 30 credits in each semester. However, the average number of credits to be registered is recommended to be 22.

3.6 Make-up Examinations :

The make-up examinations at the end of both odd and even semesters are allowed only for those students with 'X' and "I" grade in the corresponding SEE's.

The students with 'F' grade in corresponding SEE's are only eligible for Supplementary Semester.

The grade 'X' is awarded to a student having high CIE rating ($\geq$ 90%, i.e. total CIE marks is $\geq$ 45) in a course, but SEE performance is observed to be poor, which could result in an overall 'F' grade in the course.

3.7 Supplementary Semester :

The supplementary semester shall be compulsorily conducted once at the end of even semester of every year. All those students who have fulfilled attendance shall take up CIE's only. The rest of the students with attendance shortage shall earn attendance and CIE's afresh.

3.7.1. Registration for Supplementary Semester:

The following requirements are to be satisfied:

- A student can register for any number of subjects (Theory or lab), but limited to a maximum of 16 credits.

- Registrants should pay the prescribed fee for attending classes and subsequent CIE's, SEE's, as applicable, within the due date.

- In case of courses for which attendance is to be satisfied by the registrants and hence the classes are to be attended, there should be a minimum of 5 registrant-students for such courses,

- In case of courses for which attendance is not to be satisfied by the registrants and hence the classes are not to be attended, there is no such constraint of minimum registrants.

- In case, a student clears a course in challenge revaluation/ make up examination, then the fee paid towards the registration of such supplementary semester courses will be refunded to all such students subject to the prevailing rules.

4. ATTENDANCE REQUIREMENTS AND WITHDRAWAL FROM COURSES

4.1 **Attendance Requirements:** A minimum of 85 percent attendance is compulsory in each course. However, in extra-ordinary circumstances such as illness, participation in University level co-curricular/ extra-curricular activities and participation in other academic activities such as seminars/ workshops/ presentation of papers in conferences, etc. with prior permission, a maximum of 10% attendance may be condoned by the Principal on the specific recommendation by GRC.

(i) A student shall keep track of the attendance status regularly. If a student does not fulfill the minimum requirement of attendance in a course, the student shall be awarded an F Grade in that course and shall repeat the course in its entirety in the subsequent semester whenever the course is offered.

4.2 **Withdrawal from Courses:** There is no provision for dropping of any of the registered courses under any circumstances. However, a student with poor CIE performance (less than 40% marks) in some course(s) can withdraw from such course(s) (retaining the minimum credits specified as per rule 3.5), before the prescribed date (but not later than two weeks before the commencement of SEE).

- A student can withdraw a course only if there is no shortage of attendance ($\geq 75\%$) in that course.

- Accordingly, a student having poor performance in CIE can withdraw from such a course(s). Such a student shall submit a written application to the principal duly signed by the student with complete academic details and recommended by the concerned faculty advisor and the Head of the Department before the stipulated date.

- The withdrawal of a course is allowed only once at any level, only if the total credits registered are more than 16 in a given semester even after availing such a facility.

- A student having poor performance in CIE in any of the courses of the program can withdraw from such courses, not restricted by the minimum no. of credits specified as per rule 3.5, before the prescribed date.

- In case of withdrawal(s) as above, the student shall be awarded W Grade (see 6.4) for such course(s). Such a withdrawal will not affect the SGPA/CGPA. The student shall re-register for such course(s) either in the makeup exam or in a subsequent semester whenever the course(s) is offered, as per the criteria next.

- If a student withdraws from a registered course with satisfactory attendance, the student shall earn CIE marks afresh, whenever the course is offered and then appear for the relevant SEE. Under any circumstances, the backlog courses are not permitted to be withdrawn.

4.3 **Dropping of courses:** The students are permitted to drop the courses on or before CIE-II of the respective semester, satisfying minimum number of credits criteria (16 credits). Further, such students are permitted to register for the course, whenever it is offered (if it is a core course) or student can register for same elective/different elective offered during the subsequent academic semester/year.

5. EVALUATION SYSTEM

A student needs to earn a total of exactly 175 credits for the award of the B.E. degree. The student accumulates credits by passing courses in every semester. The credits associated with a course depend on the number of hours of instruction per week. A student is allowed to earn the required 175 credits for the award of B.E. degree by registering for a specified minimum number of credits in each semester and secure the degree by taking one or more additional semesters without any sense of failure. However, the number of credits to be earned by lateral entry Diploma students, for the award of the degree, shall be exactly 135.

The course curriculum shall contain Lecture (L), Tutorial (T), Practical/ Laboratory (P), Self and Credit awarded (C) for the course which are mentioned as (L-T-P-C)C. Every course in the programme is assigned a certain number of credits according to the following pattern:

One credit for each lecture hour per week; e.g., 4 lectures (4–0–0–4)4

One credit for two tutorial hour per week; e.g., 3 lectures and 2 hour tutorial (3-1-0-4)4

1.5 credits for each practical session of 3 hours per week; e.g., 3 hours of practical (0-0-3-1.5) 1.5

One credit for each lecture and one credit for each practical session of two hours/week; e.g., (3–0–2-4)

6 . STUDENT ASSESSMENT

The student assessment shall consist of two components in all the theory/ practical courses: Continuous Internal Evaluation (CIE) and Semester End Examination (SEE).

All theory and practical courses shall carry 100 marks (CIE+SEE) each (with the audit courses having only the CIE).

6.1   Continuous Internal Evaluation (CIE)

6.1.1 CIE for theory courses : The cumulative evaluation of performance shall be for a total of 50 marks. A maximum of 30 marks for tests and 20 marks for activities shall be allotted (from 2021-22 admitted batch). However, in case of courses which need special provisions, the evaluation scheme approved by the concerned BoS shall be adopted. The scheme of evaluation and the rubrics shall be submitted by the faculty offering the course to the HoD, before commencement of the course. The lesson plan and the scheme of evaluation shall be shared with the students.

In case of theory courses, continuous evaluation has been given more importance in NEP 2020, the minimum marks to be secured in CIE to appear SEE shall be respectively 12 and 8 in tests and activities respectively.

Three tests shall be conducted each for maximum of 20 marks. The total marks secured by students shall be reduced proportionately to 30 marks. A minimum of two activities shall be conducted in each course for 20 marks.

6.1.2 CIE for practical courses : CIE consists of performance evaluation in each class and record writing for a total of 40 Marks. Activities relevant to laboratory courses shall be evaluated for 10 Marks. (Total 50 marks).

6.1.3   CIE for drawing courses : CIE consists of regular evaluation of drawing sheets for a total of 30 Marks and a minimum of two tests for 20 Marks.(Total 50 marks).

6.1.4   CIE for mini projects, internship, industrial training, certification courses/ workshop and Seminars shall be made known to the students at the beginning of the semester.

6.1.5   Eighth Semester projects evaluation is to be carried out in three stages: Synopsis evaluation for 10 marks, Mid-term evaluation for 15 marks and Semester end internal evaluation for 25 marks. Semester End Examination involving external examiner is for 50 marks.

Synopsis evaluation : on or before the end of 2nd week of 8th Semester, approval of the synopsis and evaluation for 10 marks by the concerned Project guide and Project coordinator/HoD to record the marks at the department level.

Mid-term evaluation : during the 8th week for 15 marks, to be done by a jury consisting of Project Coordinator, Project Guide, HoD. or his nominee. The official record of marks are to be maintained.

Semester end internal evaluation: to be completed by at least one week before the end of term days for 25 marks. The jury constituted for this purpose has to consist of Project Guide, Project Co-ordinator, HoD. or his nominee and staff members of related specialization. 10 marks in this evaluation shall rest with the Project guide and remaining 15 marks is to be averaged out upon evaluation by the individual members of jury, made upon presentation of the project along with due demonstrations.

Project work demonstration during SEE for 50 marks is to be made compulsorily in case of all the projects as applicable.

6.2 Semester End Examination (SEE)

SEE shall consist of a written or practical examination conducted at the end of the semester and shall be based on the entire course contents. The mode of SEE and marks assigned shall be made known to the students by the course instructor at the beginning of the semester.

Eligibility to attend SEE :

The eligibility criteria to attend the SEE in a course are:

• Attendance shall not be less than 85%.

• CIE marks shall not be less than 40% (minimum of 12 marks from tests and 08 marks from activities).

A student not fulfilling one or both of the above criteria in a course shall be assigned "F" grade and will have to re-register for that course either during the supplementary semester or any subsequent semesters whenever the course is offered. In case of an elective course, the student may re-register either for the same elective course or choose another elective from the same pool of electives.

6.3   Passing standards

6.3.1 A student shall score a minimum 40% marks in CIE and SEE put together with a minimum of 40% marks in SEE.

6.3.2 Vertical Progression (as per VTU)

Student admitted to First year :

a. Students having not more than four F grades in the two semesters of first year of the programme shall be eligible to move to II year.

b. Student having not more than four F grades in the four semesters of I and II year shall be eligible to move to III year.

c. Students who have earned all the prescribed credits of I year and having not more than four f grades in the four semester II and III year shall be eligible to move to IV year.

Diploma Student admitted to Second year (Lateral Entry) :

a.	Students having not more than four F grades (excluding the fail or pass status of additional mathematics I and II). In the two semesters of II year of the programme shall be eligible to move to III year.

b.	Student having not more than four F grades (excluding the fail or pass status of additional mathematics I and II if any) in the four semesters of II and III year shall be eligible to move IV year.

c.	The mandatory non-credit courses additional mathematics I and II prescribed at III and IV semesters respectively to lateral entry diploma holder admitted to III semester of B.E/B.Tech, programmes shall attend the classes during the respective semester to satisfy attendance and CIE requirements and to appear for the semester end examinations.

    i.	In case, any student fails to satisfy the attendance requirements of the courses additional Mathematics I and II, he/she not be eligible to appear for the semester end examination of that course.

    ii.	Students who have satisfy the attendance requirements but not the CIE requirements of the course additional mathematics I and II shall be permitted to register afresh and appear for SEE after satisfying the CIE requirements in the same course/s (with or without satisfying the attendance requirements) when offered during subsequent semester/s.

d.	Completion of additional mathematics I and II shall be mandatory for the award of degree.

6.3.3	A Student who wants admission to the autonomous program from a non-autonomous program, shall submit the previous marks card(s) and transcript obtained till date from VTU to the office of Dean-Exams/ EC for the purpose of exam marks to equivalent grade conversion. The criteria for movement to the third semester for such student(s) under autonomous schemes shall be same as rule 6.3.2.

6.3.4	All students shall complete the B.E. program within twice the academic years of study remaining, i.e..,

If rejoined, maximum period of study allowed

First year (I sem)	8 years
Second year (III sem)	6 years
Third year (V sem)	4 years
Fourth year (VII sem)	2 years

**6.4	Performance Evaluation :**The performance evaluation is carried out separately (i) for each course in terms of letter grades, (ii) for all courses in a

semester in terms of SGPA and (iii) for all semesters at a given point of time during the program, in terms of CGPA.

6.4.1 Letter Grades : The performance of a student in a specific course shall be assigned a letter grade based on an absolute scale, and shall be a measure of the performance of the student in that course. The letter grades and the corresponding Grade Points and performance levels are as indicated below:

Grade	Grade Points	Marks	Performance
S	10.0	90 – 100	Outstanding
A	9.0	80 – 89	Excellent
B	8.0	70 – 79	Very Good
C	7.0	60 – 69	Good
D	5.0	50 – 59	Above Average
E	4.0	40 – 49	Poor
F	0.0	00 – 39	Fail
I	-	-	Incomplete
W	-	-	Withdrawal
X	-	-	Transitional
Y	-	-	Satisfactory(for Audited Courses)
N	-	-	Not satisfactory (for Audited Courses)

Grade F : Awarded to a student in a given course who:

(i)   fails to get the minimum of 40% marks in CIE

(ii)   fails to get 40% marks in SEE

(iii) fails or does not register for the expected courses in the immediate make-up SEE

(iv)   does not attend SEE without justifiable reasons or make-up SEE. All the I and X grades are deemed to be F grade, if a student fails in such course(s) in the immediate make up SEE or does not attend the makeup SEE at all.

Grade I :   Awarded to a student having satisfactory attendance and meeting passing requirements in CIE, but remains absent from SEE for reasons acceptable to the GRC, like illness or accident which disable the student from attending the SEE, a calamity in the family at the time of SEE which requires the student to be away from the college.

Grade W : Awarded to a student who withdraws from a course before the prescribed date. Such students should have satisfied minimum attendance criterion. The total number of courses that can be withdrawn is subjected to minimum credits per semester criterion.

Grade X : Awarded to a student having high CIE rating (≥ 90%, i.e. total CIE marks is ≥ 45) in a course, but SEE performance is observed to be poor, which could result in an overall 'F' grade in the course. This is not applicable for backlog courses.

Grade Y : Awarded to a student who satisfies the attendance and other class room requirements of mandatory audit courses.

Grade N : This is awarded to a student who does not satisfy attendance and other class room requirements of mandatory audit courses. In such cases, the student should earn Y grade by re-registering for the course.

Note : *I, W and X are transitional grades awarded. They shall be converted into one of the letter grades S to F after the student completes the course requirements.*

The SGPA and CGPA are calculated as per the following formula (VTU guidelines):

$$\text{SGPA} = \frac{\sum[(\text{Course Credits}) \times (\text{Grade points})] \text{ for all courses in that semester } \textbf{excluding transitional} \text{ grades}}{\sum[(\text{Course Credits})] \text{ for all courses in that semester } \textbf{excluding F and transitional} \text{ grades}}$$

$$\text{CGPA} = \frac{\sum[(\text{Course Credits}) \times (\text{Grade points})] \text{ for all courses } \textbf{excluding those with F and transitional} \text{ grades until that semester}}{\sum[(\text{Course Credits})] \text{ for all courses } \textbf{excluding those with F and transitional} \text{ grades until that semester}}$$

Diminishing Grade rule : Further, if a student fails in any course and gets a pass in the same taking attempts, the grade obtained will be reduced by one level when the course is cleared, subject to the minimum of E grade. This rule will not apply for I grade which gets converted to any successful grades in the immediate make up examination. For example, the diminishing grade for the obtained grades S, A, B, C, D and E, will be A, B, C, D, E and E respectively.

6.4.2 Grace Marks Rules : Based on the prevailing practice and rules of VTU, the following rules have been framed to be applicable for the Autonomous Scheme of Examinations at the College while awarding any grace marks:

(i) **One Mark grace** is awarded in all the courses, if a student successfully completes (clears) those courses, because of the addition of the grace mark. This is applicable to all students irrespective of the number of such courses in a given semester as also the courses being backlog courses.

(ii) **Two Marks grace** is awarded in only one course during any given main semester of the program, if a student has failed only in one course and if he/she successfully completes (clears) that course because of the addition of two marks as grace mark. This rule is subjected to the condition that the student has cleared all the courses of that semester (not having W or I Grade) without getting the benefit under rule 6.4.2(i) as above. This is not applicable to more than one course or for any of the backlog courses.

6.5. Announcement of Results

The results of the examinations conducted are announced as per the schedule announced (within 3-4 days after the completion of Theory and Practical Examinations).

6.6. Paper Seeing Facility:

Paper seeing facility is provided, before the announcement of the final results of SEE or Make-Up Examinations Guidelines for Paper seeing:

➢ The Dean (Exams) shall announce the date and time of seeing the Answer Scripts by the students after the announcement of the provisional examinations result.

➢ The students are allowed for paper seeing only their valued answer scripts on the specified date and time, course wise as per norms.

➢ The concerned faculty member shall show the answer scripts to the students on the scheduled date/time. Faculty/student shall not be allowed to do any corrections/modifications during paper seeing.

➢ The students shall put forth the grievances if any, through an application to the Department Academic Committee (DAC).

➢ There is no revaluation of the answer scripts, however challenge valuation is allowed as per norms.

➢ The Department Academic Committee (DAC) shall hold a meeting to address the grievances submitted by the students and submit a report to the Dean (Exams).

➢ The Decision of the Dean (Exams) on this matter is final and binding.

6.7 Challenge Valuation :

A student with grievance(s) after paper seeing can apply for Challenge Valuation with a prescribed fee within two days from the announcement of paper seeing results. The Dean (Exams) shall arrange for a challenge valuation by a subject expert(s). The rules of challenge valuation applicable for award of marks are as under:

(i) If the decrease in the challenge valuation marks is by any margin, then the original marks corresponding to the first evaluation marks is awarded to the student.

(ii) If the increase in the challenge valuation marks is less than or equal to fifteen, then the valuation marks corresponding to the challenge valuation marks is awarded to the student.

(iii) If the increase in the challenge valuation marks is more than fifteen, then the answer script will be sent for third valuation and the average of the best two marks shall be awarded.

6.7.1 Refund of Challenge Valuation Fee In case of an improvement in marks after challenge valuation is greater than 15 the refund of the challenge valuation fee is made as per college norms (against an application). This is not just based on the change of grade.

6.8 Make up Examination

A student with I or X grade may take a make-up examination which will be held as per the dates notified (normally within 10 days after the announcement of the SEE results):

Diminished Grade : The grade secured by a student is diminished, if the student has obtained F grade in previous attempts for that course. The Grade card, for a given semester, will be issued only after all courses of that semester and previous semesters are completed successfully.

6.9 Registration of failed courses :

A student who has taken SEE and has obtained F grade (failed) may register for those course(s) whenever the course(s) is/are offered (with the new syllabus if revised). In case of courses not offered, an equivalent course decided by the corresponding department BOS meeting to be registered. The student shall satisfy the attendance and CIE requirements afresh as per the norms.

For vertical progression, a maximum of 4 courses with F grades (excluding courses with W grades) are permitted at the end of each academic year {subjected to the sub rule: 6.3.2 i(b)}

6.10 Grade Card and Transcript :

The grade-card of a semester will be issued only after a candidate successfully completes all the courses of that semester. In other words, only one

grade-card per semester will be issued irrespective of the attempts taken by a student. However, the date and Year of passing and number of attempts for each course will be shown in the grade-card in respect.

6.10.1 In case of mandatory audit courses, the grades shall be either Y (Satisfactory) or N (Not Satisfactory).

6.10.2 Only courses with credits will be included in the computation of CGPA & SGPA. Audit courses and mandatory non-credit courses shall not be considered in the computation.

6.10.3 Duplicate Grade cards : Provision for the issue of duplicate Grade Card(s) to a student - the candidate has to register a complaint at the police station in connection with the lost Grade Card with all particulars. Further, the candidate has to submit an affidavit duly prepared by the Notary in the following format:

AFFIDAVIT

I _____ aged about _____ years, S/o / D/o _____ residing at _____ _____, do here by solemnly affirm and state an oath: I say that, I am the deponent herein. I say that, I have completed my _____ semesters B.E. Course in the academic years _____ to _____ at Malnad College of Engineering, Hassan. I say that, my above said _____ semester original Grade card was lost/ misplaced due to my inadvertence. I say that, in spite of diligent search I am unable to trace the original of the aforesaid Grade card and hence they are taken as lost, and if traced out, I will produce them before the above said college. I say that, this affidavit is required for the purpose of obtaining duplicate grade card of the above said _____ semester/s. I do swear in the name of God that, this is my name and signature and all the contents of this affidavit are true and correct to the best of my knowledge, information and belief.

Identified by me,

Despondent

Date :
Place:

The candidate has to submit the request to the DEAN (EXAMS) section in the above prescribed format. The fee of Rs. 500/- per grade card (Rupees five hundred only) towards supply of the duplicate grade card and office charges is to be paid through bank challan (pink) to comply with the procedures. Further, Rs. 250/- has to be paid by the candidate through bank challan (Pink)

for each of the Grade Card to be printed in addition to the above. Such grade cards will be printed with a water mark "Duplicate Grade Card" in the background.

6.10.4 Transcript : Transcript/s will be issued to all the eligible students at the end of eighth semester. However, partial transcripts will also be issued to the students (those who aspire for higher studies) at the end of sixth semester, on request. The students have to apply for the transcripts by paying the prescribed fee of Rs. 500/-for the first copy and Rs. 300/- per subsequent copy. The transcripts will be presented to all the graduands of B.E. (AUTONOMUS) program during the graduation day.

6.10.5 Percentage equivalence of the Grade Points :

To provide equivalence of the CGPA with the percentage and / or class awarded as in the conventional system of declaring the result of university examinations. Formula for converting CGPA into Percentage of marks : Percentage of Marks = (CGPA-0.75) x 10

6.10.6 Grade point range and corresponding class :

Grade Point range	Class
≥ 5 &< 6.75	Second
≥ 6.75 < 7.75	First
≥ 7.75	Distinction

6.10.7 Gold-Medalists – the CGPA criterion : The top scorer of each branch of study shall be the Gold medalist of that branch of engineering. The gold medalist will be decided based on the CGPA earned at the end of the program. In case of students entering autonomous program from VTU, the equivalent CGPA of VTU semesters (computed as per VTU guidelines) is considered. However, in case of lateral entry students, the CGPA is considered over 6 semesters of study only (3rd to 8th semester). Further, such a student is expected to have successfully completed all the courses studied during the BE program in first attempt only. In this case, appearing makeup examination is considered as an attempt. This rule is applicable to all category of students admitted to the program.

7. LEAVE OF ABSENCE AND TEMPORARY WITHDRAWAL

7.1 If the period of leave is more than two days and less than two weeks, prior application for leave shall be submitted to the concerned HOD with the recommendation of the Faculty Mentor stating the reasons for the leave along with the supporting documents. In any case, a student shall have a minimum of 75% attendance in each course.

7.2 If the period of leave is two weeks or more, prior application for leave shall be made to the Dean (AA) with the recommendations of the Faculty Mentor and the concerned HOD stating the reasons for the leave along with the supporting documents. The Dean (AA) may, on receipt of such application, grant leave or advice the student to withdraw from the course. In any case student shall have 75% attendance to become eligible.

7.3 It will be the responsibility of the student seeking leave to intimate the course faculty, the HOD and others concerned regarding his absence before availing leave.

7.4 A student may be permitted to withdraw temporarily on the grounds like illness, grave calamity in the family or any other serious happening. The withdrawal may be for periods which are integral multiples of a semester provided that:

(a) The student applies to the AC through Dean (AA) within 6 weeks of the commencement of the semester or from the date the student last attended the classes, whichever is later, stating fully the reasons for such withdrawal together with the supporting documents and endorsement from the student's parent/guardian.

(b) Even by taking into account the expected period of withdrawal, the student has the possibility to complete the total number of credits for the degree programme within the specified time limit.

(c) The student does not have any dues or demands towards the college including tuition and other fees as well as library/ department materials.

(d) A student availing of temporary withdrawal from the college under the above provision shall pay such fees and/or charges as fixed by the college until such time the student's name appears on the roll list. However, the fees/charges once paid would not be refunded.

(e) A student may avail of the temporary withdrawal facility only once during the degree programme. However, in exceptional cases as decided by the Dean (AA) a student can avail of this provision one more time.

8. PERMANENT WITHDRAWAL OF ADMISSION

8.1 A student who withdraws admission before the closing date of admission for the Academic Session is eligible for refund of the deposits and fees as per the norms. Once the admission for the year is closed, the following conditions govern withdrawal of admission:

(a) A student, who wants to leave the Institute for good, shall be permitted to do so. The transfer certificate shall be forwarded to the college to which student has obtained offer of admission.

(b) The decision of the Principal regarding all aspects of withdrawal of a student shall be final and binding.

9. CONDUCT AND DISCIPLINE

9.1 Students shall conduct themselves within and outside the premises of the college in a befitting manner.

9.2 As per the order of Honorable Supreme Court of India, Ragging in any form is considered as a criminal and culpable offence and is banned. Any form of ragging will be severely dealt with.

9.3 The following acts of omission and/or commission shall constitute gross violation of the code of conduct and are liable to invoke disciplinary measures:

a) Ragging

b) Lack of courtesy and decorum; indecent behavior anywhere within or outside the campus

c) Indecent dressing within the campus.

d) Willful damage or stealthy removal of any property/ belongings of the college/ Hostel or of fellow students/ citizens.

e) Possession, consumption or distribution of alcoholic drinks or any kind of narcotics or hallucinogenic drugs.

f) Mutilation or unauthorized possession of library books.

g) Noisy and unseemly behavior disturbing studies of fellow students.

h) Possession/ distribution of pornographic contents through DVDs/ CDs/ Videos/ Photographs/ Internet, etc.

i) Possession/ distribution of terrorism literature through DVDs/ CDs/ Videos/ Photographs/ Internet, etc.

j) Hacking in computer systems (such as entering into other person's area without prior permission, manipulation and/or damage of computer hardware and software or any other cyber crime etc.).

k) Plagiarism of any nature.

l) Not adhering to the college Dress Code.

m) Any other act of gross indiscipline as decided by the Dean(AA) from time to time.

n) Possession of cell phones on campus (as per VTU, our affiliating university norms).

o) Not wearing Identity cards while on campus.

p) Sexual harassment, indecent/ vulgar reference of any nature.

q) Any writing on the walls, boards, or desks.

Commensurate with the gravity of offence, the punishment the CDC will deny it may be: reprimand, imposition of fine, expulsion from the Hostel, debarment from the examination, disallowing the use of certain facilities of the college, suspension for a specified period or even outright expulsion from the college, or even handing over the case to appropriate law enforcement authorities or the judiciary, as required by the circumstances.

9.4 For an offence committed in (i) Hostel, (ii) a department or in a class room and (iii) elsewhere, the Warden, the HOD and Dean (SA) respectively shall have the authority to reprimand and report to the Principal for suitable action.

9.5 Dean (Exams) shall take appropriate action in case of adoption of unfair means and/ or any malpractice in any examination.

9.6 All cases of serious offence, possibly requiring punishment other than Reprimand/ fine shall be reported to the Principal.

9.7 The college level Standing CDC constituted by the Principal shall be the authority to investigate the details of the offence and recommend disciplinary action based on the nature and extent of the offence committed.

10. GRADUATION REQUIREMENTS AND GRADUATION DAY CEREMONY

10.1 Degree Requirements A student must have earned a minimum of 175 (135 in case of Lateral entry Diploma students) credits as per the prescribed curriculum, within a maximum duration of 8 years (6 in case of lateral entry Diploma students) from date of registration for the programme. A student must also have a minimum CGPA of 5.0 at the end of the programme and earn 100 activity points.

10.2 Eligibility A student shall be eligible for the award of the degree if:

    a.   The student has fulfilled all the requirements of the degree.

    b.   No dues are payable by the student to the institute, departments, hostel, library, sports and/ or any other centers

    c.   No disciplinary proceeding is pending against the student.

10.3 Procedure for the award of degree

10.3.1 A student shall apply for the award of the degree in a prescribed format along with the prescribed No-Dues Certificate to the respective department. The Internal BOS/Department Academic Committee (DAC) shall verify the same and send recommendations to the Academic Council.

10.3.2 The Academic Council shall prepare the list of eligible students for the award of degree and submit the same to the University for Approval.

10.3.3 After approval by the University, degrees will be awarded to the students in a Graduation Ceremony.

10.3.4 Degree will be awarded in absentia to a student who is unable to attend the Graduation Ceremony.

10.3.5 A student is required to apply for the award of degree in the Graduation Ceremony or in absentia along with the prescribed fee.

10.3.6 A student can apply for Provisional Degree Certificate (PDC) issued by the College before the Graduation Ceremony by paying a prescribed fee.

10.3.7 ClassDeclaration: The Class declaration will be made to every student as per VTU norms, in the respective Provisional Degree Certificate only. It will also be mentioned in the final Degree Certificate by VTU.

10.3.8 Graduation Day: The graduation Day for each academic year will usually be held during the last week of July. It will be made known to the graduands before the end of the term days of that particular batch.

10.3.9 Issue of PDC & Transcripts: On the Graduation Day, the PDC and Transcript will be issued to all the students who have becomes eligible for the award of the BE Degree. All those students who would become eligible for the award of the BE Degree by any later date have to wait for issue of PDC and Transcript till the next Graduation Day.

11. TERMINATION FROM THE ACADEMIC PROGRAMME

A student shall be terminated from academic program and shall leave the College in the following circumstances:

- If the student fails to satisfy all the requirements for the award of the degree stipulated in 10.1 and 10.2

- If the student is absent for more than 6 weeks at a stretch in a semester without sanctioned leave.

- Failure to meet the standards of discipline prescribed by the College, which may change from time to time.

12. CHANGE OF BRANCH

12.1   A student is eligible for the change of branch at the start of third semester strictly as per the existing rules of the AICTE, Government of Karnataka, Director of Technical Education and the University.

12.2   A student applying for change of branch must have completed all the common credits of the first two semesters and apply in a prescribed format when notified.

12.3   The change of branch, if made, shall be according to the merit of the applicants.

13. AMENDMENTS AND JURISDICTION

13.1   The rules and regulations listed herein govern the imparting of instructions, conduct of examinations and evaluation of performance leading to the award of the Bachelor of Engineering degree.

13.2   The regulations listed herein shall be binding on all students enrolled for the Bachelor of Engineering degree.

13.3   The regulations listed herein may be amended, updated, changed by the Academic Council from time to time and shall be binding on all parties concerned including students, faculty, staff, departments and college authorities.

13.4   All disputes arising from the regulations listed herein must be addressed to the Academic Council. The decision of the Academic Council is final and binding on all parties. Any legal issues arising from this set of regulations shall be limited to the legal jurisdiction determined by the location of the College and not that of any other parties.

14. DISCIPLINARY RULES

The rules of decorum and discipline to be observed by all the students of the institution are as under :

- They should attend the classes regularly.

- They should be punctual to the classes.

- They should take all the assignments and tests seriously.

- They should not meddle with the equipment and tools in the laboratories and workshops without the permission of the staff member(s) in-charge. They will be responsible for the damage caused due to negligence and will have to pay for their replacement.

- They should maintain silence in the Classrooms, Laboratories, Library, Drawing halls, and Workshops.

- Use of mobile phones in the institute premises is strictly prohibited. This is also a strict guideline issued from VTU.

- They should not affix any notice or remove any office notice from the office or other notice Boards, without the prior permission from the concerned.

- They should not indulge in strikes/ picketing/mass bunks of classes/etc. of any form, and they should not cause any damage to the property of the institute.

- They should not be found guilty of causing undue disturbances of any form, in the campus, for the classes/ examinations, etc.

- Smoking, Consumption of alcoholic beverages and Drugs are strictly forbidden.

- They must park their vehicles properly, in the demarked area, avoiding disturbance to the classes.

- They must not go on tours of any type without the permission of the authorities and also without an accompanying faculty.

- Ragging in any form is strictly prohibited. Serious action will be taken on the offenders.

- They should not indulge in any activity, anywhere, that spoils the prestige of the institute.

15. AICTE GUIDELINES FOR PREVENTION AND PROHIBITION OF RAGGING IN TECHNICAL INSTITUTIONS

The Raghavan Committee constituted by the Honorable Supreme Court has mentioned the following types of ragging:

• Ragging has several aspects with psychological, social, political, economic, cultural, and academic dimensions.

• Any act that prevents, disrupts or disturbs the regular academic activity of a student should be considered to be with in the academics related aspects of ragging. Similarly, exploiting the services of a junior student for completing the academic tasks assigned to an individual or a group of seniors is also an aspect of academics related ragging prevalent in many technical institutions.

• Any act of financial extortion or forceful expenditure burden put on junior student by seniors should be considered as an aspect of ragging for economic dimensions.

• Any act of physical abuse including all variants of it: sexual abuse, homosexual assaults, stripping, forcing obscene and lewd acts, gestured, causing bodily harm or any other danger to health or person can be put in the category of ragging with criminal dimensions.

• Any act or abuse by spoken words, emails, snail-mail, blogs, public insults should be considered to be within the psychological aspects or ragging. This would also include deriving perverted pleasure, sadistic thrill from actively or passively participating in discomfiture to others, absence of preparing 'fresher's in the run up to their admission to higher education and life in hostel and this can be ascribed as a psychological aspect of ragging. Any act that affects the mental health and self-confidence of students also can be described in terms of the psychological aspects of ragging.

• The human rights perspective of ragging involves the injury caused to the fundamental right to human dignity through humiliation heaped on junior students by seniors; often resulting in the extreme step of suicide by the victims.

15.1 Actions against students for indulging and abetting in Ragging in technical institutions, Universities including Deemed to be University imparting technical education.

- The punishment to be meted out to the persons indulged in ragging has to be exemplary and justifiably harsh to act as a deterrent against recurrence of such incidents. The students who are found to be indulged in ragging should be debarred from taking admission in any technical institution in India.

- For every single incident of ragging, a First Information Report (FIR) must be filed without exception by the institutional authorities with the local police authorities.

- Depending upon the nature and gravity of the offence as established by the Anti-Ragging Committee of the institution, the possible punishments for those found guilty of ragging at the institution level shall be one or any combination of the following:-

  o   Cancellation of admission

  o   Suspension from attending classes

  o   Withholding / withdrawing scholarship / fellowship and other benefits.

  o   Debarring from appearing in any test / examination or other evaluation processes

  o   Withholding results

  o   Debarring from representing the institution in any regional, national/ international meet, tournament, youth festival, etc.

  o   Suspension /expulsion from the hostel

  o   Rustication from the institution for period ranging from 1 to 4 semesters

  o   Expulsion from the institution and consequent debarring from admission to any other institution.

  o   Fine of Rupees 25,000/-

  o   Collective punishment: when the persons committing or abetting the crime/ragging are not identified, the institution shall resort to collective punishment as a deterrent to ensure community pressure on the potential raggers.

- The institutional authority shall intimate the incidents of ragging occurred in their premises along with action taken to the Council and immediately after occurrence of such incident and inform the status of the case from time to time.

16. AICTE MANDATORY COMMITTEES

16.1 Special Grievance Redressal Committee (SGRC)

As per the AICTE Regulations- Mechanism for Grievance Redressal Act – 2012, a Special Grievance Redressal Committee (SGRC) has been set up at the institution with the Ombudsman appointed by VTU for Redressal of Grievances (including ragging) of students of the Institution.

Receive online/written requests/complaints from students/parents/faculty/staff regarding any kind of grievances on academic matters, unfair evaluation process, attendance, discrimination, harassment, victimization, library facilities, sports facilities, student amenities, canteen facilities etc. Students, Parents, Faculty members and Non teaching staff can register them self in the portal https://mcehassan.edugrievance.com and submit their grievances. The committee will deliberate and suggest appropriate remedies in the genuine cases.

16.2 College Internal Complaints Committee (CICC)

The committee is formed by the Principal in accordance with the guidelines specified by AICTE and VTU, Belagavi.

The objectives, roles and responsibilities:

- Prevent discrimination and sexual harassment, by promoting gender harmony among students and employees.

- Make recommendations to the management for changes/elaborations in the rules to lay down procedures for the prohibition, resolution, settlement and prosecution of acts of discrimination and sexual harassment against women students and employees.

- Deal with cases of discrimination and sexual harassment against women, in a time bound manner, aiming at ensuring support services to the victims and termination of the guilty party.

- Recommend appropriate punitive action against the guilty party to the Management.

  The Committee shall meet as often as may be needed and appropriate. However, the frequency of meeting is once in a year and as and when necessary.

College Internal Complaints Committee Members Year 2021-22

Sl. No.	Name	Designation and Affiliation	Contact No. Email-ids	Gender
Chairman				
1	Dr. Indra Bahaddur,	Asst. Professor , Dept. of E & C Engg	Mob:9731793730 OFF:08172-245361 brs@mcehassan.ac.in	F
Members				
2	Dr. P.C. Srikanth,	Professor, Dept. of E & C Engg.	Mob: 7899064712 OFF:08172-245361 pcs@mcehassan.ac.in	M
3	Smt. Margaret R.E.	Asst.Professor &Head,Dept. of MCA	Mob: 9448006138 OFF:08172-245317 rem@mcehassan.ac.in	F
4	Smt.C.D.Parvathamma	Registrar	Mob : 9611626284 OFF:08172-245093 cdpmce@gmail.com	F
5	Smt. M.N. Radhamma	Helper ,Dept. of Civil Engg. (Non-teaching staff)	Mob: 8970718942 OFF:08172-245538	F
6	Kum. Neethi M.V. (Ph.D.)	Student	Mob: 8550852565 OFF:08172-245317 neethi.mv@gmail.com	F
7	Kum. Pooja H.M., (M.Tech)	Student	Mob: 8310110457 OFF:08172-245317 poojahm.hsn@gmail.com	F
8	Kum. Yamini H.V. (UG)	Student	Mob: 8296282737 OFF:08172-245317 yamini@gmail.com	F
Member from the NGO				
9	Smt. K.T. Jayashree	President, Ananya Trust	Mob : 9632065044 ktj.shree@gmail.com	
Legal Advisor				
10	Sri. Chandrahas	Asst. Professor, Sri.Krishna Law College,Hassan	Mob: 9036422546	M

17. GUIDELINES FOR RECOMMENDING PENALTIES AND PUNISHMENTS TO THE STUDENTS INVOLVED IN MALPRACTICE COMMITTED DURING THE AUTONOMOUS EXAMINATIONS.

Sl. No.	Nature of Malpractice	Penalty to be imposed / punishment
1	Revealing the identity of the candidate	To be awarded 'F' grade for the course in which the candidate has revealed his/her identity. Penal fee as per VTU norms / As decided by MCE.
2	a. Possession of Manuscript / Printed or Typed Matter, Books or Notes and Written Matter on Calculator, Instrument Box etc., or having any other Written Matter on the person (For example Palm, Hands, Legs, Clothes, Socks etc.)	To be awarded 'F' grade for the course and deny Makeup examination benefit for the course. Penal fee as per VTU norms / As decided by MCE.
	b. Possession of Mobile /tablet/ any electronic gadget, which can aid the candidate to write answer in examination in both theory and practical.	To be awarded 'F' grade for the course and deny Makeup examination benefit for the course. Penal fee as per VTU norms / As decided by MCE.
3	Detection of identical answers in the answer scripts of different candidates or allowing a candidate to copy from his/her answer script	To be awarded 'F' grade for the course and deny Makeup examination benefit for the course. Penal fee as per VTU norms / As decided by MCE.
4	Appeal to the examiner with money as enclosures to the answer book / use of abusive obscene language or threatening remarks in the answer book	To be awarded 'F' grade for the course and deny Makeup examination benefit for the course. Penal fee as per VTU norms / As decided by MCE.
5	Found giving or receiving assistance at the examination, passing the questions paper with Written Answer / formulae / Answer Script/ additional sheet / Graph sheet /Drawing sheet for purpose of copying	To be awarded 'F' grade for the course. Penal fee as per VTU norms / As decided by MCE.
6	Destroying the documentary evidence	To be awarded 'F' grade for the course. Penal fee as per VTU norms / As decided by MCE.

Sl. No.	Nature of Malpractice	Penalty to be imposed / punishment
7	Insertion of Additional Sheets / Graph Sheets / Drawing Sheets, use of Answer Book which is not issued at the Examination Hall.	To deny the benefit of performance of examinations of all the course for which the candidate has appeared in that examinations
8	In case of impression or found guilty of deliberate prior arrangements to cheat in the examination	To deny the benefit of performance of the examination of all subjects for which the candidate who has appeared and who has arranged another person to impersonate (both attended and to be attended of the particular examination conducted including arrear examinations to both the candidates) & debar him/her for a minimum of two examinations. (for the person who has impersonated, the punishment shall extend up to reprimanding)
9	Abusing, Threatening, Manhandling the Examination Authorities at the examination hall or in the premises of the examination centre, as well as misconduct of a very serious nature.	To deny the benefit of performance of the examination of all subjects/ courses for which the candidate has (both attended and to be attended of the particular examination conducted including arrear examinations) & debar him/her for a further number of chances extending up to two more examinations depending on the degree of miscount
(Nature of malpractice mentioned from 1 to 9 shall be applicable to both theory and practical examination)		
10	Any other Malpractices connected with the autonomous examination(by any unusual means) other than the above mentioned.	Committee can recommend suitable penalties & punishment
	The chief superintendent shall allow the candidate to write all subsequent examinations and send the answer books to the office of the Dean (Examinations) following day. in special circumstances like impersonation case, both the students involved are **not allowed to write examination of any courses of that semester. Such candidates are permitted to register to any courses subsequently as per the decision of MEC.**	

Sl. No.	Nature of Malpractice	Penalty to be imposed / punishment
	a. The examiner shall, if he / she suspects malpractice while valuing the answer scripts or other material such as insertion of answer sheets, revealing of identity or enclosures, such as currency, shall return the answer with reasons in writing to the Dean (Examinations) MCE, Hassan. If already valued, marks shall not be entered in the regular marks lists in which the marks awarded to the other candidates are furnished but enter them in a separate list which shall be enclosed in a sealed cover and forwarded to the Dean (Examinations) MCE, Hassan	
	b. The examination hall supervisor or squad appointed for the purpose shall report the malpractice, if any to the chief superintendent / principal through examination sections officials immediately (in both theory and practical examinations). Further documentation and pertaining procedures to be followed as per the VTU / MCE autonomous norms . The decision pertaining to above penalties and punishments of the candidate may be communicated to all the concerned. If the student and or student fail to attend the MEC meeting on the stipulated day, they shall abide by the decision taken by the committee.	
	Enquiry under Malpractice Cases Consideration Committee is independent of the criminal proceedings if any in the appropriate court of law	

Duties and responsibilities of MEC

1. Malpractice committee shall conduct an enquiry, verify the document at the time of booking MPC and decide the degree of punishment in the presence of committee members as per the guidelines.

2. MEC shall decide the penal fee looking in to gravity and nature of malpractice considering VTU norms as guidelines / As decided by the MEC.

3. The candidate is issued with a warning that repetition of such acts (1 to 6) in any examination during the programme will end in severe punishments like debar from examination for minimum of one year or more.

4. Documentation regarding presence of MPC candidate and parents for the meeting, undertaking from the candidate shall be made.

5. MEC authorizes Documentation of the meeting proceedings to Dean (examinations) in consultation with Principal , Vice-Principal and Dean(A.A).

ODD SEMESTER TIME TABLE

	I	II	III	IV	V	VI	VII	VIII
Monday								
Tuesday								
Wednesday								
Thursday								
Friday								
Saturday								

C.I.E. TIME TABLE

Date & Day	Time & Course Code		

ODD SEMESTER - SELF APPRAISAL

I. Letter / Phone Calls

Important Letters received	
Important Letters written	
Important Phone Calls received	

II. Library Work

Books Borrowed	
Books Returned	
Visit to the Reference Library	

III. Performance in Tests

Good	
Satisfactory	
Must Improve	

IV. Attendance Information

Sl. No.	Course title with course code	Number of Classes Conducted	Number of Classes Attended

V. Sports and Games Information

VI. Extracurricular Activities Information

VII. Important Notes…………..

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EVEN SEMESTER TABLE

	I	II		III	IV	V		VI	VII	VIII
Monday										
Tuesday										
Wednesday										
Thursday										
Friday										
Saturday										

C.I.E. TIME TABLE

Date & Day	Time & Course Code		

EVEN SEMESTER - SELF APPRAISAL

I. Letter / Phone Calls

Important Letters received	
Important Letters written	
Important Phone Calls received	

II. Library Work

Books Borrowed	
Books Returned	
Visit to the Reference Library	

III. Performance in Tests

Good	
Satisfactory	
Must Improve	

IV. Attendance Information

Sl. No.	Course title with course code	Number of Classes Conducted	Number of Classes Attended

V. Sports and Games Information

VI. Extracurricular Activities Information

VII. Important Notes…………..

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SCHEME & SYLLABUS

**FIRST YEAR B.E.
I AND II SEMESTERS
(COMMON TO ALL BRANCHES)**

Academic Year 2021-22

PROGRAM OUTCOMES (POs)

Engineering Graduates will be able to : ……………

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

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

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

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

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

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

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

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

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

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

11. **Project Management and Finance :** Demonstrate knowledge and understanding of the engineering and management principles and apply the set ones own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning :** Recognize the need for, and have the pre parathion and ability to engage in independent and life-long learning in the broadest context of techno logical change.

EVALUATION SCHEME

In each course, there is a Continuous Internal Evaluation (CIE) and a Semester End Examination (SEE) both of equal weight age of 50 marks.

CIE

Evaluation	CIE1	CIE2	CIE3	Activities★	Final CIE Marks
Marks Weightage	10	10	10	20	CIE1+CIE2+CIE3+ Activities Marks

★Activities are assessment methods like theory assignments, quiz, laboratory assignments, mini-project, seminar etc. to be explicitly mentioned by the course faculty at the commencement of the semester and records of evaluation should be maintained. Maximum number of activities should be 3 and minimum 2 (It is limited to 1 in case of laboratory).

SEE

Evaluation	Marks
There shall be 5 Modules in theory courses, i.e. 8 hours per Module for a 3 credit course of 40 hours duration / 10 hours per Module for a 4 credit course of 50 hours duration. Five questions shall be set for SEE with 100% choice for each question, i.e. **Module 1 :** Question 1 & 2 main questions with 20 marks each and with choice. **Module 2 :** Question 3 & 4 main questions with 20 marks each and with choice. **Module 3 :** Question 5 & 6 main questions with 20 marks each and with choice. **Module 4 :** Question 7 & 8 main questions with 20 marks each and with choice. **Module 5 :** Question 9 & 10 main questions with 20 marks each and with choice.	**50** (Examination will be conducted for 100 Marks and then score is scaled down by 50%)

Scheme of Teaching for Academic Year 2021-22

Odd Semester

PHYSICS CYCLE

Course Category	Course Code	Course Title	L-T-P	Credits	Contact hours
BS	21PH101	Engineering Physics	4-0-0	4	4
BS	21MA102	Calculus and Numerical Methods	3-2-0	4	5
ES	21EE103	Basic Electrical Engineering	3-0-0	3	3
ES	21MD 104A/B	Engineering Drawing	1-0-5	3	6
ES	21CV105	Engineering Mechanics	3-0-0	3	3
BS	21PH106	Engineering Physics Laboratory	0-0-2	1	2
HS	21PE107	Physical Education Activity (PEA)	0-0-2	1	2
PR	21DT108	Design Thinking Laboratory	0-0-2	1	2
		Total		**20**	**27**

CHEMISTRY CYCLE

Course Category	Course Code	Course Title	L-T-P	Credits	Contact hours
BS	21CH101	Engineering Chemistry	4-0-0	4	4
BS	21MA102	Calculus and Numerical Methods	3-2-0	4	5
ES	21EC103	Basic Electronics Engineering	3-0-0	3	3
ES	21ME104	Elements of Mechanical Engineering	3-0-0	3	3
ES	21CS105	Programming for Problem solving	4-0-0	4	4
BS	21CH106	Engineering Chemistry Laboratory	0-0-2	1	2
ES	21CS107	Computer Programming Laboratory	0-0-2	1	2
PR	21DT108	Design Thinking Laboratory	0-0-2	1	2
		Total		**21**	**25**

Even Semester

CHEMISTRY CYCLE

Course Category	Course Code	Course Title	L-T-P	Credits	Contact hours
BS	21CH201	Engineering Chemistry	4-0-0	4	4
BS	21MA202	Differential equations and vector calculus	3-2-0	4	5
ES	21EC203	Basic Electronics Engineering	3-0-0	3	3
ES	21ME204	Elements of Mechanical Engineering	3-0-0	3	3
ES	21CS205	Programming for Problem solving	4-0-0	4	4
BS	21CH206	Engineering Chemistry Laboratory	0-0-2	1	2
ES	21CS207	Computer Programming Laboratory	0-0-2	1	2
		Total		**20**	**23**

PHYSICS CYCLE

Course Category	Course Code	Course Title	L-T-P	Credits	Contact hours
BS	21PH201	Engineering Physics	4-0-0	4	4
BS	21MA202	Differential equations and vector calculus	3-2-0	4	5
ES	21EE203	Basic Electrical Engineering	3-0-0	3	3
ES	21MD204 A/B	Engineering Drawing	1-0-5	3	6
ES	21CV205	Engineering Mechanics	3-0-0	3	3
BS	21PH206	Engineering Physics Laboratory	0-0-2	1	2
HS	21PE207	Physical Education Activity (PEA)	0-0-2	1	2
		Total		**19**	**25**

Note : BS: Basic Science Course, ES: Engineering Science Course, HS: Humanities Course, PR : Project Based Course, 21MD104/204 A: Manual Drafting, 21MD104/204 B : CAED

Title	ENGINEERING PHYSICS		
Course Code	21PH101/201	L-T-P- C	4-0-0- 4
Exam	3 Hrs.	Hours/Week	4
SEE	50 Marks	Total Hours	50

Prerequisite : Knowledge of modes of transfer of heat, Basics of band theory of solids, working principle of capacitors, Fundamentals of translatory motion, oscillatory motion and elasticity and geometrical optics.

Course Objective : Objective of the course is to make students learn underlying principles and applications of physics in the respective fields and to develop effective solutions for engineering problems.

Course outcomes : At the end of course, student will be able to :

Sl. No.	Course outcomes	Mapping to PO's
1	Discuss the concepts of wave-particle dualism, electrical conductivity, crystallography, oscillations, and photonics.	1,2
2	Illustrate the laws of thermal and optical radiations, free electrons, waves, materials science, and rigid body dynamics.	1,2
3	Solve problems on quantum nature of radiation, interaction of radiation with matter, charge dynamics, and simple harmonic oscillations.	1,2
4	Interpret the theories of quantum mechanics, free electrons, crystallography, laser, and vibrations in advanced applications.	1,2

MODULE-1   10 HRS

Black body radiation spectrum, Wien's law and Rayleigh Jeans law (no derivations). Assumptions of quantum theory of radiation, Planck's law. Photoelectric effect. Application in quantum computing and solar appliances. de Broglie hypothesis of matter waves. Expression for de Broglie wavelength of electron. Applications in SEM, TEM, and advent of nanotechnology (Qualitative). Characteristics of matter waves:Phase velocity and group velocity; derivation of relation between group velocity and particle velocity and speed of light. Heisenberg's uncertainty principle. Its application to show the nonexistece of electron in nucleus of atoms. Wave function. Probability density and normalization of wave function (Max Born's interpretation. Setting up of one-dimensional time independent Schrodinger's wave equation.), eigen values and eigen functions. Application of Schrodinger wave equation- Eigen values and Eigen function for a free particle and a particle in a potential well of infinite depth.

Numerical problems on de Broglie equations, Photoelectric effect and Eigenvalue equation.

Self-learning topics : Experimental evidences of wave-particle dualism-Compton effect.

MODULE-2 10 HRS

Free electrons in metals. Classical free electron theory-assumptions. Drift velocity, Mean free path, Mean collision time, Relaxation time. Expression for electrical conductivity in metals. Failures of classical free electron theory. Quantum free electron theory–assumptions. Fermi energy. Fermi-Dirac distribution function (Fermi factor). Merits of quantum free electron theory. Effects of impurity and temperature on electrical resistivity of metals. Application in material selection and development of conducting wires (transmission lines and winding wires), rheostats and resistors. Semiconductors-effects of impurity and temperature on their electrical resistivity: Applications in development of electronic devices (mention diodes, transistors, LEDs, etc.,)

Superconductors. Temperature dependence of electrical resistivity in superconductors. Meissner effect (qualitative). Critical magnetic field. Type I and Type II superconductors. BCS Theory. Applications of superconductors; superconducting magnets, MRI, SQUID (to mention) and Maglev Vehicle (qualitative discussion).

Numerical problems on electrical conductivity, Fermi energy,and critical magnetic field.

Self-learning topics : High temperature superconductors.

MODULE-3 10 HRS

Space lattice, Bravais lattice–unit cell, primitive cell. Lattice parameters. Directions and planes, Miller indices. Expression for interplanar spacing. Coordination number. Atomic packing factors (SC,FCC,BCC). Bragg's law. Bragg's spectrometer. Application of x-ray spectrometer in material characterizations.

Dielectric materials. Polarization and its types. Expression for internal field. Claussius-Mossotti equation (no derivation). Applications of dielectrics in capacitors, transformers, LCDs, and microwave tunable devices.

Numerical problems on Miller indices, Interplanar space, Bragg's law and Claussius-Mossotti equation.

Self-learning topics : X-rays: properties and classification

MODULE-4 10 HRS

Simple harmonic vibrations. Free vibrations. Damped vibrations-derivation of expressions for displacement of damped harmonic motion. Discussion of types of damped vibrations. Quality factor, relaxation time, logarithmic decrement. Forced vibrations-derivation of expression for amplitude and phase-variation with frequency. Applications in vibration analysis and drones. Resonance. Condition for amplitude resonance. Nondestructive testing and other applications of mechanical and electrical resonance.

Rigid body. Moment of inertia. Torsional pendulum-derivation of expression for time period of oscillation and mention of its uses. Bending of beams- derivation of expression for bending moment of a beam. Cantilever-derivation for depression of loaded end of a single cantilever. Uses of cantilevers in structures and robotics.

Numerical problems on Amplitude and phase of forced vibrations,time period of oscillation, bending moment and depression/Young's modulus of cantilever.

Self-learning topics : Sharpness of resonance; effect of damping.

MODULE-5   10 HRS

Interaction of radiation with matter. Expression for energy density in terms of Einstein's coefficients. Requisites of a Laser system. Conditions for laser action. Types of laser devices (to mention Solid, Gas and Semiconductor lasers), Semiconductor Laser- construction and working. Holography. Applications of lasers in industry and defence.

Optical fibers. Construction and principle. Ray propagation mechanism. Angle of acceptance and numerical aperture- their relationship with refractive indices of core and clad and condition for ray propagation. Modes of transmission-V-number and number of modes (expressions). Types of optical fibers. Attenuation. Applications in Point to point communication, computer networking,endoscopy, etc.

Numerical problems on Boltzmann factor, V-number, Numerical aperture, and attenuation. Self-learning topics:

Development of solid, liquid, and gas lasers. Dispersion in optical fibers

Text Books:

1. Engineering physics: R K Gaur and S L Gupta, ISBN: 9788189928223, Dhanpat Rai Publishing Company (P) Ltd. Edition, 2011.

2. Solid state physics: S O Pillai, ISBN-10: 9386070928, New Age International Pvt. Ltd, Eighth edition, 9 January 2018.

Reference Books :

1. Modern Physics, Kenneth S. Krane, ISBN-13: 9781118061145, John Wiley & Sons Inc., 3rd Edition, 2012.

2. Introduction to Solid State Physics, Charles Kittel, ISBN: 978-1-119-45416-8, 8th Edition Wiley.

3. Concepts of Modern Physics, Arthur Beiser, ISBN-10 : 0070151555, 5th Edition, Tata McGraw – Hill Edition

4. B.B. Laud - Lasers and non-linear optics, New Age International, ISBN: 9788122430561, 3rdEdition, 2015.

5. Fiber Optics: A K Ghatak and K Thyagarajan, ISBN-13: 978-0521577854, Cambridge University Press India Pvt. Limited, 1998.

6. E-resources; NPTEL courses on Engineering physics.

Title	**CALCULUS AND NUMERICAL METHODS**		
Course Code	**21MA102**	**L-T-P-C**	**3 – 1 – 0 - 4**
Exam	**3 Hrs.**	**Hours/Week**	**5**
SEE	**50 Marks**	**Total Hours**	**70**

Prerequisite : Class 12 calculus

Course Objective : To train the students to acquire knowledge in calculus and numerical methods so as to solve basic engineering application problems.

Course outcomes : At the end of course, student will be able to :

Sl. No.	Course outcomes	Mapping to PO's	Mapping to PSO's
1	Compute Taylor series, partial derivatives and solve simple problems connected with multiple integrals.	1	-
2	Inspect for the maximum output of a function (experimental data), analyse the region of integration connected with multiple integrals so as to determine the area, volume.	1,2	-
3	Apply the numerical methods to compute: The area of a region, root (input) of an equation for the given output, missing input or output of the given experimental data (interpolation/extrapolation).	1	-
4	Model the real life problems/engineering application problems and solve the same.	1,2	-

MODULE-1   8 HRS

Differential Calculus : Definition of average growth rate and its illustrative examples. Definition of differentiability. Statement of Taylor's theorem, Taylor series for a function of one variable - Illustrative examples.

Partial Differentiation : Definition of Partial derivative, Physical and geometrical interpretation of partial differentiation, Application oriented problems on the partial derivatives from engineering field, and Illustrative examples, Statement of Taylor theorem for a function of two variables and illustrative examples on Taylor series.

Self-learning topics : Evaluation of Jacobians, Expansion of a function as a Maclaurin series for function of one variable and two variables-illustrative examples.

MODULE-2   8 HRS

Differential Calculus: Maxima & Minima for a function of two variables, finding extreme values of the function using Lagrange's multipliers method. Illustrative examples from engineering field. Mathematical modelling through differential equations of first order first degree and solution-modelling of population growth, finding initial velocity of the space vehicle so that it has to escape from earth.

Self-learning topics : Modeling of inflected diseases, carbon dating-half-life period, mixing problem involving one tank, two tank.

MODULE-3   8 HRS

Numerical Methods : Numerical Solution of algebraic & transcendental equations by Bisection method, Newton Raphson method, Numerical Interpolation-Definition of forward, backward differences, Newton's forward and backward interpolation formula, Lagrange's interpolation formula.

Self-learning topics : Inverse Lagrange's interpolation formula, central difference formula- Bessel's formula, to find the relation between the input and output of an experimental data using suitable interpolation formula.

MODULE-4   10 HRS

Multiple Integrals : Double integrals in Cartesian & Polar form, Application to find area. Evaluation of triple integrals in Cartesian & Spherical co-ordinate system.

Self-learning topics : Applications to find volume using double integral, to find centre of gravity, moment of inertia using multiple integrals.

MODULE-5   8 HRS

Numerical Integration: Evaluation of a line integral by Trapezoidal rule, Simpson's 1/3rd and 3/8th rule, Weddle's rule. Illustrative examples from engineering field.

Numerical Double Integration: Computation of a double integral by Simpson's 1/3rd rule.

Self-learning topics : To solve the system of non-linear equations by Newton's method.

Note - Theorems and properties without proof. Applicable to all the Modules.

Text Books:

1. Dr. B. S. Grewal, Higher Engineering Mathematics, Khanna Publications, 44th edition, 2016.

2. Erwin Kreyszig, Advanced Engineering Mathematics, Wiley India Pvt. Ltd. 8th Edition (Wiley student edition) 2004.

Reference Books:

1. Calculus by Thomas Finney, 9th edition, Pearson education, 2002.

2. R K. Jain and S. R. K. Jain & S. R. K. Iyengar, Numerical methods, New age international pvt. Publishers, 6thedition, 2014.

3. P. Bali and Manish Goyal, A textbook of Engineering Mathematics, Laxmi Publications, Reprint, 2010.

Title	DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS		
Course Code	21MA202	L-T-P-C	3 – 1 – 0 - 4
Exam	3 Hrs.	Hours/Week	5
SEE	50 Marks	Total Hours	70

Prerequisite : Knowledge of Class 12th calculus& vectors

Course Objective : To train the students to acquire knowledge in differential equations and vector calculus so as to solve basic engineering application problems/ real life application problems.

Course outcomes : At the end of course, student will be able to:

SL. No.	Course outcomes	Mapping to PO's	Mapping to PSO's
C01	Apply suitable methods to solve the simple problems of ordinary differential equations / partial differential equations and vector calculus, analytically / numerically	1	-
C02	Examine the higher order problems(more difficult problems) that are connected with differential equations /partial differential equations and solve.	2	-
C03	Introspect the geometry of the region to compute the vector integration problems of gauss divergence theorem, stokes theorem, greens theorem	2	-
C04	Model the real-life problems / Engineering application problems and hence solve the same.	1, 2	-

MODULE-1   **8 HRS**

Differential Equations of First order First Degree (DE) : Solution of exact differential equations.

Higher Order Differential Equations Linear differential equation with constant coefficients - Solutions of homogeneous equations. Particular solution of non - homogenous differential equations by inverse differential operator method for the following standard forms; exponential, polynomial, trigonometric and their product.

Self – study : Linear differential equations, Bernoulli's differential equations.

MODULE-2   8 HRS

Differential Equations - Method of variation of parameters to solve linear differential equation with constant coefficients.

Applications of first order, first degree differential equations: simple electric circuit, Newton's law of cooling, heat flow problems.

Applications of second order, first degree Differential equations - oscillations of a spring-case-modelling of forced oscillations with damping and its solution.

Orthogonal trajectories in Cartesian form, illustrative examples. Applications to find the orthogonal trajectories for equi-potential lines in an electric field between two concentric cylinders, streamlines of flow in the channel, curves of constant temperature in a body.

Self – study : Matrix method to solve homogeneous differential equations of order 2, degree 1.

MODULE-3   8 HRS

Numerical solution of first order, first degree ODE : Taylor series method, Runge-Kutta (RK) method of fourth order, Milne's predictor corrector methods, Mixing problems involving two tanks-an application connected with simultaneous differential equations.

Self-Study - Numerical solution of Simultaneous differential equations, numerical solution of second order differential equations by RK method.

MODULE-4   8 HRS

Partial Differential Equations : Solving PDE by variable separable method, To find all possible solutions of one-dimensional wave equation, solution of system of equations by Gauss Seidel iteration method.

Numerical solution of a Laplace equation, Poisson equation by finite difference approximation method--using standard five point formula, diagonal formula and iterative formulas.

Self – study : To find all possible solutions of one-dimensional heat equation, two dimensional Laplace's equation.

MODULE-5   10 HRS

Vector Calculus : Velocity & acceleration of a vector point function, movement

of a force, velocity of a rotating body, rotation of rigid body, Gradient, divergence & curl. Physical & Geometrical Interpretation of dot product, Gradient, divergence & curl, irrotational vectors, illustrative examples from engineering field.

Line integrals, surface integrals and volume integrals, Statement of Green's theorem, Stokes theorem and Illustrative examples from engineering field.

Self – study : Gauss divergence theorem, Illustrative examples from engineering field

Note - Theorems and properties without proof. Applicable to all the Modules.

Text Books:

1. Dr. B. S. Grewal, Higher Engineering Mathematics, Khanna Publications, 44th edition, 2016.

2. Erwin Kreyszig, Advanced Engineering Mathematics, Wiley India Pvt. Ltd. 8th Edition (Wiley student edition) 2004.

Reference Books:

1. Calculus by Thomas Finney, 9th edition, Pearson education, 2002.

2. R K. Jain and S. R. K. Jain & S. R. K. Iyengar, Numerical methods, New age international pvt. Publishers, 6thedition, 2014.

3. N.P. Bali and Manish Goyal, A textbook of Engineering Mathematics, Laxmi Publications, Reprint, 2010.

Title	**BASIC ELECTRICAL ENGINEERING**		
Course Code	**21EE103/203**	**L-T-P**	**(3-0-0) 3**
Exam	**3 Hrs.**	**Hours/Week**	**4**
SEE	**50 Marks**	**Total Hours**	**50**

Prerequisite : Ohms law and Kirchhoff's laws. Current and power in pure R, L and C. Vector algebra. Basic knowledge in magnetic circuits and electromagnetic induction.

Course Objective : The student will acquire basic knowledge of electrical power systems, protective devices, electric circuits, measuring systems and machines.

Course outcomes : At the end of course, student will be able to :

SL. No.	Course outcomes	Mapping to PO's	Mapping to PSO's
1	Explain the basic concepts of electrical generation, transmission, distribution and basic electrical protection devices.	1,2	-
2	Describe the basic principle and construction of analog and digital measuring instruments.	1,2	-
3	Apply the fundamentals of single phase and three phase AC circuits and perform related calculations.	1,2	-
4	Apply the basic concepts of electrical machines.	1,2	-

MODULE-1   8 HRS

Electric Energy systems : Significance of electrical energy, sources of energy (Conventional/renewable), Single line/block diagram representation of a typical power system. Brief introduction to the electrical generation, transmission and distribution subsystems indicating typical voltage levels.

General concept of earthing, types of earthing, introduction to protective devices- Fuses, MCB, ELCB, MCCB, General types of wires and cables and selection, Electrical Tariff, Elementary calculation of energy consumption.

Self-learning topics : General safety precautions in handling electrical equipment.

MODULE-2   8 HRS

AC systems: Generation of single/three phase voltages, Instantaneous/average/ rms values. Definition of impedance, admittance, real power, reactive power, apparent power and power factor. Analysis of series R-L, R-C, R-L-C circuits, phasor diagrams. Illustrative examples involving series and parallel circuits.

Self-learning topics : Measurement of voltage, current, power and power factor in single phase AC system

MODULE-3   8 HRS

Three phase systems : Star-Detla connection – calculation of voltage, current and power in a balanced three phase Star-Delta system.

Electromechanical / Digital Instruments : Construction, working and principle of operation of Dynamometer type wattmeter. Digital meters, Merits and demerits of digital meters over analog meters, digital multimeter and digital voltmeter.

Self-learning topics : Measurement of Voltage, current, power and power factor in three phase AC system. Digital/smart energy meter.

MODULE-4   8 HRS

Electrical Machines : Specifications of machines, classification of machines, DC machines - Constructional features, working principle of generator, EMF equation, Working principle of motor, Torque equation, Types of motors and their Voltage & Current relations, applications, Illustrative examples.

Self-learning topics : Brushless DC Motors and their application

MODULE-5   8 HRS

Transformers : Classification of transformers, applications of each type, construction of core and shell type transformers, principle of operation, EMF Equation, Transformation ratio, Power losses and efficiency, Illustrative examples on EMF equation and efficiency.

Induction machines : Induction Motors-Concept of rotating magnetic field, classification (Squirrel cage and Slip ring motors) Principle of operation and Constructional features, Slip and its significance, Single-phase induction motors, working principle, classification and applications.

Self-learning topics : Applications of transformers and induction motors, Electric motors used in Electric Vehicles.

Text Books :

1. Rajendra Prasad, *Fundamentals of Electrical Engineering*, Prentice-Hall of India Pvt. Ltd., 3rd editon, 2014.

Reference Books:

2. D. C. Kulshreshtha, *Basic Electrical Engineering*, McGraw Hill, 2nd edition, 2019.

3. E. Hughes, *Electrical and Electronics Technology*, Pearson Education, 2010.

4. K. Uma Rao and A. Jayalakshmi, *Basic Electrical Engineering*, Pearson Education, 2011.

Title	ENGINEERING DRAWING		
Course Code	21MD104/204 A/B	L-T-P-C	(2-0-4-3)
Exam	3 Hrs.	Hours/Week	06
SEE	50 Marks	Total Hours	78

Note – 1) 21MD104/204 A – Manual drawing (for ME/CV)

2) 21MD104/204 B – Compueter Aided Engineering Drawing (for ECE EE/CS/IS/EI)

Course Objective : To introduce the students to "universal language of Engineers" for effective communication and perform drafting exercises of geometrical shapes, solids and machine elements in different systems of Projection using BIS/ISO standards and conventions with the aid of manual drafting and CAD package to effectively take-up the basic industrial/societal drawing needs.

Course Outcomes : Upon completion of the course, students shall be able to:

SL. No.	Course outcomes	Mapping to PO's	Mapping to PSO's
1	Visualize geometrical solids in 3D space through exercises in Orthographic Projections		-
2	Develop the lateral surfaces of geometrical solids and transition pieces	5, 10	-
3	Interpret isometric views and draw orthographic views of machine components and perspective projections		-

Course contents:

MODULE-1   20 HRS

Principles of orthographic Projections : Different planes of projection and views taking point as an example with explanation about distance of a point from planes of projections. Concept of true length and true inclination of a line (emphasis on practical problems). Projection of Planes by Change of position method only (no combination of planes).

MODULE-2   24 HRS

Front, top, profile and auxiliary views of geometric solids resting with their base completely on HP (no other positions).

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Development of lateral surfaces, Introduction to Section Planes and section of regular solids, Parallel and Radial line methods.

MODULE-3 18 HRS

Conversion of Isometric views into Orthographic views: Simple machine components. Isometric projections of geometric solids and simple machine components.

MODULE-4 16 HRS

Perspective projections of regular geometric solids (1- point and 2-point perspectives).

Text Books:

1. Engineering Drawing: N.D.Bhatt & M.Panchal. 37th Edition 1996, Charotar Publishing House. Gujarat

REFERENCES:

1. Engineering Drawing & Design : Cencil Jensen, Jay D. Helsel, Dennis R. Short, Seventh Edition , Tata McGraw-Hill 2012.

2. Engineering Drawing: K.R. Gopal Krishna, 24th Edition 1999 Subhash Publications, Bangalore.

Title	ENGINEERING MECHANICS		
Course Code	21CV105/ 205	L-T-P	(3-0-0)3
Exam	3 Hrs.	Hours/Week	3
SEE	100 Marks	Total Hours	40 Hours

Course objectives : in this Course, the students are acquainted to analyse and predict various mechanical static and dynamic forces at rest and in motion. Students will accomplish to workout geometrical properties of planar elements and forces in space.

Course outcomes : Upon completion of the course, students shall be able to:

COs	Course outcomes	Mapping to PO's
1	Develop free body diagrams for different force systems and determine the resultant forces	PO1, PO2
2	Apply equilibrium equations in statics	PO1, PO2
3	Determine geometric properties like centroid and moment of inertia for planar elements	PO1, PO2
4	Apply Newton's law in motion, and recognize different kinds of particle motions	PO1, PO2

MODULE-1   10 HRS

Introduction : Definition of force, characteristics of force - Basic idealizations of mechanics like particle, continuum, rigid body - Basic principles of Mechanics - Units of measurements. Coplanar Concurrent Force System: Coplanar forces - Coplanar concurrent force system - Resolution and composition of forces. Static Equilibrium of coplanar concurrent force systems. Coplanar Non-Concurrent Force System: Moment of a force-couple– and its characteristics - Varignon's Theorem of moments - Composition of coplanar non-concurrent Force Systems - Static equilibrium of coplanar non-concurrent Force Systems.

MODULE-2   10 HRS

Support Reaction : Different types of supports. Introduction to statically determinate and indeterminate beams. Determination of support reactions for statically determinate beams subjected to various types of loads. Friction: Concept of frictional force - Types of friction - laws of static friction. Static equilibrium of coplanar force systems involving friction, Friction in Block and ladders.

MODULE-3   10 HRS

Centroid and Centre of Gravity : Determination of the position of centroid of plane figures (rectangular, triangular, sector or segment of circle, semi-circular and quadrant) by the method of integration - Determination of the position of centroid of plane figures and built-up sections by the method of moments.

MODULE-4

10 HRS

Second Moment of Areas (Moment of inertia) : Second moment of an area, moment of inertia, product of inertia, principal moments of inertia (concepts), polar moment of Inertia, Radius of gyration, Parallel axes and perpendicular axes theorems - Determination of moment of inertia and radius of gyration of plane figures (rectangular, triangular, sector or segment of circle, semi-circular and quadrant), composite areas and built- up sections.

MODULE-5

10 HRS

Introduction to Dynamics – Classification, Linear & Curvilinear motion, Projectiles, Law of conservation of momentum, Collision of elastic bodies, D'Alembert's Principle, Kinetics of rigid bodies - Numerical Examples.

SELF LEARNING ACTIVITIES- ENGINEERING MECHANICS

- Visit a building and list the structural components and identify the nature of loading on them. The load may be a point load, a UDL, a UVL or a combination of these-discuss with the faculty.

- Visit a railway station/Bus stand and list the steel structural components-discuss the loading pattern with the faculty.

- Visit an automobile workshop and observe the components of a vehicle and discuss the types of loads with the faculty.

- Visit a substation and observe transmission towers, electric poles, guy wires-discuss with the faculty on wind load, tension in wires, forces on guy wires etc.,

Text Books:

1. I B Prasad, "A Textbook of Applied Mechanics Dynamics and Statics", Khanna Publishers. New Delhi. ISBN No. 978-81-7409-068-1, 19th Edition, Eleventh Reprint 2016.

2. R. K Bansal, "A Textbook of Engineering Mechanics", Laxmi Publications, New Delhi.2015.

Reference Books:

1. Rajashekaran S, and Sankar Subramanian, G., "Engineering Mechanics – Statics and Dynamics", VikasPublications.

2. Timoshenko and Young, "Engineering Mechanics" TMH publishing, India. Statics and Dynamics".2006.

3. Beer and Johnston, Vector Mechanics for Engineers Statics and Dynamics" (In SI Units) 8th Edition - 2007 – Mc.GrawHillPublications.

4. S.S.Bhavikatti ' Engineer Mechanics' , New Age International Publishers, 5th Edition.

5. Ramamrutham S: "Text book of Applied Mechanics", Dhanpat Rai and Sons, New India. 1997.

Course Title	ENGINEERING PHYSICS LABORATORY		
Course Code	21PH106/206	L-T-P-C	0-0-2-1
Exam	3 Hrs.	Hours/Week	2
SEE	50 Marks	Total Hours	26

Course Objective : Objective of the course is to make learners able to apply and verify concepts of physics experimentally.

Course outcomes : At the end of course, student will be able to :

SL. No.	Course Outcomes	Mapping to POs
1	Demonstrate experimentally the properties of semiconductors, dielectrics, elastic bodies, vibrations, radiation, and optical phenomena.	1,9
2	Calculate the physical quantities using the experimental data.	1,9

A. Guided laboratory

1. Verification of Stefan's law of radiation.

2. Determination of Planck's constant using Light Emitting Diodes.

3. Determination of dielectric constant by charging and discharging of a capacitor.

4. Estimation of frequencies of vibrating string and AC using Sonometer.

5. Determination of resonance frequency and inductance using LCR circuits.

6. Determination of Young's modulus using single cantilever.

7. Determination of wavelength of LASER by diffraction technique.

8. Determination of numerical aperture and modes of transmission of optical fiber.

B. Open ended laboratory (few examples are given bellow)

1. Measurement of effective resistance of series combination of three resistors.

2. Measurement of effective capacitance of parallel combination of three capacitors.

3. Measurement of effective emf of series combination of three cells.

DESIGN THINKING LABORATORY

Course Code:	21DT108	L-T-P-C	0-0-2-1
Exam Hours:	00	Hours/Week	2
SEE:	00	Total Hours	28 Hours

Course Objective : Aims to blends theory and practice of design thinking from a systems-level, multi-sector and cross-disciplinary perspective. Focused on Human Centered Design (HCD), Design Thinking and Social Research Method, participants are introduced to a variety of practices, processes and tools that community-change agents use to inform, inspire and create lasting, meaningful solutions.

Course Outcomes (CO's) : Upon Completion of the course, students shall be able to :

Sl. No.	Course outcomes	Mapping to PO's
1.	Develop awareness regarding the sector in the regions and the sustainable development goals	PO7, PO9, PO10
2.	Acquire essential skills such as interpersonal skills, communication skill to indulge with different stakeholders of the community to identify the problems	PO8, PO9, PO10
3.	Apply research methods to organise, analyse and define the problem	PO2, PO4
4.	Design solutions to the challenges identified along with the stakeholders of the community	PO1, PO6, PO9, PO10
5.	Build prototype using rapid prototyping tools for the ideas that can solve the identified problem	PO1, PO3, PO5, PO11, PO12

Course Contents :

Week	Session	Key Topics
1	Introduction to Social Innovation Program	• Introduce the Social Innovation Program
		• Course Outcomes (Knowledge, Skill & Attitude)
		• Pre-requisites
		• Deliverables - Journey from Idea to Preincubation
		• Design challenge - design a better commute for partner

2	Introduction to Sustainable Development Goals	• Introduction to the MDGs.
		• Introduction to the SDGs.
		• What is required to achieve the SDGs by 2030?
		• SDG on my Plate
3	Introduction to Design Thinking	• What is Design Thinking?
		• Phases in Design thinking
		• When to use Design Thinking?
		• Design Thinking Challenge
4	Introduction to Product design and development	• Product Design and Development Cycle
		• Design Thinking in product design
		• Design Challenge
5	Introduction to Research Secondary Research & Primary Research	• How to use Google scholars to find research papers
		• How to search effectively using Google search engine
		• Activity- Secondary research on sectors
		• How to empathise with your users?
		• Interview Techniques
		• How to conduct surveys
		• Field Activity: Identifying an organisation /company/industry for the project and conducting field research (Physically / Online)
6	Research analysis and designing the problem brief & Ideation	• Cause and effect analysis
		• Stakeholder analysis
		• Defining the problem brief
		• Activity - Analysis of the field activity
		• Silent Ideation using Miro
7	Sketching your Ideas	• One point perspective
		• Two point perspective
		• Three point perspective

8	Computer Aided Modelling	• Introduction to Onshape
		• Creating files for 3D printing
		• Creating files for Laser Cutting
		• Creating files for Vinyl Cutting
9	User Interface Design	• Introduction to User Interface design
		• Low fidelity prototype, Medium Fidelity, High Fidelity Prototype
		• Introducing to Adobe XD
		• Creating screens in Adobe XD
10	Planning and Prototype	• Project planning using clickup
		• Create 3D model of the design
		• 3D print the parts
		• Laser cut the parts
		• Assembling the electronics
		• What is a pitch deck
		• Introduction to Canva
		• Creating Pitch decks for the prototypes
11	Pitch Deck	• What is a pitch deck
		• Introduction to Canva
		• Creating Pitch decks for the prototypes
12	Social Innovation Expo	Social Innovation Project pitching event and exhibition

Course Title	ENGINEERING CHEMISTRY		
Course Code	21CH101/201	L-T-P-C	4-0-0-4
Exam	3 Hrs.	Hours/Week	4
SEE	50 Marks	Total Hours	50

Course Objective : The objective of this course is to build a strong foundation and basic skills in Engineering Chemistry for technological competence in industries.

Course Outcomes : After the completion of the course, students shall be able to :

SL. No.	Course Outcomes	Mapping to POs
CO1	Describe the construction and working of chemical cells and batteries.	PO1, PO2
CO2	Illustrate the different types of chemical processes and their importance in the field of engineering.	PO1, PO2
CO3	Distinguish among properties & applications of polymers, water and chemical energy.	PO1, PO2
CO4	Apply various principles to solve numerical problems related to chemical energy, water and others.	PO1, PO2

Course Contents :

MODULE-1   10 HOURS

Fuels and combustion : Fuels-Definition, Classification based on the physical state and occurrence with examples, Calorific value –definition, classification - Gross and Net calorific values, units in S.I system. Characteristics of an ideal fuel. Experimental determination of calorific value of a solid fuel using Bomb Calorimeter. Numerical problems on GCV and NCV.

Chemical processing of Petroleum : Petroleum cracking – Definition. Types of cracking-thermal and catalytic cracking. Fluidized catalytic cracking. Reforming of petrol with reactions (Isomerisation, cyclisation, aromatisation and dehydrogenation). Octane number & Cetane number. Knocking of petroleum, knocking mechanism. Prevention of knocking – anti knocking agents (TEL & MTBE). Power alcohol, biodiesel and Synthetic petrol -preparation by Bergius Process.

MODULE-2 10 HOURS

High Polymers : Introduction, definition and classification with examples. Glass transition temperature (Tg) - definition, factors affecting Tg and significances of Tg.

Resins and plastics – Types of plastics- thermoplastics & thermosetting plastics-differences. Compounding of resins in to plastics. Synthesis, properties and Industrial applications of PMMA, Polyurethane, Polycarbonate and Kevlar.

Adhesives – Meaning, Preparation, properties and applications of Epoxy resins & Phenol-formaldehyde resins.

Biodegradable polymers - Introduction, types of biodegradable polymers, preparation, properties and applications of polylactic acid (PLA).

Elastomers - Definition, types-natural and synthetic rubber. Preparation of natural rubber from latex, deficiencies of natural rubber, compounding and vulcanization of natural rubber.

Synthetic rubber - Advantages of synthetic rubber over natural rubber. Preparation, properties and industrial applications of SBR rubber, Thiokol, butyl rubber and silicon rubber.

MODULE-3 10 HOURS

Water and its treatment : Introduction, sources of water, impurities in water, standards of water for industrial supply. Hardness of water, determination of total hardness by EDTA method. Boiler feed water and boiler problems, **Boiler scales and sludge's,** External treatment of boiler feed water- Hot Lime -Soda process and Ion exchange method. **Internal treatment of water** – phosphate conditioning & Calgon treatment.

Desalination – Meaning, purification of water by reverse osmosis.

Potable water – Meaning, Standards of potable water, treatment of water for town supply. BOD, COD- definition, experimental determination of COD value with problems.

MODULE-4 10 HOURS

Electrochemistry : Introduction, electrochemical cells – Definition, Types of electrochemical cells, Construction, working & representation of galvanic cell. Modern sign conventions, single electrode potential, standard electrode potential. E.M.F of a cell, derivation of Nernst Equation.

Concentration cell- Definition with example, derivation of emf of concentration cell. Types of electrodes. **Secondary reference electrodes –** calomel electrode, ion selective electrodes- glass electrode. Determination of pH of a solution using glass electrode. Potentiometric estimation of FAS using $K_2Cr_2O_7$ solution. Numerical problems on E, E^0, E_{cell}, E^0cell and concentration cells.

Metal finishing : Introduction, technological importance of metal finishing. Significance of polarization, decomposition potential and over voltage.

Electroplating – Definition, factors affecting the nature of electro deposit - metal ion concentration, current density, complexing agents, organic additives, p^H, temperature & throwing power. Electroplating of Copper by cyanide bath method.

Electroless plating - Definition, distinction between electroplating and electroless plating. Advantages of electroless plating. Electroless plating of Nickel.

MODULE-5   10 HOURS

Chemistry of nanomaterials (CNM) : Introduction to nanomaterials. Properties of nanomaterials, Classification.

Synthesis : top-down and bottom-up approaches. Chemical methods of synthesis- solution combustion and hydrothermal methods. Characterization techniques like PXRD, SEM, and TEM (only introduction). Applications and disadvantages of nanomaterials.

Battery technology : Batteries- Definition, difference between battery and cell. Battery characteristics. Classification of batteries – primary & secondary batteries. Secondary batteries - construction, working and industrial applications of Lead- acid battery.

Modern batteries : Construction, working and industrial applications of Zinc-air battery, Nickel metal hydride battery and Li batteries.

Fuel Cells- Introduction, definition, construction, working and industrial applications of H_2-O_2 fuel cell & methanol-oxygen fuel cell. Differences between battery and fuel cell.

TEXT BOOKS

1. Engineering Chemistry by M.M. Uppal, Khanna Publishers (2001 edition).

2. A text Book of Engineering Chemistry- by P C Jain and Monica Jain, Dhanapatrai Publications, New Delhi.(2015 edition)

REFERENCE BOOKS

1. Principles of Physical Chemistry B.R.Puri, L.R.Sharma & M.S.Pathania, S.Nagin Chand &Co., (2008 edition).

2. Text Book of Polymer Science by V.R.Gowarikar, N.V.Viswanathan and J.Sreedhar, Wiley-Eastern Ltd (2006 edition).

3. Industrial Chemistry by B.K.Sharma, GOEL Publishing House (2014 edition).

4. Industrial Electrochemistry, Second Edition by Derek Pletcher & Frank C. Walsh publisher: Chapman & Hall, USA (1993 edition)

Title	BASIC ELECTRONICS ENGINEERING		
Course Code	21EC103/203	L-T-P	3-0-0-3
Exam	3 Hrs.	Hours/Week	3
SEE	50 Marks	Total Hours	40

Prerequisites (if any) : Semiconductor diode, Zener diode, Half- Wave rectifier, LC tank circuit.

Number Systems – Binary, Octal and Hexadecimal, OR,AND, NOT gates

Course Objective : Study of basic electronics devices, circuits and system including digital devices, microprocessor and microcontroller, operational amplifier, communication and display devices.

Course outcomes : At the end of course, student will be able to:

Sl. No.	Course outcomes	Mapping to PO's	Mapping to PSO's
1	Apply the knowledge of semiconductor devices to understand the working of electronics devices and circuits to study their operating conditions.	1,2,5	1
2	Explain the applications of electronic devices and their working.	1,2	1
3	Illustrate the working principles of digital circuits, microprocessor and microcontroller.	1,2	1
4	Describe the working principle of analog devices and communication system.	1,2	1

MODULE-1 08 HRS

Analog Devices : BJT: Input and output characteristics of CE configuration, JFET: Working principle, Drain and transfer characteristics, applications. MOSFET: Enhancement and depletion type N-channel, P-channel MOSFETs, Drain / Transfer Characteristics. Other devices: SCR, Photodiode and Solar cell - working principles and applications.

MODULE-2 08 HRS

Electronics Circuits: Bridge Full-Wave rectifier: Circuit diagram, working, input and output waveforms, Rectifier with C filter, Zener voltage regulator. Transistor amplifier -Fixed bias, Collector to emitter bias, Voltage-Divider Biasing Circuit, CE amplifier, RC phase shift oscillator, Colpitt's oscillator and Crystal oscillator. (Substitution Problems).

MODULE-3

08 HRS

Digital Electronics: NAND, NOR, Ex-OR gates, Half Adder, Full Adder, Encoder, Decoder, SR Flip Flop, JK Flip-Flop, D-Flip Flop, T- Flip-Flop, Introduction to Microprocessors and Microcontrollers,8051 Microcontroller architecture.

MODULE-4

08 HRS

Operational Amplifier : Characteristics (Ideal and Practical), Inverting and Non-inverting Amplifier, Voltage follower, Summing Amplifier and Subtractor, Numerical examples as applicable.

Display instruments : Cathode Ray Oscilloscope, Digital Oscilloscope.

MODULE-5

08 HRS

Communication Systems : General communication system, Need for modulation – Amplitude Modulation, Frequency modulation (Substitution Problems). FM Radio, Digital modulation Techniques - ASK and FSK, Cellular Networks, Blue tooth, Internet of Things. (Block Diagram approach only).

Text Books:

1. David. A. Bell, "Electronic Devices and Circuits", 5th Edition, 2008, Oxford UniversityPress.

2. M. Morris Mano,"Digital Logic and Computer Design", 5th edition, 2002,PHI.

Reference Books:

1. SantiramKal, "Basic Electronics: Devices, Circuits and IT Fundamentals", 2009,PHI.

2. Ramakant A. Gayakwad, "Op-amps and linear integrated circuits", 4th edition, 2000, Prentice Hall.

3. George Kennedy, "Electronic communication systems", 6th edition, 2017, McGraw HillIndia.

4. Muhammad Ali Mazidi, "The 8051 Microcontroller and Embedded Systems using Assembly and C", 2nd Edition, 2011,Pearson.

Title	ELEMENTS OF MECHANICAL ENGINEERING		
Course Code	21ME104/204	L-T-P-C	(3-0-0) 3
Exam	3 Hrs.	Hours/Week	03
SEE	50 Marks	Total Hours	39

Course Objective : To introduce fresh entrants of all undergraduate Programmes the principles and fundamentals of Mechanical Engineering.

Course Outcomes : At the end of course, student will be able to

Sl. No.	Course outcomes	Mapping to PO's	Mapping to PSO's
1	Explain the working of steam boilers, steam turbine, gas turbine, hydraulic turbine, IC engines and Electrical Vehicle.	1,2	-
2	Describe the mechanism of power transmissions, bearings, purpose and methods of lubrication.	1,2	-
3	Identify engineering materials, their properties, manufacturing methods, automation of manufacturing process encountered in engineering practice.	1,2	-
4	Differentiate various non conventional machining and working on refrigeration and air conditioning.	1,2	-

MODULE -1 08 HOURS

Introduction to Mechanical Engineering- Thermal, Design and Manufacturing Engineering.

Boilers and Properties of steam : Formation of Steam with constant pressure, Type and properties of steam-Specific volume, Internal energy, and Dryness fraction (numerical problems). Basic principle of water tube boiler & Fire tube boiler, list & functions of boiler mountings & accessories (no construction Details).

Steam Turbines – working Principle of Impulse & Reaction turbine.

Gas turbines cycles - working principle of Open &Closed cycle gas turbine.

Hydraulic turbines – working principle & operation of Impulse & Reaction turbines.

Self study : Energy Conversion: Sources of Energy, Energy alternatives.

Activity : Laboratory visit (Fluid Mechanics and Machinery Laboratory)

MODULE - 2 08 HRS

I.C. Engines – Heat Engine, I. C Engines – Classification, Parts, Terminology, 4 stroke petrol and diesel engine. Numerical problems on IP, BP, FP, Efficiency.

Electrical Vehicle Technology : Basic concepts

Power Transmission : Gears - spur gears, bevel gears, helical gears, worm gear sets, rack and pinion, simple and compound gear trains, Belt and chain drives. Expression of Velocity Ratio for Gears drives, Belt drives, chain drives and gear trains, Numerical problems on Velocity ratio.

Self study : Various pollutants from the IC Engine Emission and Effect on the environment. Electric vehicle Components.

Activity : Comparative study of I C Engine and Electrical vehicle system. Preparation and Presentation of a Report.

MODULE - 3 08 HRS

Lubrication and Bearings : Purpose of lubrication, Types and properties of lubricants, Drop Feed and Splash lubrication, Introduction to Bush bearing and Anti friction Bearings.

Materials and Mechanical properties - Engineering Materials; Metals and their alloys, ceramics, polymers, composite materials. Concepts of Stress, Strain, stress-strain diagram for Ductile and Brittle Material When subjected to Tension. Factor of safety (F.O.S.). Numerical problems on Stress, Strain and Change in length.

Self study : Tension, Compression, and Shear, Strain, stress-strain diagram for Ductile and Brittle Material When subjected to Compression.

Activity : Demonstration on Tensile & Compression Testing using UTM.

MODULE - 4 08 HRS

Manufacturing Processes : Introduction and classification of manufacturing processes. Casting-Principles of Sand casting, Permanent Mould casting, Hot chamber Die- casting process, Advantages, Limitation and Applications.

Metal Forming : Principles of Rolling, Extrusion (Direct & Indirect Extrusion). Forging operations.

Joining process : Brief description of Electric Arc Welding, Gas Welding, Brazing and Soldering.

Self study : Plastic processing: Injection Moulding of plastics. Cold chamber Die- casting process.

Activity : Workshop visit (Demonstration on Sand mould Casting, Forging and Welding)

MODULE - 5

Non-conventional Machining - EDM, ECM and LBM. Automation: Concept of CNC system and Automation, advantages and disadvantages.

Refrigeration & Air Conditioning : unit of refrigeration, Refrigeration effect, Ton of Refrigeration, COP. Refrigerants- Types & properties of refrigerants. Parts of refrigerator, Working principle of Vapour compression and Vapour absorption refrigerators. Introduction to Air conditioning, working principle of room / window Type air conditioning system.

Self study : Principle of Conventional Machining process, Basic machining operations.

Activity : Preparation of report and Presentation on Advanced Manufacturing Methods.

Visit to Refrigeration unit.

TEXT BOOK:

1.   Elements of Mechanical Engineering by V. K. Manglik, PHI, 2014, ISBN: 978-81-203-5025-0

REFERENCES:

1.   Elements of Mechanical Engineering - K P Roy, S K H Choudry, A K H Choudry, Roy Media promoters and publishers, Mumbai, 7th edition, ISBN : 4567145216, 1234567145210.

2.   Basic Mechanical Engineering - Basanth, Agrwal& C.M. Agrawal 2008. Wiley India Pvt. Ltd 2008, ISBN 13, : 9788126518784.

3.   An Introduction to Mechanical Engineering,- Jonathan Wickert, 2nd edition, Cengage Learning 2006, ISBN-10: 1-111-57682.

4.   Electric and Hybrid vehicles by A. K. Babu Khanna Publications.

Title	PROGRAMMING FOR PROBLEM SOLVING		
Course Code	21CS105/205	L-T-P-C	4-0-0-4
Exam	03 Hours	Hours / Week	04
SEE	50 Marks	Total hours	50

Course Objective : Aims to provide fundamental programming concepts which are essential to develop program for a given problem.

Course Outcomes (COs) : Upon Completion of the course, students shall be able to:

COs	Statement	POs
1.	Describe the basic concepts of C programming	PO1
2.	Apply the knowledge of C programming constructs for a given problem	PO1, PO2
3.	Analyse the given problem to determine the output and correctness of the programs given	PO1, PO2
4.	Develop a program to find a solution for the given requirements	PO1, PO2, PO5, PO9, PO10

Course Contents :

MODULE – 1   10 Hrs

Algorithm and Flowchart, Introduction : Importance of C, Basic structure of C program, executing a C program, Characters set, C tokens, Variables, Data types, Operators, Expressions, Evaluation of expressions, Operator precedence and associativity, Type conversion,Defining Symbolic constants ,Simple programs.

Self Study : Extended data types

MODULE – 2   10 HRS

Managing Input and Output Operations, Decision making and Branching. elseif…ladder statements, The ?: operator, Simple programs.

MODULE – 3   10 HRS

Decision making and Looping, Jumps in Loops, programming examples,Nested loops,Arrays: One-dimensional Arrays, Two-dimensional Arrays, , Program to merge two arrays in sorted order, programming examples

Self-Study: Multidimensional array

MODULE – 4 10 HRS

Character Arrays, Arithmetic operation on characters, String handling functions, User-defined Functions, Elements of User defined function, Category of functions, Parameters passing in functions: call by value and call by reference, Nesting of function, Recursion, Passing arrays to functions, Passing strings to functions.

Self-Study: Additional built-in string functions.

MODULE – 5 10 HRS

Structures : Defining a structure, Declaring a structure variable, Accessing structure members, Structure initialization, Operations on individual members, Arrays of structure, Structure within structure.

Pointers : Understanding pointers, Accessing the address of a variable, Declaring pointer variables, Initialization of pointer variables, Accessing a variable through its pointers, Pointer expressions, Pointers increments and scale factor, Pointers and arrays, Pointers as function arguments, Pointers to function.

Text Books :

1. Balagurusamy E, "Programming in ANSI C", 7th Edition, Tata Mc Graw Hill, 2013.

Reference Books :

1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language", 2nd Edition, PHI, 2012.

2. Programming Techniques through C, M. G. V.Murthy, Pearson Education, 2014

MOOCs :

1. http://nptel.ac.in/courses/106104128/

Title	**ENGINEERING CHEMISTRY LABORATORY**		
Course Code	21CH106/206	**L-T-P-C**	0-0-2-1
Exam	3 hours	**Hours/week:**	2
SEE	50 marks	**Total hours**	50

Course objectives : To provide students with practical knowledge of quantitative analysis of materials by volumetric and instrumental methods for the determination of constituents present in a sample.

Course outcomes : After the completion of the course students shall be able to :

CO1	Analyse the hardness of water, CaO in cement, COD of waste water, percentage of iron and copper content in the given samples.	PO1
CO2	Apply the analytical techniques like conductometry, colorometry and potentiometry for accurate chemical analysis.	PO2

LIST OF EXPERIMENTS

PART- A (Volumetric Analysis)

1. Estimation of $KMnO_4$ using Mohr's salt crystals.
2. Determination of Total hardness of a given sample of hard water using EDTA.
3. Determination of Calcium oxide in the given sample of cement by EDTA method.
4. Determination of percentage of iron in the given sample of haematite ore solution using potassium dichromate crystals by external indicator method.
5. Determination of COD of the given industrial waste water sample.
6. Determination of percentage of copper in brass using standard sodium thiosulphate.

PART- B (Instrumental Methods)

1. Determination of pKa value of weak acid using pH meter.
2. Estimation of FAS using $K_2Cr_2O_7$ by Potentiometric Method.
3. Estimation of copper using Colorimeter.
4. Estimation of HCl using standard NaOH by conductometric method.
5. Determination of viscosity coefficient of a given liquid using Ostwald's Viscometer.

Reference Books :

1. Engineering chemistry lab manual, written by faculty, Department of chemistry, MCE Hassan.
2. Vogels text book of quantitative inorganic analysis, revised by J. Bassett, R.C. Denny, G.H. Jeffery, 4th Ed.
3. Applied chemistry theory and practice by O. P. Vermani and A. K. Narula, second edition.

Title	COMPUTER PROGRAMMING LABORATORY		
Course Code	21CS107/207	L-T-P-C	0-0-2-1
Exam	3 Hours	Hours/week:	2
SEE	50 marks	Total Hours	28

Course Objective : Design, develop and document programs using C Language.

Course Outcomes (COs) : At the end of the course the student will be able to :

1.	Implement program using C for the given problem.	PO3, PO2
2.	Test and debug a given program for the various test cases.	PO1, PO2

Demonstration Experiments

1. Demonstration of Scratch Tool.

2. a. Write a C program to read length of the sides of a triangle and find its area.

   b. Write a C program to read radius of a circle and find its area and circumference

3. An employee gets DA 90% of basic salary; HRA 15% of basic salary, CA 5% of basic salary. And also employee has to pay income tax of 10% of gross salary (Grass salary= Basic Salary+ DA+HRA+CA). Write a C program to read the basic salary of an employee and find the take home salary of the employee (Take home salary = gross salary – income tax)

4 Heights of three students in a class are h1, h2 and h3. Write a C program to find the tallest among three students using nested if else statement.

5 Read first name, middle name and last name of a person. Write a C program to concatenate first name with middle name without using built in function. And concatenate the resultant string with last name using built in function.

Guided Laboratory Experiments

1. Quadratic equation is given by $ax^2+bx+c=0$, where a, b and c are the coefficients provided where $a \neq 0$. The formula to find roots of quadratic equation is $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ Write a C program to find all the roots and test it for all three cases(based on discriminant value).

2. A shop keeper requires performing simple calculations like addition, subtraction, multiplication and modulo division for his daily business. Write a C program to design a simple calculator for shop keeper.

3. An electric power distribution company charges its domestic consumers as follows:

Consumption Units	Rate of Charge
0-200	Rs. 0.50 per unit
201-400	Rs.100 plus Rs.0.65 per unit excess of 200
401-600	Rs.230 plus Rs.0.80 per unit excess of 400
601 and above	Rs.390 plus Rs.1.00 per unit excess of 600

Write a C program to read the customer number, power consumed and display the amount to be paid by the customer.

4. Sine series is given by $x - \frac{x^3}{3!} + \frac{x^5}{5!} + \frac{x^7}{7!} + \ -\ -\ -\ -\ -$ up to n terms, where x is an angle in radian. Write a C program to find sine value for a given angle. Also verify calculated sine value using built in function. [where radian $= \frac{\pi}{180}$]

5. A person wants to register his newly purchased car. He is passionate to have a palindrome number for car registration. Write a C program to check whether the number allotted is palindrome or not.

6. Given a list of n student's weight, write a C program to find a student with given weight. If found, display the position of the student in the list else display suitable message.

7. Given two matrices, write a C program to check whether the matrices are multipliable, if so find the product matrix, otherwise display suitable message.

8. Given a matrix, write a C program to find its transpose. Also find sum of upper triangle elements and sum of lower triangle elements of the transposed matrix.

9. Write a C program to read a string, find number of vowels and consonants in it.

10. Given a list of N student's names, write a C program to arrange names in alphabetical order.

11. Develop a C function to check whether a given number is prime or not. Write a C program to read a range of numbers and print all the prime numbers in that range using the above function.

12. Develop a function to find the factorial of a given number. Using the above function write a C program to find nCr and nPr where nCr $= \frac{n!}{r!(n-r)!}$ and $= nPr \ \frac{n!}{(n-r)!}$

13. Develop a C function to swap two numbers. Write a C program using the above function to sort a given set of integers.

14. Define a structure data type called student containing members: name, usn, marks of CIE1, CIE2, CIE3, activity1 and activity2. Write a C program that would assign values to individual members and display them along with the total internal marks of all students where total internal marks is sum of best of two CIE marks, acitvity1 and activity2.

15. The mark scored by 'n' number of Students for the course 20CS105 in section 'A' is stored in an array. Write a C program to find sum and average of marks using pointers.

Open Ended Laboratory Experiments (Activity)

1. Develop a C program to solve a puzzle/game like tic-tac-toe.

2. Develop a C program to check whether two strings are anagram or not.

3. Develop a C program to generate bill in a grocery store.

4. Develop a C program to generate magic square.

5. Develop a C program to solve 4 queens problem.

BLOOM'S TAXONOMY ACTION VERBS

Definitions	Remembering (L1)	Understanding (L2)	Applying (L3)	Analyzing (L4)	Evaluating (L5)	Creating (L6)
Bloom's Definition	Exhibit memory of previously learned material by recalling facts, terms, basic concepts, and answers.	Demonstrate understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas. ★	Solve problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way.	Examine and break information into parts by identifying motives or causes. make inferences and find evidence to support generalizations.	Present and defend opinions by making judgments a bout information, validity of ideas, or quality of work based on a set of criteria.	Compile information together in a different way by combining elements in a new pattern or proposing alternative solutions.
Verbs	• choose • define • find • how • label • list • match • name • omit	• classify • compare • contrast • demonstrate • explain • extend • illustrate • infer • interpret	• apply • build • choose • construct • develop • experiment with • identify • interview • make use of	• analyze • assume • categorize • classify • compare • conclusion • contrast • discover • dissect	• agree • appraise • assess • award • choose • compare • conclude • criteria • criticize	• adapt • build • change • choose • combine • compile • compose • construct • create

Verbs					
• recall • relate • select • show • spell • tell • what • when • where • which • who • why	• outline • relate • rephrase • show • summarize • translate	• model • organize • plan • select • solve • utilize	• distinguish • divide • examine • function • inference • inspect • list • motive • relationships • simplify • survey • take part in • test for • theme	• decide • deduct • defend • determine • disprove • estimate • evaluate • explain • importance • influence • interpret • judge • justify • mark • measure • opinion • perceive • prioritize • prove • rate • recommend • rule on • select • support • value	• delete • design • develop • discuss • elaborate • estimate • formulate • happen • imagine • improve • invent • make up • aximize • inimize • modify • original • originate • plan • predict • propose • solution • solve • suppose • test • theory