



#### ABOUT ARISTOTLE EDUCATIONAL SOCIETY

Aristotle Educational Society was established in 2000, with an aim of bringing quality Engineering and management education closer to the student's populace at large. The society is founded by experienced and visionary team of academicians, industrialists and NRI Entrepreneurs, whose valuable knowledge and experience are the guiding factors for K G Reddy College of Engineering & Technology (KGRCET). At KGRCET we are always for every driving improvements and innovation in education, is it infrastructure expansion or faculty talent acquisition. Our endeavour is to provide best of the class facilities and services to our students.

Twenty First Century society is considered to be a knowledge society. But many of our educationists and captains of industry are of the opinion that there is a significant mismatch between the kind of education students are equipped with from our institutions and the industry's expectations. It is precisely to bring down this gap that our focus is on continuous enhancement of both the technical skills as well as the soft skill of our students in order to compete and succeed in the global work places of tomorrow.

#### Vision:

To become new-age engineering institution which is recognized for its innovative teaching and learning culture, research and entrepreneurial ecosystem, and sustainable social impact in the community.

#### Mission:

- To offer undergraduate and post-graduate programs that is supported through industry relevant curriculum and innovative teaching and learning processes that would help students succeed in their professional careers.
- To provide necessary support structures for students, which will contribute to their personal and professional growth and enable them to become leaders in their respective fields.
- To provide faculty and students with an ecosystem that fosters research and development through strategic partnerships with government organisations and collaboration with industries.
- To contribute to the development of the region by using our technological expertise to work with nearby communities and support them in their social and economic growth.





# TEN RULES TO TRANSFORM YOURSELF INTO AN IDEAL STUDENT AND A PERFECT PROFESSIONAL

- The first thing is punctuality. You are expected to be in your seat in the classroom by 9:00
  am. However, 10 minutes of grace time is given to enter the class. If you arrive at the
  institute after 9:10 am and before 09:50 am you can attend the rest of the classes. From 10:00
  am, no student will be allowed to gain entry into the campus. You are not permitted to enter
  the class after the commencement of the class (except 1<sup>st</sup> period) and should not leave a class
  before that class ends.
- 2. You should not leave the campus during the working hours (between 9:00 am and 3:45 pm) without prior permission from the principal. Students' who wishes to leave the campus for any reason may apply for permission to the concerned Head who in turn forward the case to the Principal. The Principal may issue the Gate pass after getting the consent of the parent.
- 3. You must wear neat and clean formal dress. Your attire should be befitting to the status of a student doing a professional course. You must wear (display) the Identity Card as long as you are in the campus.
- 4. Use of mobile phones is strictly prohibited in the class rooms/ labs/ workshops/ library/computer labs/Offices and other prominent places.
- 5. All the interpersonal communication within the campus must be only in English. If mistakes, fear/tension, mother tongue influence etc. are your reasons for not speaking in English, you must realize that they are all part and parcel of the learning process. Unless you make mistakes and learn from your mistakes you will never be able to acquire good command over English. As you are all aware, good command over English paves the way for a good professional career.
- 6. In case there is any delay on the part of any teacher in entering your class, and as a result the students are idle, one of the students from your class (preferably CR) may contact the HOD/Academic Counselor for corrective measures/necessary arrangements. You should not be seen in corridors, canteen, and buses or anywhere outside your classroom/lab without carrying a permission letter. If you do not have any teaching hours you are advised to make use of your free time productively, by utilizing various facilities
- 7. You must actively participate in all academic and extracurricular activities like; Seminars/Workshops, Tech Fests, College Day and all the National Festivals and use them as a platform to present yourself and grow as a better individual.
- 8. As a student, you are expected to cultivate habits like practicing self-discipline, showing dedication towards your studies and respecting the teachers and elders.
- 9. If any one of you has any complaints or grievances against the institution, you are always welcome to bring them to the notice of your respective departments and get your problems solved.
- 10. Never forget that you are always welcome to make your suggestions for the improvement of the institution. Your suggestions will be appreciated and implemented if they found to be good, innovative and helpful to us in offering better services to all





# CODE OF CONDUCT OF STUDENTS

It shall be the responsibility of the students of KGRCET to

- 1. Be familiar with and adhere to this Code and any amendment brought to this Code.
- 2. Behave in a dignified and courteous manner and show due respect to the authorities, employees, elders and fellow students.
- 3. Access all educational opportunities and facilities available in the college and make good use of them to benefit academically and develop scientific temper.
- 4. Respect the laws of the country and human rights and conduct in a responsible and dignified manner at all times.

# **BEHAVIOUR & CONDUCT OF THE STUDENT IN THE CAMPUS**

- Students are expected to be in the classroom by 8.55 am. Only 5 minutes of grace time can be given. No student will be allowed to enter into the campus after 10 am. Students are not permitted to enter a class after the commencement of the class and leave before that class ends.
- Students should not leave the campus during working hours (between 9:00 am and4:15 pm). Students may be permitted to leave the campus only in exceptional circumstances with the prior permission of the Head of the Department concerned and the Principal only. Gate pass will be issued only after the authorization of the Principal.
- Students must wear neat and clean formal dress. Wearing of jeans, T-shirts and sandals is not permitted. Identity Card is to be worn around the neck at all times.
- Use of mobile phones is strictly prohibited in the classrooms, labs, workshops, library, computer labs, offices and seminar halls.
- All the interpersonal communication within the campus must be in English only.
- If any teacher does not report to the class for any reason, the CR is to contact the HOD/Dean Academics for necessary alternative arrangements.
- Students are not to be seen in corridors, canteen, and buses or anywhere outside classrooms/labs without a letter of permission. Free time may be utilized in Library, Digital Library, Language Lab, Sports Lounge, etc.
- Students are encouraged to actively participate in all academic and extracurricular activities like seminars, workshops, clubs, technical fests, sports, College Day and National festivals and use them to develop their technical and soft skills.
- Students are expected to develop manners, self-discipline and integrity and groom themselves to be responsible engineers of the country.
- Students should not indulge in ragging of any form in the campus or off the campus.





# **RULES FOR STUDENTS**

- Students are advised and expected to
- Be punctual for all the activities.
- Be regular for the classes, labs, workshops and examinations.
- Greet their faculty and seniors.
- Express themselves appropriately without the use of profane language or offensive gestures.
- Respect the safety of others by not bringing real or imitation weapons to college or the hostel.
- Avoid indulging in loose talk or spreading rumours on campus.
- Refrain from sitting in places such as parapets, stairs, footpaths, etc.
- Wear their identity cards while on the campus.
- Keep away from possession or consumption of chewing gum, narcotic drugs, tobacco, alcohol and other intoxicating substances which are strictly prohibited by law.
- Do not indulge in anti-institutional, anti-social, anti-national, communal, indecent, immoral or political activities within the campus and hostels
- Do not organize, attend or participate in any activity or agitation sponsored by political or religious organizations.
- Do not respond to any form of strike, procession or agitation including slogan shouting or boycott of activities.
- Take prior approval and permission of the Principal before undertaking any educational/recreational tours or industrial visits.
- Avoid coming to the college in their personal vehicles. Vehicles should be parked in the designated parking space only. Rash or negligent driving of vehicles, blowing of horns and riding with more than one pillion rider is prohibited.
- Report promptly any unauthorized entry of outsiders into the campus as well as hostels.





# ACADEMIC REGULATIONS

#### 1. Holidays

KGRCET strictly follows the holidays notified by JNTUH Academic calendar.

# 2. Attendance

• A student shall be eligible to appear for University Examinations, if he/she possesses an aggregate of at least of 75% of attendance in all the subjects.

• A student will not be promoted to the next semester unless he/she satisfies the attendance requirement of the present semester / 1<sup>st</sup> year.

• If any student wants to go on leave for three or four days, the parents should meet the academic Counsellor of the class, to which the student belongs to, to get the permission.

• Attendance is compulsory on the preceding and the proceeding days of any holiday.

#### 3. Credit System

The credit system is as per the JNTUH Course Structure and syllabus. Students can have the details by going through the syllabus books.

# 4. Distribution and weight age of marks:

The performance of a student in each semester / I year shall be evaluated subject wise with a maximum of 100 marks for theory and 100 marks for practical subject.

Subject	Internal Exam	Assignments	End semester Exam	<b>Total Marks</b>
Theory	20	5	75	100
Practical	25	-	75	100

After a student has satisfied th	ne requirements prescr	ibed for the compl	letion of the program and
is eligible for the award of B.	Fech. Degree he shall	place in one of the	following 4 Classes:

Class Awarded	% of marks to be secured	
First class with		From the aggregate,
Distinction	70 % and above	marks secure from the
Eirst Class	Below 70% but not less than	best 160 credits
Filst Class	60%	
Second Class	Below 60% but not less than	
Second Class	50%	
Page Class	Below 50% but not less than	
1 255 C1255	40%	

For further details on academic regulations, please refer the syllabus books





#### **GENERAL INFORMATION**

#### Communication

In case any student or parent wants to contact the college, authorities and put forward their views should communicate the same to the Head of the department/Principal. Any change of address, the parents have to report it to the academic counselor concerned either personally or by making a phone call.

# Ragging

Ragging is strictly prohibited, on the campus and there is an anti-ragging squad working in the college premises and if any senior students are observed troubling the fresher's stringent action will be taken against the culprits and there should be no doubt in any body's mind about the commitment of the college authorities to crush the ragging with an iron hand.

#### Library (Rules and Regulations)

The college has a spacious and well-stocked library with text books and reference books and several national and international journals and magazines. The stockpile of the books goes on increasing year after year to help students keep abreast of the latest information. All the students are advised to put the library to the optimum utilization and try to widen your knowledge. The Digital library is equipped with 21000+ online E journals.

Titles	:	3012
Volume of books	:	22793
Print Journals	:	60
<b>E-Journals</b>	:	DELNET-1230
Seating Capacity	:	150
Timings	:	8 AM – 6 PM
Digital Library	:	30 systems, High speed Internet, 21000+ online journals



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# SEMESTER I ACADEMIC CALENDAR-JNTUH

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B. Tech./B.Pharm. II, III & IV Years I & II Semesters

#### B. Tech/B.Pharm. II, III & IV Years - I Semester

C No	Dental	Duration		
5. 140	Description	From	То	
1	Commencement of I Semester classwork		01.09.2020	
2	1 <sup>st</sup> Spell of Instructions (including Dussehra Recess)	01.09.2020	31.10.2020 (9 Weeks)	
3	Dussehra Recess	19.10.2020	24.10.2020	
4	End Examinations preparation holidays - Previous Semesters	02.11.2020	04.11.2020 (3 days)	
5	2 <sup>nd</sup> Spell of Instructions (including First Mid Term Examinations)	14.12.2020	13.02.2021 (9 Weeks)	
6	First Mid Term Examinations	21.12.2020	28.12.2020 (1 Week)	
7	Submission of First Mid Term Exam Marks to the University on or before		04.01.2021	
8	Second Mid Term Examinations	15.02.2021	20.02.2021 (1 Week)	
9	Practical classes	22.02.2021	27.02.2021 (1 Week)	
10	Preparation Holidays and Practical Examinations	01.03.2021	06.03.2021 (1 Week)	
11	Submission of Second Mid Term Exam Marks to the University on or before		27.02.2021	
12	End Semester Examinations	08.03.2021	20.03.2021 (2 Weeks)	

B. Tech./ B.Pharm. II, III & IV Years - II Semester

S. No	Developing		Duration		
	Description	From	To		
1	Commencement of II Semester classwork		22.03.2021		
2	1st Spell of Instructions	22.03.2021	15.05.2021 (8 Weeks)		
3	Summer Vacation	17.05.2021	29.05.2021 (2 Weeks)		
4	First Mid Term Examinations	31.05.2021	05.06.2021 (1 Week)		
5	Submission of First Mid Term Exam Marks to the University on or before		11.06.2021		
6	2nd Spell of Instructions	07.06.2021	31.07.2021 (8 Weeks)		
7	Second Mid Term Examinations	02.08.2021	07.08.2021 (1 Week)		
8	Preparation Holidays and Practical Examinations	09.08.2021	14.08.2021 (1 Week)		
9	Submission of Second Mid Term Exam Marks to the University on or before		14.08.2021		
10	End Semester Examinations	16.08.2021	28.08.2021 (2 Weeks)		

Note: 1 All the laboratory courses shall be conducted once normalcy is restored.

2 Regular End Semester Examinations of previous Semester (including lab exams) as per the data received from the Examination branch: 05.11.2020 to 11.12.2020.

Sd/- xxxxxx DIRECTOR, ACADEMIC & PLANNING



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**SEMESTER I** 



#### **ACADEMIC CALENDAR – EEE Department** -KG Reddy College of Engineering & Technology KGREDDY (Approximately to Art 11, these factor, Additional to 2017101, Hydronia (Arthury (Voltager), Monumbud (Manufal), R. & Dan, TS-503 (2011) Secredited by NA.66. Fhate: 31-08-2020 KGRCFT/A Y/Dept/ Department of Electrical and Electronics Engineering AcademicCalendar AcademicYear:2020-2021 Semester:ODD Mon Fue Wed Thu Fri Sat No. of Events Month Week working days 5 II" DARGasting 4 T 14<sup>n</sup> -II Year Goest Lecture onECA 21<sup>n</sup> DABMeeting 22<sup>nt</sup>-III Year Expert Lecture on MI 28<sup>n</sup> -IV Year HVDC 12 19 26 10 11 17 15 16 18 14 26 Sept 21 4 5. 30 29 28 Expert Lessione 2<sup>nd</sup> -Gundhi Juganti 6. 9th - STARIES Millering 5 6 7 8 9 10 -00 Year Seminar on C.A. IV Year Guess Lexiate on 8. 12 13 14 15 16 17 19 Oct 9. 10. 26 27 28 29 31 11 2 4 12. 10 13 16 18 25 14. Nov 24 22 15. \*\*. B Year Expert Lecture on AE \* -DAB Meeting 2\* -Second Saturday 3\* -DAB Meeting 16. 2 9 10 17 17 11 18 x 18. Dec 14 Mind - I E 19. 21 23 24 20. rung Day 28 29 30 31 1"-Newye 11"-DAB 13"-Bhog 14"-Ping 18" - Web 19" - Web 25" - Wor 26" - Rep 21 Jan -DAB Med 6 22. 4 16 23 14\*-Pongal 18\*- Webnur en E- vehicles 19\*- Webnur en E- vehicles 28\*- Werkshop en E- vehicles 28\*- Republic Day 39\*-DAB Meeting 13- Last Working Day 13- DAB Meeting 15 to 20 - Second Mid Term Exan 22-27-Practical Classes 24 18 19 20 21 . 25. 25 27 28 29 30 26 04 05 26 01 02 03 06 13 10 27 08 09 22-27 -Practical Classes 24 Feb 28 15 16 17 18 19 20 29 26 22 23 24 25 27 **Total Working Days** 138 Holidays **Co-curricular** Activities Extra-curricular Activities 1 Student Counseling by the Faculty in th First w eek of every me Next Semester Starts End Of Theory Term Start Last Practical Theory Examination 8-03-2021 Working Day Examination 13-02-2021 01-03-2021 Examination 20-03-2021 22-03-2021 01-09-2020 to 06-03-2021 1mg HOD Principal HEAD Prin nal of Electrical & Electronics Engineering States ( To have been a filled and a state of the state o 100 KG Reddy College of Engineering & Technology Childur (V), Moinabad (M), R.R. Dist-501 504. 19 T 1 notest (M) Gin Ruf C





#### ABOUT THE DEPARTMENT

Electrical and Electronics Engineering Department, established in the year 2008, is one of the oldest departments of K G Reddy College of Engineering and Technology. The Primary objective of the department is to impart quality education and training at the undergraduate level in the areas of Electrical and Electronics Engineering.

The Department has qualified and experienced faculty in all the related fields of Electrical and Electronics Engineering. The theoretical knowledge is further supplemented by well equipped laboratories. The department regularly organizes invited lectures by experts from industries in various fields of Electrical and Electronics Engineering. Workshops and Industrial visits are regularly conducted under the association of Electro Technia Association for Empowering (EAE).

The department is headed by **Mrs P.Samyuktha**, **Associate Professor**, who is having vast academic and research experience. Students are encouraged to participate in various Workshops, Seminars, Conferences and technical competitions at various levels.

#### Vision:

• To become a renowned department imparting both technical and non-technical skills to the students by implementing new engineering pedagogy's and research to produce competent new age electrical engineers.

#### Mission:

- To transform the students into motivated and knowledgeable new age electrical engineers.
- To advance the quality of education to produce world class technocrats with an ability to adapt to the academically challenging environment.
- To provide a progressive environment for learning through organized teaching methodologies, contemporary curriculum and research in the thrust areas of electrical engineering.





# Subject Allocation:

S. No.	Name of the	Name of the Subject	Mobile	E-mail Id
	Faculty			
1	k.Syed	Electro magnetic fields	9848606081	syedkhamrudding@kgr.ac.in
2	B. Lingam	Electrical circuits	9440787910	Lingam224@gmail.com
3	d.chandraprakash	Analog Electronics	98785616518	d.chandraprakash@kgr.ac.in
4	Kalpana	Engineering Mechanics	9441924247	kapanag@kgr.ac.in
5	SK Syed Hussain	Electrical machines-I	9493963899	syedhussain@kgr.ac.in
6	B. Lingam	Electrical circuits Lab	9494787910	lingam@kgr.ac.in
7	SK Syed Hussain	Electrical Machines Lab	9493963899	syedhussain@kgr.ac.in





# **Mentor Details:**

S. No.	Name of the Mentor	Mobile	Mentees Roll No.
1	Sk Syed Hussain	9493963899	19QM1A0201 - 20QM5A0215
			and
			18QM1A0201
2	Khamruddin Syed	9848606081	20QM5A0216 - 20QM5A0223
3	Dr. T.V. V. Pavan	9885063119	
	Kumar		20QM5A0224 - 20QM5A0231

# **Class In-charges:**

S. No.	Name of the Class In-charge	Mobile	E-mail Id
1	Sk Syed Hussain	8096766126	syedhussain@kgr.ac.in

# **Class Representative Details:**

S. No.	Name of the CR	Roll No.	Mobile
1	Sai chary	19QM1A0205	6304091311



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#### **Time Table:**

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Accredited by NAAC

Department of Electrical and Electronics Engineering

Time Table for the Academic Year 2020-21

Date: 07-01-2021

Class: II YEAR -I SEM

KG REDDY

Effective from: 07/01/21

#### BRANCH: EEE

Day/Date	09.30 AM to	10.30 AM to	11:30 AM to	12:30 PM to
	10:15 AM	11:15NOON	12:15PM	01.15PM
Monday	ECA	EMF	EM-I	AE
Tuesday	EM-I	EMF	EM	AE
Wednesday	EM	AE	ECA	EMF
Thursday	EMF	EM-I	ECA	EM-I
Friday	AE	ECA	EM	SWD
Saturday	ECA	EM	EM-I	EMF

CODE	SUBJECT TITLE	SUBJECT NAME	NAME OF THE FACULTY
EE301ES	EM	Engineering Mechanics	Mrs. Kalpana
EE305PC	EMF	Electromagnetic Fields	Mr.Khamruddin Syed
EE303PC	AE	Analog Electronics	Dr.Chandraprakash
EE302PC	ECA	Electrical Circuit Analysis	Mr.B.Lingam
EE304PC	EM-I	Electrical Machines - I	Mr.SK.Syed Hussain
MC309	GS	Gender Sensitization Lab	

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# COURSE DESCRIPTION DOCUMENTS

#### **ANALOG ELECTRONICS**

Semester	: II year I semester
Subject	:Analog Electronics
Name of the faculty	: D.CHANDRAPRAKASH
No of contact hours/week	: 5

#### **Course Overview** :

This subject covers diodes, transistors, JFETs, op-amps, and basic **analog** circuit design as applied to audio and radio frequency **circuits**. Students spend the second half of the term designing their own projects. ... Audio mixer, effects engine, Dolby decoder, and multi-channel power amplifiers op amp.

Test portion		
Test no.	Topics	
1	L1-L30	
2	L31-L62	
Assignment portion		
Assignment no.	Topics	
1	L1-L30	
2	L31-L62	

Submitted by

**Signature of Faculty** 

Date :

Approved by

Signature of HoD

Date:





# **Course Objectives:**

To introduce components such as diodes, BJTs and FETs their switching characteristics

- $\checkmark$  applications Learn the concepts of high frequency analysis of transistors.
- ✓ To give understanding of various types of basic and feedback amplifier circuits such as smallsignal, cascaded, large signal and tuned amplifiers. To introduce the basic building blocks of linear integrated circuits.
- ✓ To introduce the concepts of waveform generation and introduce some special function ICs.

#### **Course outcomes:**

CO 1:Design and analyze BJT amplifiers.

CO2: Analyze the MOSFET Architecture

CO3: Design DIFFERENT Types of multistage amplifiers.

CO4: Utilize the concepts of negative feedback to improve the stability of amplifiers and positive feedback to generate sustained oscillations.

CO5: Design op amp

Lecture	Topic to be covered	Topic outcome
No.		
	Unit-I	
L1	Introduction	
L2	P-N junction diode	DISCUSSP-N junction diode
L3	I-V characteristics of a diode	I-V characteristics of a diode
L4	review of half-wave and full-wave rectifiers	review of half-wave and full-wave rectifiers
L5	clamping and clipping circuits	clamping and clipping circuits
L6	Input output characteristics of BJT in CB	Input output characteristics of BJT in CB
L7	Input output characteristics of BJT in CE	Input output characteristics of BJT in CE
L8	Input output characteristics of BJT in CC	Input output characteristics of BJT in CC
L9	biasing circuits	biasing circuits
L10	Load line analysis,	Load line analysis,





L11	common-emitter	common-emitter
L12	common-Base	common-Base
L13	common-collector	common-collector
L14	Small signal equivalent circuits,	Small signal equivalent circuits,
L15	Revission	Revission
	Unit-II	
L16	MOSFET structure	MOSFET structure
L17	I-V characteristics	I-V characteristics
L18	MOSFET as a switch	MOSFET as a switch
L19	small signal equivalent circuits - gain	small signal equivalent circuits - gain
L20	input and output impedances	input and output impedances
L21	small-signal model and common- source	small-signal model and common-source
L22	small-signal model and common-gate & drain	small-signal model and common-gate & drain
L23	trans conductance, high frequency equivalent circuit	trans conductance, high frequency equivalent circuit
	Unit-III	
L24	Direct coupled	Direct coupled
L25	RC Coupled multi-stage amplifiers	RC Coupled multi-stage amplifiers
L26	Differential Amplifiers	Differential Amplifiers
L27	- Class A amplifier	- Class A amplifier
L28	Class B amplifier	Class B amplifier
L29	Maximum Value of Efficiency of Class A Amplifier, Transformer Coupled	Maximum Value of Efficiency of Class A Amplifier, Transformer Coupled Amplifier



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	Amplifier	
L30	Push Pull and Complimentary	Push Pull and Complimentary Symmetry
	Symmetry Class B	Class B
L31	Class AB Power Amplifiers	Class AB Power Amplifiers
L32	Principle of operation of class –C	Principle of operation of class –C
	Amplifier,	Amplifier,
L33	Class A,B,AB,C power	Class A,B,AB,C power amplifiers(Tutorial
	amplifiers(Tutorial	
	Revission	Revission
	Unit-IV	
L38	Classification of amplifiers	Students are able to classify the types of
		feedback amplifiers.
L39	Concepts of feedback	Students are able to describe the
		importance of feedback
L40	General characteristics of negative	Students are able to describe the
	feedback amplifiers – Effect of	characteristics of feedback amplifiers
	Feedback on Amplifier	
	characteristics	
L41	Classification of feedback amplifiers	Students are able to describe the operation
	Voltage series, Voltage shunt	of voltage series and voltage shunt
T 10		feedback amplifier.
L42	Current series and Current shunt	Students are able to describe the operation
	Feedback configurations	of current series and current shunt
I 42	Circula and blance	feedback amplifier
L43	Simple problems	Students are able to solve the problems.
L44	Classification of feedback	Students are able to classify the types of
	amplifiers(Tutorial)	feedback amplifiers.
L45	Condition for oscillations	Students are able to differentiate the types
		of oscillators.
L46	RC and LC type Oscillators-	Students are able to differentiate the types
	Frequency and amplitude stability of	of oscillators.
	oscillators	
L47	Quartz Oscillator	





L48	Hartley Oscillators	
L49	Colpitts Oscillators	Students are able to differentiate the types of oscillators.
L50	RC-phase shift and Wien-bridge oscillators.	
L51	Classification of Oscillators(Tutorial)	Students are able to differentiate the types of oscillators.
	Unit-V	
L52	Operational Amplifiers	Operational Amplifiers
L53	Ideal op-amp	Ideal op-amp
L54	Output offset voltage, input bias current	Output offset voltage, input bias current
L55	input offset current, slew rate	input offset current, slew rate
L56	gain bandwidth product	gain bandwidth product
L57	Inverting Amplifier	Inverting Amplifier
L58	Non Inverting Amplifier	Non Inverting Amplifier
L59	Differentiator	Differentiator
L60	integrator,	integrator,
L61	Square-wave generator	Square-wave generator
L62	triangular-wave generators	triangular-wave generators
L63	revision	revision





#### **Text / Reference Books:**

- Electronic Devices and Circuits, David A. Bell 5th Edition, Oxford
- Integrated Electronics, Jacob Millman, Christos C Halkias, McGraw Hill Education
- Electronic Devices and Circuits theory– Robert L. Boylestead, Louis Nashelsky, 11th Edition, 2009, PearsonOP Amp by lal kishore

#### Activities in the class:

- 1. A student has to write key points about the topic discussed in the class after explanation.
- 2. Descriptive test will be conducted after completion of each unit.
- 3. Student has to give presentation on covered topics.

#### Grading:

For presentation the student will be judged by his understanding of concepts, applications, basic knowledge and confidence level.

#### **Evaluation Scheme:**

•	Internal Assessment (sum of scores obtained in two tests)	-20
•	Assignments	- 05

• End Semester Examination - 75

Total - 100





Year / Semester	: II YEAR I-SEM
Subject	: ELECTRICAL MACHINES - I (EE304PC),
Name of the faculty	: Mr. SK Syed Hussain
No of contact hours/week	:4
Course overview:	

The operational principle of Transformers and Direct Current (DC) Electrical Machines are covered in this course. Both the single-phase and three-phase transformers are analyzed in details considering magnetic circuit design, parallel operation, various connection diagrams, etc. Thereafter, the DC machines are presented starting from their construction, principle of operation, starting, braking and speed control methods.

Test portion		
Test no.	Topics	
1	L1-L31	
2	L32-L55	
Assignment portion		
Assignment no.	Topics	
1	L1-L31	
2	L32-L55	

Submitted by

**Signature of Faculty** 

Date :

Approved by

**Signature of HoD** 

Date:





# **Course Objectives:**

At the end of this course the student will be able to:

- 1. Study and understand different types of DC generators, motors and transformers, their construction, operation and applications.
- 2. Analyze performance aspects of various testing methods.
- 3. Explain different excitation and starting methods of DC machines
- 4. Control the voltage and speed of a DC machines

#### **Course Outcomes:**

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

CO1. Identify different parts of a DC machine & understand its operation

CO2. Carry out different testing methods to predetermine the efficiency of DC machines

CO3. Explain different excitation and starting methods of DC machines

CO4. Control the voltage and speed of a DC machines using various speed control methods

CO5. Analyze single phase and three phase transformer circuits

LECTURE	TOPIC TO BE COVERED	TOPIC OUTCOME
NO.		(Upon the completion of this topic the student will be able to)
L1	Over view of course	Outline the topics of electrical machines
		course
L2	Unit-I: Introduction	Identify the importance of the dc generators
L3	Principle of Operation	Explain the operation of dc generators
L4	Constructional Features	List and explain the parts of dc generator
L5	Armature windings	Draw the lap and wave windings
L6	Armature windings	Draw the lap and wave windings
L7	EMF equation	Derive the EMF equation of dc generator





LECTURE	TOPIC TO BE COVERED	TOPIC OUTCOME
NO.		(Upon the completion of this topic the student will be able to)
L8	Armature Reaction	Explain the effect of armature reaction
L9	Methods of improving commutation	List the methods of improving commutation
L10	Types of generators	Classify different types of dc generators
L11	Critical resistance and critical speed	Define critical resistance and critical speed
L12	Characteristics of shunt generators	Draw the characteristics of shunt generators
L13	Characteristics of series generators	Draw the characteristics of series generators
L14	Characteristics of compound generators	Draw the characteristics of compound generators
L15	Unit-II: Principle & operation of DC	Demonstrate the working principle of dc
	Motors	motors
L16	Back EMF	Derive the expression of back EMF
L17	Torque Equation	Derive torque equation
L18	Applications of Motors	List the applications of dc motors
L19	Armature reaction and Commutation	Explain Armature reaction and
1.20		Commutation
L20	Speed control of DC motors	Control speed of DC motors
L21	Speed control of DC motors	Control speed of DC motors by various methods
L22	3 and 4 point starters	Explain 3 and 4 point starters
L23	Testing of DC machines	Test dc machines performance
L24	Losses of dc machine	Study the losses of dc machine
L25	Constant and variable losses	Study the constant and variable of dc machine
L26	Calculation of efficiency	Calculate the efficiency of dc machine
L27	Condition for maximum efficiency	Obtain the condition for maximum efficiency
L28	Unit-III: Methods of testing	Identify the methods of testing dc machines
L29	Methods of testing	Explain the methods of testing dc machines
L30	Brake test	Perform the brake test on dc machine
L31	Swinburnes test	Perform the swinburnes test on dc machine
	I MID EXAMIN	ATION
L32	Hopkinsons test	Perform the Hopkinsons test on dc machine
L33	Fields test	Perform the Fields test on dc machine
L34	Separation of stray loss	Discuss the Separation of stray loss





LECTURE	TOPIC TO BE COVERED	TOPIC OUTCOME
NO.		(Upon the completion of this topic the student will be able to)
L35	<b>Unit-IV</b> : Constructional Details of a	Describe the Constructional Details of a
	transformer	transformer
L36	Hysteresis and eddy current loss	calculate the losses in transformer
L37	EMF Equation of transformer	Derive the EMF equation of transformer
L38	Operation on no load and on load	Explain the Operation on no load and on load
L39	Equivalent Circuit of 1-Ph transformer	Draw the Equivalent Circuit of 1-Ph transformer
L40	Regulation of single phase transformer	Check the Regulation of single phase transformer
L41	All day efficiency	Calculate the all day efficiency
L42	Effect of variations of frequency and	Describe the effect of variations of
	supply voltage on iron losses	frequency and supply voltage
L43	<b>Unit-V:</b> Testing of 1-phase transformers	Test the single phase transformers
L44	OC and SC tests	Conduct the oc and sc tests on 1-ph T/F's
L45	Sumpner's test	Conduct the sumpners test on 1-ph T/F
L46	Predetermination of efficiency and regulation	Predetermination of efficiency and regulation
L47	Separation of losses test	Conduct Separation of losses test
L48	Parallel operation with equal an unequal voltage ratios	Conduct Parallel operation
L49	Problems	Solve problems on 1-ph transformers
L50	Auto-transformers	Discuss about auto transformers
L51	Equivalent circuit	Draw the equivalent circuit of 1-ph transformer
L52	Comparison with two windings t/fs	Compare transformers with different windings
L53	Polyphase connections-y/y, y/ $\Delta$ , $\Delta$ /y, $\Delta$ / $\Delta$ and open $\Delta$	Illustrate Polyphase connections-y/y, y/ $\Delta$ , $\Delta$ /y, $\Delta$ / $\Delta$ and open $\Delta$
L54	Revision	Recall the topics in Electrical machines-I
L55	Revision	1
	II MID EXAMI	NATION



(Approved by AICTE, New Delhi, Affiliated to JNTUH, Hyderabad) Chilkur (Village), Moinabad (Mandal), R. R Dist, TS-501504



# **Reference Books:**

1. Electrical Machines by PS Bhimbra, Khanna Publishers.

2. Principles of Electrical Machines by V. K. Mehta & Rohit Mehta, S. Chand Publishing.

#### Activities in the class:

- After completion of every class students should write summary of what has been said in the class.
- After completion of every unit a test will be conducted.
- For every two or three units a quiz pr presentation will be held.
- All the assessment, quiz and extra activities marks will be considered for the evaluation of the mid papers.

#### **Grading:**

- Depending upon the performance on seminars and quiz the student will be awarded **GRADE** –**A** (5 marks)
- If the students performance is good only in seminars then they will be awarded with **GRADE-B** (4 marks)
- If the students performance is good only in quiz then they will be awarded with **GRADE-C (3 marks)**

#### **Evaluation Methods:**

Assessment Tool	Weightage(Marks)
Home Assignment1	5
Home Assignment2	
Descriptive1	10
Descriptive2	
Objective1	10
Objective2	
Final Examination	75
Total	100





Semester / Sections	: II year I SEM
Subject	: Electrical Circuit Analysis (EE302PC)
Name of the faculty	: B. Lingam
No of contact hours/week	:5
Course overview	

The course aims at applications and analysis of the Electrical circuits . Electrical circuits are analyzed with DC&AC inputs. The electrical circuit theorems like thevenin's, Norton's, maximum power transfer theorem are analyzed with multiple parameters. Two port Networks are analyzed. Laplace transform are applied for Analysis of Electrical circuits. The Electrical Circuit analysis is much needed for further strengthening the Electrical and Electronics engineering course

Test portion		
Test no.	Topics	
1	L1-L33	
2	L34-L58	
Assignment portion		
Assignment no.	Topics	
1	L1-L33	
2	L34-L58	

Submitted by

**Signature of Faculty** 

Date :

Approved by

Signature of HoD

Date:





# **Course Objectives:**

To understand Magnetic Circuits, Network Topology and Three phase circuits.

- > To analyze transients in Electrical systems.
- > To evaluate Network parameters of given Electrical network
- > To design basic filter configurations

#### **Course outcomes:**

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

CO1: Apply network theorems for the analysis of electrical circuits.

CO2: Obtain the transient and steady-state response of electrical circuits.

CO3: Analyze circuits in the sinusoidal steady-state (single-phase and three-phase).

CO4: Analyze Electrical Circuit Analysis Using Laplace Transforms:

CO5: Analyze two port circuit behaviour.

Topic Outcome		
Sr. No	Topic to be covered	At the end student will be able to
L1	UNIT 1: Network Theorems:	
L2	Introduction to Electrical circuits	Describe electrical circuits
L3	Basic definitions of circuits, loop, node	Understand Basic definitions of circuits, loop, node
L4	Superposition theorem, problem on Superposition theorem	Apply Superposition theorem
L5	The venin theorem, problem on The venin theorem,	analyze thevenins theorem
L6	Norton theorem, problem on Norton theorem	Analyze Norton theorem,
L7	Maximum power transfer theorem	Apply Maximum power transfer theorem
L8	Reciprocity theorem	Analyze Reciprocity theorem
L9	Compensation theorem, problem on Compensation theorem,	Apply Compensation theorem
L10	Analysis with dependent current and	Describe and Analyze dependent





	voltage sources	current and voltage sources
L11	Node and Mesh Analysis	Describe Node and Mesh Analysis
L12	Concept of duality and dual networks	Understand Concept of duality and dual networks
L13	UNIT 2: Solution of First and Second order Networks	Explain first, second order circuits
L14	Solution of first and second order differential equations	Analyze first, second order circuits
L15	Series R-L, R-C, RL-C circuits	Modeling of Series R-L, R-C, RL-C circuits
L16	parallel R-L, R-C, RL-C circuits	Modeling of parallel R-L, R-C, RL- C circuits
L17	Problems on R-L, R-C, RL-C circuits	Analyze R-L, R-C, RL-C circuits
L18	initial and final conditions in network elements	Describe initial and final conditions in R-L, R-C, RL-C circuits
L19	forced and free response	Understand forced and free response
L20	time constants, steady state and transient state response for DC Excitations	Understand the response for DC Excitations
L21	time constants, steady state and transient state response for AC Excitations	Analyze state and transient state response for AC Excitations
L22	Compassion of series & parallel circuits	Illustrate series & parallel circuits
L23	Problems and revision on R-L, R-C, RL-C circuits	Solve Problems on R-L, R-C, RL-C circuits
L24	Elements analysis and response in DC&AC circuits	Analyze response in DC&AC circuits
L25	Tutorial – forced and free response in DC,AC circuits	Solve Problems response in DC,AC circuits
L26	UNIT3: Sinusoidal Steady State Analysis:	Understanding of Sinusoidal Steady State Analysis
L27	Representation of sine function as rotating phasor	Discuss Representation of sine function
L28	phasor diagrams, impedances and admittances	Understand phasor diagrams, impedances and admittances





L29	AC circuit analysis	Analyze AC circuits
L30	effective or RMS values,	Apply and solve for RMS values
L31	average power and complex power	Understand average power and complex power
L32	Problems on AC circuit analysis	Solve Problems on AC circuit analysis
L33	Assignment-I discussions and revision	Summarize AC circuit analysis
	Mid 1 exami	nation
L34	Three-phase circuits.	Understand Three-phase circuits.
L35	Mutual coupled circuits,	Understand Mutual coupled circuits,
L36	Dot Convention in coupled circuits,	Apply Dot Convention in coupled circuits,
L37	Principle of Operation of Ideal Transformer	Discuss Ideal Transformer
L38	Problems on Mutual coupled circuits,	Solve Problems on Mutual coupled circuits
L39	Problems on Three-phase circuits.	Solve Problems on Three-phase circuits.
L40	Comparison between single, three phase circuits	Summarize single, three phase circuits
L41	UNIT IV- Electrical Circuit Analysis	Use of Laplace Transforms
	Using Laplace Transforms	
L42	Review of Laplace Transform	Understand the Use of Laplace Transforms
L43	Analysis of electrical circuits using Laplace Transform for standard inputs	Analyze electrical circuits using Laplace Transform for standard inputs
L44	convolution integral, problems on convolution,	Solve Problems on convolution
L45	inverse Laplace transform	Apply inverse Laplace transform
L46	transformed network with initial conditions	Analyze network with initial conditions





L47	Transfer function representation	Analyze Transfer function representation
L48	Poles and Zeros. Frequency response (magnitude and phase plots),	Solve Frequency response
L49	Frequency response (magnitude and phase plots),	Solve Poles and Zeros for any electrical circuits
L50	series and parallel resonances	Relate series and parallel resonances
L51	Problems on Frequency response (magnitude and phase plots)	Analyze (magnitude and phase plots),
L52	Problems on Laplace Transform for standard inputs	Solve for Laplace Transform for standard inputs
L53	UNIT V: Two Port Network and Network Functions:	Analyze two port networks
L54	Two Port Networks, , terminal pairs,	Understand Two Port Networks, , terminal pairs,
L55	relationship of two port variables, impedance parameters, admittance parameters,	Analyze impedance parameters, admittance parameters
L56	transmission parameters and hybrid parameters	Construct transmission parameters and hybrid parameters
L57	Interconnections of two port networks.	Analyze Interconnections of two port networks.
L57 L58	Interconnections of two port networks. Problems on impedance parameters, admittance parameters	AnalyzeInterconnections of two port networks.SolveProblems on impedance parameters, admittance parameters





# **Text Books:**

1. M. E. Van Valkenburg, "Network Analysis", Prentice Hall, 2006.

2. D. Roy Choudhury, "Networks and Systems", New Age International Publications, 1998.

#### **Reference Books:**

1. W. H. Hayt and J. E. Kemmerly, "Engineering Circuit Analysis", McGraw Hill Education, 2013

2. C. K. Alexander and M. N. O. Sadiku, "Electric Circuits", McGraw Hill Education, 2004.

3. K. V. V. Murthy and M. S. Kamath, "Basic Circuit Analysis", Jaico Publishers, 1999.

#### Activities in the class:

- 1. JAM( Just a minute).Students have to speak about the completed topic.
- 2. Quiz/Discussion of objective type questions for mid exams.
- 3. Slip tests will be conducted at the end of each unit.

**Grading:** Marks for active participation, attendance and performance in slip tests and assignments

#### **Basic ground rules:**

1. Usage of mobile phone in class is strictly prohibited.

2. No attendance will be given to students if they are late by 10 minutes and they are expected to attend classes regularly.

3. Students must maintain separate notes, note the important points and solve all the given problems in class.

#### **Evaluation Scheme:**

•	Internal Assessment (sum of scores obtained in two tests)	- 20
•	Assignments	- 5
•	End Semester Examination	- 75

Total - 100





Semester / Sections	: II year I SEM:
Subject	Engineering Mechanics
Name of the Faculty	: G. Kalpana
No of contact hours/week	: 4
Course Overview:	

Engineering mechanics is the application of mechanics to solve problems involving common engineering . The goal of this Engineering Mechanics course is to expose students to problems in mechanics as applied to plausibly real-world scenarios. Problems of particular types are explored in detail in the hopes that students will gain an inductive understanding of the underlying principles at work; students should then be able to recognize problems of this sort in real-world situations and respond accordingly.

Further, this tsubjectaims to support the learning of Engineering Mechanics with theoretical material, general key techniques, and a sufficient number of solved sample problems to satisfy the first objective as outline

#### **Test Portion:**

Test Portion		
Test No.	Topics	
1	L1-L35	
2	L36-62	
Assignment Portion		
Assignment No. Topics		
1	L1-L35	
2	L36-62	

#### Submitted by

#### **Signature of Faculty**

Date :

Approved by

**Signature of HoD** 

Date:





# **Course Objectives:**

- Explain the resolution of a system of forces, compute their resultant and solve problems using equations of equilibrium  $\Box$  Perform analysis of bodies lying on rough surfaces.
- Locate the centroid of a body and compute the area moment of inertia and mass moment of inertia of standard and composite sections
- Explain kinetics and kinematics of particles, projectiles, curvilinear motion, centroidal motion and plane motion of rigid bodies.
- Explain the concepts of work-energy method and its applications to translati, rotation and plane motion and the concept of vibrations

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

- **CO1:** Determine resultant of forces acting on a body and analyse equilibrium of a body to a system of forces.
- CO2: Solve problem of bodies subjected to friction and types of jacks
- **CO3**: Find the location of centroid and calculate moment of inertia of a given section.
- **CO4**: Understand the kinetics and kinematics of a body undergoing rectilinear, curvilinear, rotatory motion and rigid body motion.
- **CO5:** Solve problems using work energy equations for translation, fixed axis rotation and plane motion and solve problems of vibration

Lecture no.	Topic to be covered	Topic outcome
	Unit 1 :	
1	<b>UNIT-I</b> Introduction to Engineering Mechanics;,	Demonstrate concept Engineering Mechanics;,
2 & 3	Force Systems: Basic concepts	Describe about Force Systems: Basic concepts,
4	Particle equilibrium in 2-D & 3- D;	Explain aboutParticle equilibrium in 2-D & 3-D;

#### **Topic Outcomes:**





5	Rigid Body equilibrium	Solve problems on Rigid
		Body equilibrium
6&7	System of Forces,	Explain System of Forces,
8&9	Coplanar Concurrent Forces,	Demonstrate about
		Coplanar Concurrent
		Forces,
10&11	Components in Space – Resultant-	Describe Components in
	Moment of Forces and its	Space – Resultant- Moment
	Application;	of Forces and its
		Application;
12	Couples and Resultant of Force	Couples and Resultant of
	System,	Force System,
13&14	Equilibrium of System of Forces,	Solve the previous year
	Free body diagrams, Equations of	university
	Equilibrium of Coplanar Systems	questions papers.
	and Spatial Systems; Static	
	Indeterminacy	
15	Rivision	Demonstrate construction of
		R.C.C elements.
	UNIT 2 :	
16&17	Friction: Types of friction,	Explain Types of friction
	Limiting friction, Laws of Friction,	
18&19	Static and Dynamic Friction:	Explain Static and Dynamic
	Motion of Bodies.	Friction: Motion of Bodies.
20&	wedge friction screw jack &	Describe wedge friction
21	differential screw jack:	screw jack & differential
	anioronial sere w Jack,	screw jack
22&23	Centroid and Centre of Gravity	Explain Centroid and
		Centre of Gravity
24&25	Centroid of Lines. Areas and	Determine Centroid of
210020	Volumes from first principle	Lines Areas and Volumes
	· · · · · · · · · · · · · · · · · · ·	from first principle
26	centroid of composite sections:	Determine centroid of
	Centre of Gravity and its	composite sections. Centre of
	implications – Theorem of Pappus	Gravity and its implications
	implications. Theorem of Lappus	- Theorem of Pappus





27	Revision	Solved Previous exam
		question papers
28	Group discussion.	
	UNIT 3 :	
29	Area moment of inertia-	Determine moment of inertia
	Definition, Moment of inertia	composite sections
	of plane sections from first	
	principles,	
30	Theorems of moment of inertia,	Describe Theorems of
		moment of inertia,
31&32	Moment of inertia of standard	DetermineMoment of
	sections and composite sections;	inertia of standard sections
		and composite sections
33&	Product of Inertia, Parallel Axis	Explain Product of Inertia,
34	Theorem, Perpendicular Axis	Parallel Axis Theorem,
	Theorem	Perpendicular Axis
		Theorem
35&	Mass Moment of Inertia:	Determine Moment of
36	Moment of Inertia of Masses -	Inertia of Masses -
	Transfer Formula for Mass	Transfer Formula for
	Moments of Inertia – Mass	Mass Moments of
	moment of inertia of	Inertia – Mass moment
	composite bodies.	of inertia of composite
	1	bodies.
37&38	Revision	Solve previous year
		university question
		papers.
39&	Model presentation	Demonstration On moment
40		of inertia
	UNIT 4 :	
41	Review of particle dynamics-	Explain about Review of
11	Rectilinear motion:	particle dynamics-
	Rectificat motion,	Rectilinear motion





42	Plane curvilinear motion	Describe Plane curvilinear
	(rectangular, path, and polar	motion (rectangular, path,
	coordinates).	and polar coordinates)
L43 &	3-D curvilinear motion; Relative	Explain 3-D curvilinear
L44	and constrained motion;	motion; Relative and
		constrained motion
L45 &	Newton's 2nd law (rectangular,	Explain Newton's 2nd law
L46	path, and polar coordinates).	(rectangular, path, and polar
	Work-kinetic energy, power,	coordinates). Work-kinetic
	potential energy.	energy, power, potential
		energy.
47&48	Impulse-momentum (linear,	ExplainImpulse-momentum
	angular); Impact (Direct and	(linear, angular); Impact
	oblique).	(Direct and oblique)
49&50	Revision	Solve previous year
		university question
		papers.
	UNIT 5 :	
51&52	Kinetics of Rigid Bodies -Basic	Explain Kinetics of Rigid
	terms,	Bodies -Basic terms,
528-51	Types of motion Instantaneous	Describe types of motion
55&54	centre of rotation in plane motion	Instantaneous centre of
	and simple problems:	rotation in plane motion and
	and simple problems,	simple problems:
55856	D'Alembert's principle and its	Explain D'Alambart's
55&50	applications in plane motion and	principle and its
	connected bodies:	applications in plane motion
	connected bodies,	applications in plane motion
57.8	general principles in dynamics:	Solve problems on general
58	Work Energy principle and its	principles in dynamics:
50	application in plane motion of	Work Energy principle and
	connected bodies:	its application in plane
	connected bodies,	motion of connected bodies
59&60	Kinetics of rigid body rotation	Solve problems on Kinetics
57000	Trineties of fight body folation.	of rigid body rotation
61&62	Revision	Solve previous year
		university question
		papers.





# **Text Books:**

1.Shames and Rao (2006), Engineering Mechanics, Pearson Education

2. Reddy Vijay Kumar K. and J. Suresh Kumar (2010), Singer's Engineering Mechanics – Statics & Dynamics.

#### **References:**

1. Timoshenko S.P and Young D.H., "Engineering Mechanics", McGraw Hill International Edition, 1983.

- 2. Fundamentals of reinforced concrete by N.C. Sinha and S.K Roy, S. Chand publishers
- 3. Andrew Pytel, Jaan Kiusalaas, "Engineering Mechanics", Cengage Learning, 2014.
- 4 Beer F.P & Johnston E.R Jr. Vector, "Mechanics for Engineers", TMH, 2004.
- 5. Hibbeler R.C & Ashok Gupta, "Engineering Mechanics", Pearson Education, 2010.
- 6. Tayal A.K., "Engineering Mechanics Statics & Dynamics", Umesh Publications, 2011.
- 7. Basudeb Bhattacharyya, "Engineering Mechanics", Oxford University Press, 2008.
- 8. Meriam. J. L., "Engineering Mechanics", Volume-II Dynamics, John Wiley & Sons, 2008.

# Activities in the class:

- 1. Playing construction videos for knowledge updating.
- 2. Group discussion.
- 3. Conducting seminars to present models and power point presentations.

**4**. Live demonstration for designing of steel members by using different software like Staad Pro, Etabs, Ansys, Struds and Scadds.

5. Motivating the students to active participating in presentation activities.

#### **Basic Ground Rules:**

**1**. Students should bring required materials and accessories like class note books, code books and calculators.

- 2. Students are supposed to maintain disciple in the class room.
- **3**.Each student must wear the college Identification Card around their neck.
- 4. Students must be present in class before the stipulated time for each class.
- 5. No extension of dates will be given to any student for submitting their assignments.

#### **Evaluation Scheme:**

Internal Exam I	:	25
(10 Descriptive+ 10 Objective+ 5 Assignments)		
Internal Exam II	:	25
(10 Descriptive+ 10 Objective+ 5 Assignments)		
Total internal Marks	:	25
(Average of Internal Exam I and Internal Exam II)		
University Exam Marks	:	75
Total Marks	:	100





Semester / Sections	: II year I SEM
Subject	: Electromagnetic fields
Subject Code	: ELECTROMAGNETIC FIELDS (EE323ES)
Name of the faculty	: Khamruddin Syed
No. of contact hours /week	: 5

#### **Course Overview:**

Electromagnetic fields deals with the electrical and magnetic fields under static and dynamic conditions. The subjects discusses in detail about electromagnetic laws and their applications. The subjects also deals with basic principle of operations of electrical machines and transmission lines.

Test Portion			
Test No.	Topics		
1	L1-L30		
2	L31-L63		
Assignment Portion			
Assignment no.	Topics		
1	L1-L30		
2	L31-L63		

Submitted b	v

Approved by

(Signature of the faculty) Date:

(Signature of HOD) Date:





# **Course Objectives:**

- 1. Outline the concepts of electric field, magnetic field
- 2. Apply the concept of electric and magnetic fields in machines
- 3. Get solid foundation in engineering.
- 4. Solve problems and also to pursue Higher studies.

#### **Course Outcomes:**

- 1. (CO1) Compute the force, fields & Energy for different charge & current Configurations.
- 2. (CO2) Evaluate capacitance and inductance
- 3. (CO3) Analyze Maxwell's equation in different forms (Differential and integral)
- 4. (CO4) Analyze Lorentz force equations and self and mutual inductances
- **5.** (CO5) Analyze time varying fields of Electro- Magnetic fields to understand transmission lines

#### **Topic Outcomes:**

S.N.	TOPIC	TOPIC OUTCOMES	
UNIT – I			
	At the end	of the topic, the student will be able to	
L1	Introduction to Electromagnetic fields	Explain nature of electromagnetic fields	
L2	Coulombs law	Derive coulombs law and calculate force in various cases	
L3	Electrical field intensity	Apply and calculate Electrical field intensity due to various conditions	
L4	point charge in an electrostatic field	Derive Work done in moving a point charge in an electrostatic field	
L5	Electric Potential	Calculate Electric field and Potential	
L6	potential function – Potential gradient	Explain Properties of potential function	
L7	Gauss's Law	Application of Gauss's Law to complex electrical field calculations	
L8	Maxwell's first law	Analyze the Maxwell's first law and calculation of Electric Potential	
L9	Laplace's equation in one variable	Derive Laplace's equation to 3 variable	





L10	Electric dipole	Calculate the Dipole and dipole moment
L11	Torque of Electric dipole	Apply Electric dipole in an molecule
L12	Conductors and Insulators	Explain the behavior of conductors in an
212	Conductors and insulators	electric field
L13	Problems on Gauss's Law	Explain Gauss's Law to complex electrical
L14	Problems on Laplace's equation	Derive Laplace's equation
L15	Problems on Electrical field	Apply of Columbus law and Electrical field
	intensity	
16	Laplace's equation of 2 variable	Apply of Laplace's equation in real time
	UNI	Т - П
17	Dielectrics & Capacitance	Explain dielectrics & capacitance
18	conductors in an electric field	Analyze behavior of dielectrics &
		capacitance in an electric field
19	field inside a dielectric material	Identify physically dielectric properties
20	Dielectric – Conducto	Explain the polarization – dielectric –
		conductor and dielectric
21	Dielectric boundary conditions	Solve dielectric boundary conditions
		And Describe dielectric boundary conditions
22	composite dielectrics-1	Analyze the phenomenon of Capacitance –
		Capacitance of parallel plots- spherical co-
		axial capacitors
23	composite dielectrics-2	Derive composite dielectrics boundary
		conditions
24	energy density in a static electric	Explain the energy stored and energy
	field	density in a static electric field
25	Conduction and Convection current	Apply Ohm's Law in point forms
	densities	Recognize current density
	UNI	T - III
26	Static magnetic fields	Explain the static magnetic fields and
		Observe the static magnetic field
27	Biot-Savart's law	Apply the biot - Savart's law and calculate
		magnetic field strength
28	Derive the magnetic field intensity	Calculate magnetic field strength due to
	(MFI)	various shapes
29	MFI due to circular, square and	Calculate MFI due to circular, square and
	solenoid current	solenoid current
30	magnetic flux, magnetic flux	Apply the carrying wire Relation between





	density and MFI	magnetic flux, magnetic flux density		
	MID -1			
	Maxwell's second Equation	Derive Maxwell's second Equation physical		
31		significance and to apply it		
32	Ampere's circuital law	Derive ampere's law, Its applications.		
33	Point form of Ampere's circuital	Solve point form of Ampere's circuital law		
	law	and to Analyze the point form of Ampere's		
		circuital law		
34	Maxwell's third equation	Explain Maxwell's third equation physical		
		significance		
25	UN			
35	Magneto Statics	Explain force in Magnetic fields and		
		Magnetic Potential and to Observe the		
36	Lorentz force equation	Derive the Lorentz force equation and to		
50	Lorenz lorce equation	Apply the moving charges in a magnetic field		
37	Force on a current element in a	Calculate the force on a current element in a		
57	magnetic	magnetic field		
38	Force on a straight and a long	Derive force on a straight and a long current		
	current carrying conductor in a	carrying conductor in a magnetic field		
	magnetic field			
39	Problems on Lorentz force	Apply the Lorentz force equation to moving		
	equation	charges in a magnetic field		
40	Concentrate Force between two	Derive the force between two straight long		
	straight long and parallel current	and parallel current carrying conductors and to		
	carrying conductors	understand the force between two straight long		
		and parallel current carrying conductors		
41	Problems on magnetic fields	Apply the bio savers law equation to moving		
	<u>8</u>	charges in a magnetic field		
42	Magnetic dipole and dipole	Apply the Magnetic dipole and dipole moment		
	moment			
43	Differential current loop as a	Explain the differential current loop as a		
	magnetic dipole	magnetic dipole		
44	Torque on a current loop placed	Solve the Torque on a current loop in		
	in a magnetic field	magnetic field Scalar Magnetic		
45	Vector magnetic potential	Apply the vector magnetic potential and its		
		properties		
46	Vector Poisson's equations	Apply the vector Poisson's equations to single		
		and two dimensional		





47	Self and Mutual inductance	Derive the self and Mutual inductance for	
		various cases	
48	Neumann's formulae	Develop the Neumann's formula and to Solve	
		Neumann's formula	
49	Problems on Neumann's	Solve Neumann's formula Problems on	
	formulae	Neumann's formulae	
50	Determination of self-inductance	Derive the determination of self-inductance of	
	of a solenoid and torrid	a solenoid and torrid	
51	Mutual inductance between a	Derive mutual inductance between a straight	
	straight long wire	long wire	
52	Introduction to permanent	Derive energy stored and density in a	
	magnets, their characteristics	magnetic field	
53	Magnetic force exerted in motors Explain magnetic field laws right hand rule		
54	Magnetic force exerted in	Explain magnetic field laws left hand rule	
	generators		
50	UNIT – V		
53	time varying Fields: Time varying	Explain the Time varying fields	
51	Tields	Develop the shoteness of is indeption	
54	laws of electromagnetic induction	Develop the electromagnetic induction	
22	Maxwell's fourth equation, Curl	Derive Maxwell's fourth equation	
	(E)=-B/t		
56	Maxwell's equations for time	Apply Maxwell's equations for time varying	
50	varving	Appry maxwell's equations for time varying	
57	Displacement current	Explain Displacement current	
58	Modified Maxwell's equations	Apply Maxwell's equations	
59	Pointing theorem	Derive Pointing theorem	
60	Application of pointing theorem	Apply Pointing theorem	
61	Electro static and magnetic filed	Explain Electro static and magnetic filed	
	applications	applications	
62	revision		
63	Topic beyond syllabus		
MID -2			





# **Text Books**

- 1. William H. Hayt&John A. Buck,"Engineering Magnetics", Mc. Graw-Hill companies
- Principles Of Electromagnetisam" BY SAIDUKU oxford publications, 6<sup>th</sup> edition , 2009

#### **Suggested / Reference Books**

- 1. Nathan Ida", "Engineering Electromagnetic", Springer (India) pvt. Ltd. 2<sup>nd</sup> Edition,2015.7<sup>th</sup> edition, 2009
- 2. Introduction to Electrodynamics by David J. Griffiths printice hall publications

#### Activities in the class:

- After completion of every class, I will ask the summary of the class randomly in the class
- After completion of every class, I will conduct a sudden test on today's class
- After completion of every unit a test will be conducted.
- For every two or three units a quiz presentation will be held.

#### Note:

- Assignments should be submitted on time.
- Accessing mobiles during class hours is not permitted.

#### **Evaluation Scheme:**

Internal Exam I	:	31
(10 Descriptive+ 10 Objective+ 5 Assignments)		
Internal Exam II	:	32
(10 Descriptive+ 10 Objective+ 5 Assignments)		
I otal internal Marks		
(Average of Internal Exam I and Internal Exam II)	:	25
University Exam Marks		75
Total Marks	:	100





# PROGRAM OUTCOMES

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

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

**PO 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.

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

**PO 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.

**PO 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.

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

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

**PO 9: Individual and team work:** function effectively as an individual and as a member or leader in diverse teams, and in multidisciplinary settings.

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





**PO 11: Project management and finance:** demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

**PO 12: Lifelong learning:** recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broader context of technological change.

# **PROGRAM SPECIFIC OUTCOMES**

**PSO-1:** Apply the engineering fundamental knowledge to identify, formulate, design and investigate complex engineering problems of electric circuits, power electronics, electrical machines and power systems and to succeed in competitive exams like GATE, IES, GRE, OEFL, GMAT, etc.

**PSO-2:** Apply appropriate techniques and modern engineering hardware and software tools in power systems and power electronics to engage in life-long learning and to get an employment in the field of Electrical and Electronics Engineering.

**PSO-3:** Understand the impact of engineering solutions in societal and environmental context, commit to professional ethics and communicate effectively.