B. Sc. ELECTRONICS

SYLLABUS - 2014

SCHOOLS OF EXCELLENCE
with
CHOICE BASED CREDIT SYSTEM (CBCS)

SCHOOL OF PHYSICAL SCIENCES
St. JOSEPH'S COLLEGE (Autonomous)
Accredited at 'A' Grade (3rd Cycle) by NAAC
College with Potential for Excellence by UGC
TIRUCHIRAPPALLI - 620 002, INDIA

SCHOOLS OF EXCELLENCE WITH CHOICE BASED CREDIT SYSTEM (CBCS)

POST GRADUATE COURSES

St. Joseph's College (Autonomous), a pioneer in higher education in India, strives to work towards the academic excellence. In this regard, it has initiated the implementation of five "Schools of Excellence" from this academic year 2014 – 15, to standup to the challenges of the 21st century.

Each School integrates related disciplines under one roof. The school system allows the enhanced academic mobility and enriched employability of the students. At the same time this system preserves the identity, autonomy and uniqueness of every department and reinforces their efforts to be student centric in curriculum designing and skill imparting. These five schools will work concertedly to achieve and accomplish the following objectives.

- Optimal utilization of resources both human and material for the academic flexibility leading to excellence.
- Students experience or enjoy their choice of courses and credits for their horizontal mobility.
- The existing curricular structure as specified by TANSCHE and other higher educational institutions facilitate the Credit-Transfer Across the Disciplines (CTAD) - a uniqueness of the choice based credit system.
- Human excellence in specialized areas
- Thrust in internship and / or projects as a lead towards research and
- The **multi-discipline** nature of the newly evolved structure (School System) caters to the needs of stake-holders, especially the employers.

What is Credit system?

Weightage to a course is given in relation to the hours assigned for the course. Generally one hour per week has one credit. For viability and conformity to the guidelines credits are awarded irrespective of the teaching hours. The following Table shows the correlation between credits and hours. However, there could be some flexibility because of practical, field visits, tutorials and nature of project work.

For UG courses, a student must earn a minimum of 150 credits as mentioned in the table below. The total number of minimum courses offered by a department are given in the course pattern.

SUMMARY OF HOURS AND CREDITS
UG COURSES - ELECTRONICS

Part	Semester	Specification	No. of Courses	Hours	Credits	Total Credits
I	I-IV	**Languages** (Tamil/Hindi/French/Sanskrit)	4	16	12	**12**
II	I-IV	**General English**	4	20	12	**12**
III	I-VI	**Core** Theory Practicals Internship & Project Work Comprehensive Exam	17	90	69	
		Core Electives	3	12	11	
		Allied	4	24	18	
		Additional Core Courses for Extra Credits	-	-	-	**98**
1V	V-VI	**Skilled Based Electives**				
		Between Schools (BS)	1	2	2	
		Within School (WS)	1	2	2	**4**
	V	**Inter Departmental Courses (IDC)** - Soft Skills	1	2	2	**2**
	I-IV	**NMC**				
		Communicative English	1	0	5	
		Computer Literacy	1	2	2	**7**
	I-IV	**Environmental Studies**	1	2	2	**2**
		Value Education	4	8	8	**8**
V	I-V	**SHEPHERD & Gender Studies**	1	-	5	**5**
	I-V	**AICUF, Fine Arts, Nature Club, NCC & NSS**				
		TOTAL		**180**		**150**

Course Pattern

The Under Graduate degree course consists of Five vital components. They are as follows:

Part -I : Languages (Tamil / Hindi / French / Sanskrit)
Part-II : Genera English
Part-III : Core Course
(Theory, Practicals, Core Electives, Allied, Project, Internship and Comprehensive Examinations)
Part-IV : SBE, NMC,Value Education, Soft Skills & EVS
Part-V : SHEPHERD, AICUF, Finearts, Nature Club, NCC, NSS, etc.

Non-Major Courses (NMC)

There are three NMC's – Communicative English, Computer Literacy and Environmental Studies offered in the I, II & III Semesters respectively.

Value Education Courses:

There are four courses offered in the first four semesters for the First & Second UG students.

Non Major Elective / Skill Based Elective:

These courses are offered in two perspectives as electives "With-in School" (WS) and "Between School" (BS).

Subject Code Fixation

The following code system (11 characters) is adopted for Under Graduate courses:

14	UXX	X	X	XX	XX
↓	↓	↓	↓	↓	↓
Year of Revision	UG Code of the Dept	Semester of the Part	Specification	Subject Category	Running in that part
14	**UEL**	**1**	**3**	**2**	**1**

For Example :

I B.Sc. Electronics, first semester Electronic Circuit Analysis
The code of the paper is 14UEL130201.
Thus, the subject code is fixed for other subjects.

Subject Category

00 - Languages (Tamil / Hindi / French / Sanskrit)
01 - General English
02 - Core (Theory, Practicals, Comprehensive Exams, Internship & Project viva-voce)
03 - Core Electives
04 - Allied
05 - Additional core Courses for Extra Credits (If any)
06 - Skill Based Electives (BS) & (WS)
07 - Soft Skill
08 - NMC (Communicate English, Computer Literacy/SAP)
09 - EVS
10 - Value Education
11 - SHEPHERD & Gender Studies
12 - AICUF / Nature Club / Fine Arts / NCC / NSS /etc.

EXAMINATION

Continuous Internal Assessment (CIA):

UG - Distribution of CIA Marks	
Passing Minimum: 40 Marks	
Library Referencing	5
3 Components	35
Mid-Semester Test	30
End-Semester Test	30
CIA	**100**

MID-SEM & END – SEM TEST

Centralised – Conducted by the office of COE

1. Mid-Sem Test & End-Sem Test: (2 Hours each); will have Objective + Descriptive elements; with the existing question pattern PART-A; PART-B; and PART-C
2. CIA Component III for UG & PG will be of 15 marks and compulsorily objective multiple choice question type.
3. The CIA Component III must be conducted by the department / faculty concerned at a suitable computer centres.
4. The 10 marks of PART-A of Mid-Sem and End-Sem Tests will comprise only: OBJECTIVE MULTIPLE CHOICE QUESTIONS; TRUE / FALSE; and FILL-IN BLANKS.
5. The number of hours for the 5 marks allotted for Library Referencing/ work would be 30 hours per semester. The marks scored out of 5 will be given to all the courses (Courses) of the Semester.
6. English Composition once a fortnight will form one of the components for UG general English

SEMESTER EXAMINATION

Testing with Objective and Descriptive questions

Part-A: 30 Marks
Objective MCQs only

Answers are to be marked on OMR score-sheet. The OMR score-sheets will be supplied along with the Main Answer Book. 40 minutes after the start of the examination the OMR score-sheets will be collected

Part-B + C = 70 Marks

Descriptive

Part-B: 5 x 5 = 25 marks; inbuilt choice;

Part-C: 3 x 15 = 45 marks; 3 out of 5 questions, open choice.

The Accounts Paper of Commerce will have

Part-A: Objective = 25

Part-B: 25 x 3 = 75 marks.

Duration of Examination must be rational; proportional to teaching hours 90 minute-examination / 50 Marks for courses of 2/3 hours/week (all Part IV UG Courses) 3-hours examination for courses of 4-6 hours/week.

EVALUATION

Percentage Marks, Grades & Grade Points

UG (Passing minimum 40 Marks)

Qualitative Assessment	Grade Points	Grade	Mark Range %)
Exemplary	10	S	90 & above
Outstanding	9	A+	85-89.99
Excellent	8	A	80-84.99
Very Good	7	B	70-79.99
Good	6	C	60-69.99
Satisfactory	5	D	50-59.99
RA	4	E	40-49.99
	0	RA	< 40

CGPA - Calculation

Grade Point Average for a semester is calculated as indicated here under:

$$\frac{\text{Sum total of weighted Grade Points}}{\text{Sum of Gredits}}$$

Weighted Grade Points is ***Grade point x Course Credits.*** The final CGPA will only include: Core, Core Electives & IDCs.

A Pass in SHEPHERD will continue to be mandatory although the marks will not count for the calculation of the CGPA.

Continuous Internal Assessment (CIA):

Class	Mark Range (%)
Distinction	75 & above, first attempt
First	60 & above
Second	50 to 59.99
Third	40 to 49.99

Declaration of Result:

Mr./Ms. ________________ has successfully completed the Under Grduate in _____________ programme. The candidate's Cumulative Grade Point Average (CGPA) in Part – III is ___________ and the class secured is ___________ by completing the minimum of 150 credits.

The candidate has acquired ____________ (if any) more credits from SHEPHERD / AICUF/ FINE ARTS / SPORTS & GAMES / NCC / NSS / NATURE CLUB, ETC. The candidate has also acquired _______ (if any) extra credits offered by the parent department courses.

B. Sc. ELECTRONICS
Course Pattern - 2014 Set

Sem	Part		Code	Course	Hrs	Cr
I	I	Language	14UGT110001	Language - I: (Tamil / Hindi / French / Sanskrit)	4	3
	II	English	14UGE120101	General English I	5	3
	III	Core	14UEL130201	Electric Circuit Analysis	5	4
			@	Electronics Practical – I	3	-
			@	Workshop Practice – I	3	-
	III	Allied	14UEL130401	Mathematics - I	6	5
	IV	NMC	14UCE140801	Communicative English	-	5
	IV	V. Edn	14UFC141001	Value Education: Essentials of Ethics, Yoga & Stress Management	2	2
				Library	2	
				Total for Semester I	***30***	***22***
II	I	Language	14UGT210002	Language - II: (Tamil / Hindi / French / Sanskrit)	4	3
	II	English	14UGE220102	General English II	5	3
	III	Core	14UEL230202	Electronic Devices	5	4
			14UEL230203	Electronics Practical – I	3	4
			14UEL230204	Workshop Practice - I	3	4
	III	Allied	14UEL230402	Mathematics - II	6	5
	IV	NMC	14UCE240802	Computer Literacy / SAP	2	2
	IV	V. Edn	14UFC241002	Techniques of Social Analysis	2	2
				Total for Semester II	***30***	***27***
III	I	Language	14UGT310003	Language - III: (Tamil / Hindi / French / Sanskrit)	4	3
	II	English	14UGE320103	General English III	5	3
	III	Core	14UEL330205	Electronic Circuits	6	5
			@	Electronics Practical – II	3	-
	III	Allied	14UEL330403	Applied Physics – I	4	4
			@	Applied Physics Practical	2	-
	IV	NMC	14UCE340901	Environment studies	2	2
	IV	V. Edn	14UFC341003 A	Professional Ethics-1: Social Ethics OR	2	2
			14UFC341003 B	Professional Ethics-1: Religious Doctrine	(2)	(2)
				Library	2	
				Total for Semester III	***30***	***19***
IV	I	Language	14UGT410004	Language - IV: (Tamil / Hindi / French / Sanskrit)	4	3
	II	English	14UGE420104	General English IV	5	3
	III	Core	14UEL430206	Digital Electronics	5	5
			14UEL430207	Electronics Practical – II	3	4
	III	Core Elective	14UEL430301 A	(WS):Home Appliances Servicing and Repair **OR**	4	3
			14UEL430301 B	Lab Equipment Maintenance and Servicing		
	III	Allied	14UEL430404	Applied Physics – II	4	4
			14UEL430405	Applied Physics Practical	2	2
	IV	V. Edn	14UFC441004 A	Professional Ethics-2 :Social Ethics OR	2	2
			14UFC441004 B	Professional Ethics-2:Religious Doctrine		
				Library	1	
				Total for Semester IV	***30***	***26***
V	III	Core	14UEL530208	Microprocessors and its application	5	4
			14UEL530209	Linear Integrated Circuits	5	4
			14UEL530210	Microcontroller and its application	5	4
			14UEL530211	Electronics Practical – III	6	4
	III	Core Elective	14UEL530302 A	(WD): Control system OR	4	3
			14UEL530302 B	Digital Signal Processing		
	IV	SBE	14UEL540601	(BS): Entrepreneurial Electronics	2	2
	IV	IDC	14USS540701	Soft Skills	2	2
				Library	1	
				Total for Semester V	***30***	***23***
VI	III	Core	14UEL630212	Internship		2
			14UEL630213	Power Electronics	5	4
			14UEL630214	Communication System	5	4
			14UEL630215	Sensor, Transducer and Measurement	5	4
			14UEL630216	Electronics Practical – IV	6	4
			14UEL630217	Dissertation and Viva-Voce	3	3
			14UEL630218	Comprehensive Examination	-	2
	III	Core Elective	14UEL630303 A	(WD) : Embedded System OR	4	3
			14UEL630303 B	VLSI design and VHDL programming		
	IV	SBE	14UEL640602	(WS): PC Assembling	2	2
				Total for Semester VI	***30***	***28***
I-V	V		14UCW651101	SHEPHERD and Gender Studies		5
				Total Credits for all Semesters	**180**	**150**

* Code numbers according to the subject chosen

@ Practical examination in the following even semester.

gUtk: 1 ***kz Neuk: 4***

14UGT110001 ***Gss fs: 3***

nghJjjko-I

Nehffqfs:

1. r%f khwwr rejidfis csslffa jwfhy ,yffaqfis mwKfk nrajy.
2. GJff tij› rWfij› c iueil Mfa ,yffaqfsd eak ghuhlLjy.
3. rejggioadw vOj khz thfisg gawWtjjy.

gadfs:

1. khz thfs r%f khwwrrejidfis mweJnfhs th.
2. rejggiofis eff vOJk jwd ngWth.
3. Gjjyffaqfisg gilfFk jwidAk› jwdhaT nraAk jwidAk ngWth.

myF-1: kfhf t ghujahh ftijfs

ghujjhrd ftijfs

c iueil - Kjy %dW flLiufs (10 kz Neuk)

myF-2: glLfNfhl ilahh ghlyfs

ghtyNuW ngUQrjjudhh ghlyfs

,yffzk-tykFk ,lqfs (12 kz Neuk)

myF-3: GJfftij tbtqfs

,yffa tuyhW - %dwhk ghfk

rWfij- Kjy MW rWfijfs (10 kz Neuk)

myF-4: GJfftijfs

ngz zaf ftijfs

,yffa tuyhW - ehdfhk ghfk

,yffzk - ty kfh ,lqfs (14 kz Neuk)

myF-5: nkhongahgGfftijfs

rWfij- 7 Kjy 12 Kba css rWfijfs

c iueil- 4Kjy 6 Kba css flLiufs (14 kzNeuk)

ghlE}y

1. nghJjjko- nraAs juIL- jkohaTjJiw ntsaL-2014-2017
2. r%ftay Nehffy jko ,yffa tuyhW› jkohaTjJiw ntsaL› J}a tsdhh fyY}h› jUrruhggss-2› 2014
3. c iueilf Nfhit - jkohaTjJiw ntsaL› 2014
4. rWfijjnjhFgG

Sem. I **Hours/Week: 5**

14UGE120101 **Credits: 3**

GENERAL ENGLISH-I

Objectives

To help students

- * Use words and phrases related to self, home, friends and relatives in meaningful contexts.
- * Use language to perform basic functions like describing, clarifying, suggesting, and giving directions.

Unit-1

01. Personal Details
02. Positive Qualities
03. Listening to Positive Qualities
04. Relating and Grading Qualities
05. My Ambition
06. Abilities and Skills
07. Self-Improvement Word Grid
08. What am I doing?
09. What was I doing?
10. Unscramble the Past Actions
11. What did I do yesterday?

Unit-2

12. Body Parts
13. Actions and Body Parts
14. Value of Life
15. Describing Self
16. Home Word Grid
17. Unscramble Building Types
18. Plural Form of Naming Words
19. Irregular Plural Forms
20. Plural Naming Words Practice
21. Whose Words?

Unit -3

22. Plural Forms of Action Words
23. Present Positive Actions
24. Present Negative Actions
25. Un/Countable Naming Words
26. Recognition of Vowel Sounds
27. Indefinite Articles

28. Un/Countable Practice
29. Listen and Match the Visual
30. Letter Spell - Check
31. Drafting Letter

Unit 4

32. Friendship Word Grid
33. Friends' Details
34. Guess the Favourites
35. Guess Your Friend
36. Friends as Guests
37. Introducing Friends
38. What are We Doing?
39. What is (s)he / are they Doing?
40. Yes / No Question
41. What was s/he doing?
42. Names and Actions
43. True Friendship
44. Know your Friends
45. Giving Advice/Suggestions
46. Discussion on Friendship
47. My Best Friend

Unit 5

48. Kinship Words
49. The Odd One Out
50. My Family Tree
51. Little Boy's Request
52. Occasions for Message
53. Words denoting Place
54. Words denoting Movement
55. Phrases for Giving Directions
56. Find the Destination
57. Giving Directions Practice
58. SMS Language
59. Converting SMS
60. Writing Short Messages
61. Sending SMS
62. The family debate
63. Family Today

Textbook

1. Joy, J.L. & Peter, F.M. (2014). *Let's Communicate*, New Delhi, Trinity Press.

Sem. I **Hours/Week: 5**
14UEL130201 **Credits: 4**

ELECTRIC CIRCUIT ANALYSIS

Objectives

- To learn the methods to simplify any electrical networks and to analyze the performance of complex networks.

UNIT - I: DC CIRCUIT ANALYSIS

Charge, Current, Voltage and Power - Voltage and Current Sources - Ohm's Law - Kirchhoff's Current Law - Kirchhoff's Voltage Law - The single node-pair circuits - Series and Parallel connected independent sources - Resistors in Series and Parallel - Source Transformation - Voltage and Current Division - Nodal and Mesh Analysis.

UNIT - II: SINUSOIDAL STEADY STATE ANALYSIS

Sinusoidal Steady State Analysis: Average & RMS values of periodic waveform - Form factor & Peak factor - Characteristics of sinusoids - The complex forcing function - The Phasor - Phasor relationship for R, L and C - Impedance -Admittance - Phasor Diagrams - AC Circuit Power Analysis: Average Power - Reactive power- Apparent Power - Power factor - Power triangle involving R, L &C - Analysis of series and parallel RL, RC & RLC circuit.

Frequency Response: Parallel resonance - Series Resonance - Q factor, impedance and bandwidth of the resonant circuit.

UNIT - III: NETWORK THEOREMS

Delta-Wye conversion - Superposition theorem - Thevenin's and Norton's theorem - Reciprocity Theorem - Maximum Power Transfer Theorem - Compensation Theorem - Tellegen's theorem. (Both AC and DC sources).

UNIT - IV: TRANSIENTS

Steady state and Transient response - DC response of an RL circuit - RC circuit - RLC circuit - AC transient response of RL, RC and RLC series.

UNIT-V: COUPLED CIRCUITS, DUALITY AND TOPOLOGY

Magnetically coupled circuits: Self Inductance - Mutual inductance - Coefficient of coupling - Dot convention rule - Series and Parallel connections of Coupled coils - Ideal transformer (Problems in all topics).

Network topology: Graph - Tree - Co-Tree - Incidence matrix - Tie set - Cut set - Duality of network.

BOOK FOR STUDY

1. William H. Hayt, Jr, Jack E. Kemmerly, Steven M. Durbin, “Engineering Circuit Analysis”, 6th Edition, Tata McGraw - Hill publishing company Ltd, 2008.
2. A. Sudhakar, Shyammohan S Palli, “Circuits & Networks Analysis and Synthesis”, 3rd Edition, Tata McGraw - Hill publishing company Ltd, 2008.

BOOKS FOR REFERENCE

1. Umesh Sinha, “Circuit Theory”, 4th Edition, Satya Prakasan Publications, New Delhi.
2. Paranjothi S.R, “Electric Circuit Analysis”, New Age International.
3. David E. Johnson, Johny R. Johnson, John L. Hilburn, “Electric Circuit Analysis”, 2nd Edition, PHI.

Sections

Unit	Book	Sections
I	1	2.3,2.4,2.5,3.3,3.4,3.6,3.7,3.8,3.9,4.2 – 4.5, 5.3
	2	1.4.1, 1.5 – 1.8, 2.15
II	1	10.2,10.4 – 10.8, 10.11, 11.2 11.3,11.5,11.6
	2	8.1, 8.2, 8.4, 8.5, 8.7 – 8.10, 5.3, 5.4, 6.1 – 6.5
III	1	5.6, 5.2, 5.4, 5.5
	2	3.5, 3.6, 3.9
IV	2	11.1 – 11.7
V	2	10.1, 10.3 – 10.6, 10.8, 10.9, 2.1, 2.2, 2.4, 2.7, 2.8.1, 3.8

Sem. I **Hours/Week: 6**
14UEL130401 **Credits: 5**

Allied:

MATHEMATICS-I

OBJECTIVES

- * To train the students in mastering the techniques of various branches of Mathematics.
- * To motivate the students to apply the techniques in their respective major discipline.

Unit - I: Vector Calculus

Concept of vector and scalar fields - the Del Operator - Divergence of vector - Curl of vector - Laplacian q Operator - Gauss-Divergence theorem - Stoke’s theorem - Green’s theorem (Simple Problems Only & Proof of Gauss, Green’s, Stoke’s theorems be omitted - pages 10.37-10.130).

Unit - II: Matrices

Different types of matrices - Inverse of a matrix - Solution of simultaneous linear equations by Matrix method - Cayley-Hamilton theorem (proof not be needed) - Characteristic equation, roots, vectors (pages 5.1 - 5.8 & 5.44 - 5.73).

Unit - III: Differential Equations

Second Order differential equations with constant coefficients - Laplace equation - Method of Variation of parameters (pages 8.41 - 8.76).

Unit IV: Trigonometry

Expansion of sin nx, cos nx, sinnx, cosnx, sinmxcosnx - Infinite series of sin q, cos q, tan q - Inverse trigonometry functions - Hyperbolic functions (pages 3.1 - 3.70).

Unit V: Complex Variables

Analytical functions - Cauchy-Riemann conditions - Taylor’s and Laurent’s Series - Cauchy’s integral theorem and formula (Only applications & proof of Taylor’s, Laurent’s, Cauchy’s integral theorem and formula be omitted - pages 2.1 - 2.30 & 3.12 - 3.43).

BOOKS FOR STUDY

1. A. Singaravelu, Text Book of Engineering Mathematics (For I B.E. Students) Meenakshi Publications (FOR UNITS I, II, III & IV).
2. A. Singaravelu, Engineering Mathematics (For III Semester B.E. Students) Meenakshi Publications (UNIT V).

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gUtk: 2 **kzþ Neuk: 4**
14UGT210002 ***Gssþfs: 3***

nghJjjkþo-II

Nehffqfs :

1. rka eyyþzff czhit tshjjy.
2. jkþof fhggþaqfsþy moFk› mwþTzhTk ClLk gFjþfisg gbjJg GhþeJ nfhsSjy.
3. ciueilf flLiu vOJk jþwd ngWjy.

gadfs :

1. jkþioj jþUjjkhfg gbffTk› NgrTk› gþioaþdwþ vOjTk Njhrrþ ngWjy.
2. ,yffþaqfsþy gbjjtwiw Kiwahf thofifaþy filggþbjjy.

myF: 1 **(12 kzþ Neuk)**

rþyggjþfhuk - kJiuf fhzlk (fhL fhz fhij)

,yffþa tuyhW - irtk tsujj jkþo Kjy Guhzqfs Kba.

myF : 2 **(12 kzþ Neuk)**

kzþNkfiy - ghjjþuk ngww fhij

nghþaGuhzk - nkagnghUsehadhh Guhzk

myF : 3 **(12 kzþ Neuk)**

fkguhkhazk - fhlrþgglyk

ciueil - 7 Kjy 9 Kba css flLiufs

,yffzk - vOjjþyffzk

myF : 4 **(12 kzþ Neuk)**

FzqFb k] jhd rhfþG ghlyfs

rþwwþyffþaqfs - fyþqfjJgguzþ

ciueil - 10 Kjy 11 tiuaþyhd flLiufs

myF : 5 **(12 kzþ Neuk)**

,ulrzþa ahjjþhþfk- kuzgglyk

,yffþa tuyhW - jkþo ,yffz E}yfs Kjy rþwwþyffþaqfs Kba.

,yffzk - nrhyyþyffzk

ghlE}y:

1. nraAs jþulL - jkþohaTjJiw ntsþaL› 2014-2017.
2. r%ftþay Nehffþy jkþo ,yffþa tuyhW› jkþohaTjJiw ntsþaL› J}atsdhh fyY}hþ› jþUrrþuhggssþ› 2014.
3. ciueilfNfhit› jkþohaTjJiw ntsþaL› 2010.

14UGE220102 Credits: 3

GENERAL ENGLISH-II

Objectives

To help students

* Use words and phrases related to education, entertainment, career, and society in meaningful contexts.

* Use language to perform basic functions like comparing, debating, and storytelling.

Unit 1

01. Education Word Grid.
02. Reading Problems and Solutions.
03. Syllabification.
04. Forms for Expressing Quality.
05. Expressing Comparison.
06. Monosyllabic Comparison.
07. Di/polysyllabic Comparison.
08. The best monosyllablic Comparision
09. The best di/polysyllabic Comparision.
10. Practising Quality Words.

Unit 2

11. *Wh* Words
12. Yes/No Recollection
13. Unscramble *Wh* Questions
14. *Wh* Practice
15. Education and the Poor
16. Controlled Role play
17. Debate on Education
18. Education in the Future
19. Entertainment Word Grid
20. Classify Entertainment Wordlist
21. Guess the Missing Letter
22 Proverb-Visual Description
23. Supply *Wh* Words
24. Rearrange Questions
25. Information Gap Questions

Unit 3

26. Asking Quetions
27. More about Actions
28. More about Actions and Uses

29. Crime Puzzle
30. Possessive Quiz
31. Humourous News Report
32. Debate on Media and Politics
33. Best Entertainment Source

Unit 4

34. Career Word Grid
35. Job-Related Wordlist
36. Who's Who?
37. People at Work
38. Humour at Workplace
39. Profession in Context
40. Functions and Expressions
41. Transition Fill-in
42. Transition Sord Selection
43. Professional Qualities
44. Job Procedures
45. Preparing a Resume
46. Interview Questions
47. Job Cover Letter Format
49. E-mailing an Application
50. Mock Interview

Unit 5

51. Society Word Grid
52. Classify Society Wordlist
53. Rearrange the Story
54. Storytelling
55. Story Cluster
56. Words Denoting Time
57. Expressing Time
58. What Can You Buy?
59. Noise Pollution
60. Positive News Headlines
61. Negative News Headlines
62. Matching Conditions
63. What Whould You Do?
64 If I were the Prime Minister
65. My Dream Country

Textbook

1. Joy, J.L. & Peter, F.M. (2014). *Let's Communicate*, New Delhi: Trinity Prss.

Sem. II **Hours/Week: 5**
14UEL230202 **Credits: 4**

ELECTRONIC DEVICES

Objective

- To learn the principles of working of the semiconductor & display devices.

UNIT - I: DIODES

Introduction to Semiconductor Diode - Construction - Working - Energy band diagram of PN junction - Current Equations - Volt Ampere characteristics - Diode resistance - Transition capacitance - Diffusion capacitance - Temperature characteristics.

Special Diodes: Zener diode - Varactor diode - Tunnel diode - Schottky diode - PIN diode. (Energy band diagram & VI characteristics)

UNIT - II: TRANSISTORS

Introduction to construction of transistor - Current components - Configurations of transistors - Characteristics - Analytical expressions for the characteristics - a, b & g relationships - Eber's Mol model.

UNIT - III: FET& MOSFET

Introduction to construction of FET - Working of FET - Configurations of FET - Pinch-off voltage - Volt-ampere characteristics - Low Frequency Model of FET.

Construction of MOSFET - Enhancement type - Depletion type - Volt-ampere characteristics.

UNIT - IV: POWER DEVICES

Construction of UJT - Intrinsic stand-off ratio - Equivalent circuit - Volt-ampere characteristics.

Construction of SCR - Equivalent transistor model - Working - Volt-ampere characteristics - Characteristics of TRIAC, DIAC & IGBT.

UNIT - V: SPECIAL DEVICES

Construction & working of LED - LCD - Photo diode - Photo transistor - CRT Deflection plates - Electrostatic & electromagnetic focusing.

BOOK FOR STUDY

1. Salivahanan. S, Suresh Kumar .N, Vallavaraj. A, "Electronic Devices and Circuits", 2nd Edition, TMH, 2008.

BOOKS FOR REFERENCE

1. Jacob Millman, Christos C. Halkins, Satyebranta Jit, "Electronic Devices & Circuits", 2nd Edition, TMH, 2008.
2. David A. Bell, "Electronic devices and circuits", Prentice Hall of India, 2004.
3. Floyd, "Electron devices", Pearson Asia, 5th Edition, 2001.

Sections

UNIT	BOOK	SECTIONS
I	1	4.11 – 4.16, 5.2, 5.4, 5.7.5, 5.8, 5.12
II	1	6.1, 6.2, 6.4, 6.5, 6.6, 6.10
III	1	7.1-7.6, 7.9-7.11
IV	1	17.2, 8.3, 8.4, 8.7, 8.8
V	1	22.3.2, 22.6, 22.7, 3.9, 3.10

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Sem. II **Hours/Week: 3**
14UEL230203 **Credits: 4**

Electronic Practicals-I

NETWORK AND CHARACTERISTICS EXPERIMENT

1. Study of voltage division, current division and source transformation
2. Verification of Kirchoff's voltage law.
3. Verification of Kirchoff's Current law.
4. Verification of Thevenin's Theorem.
5. Verification of Norton's theorem.
6. Verification of Superposition theorem.
7. Verification of Compensation theorem.
8. Verification of Reciprocity theorem.
9. Verification of Maximum power transformation theorem.
10. Study of Series resonance circuit.
11. Study of Parallel resonance circuit.
12. Study of Steady state analysis of series RC, LC, and RLC Circuit.
13. Study of transient state analysis of series RC, LC and RLC Circuit.
14. Calculation of RMS voltage, current, reactive power, apparent power, power factor and phase relation for RL and RC circuits
15. Study of Diode characteristics.
16. Study of Zener diode characteristics.
17. Study of Transistor characteristics - CB mode.
18. Study of Transistor characteristics - CE mode
19. Study of Transistor characteristics - CC mode.
20. Study of FET characteristics.
21. Study of MOSFET characteristics.
22. Photo electronic devices (LDR, photo diode, phototransistor and PIN diode).
23. Study of SCR characteristics.
24. Study of TRIAC and DIAC characteristics.
25. Study of UJT characteristics.
26. Study of IGBT characteristics.

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Sem. II **Hours/Week: 3**
14UEL230204 **Credits: 4**

WORKSHOP PRACTICE

1. Component Identification.
2. Functions of Multimeters, Component Checking, voltage and current measurements.
3. Study of CRO (single trace and dual trace).
4. Study of AFO.
5. Study of LCR Meter.
6. PCB Layout and Etching.
7. Soldering and De-soldering the components in PCB layout.
8. Soldering simple circuits and checking continuity.
9. Construction of Power supplies (single power supply).
10. Construction of Power supplies (dual power supply).
11. Cabinet making.
12. House wiring - I (Fitting Switches, AC Pin Sockets and Indicator Lamp in Switch Box).
13. House wring - II (two way switches, circuit breaker-ELCB).
14. Installation and testing of earth.
15. SMD soldering and de-soldering.
16. Construction and testing of serial lights using LED in 230 Volts.

17. Study of SMPS Power supply.
18. Construction of Transformer-less power supply.
19. Hobby circuits - I
20. Hobby circuits - II
21. Hobby circuits - III
22. Engineering Drawing - I
23. Engineering Drawing - II
24. Engineering Drawing - III
25. PCB layout Preparation by Software (Xpress PCB).

Sem. II **Hours/Week: 6**
14UEL230402 **Credits: 5**

Allied:

MATHEMATICS-II

OBJECTIVES

* To train the students in mastering the techniques of various branches of Mathematics.

* To motivate the students to apply the techniques in their respective major discipline.

Unit - I: PROBABILITY AND DISTRIBUTION

Concept of Probability - Binomial, Poisson, Normal distributions (Application only - pages 4.67 - 4.98)

Unit - II: LAPLACE TRANSFORMS

Definitions - Properties of Laplace transforms - Laplace transform of derivatives and integrals - initial and final value theorems - Inverse Laplace transforms - Solving D.E.(Second Order with Constant coefficient) Using Laplace transform(pages 1.1 - 1.34 & 1.39 -1.78)

Unit - III: FOURIER SERIES

General Fourier series - Fourier Sine and Cosine Series - Half range series - Fourier transforms - Properties, theorems (proof of the theorems, transforms is omitted, pages 1.5 - 1.39, 1.60 - 1.67 & 2.1 - 2.33)

Unit - IV: NUMERICAL METHODS

Solution of simultaneous linear equations - Gauss Elimination and Gauss Seidal Methods - Numerical solution to O.D.E. - Taylor's method - Euler's and Modified Euler's methods - Runge - kutta method of II and IV orders(Relevant methods Only)

Unit - V: SPECIAL FUNCTIONS

Beta and Gamma functions - Definitions -Relation between Beta and Gamma functions (Applications and Problems based on Beta and Gamma functions, pages 7.1 - 7.38)

BOOKS FOR STUDY

1. Singaravelu,Engineering Mathematics(For III Semester B.E. Students) Meenakshi Publications (UNITS I & II).
2. Singaravelu,Engineering Mathematics (For IV Semester B.E. Students) Meenakshi Publications (UNIT III).
3. Singaravelu, Numerical Methods Meenakshi Publications (UNITIV).
4. Singaravelu, Text Book of Engineering Mathematics (For I B.E. Students) Meenakshi Publications (UNIT V).

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gUtk: 3 **kz Neuk: 4**
14UGT310003 ***Gssfs: 3***

nghJjjko-III

Nehffqfs :

1. nrknkhoj jkor nraAsfshd gjndzNky fzfF› gjndz fo fzfFg ghlyfisg gbjJg nghUs GheJ nfhsSk jwd ngWjy
2. gzil ,yffaqfsy mikeJss r%ff fUjJffis czhjJjy.
3. kuGf ftij tbtqfis mwar nrajy.
4. ftijfsy mzfs mikeJss ghqifg Ghjy.
5. Gjdk to jwfhyr rKjhar rffyfisAk› mjwfhd jhTfisAk Muhaejwjy.

gadfs :

1. nrknkhoahk jko nkhoad rwgig mwjy.
2. gzil ,yffaqfs czhjJk mwffUjJffis mweJ khzth xOff newaiy thoeJ r%fjij NkkgLjJth.
3. khzth GjdjijF fwgjd %yk rKjhar rffyfis czheJ mtwwwFj jhT fhzgh.

myF : 1 (16 kz Neuk)
nghUeuhwWggil (KOikAk)

myF : 2 (10 kz Neuk)
FWenjhif› ahggyffzk (ntzgh› Mrhaggh)

myF : 3 (10 kz Neuk)
fyjnjhif ,yffa tuyhW - |jko nkhoad njhdikAk rwgGk| Kjy |rqfj njhif E}yfs| Kba. Gjdk - KOikAk.

myF : 4 (12 kz Neuk)
gjwWggjJ› GwehD}W› mzayffzk.

myF : 5 (12 kz Neuk)
jUfFws - mwk
ehybahh - nghUlghy
,yffa tuyhW - rqf ,yffaqfsd jdjjdikfs Kjy ,ulilf fhggaqfs Kba.

ghlE}yfs :

1. nraAs juilL› jkohaTjJiw ntsaL (2014-2017)
2. r%ftay Nehffy jkoyffa tuyhW› jkohaTjJiw ntsaL›2014
3. Gjdk (xtnthU fytahzLk xtnthU Gjdk).
   neheJNrhW (2014-2015)

14UGE320103 **Credits: 3**

GENERAL ENGLISH-III

Objectives:

* To enable the students to comprehend the local and global issues through the lessons.
* To enable the students to do the tasks centering on Skill Development and Grammar.
* To empower the students with interactive skills.

Tasks Designed for Each Unit	Skills Focused to be Developed for Each Unit	Hours Allotted
1. Pre-reading Task	Listening and Reading Skills through teacher-led reading practice	2 Hours
2. Objectives	Listening and Reading Skills	
3. Text	Listening and Reading Skills through teacher-led reading practice	
4. Glossary (Using Words and Phrases in Sentences)	Referring and Language Using Skills	2 Hours
5. Reading Comprehension	Reading, Speaking, and Writing Skills	1 Hour
6. Critical Analysis	Critical Thinking and Speaking Skills	2 Hours
7. Creative Task	Creative Thinking and Speaking Skills	2 Hours
8. General Writing Skills	Writing Skill	1 Hour
9. Activities on Grammar	Grammar Using and Writing Skills	2 Hours

UNIT I

* Suggestions to Develop Your Reading Habit 12 Hrs
Grammar: Simple Present Tense

UNIT II

* The Secret of Success: An Anecdote 12 Hrs
Grammar: Present Continuous Tense

UNIT III

* Hygiene 12 Hrs
Grammar: Simple Past Tense

UNIT IV

* Dr. A.P.J. Abdul Kalam: A Short Biography 12 Hrs
Grammar: Past Continuous Tense

UNIT V:

* “Golden Rule”:A Poem 12 Hrs
Grammar: Simple Future Tense & Future Continuous Tense

Textbook:

1. Jayraj, S. Joseph Arul *et al*. (2014). *Trend-Setter:* An Interactive General English Textbook for Under Graduate Students, New Delhi, Trinity.

Sem. III **Hours/Week: 6**
14UEL330205 **Credits: 5**

ELECTRONIC CIRCUITS

Objective

- To learn the working principles of Amplifier, Oscillator and feedback networks.

UNIT - I:

RECTIFIERS AND POWER SUPPLIES

Linear mode power supply: Half-wave - Full-wave - Bridge Rectifiers - Analysis for Vdc and ripple voltage with C, CL, L-C and C-L-C filters - Zener Voltage regulator - IC regulators-78XX-79XX-Switched mode power supplies.

UNIT - II:

TRANSISTOR BIASING

Bias Stability - Need for Biasing - Load Line - Thermal runaway - Stability Factors -Methods of biasing circuits for BJT -Biasing the FET - Source bias - Self bias - Voltage divider bias for FET - Use of FET as voltage variable resistor.

UNIT - III:

FREQUENCY RESPONSE OF AMPLIFIERS

Single stage amplifier: CE, CB and CC amplifiers - Small Signal analysis of amplifiers (h & re’ parameters) to obtain gain, input impedance and output impedance - FET amplifier: CS, and CD amplifiers - Frequency of amplifier - Bode plot analysis - Transient response - RC Coupled Amplifier Analysis - An Introduction to differential amplifiers.

UNIT - IV:

FEEDBACK AMPLIFIERS

Concepts of feedback - Types of negative feedback - Method of identifying feedback topology - Nyquist criterion for stability of feedback amplifiers.

Barkhausen’s Criterion - Mechanism for start of oscillation and stabilization of amplitude - RC phase shift oscillator - Wien’s bridge oscillator - Twin-T oscillators -Analysis of LC oscillators: Colpitt’s - Hartley - Clapp - Crystal Oscillator circuits.

UNIT - V:

TUNED & POWER AMPLIFIERS

Tuned Amplifier: Single Tuned - Double Tuned - Stagger tuned - Power amplifiers: Working principle of Class A, Class AB, Class B, Class C, Class D, and Class S amplifiers -efficiency of class A, Band C amplifiers.

BOOK FOR STUDY

1. Salivahanan. S, Suresh Kumar .N, Vallavaraj. A, “Electronic Devices and Circuits”, 2nd Edition, TMH, 2008.
2. Albert Paul Malvino, “Electronic Principles”, 7th Edition, TMH.

BOOKS FOR REFERENCE

1. Jacob Milliman, Christos C. Halkins, Satyebranta Jit, “Electronic Devices & Circuits”, 2nd Edition, TMH, 2008.
2. David A. Bell, “Electronic devices and circuits”, Prentice Hall of India, 2004.
3. Floyd, “Electron devices”, Pearson Asia 5th Edition, 2001.

Sections

Unit	Book	Sections
I	1	18.1, 18.2, 18.2.2, 18.2.3, 18.2.4, 18.3
II	1	6.11, 6.11.1, 6.11.2, 6.12, 7.16, 7.17
III	1 2	9.5 – 9.8, 9.10, 9.11, 9.11.1 – 9.11.5, 9.12, 9.12.1 – 9.12.3, 9.14, 10.5
IV	1	14.2 – 14.6, 15.3, 15.5, 15.6, 15.7, 15.11(i), 15.12 – 15.14
V	1	13.3.1, 13.3.2, 13.6, 12.1 – 12.10, 12.13, 12.14

Sem. III **Hours/Week: 4**
14UEL330403 **Credits: 4**

Allied:
APPLIED PHYSICS-I

UNIT-I: CONDUCTING MATERIALS

Introduction - Classical free electron theory of metals - Quantum theory - Free electron gas - Fermi energy and carrier concentration.

UNIT-II: MAGNETIC MATERIALS

Introduction - Origin of magnetic moment - Bohr magnetron - Diamagnetism, Paramagnetism and Ferromagnetism - Hysteresis - Anti-ferromagnetic materials - Ferrites - Applications.

UNIT-III: DIELECTRIC MATERIALS

Introduction - Basic definitions - Various types of polarization in dielectric materials - Frequency and temperature dependence of polarization - Internal field or local field - Clausius-Mosotti equation - Dielectric losses - Dielectric breakdown - Applications of dielectric materials - Ferroelectricity.

UNIT-IV: SUPERCONDUCTING MATERIALS

Introduction - Meissner effect - Transition temperature - Isotope effect - Types of superconductors - BCS theory - High-TC superconductors - Applications of superconductors.

UNIT-V: MODERN ENGINEERING MATERIALS

Metallic glasses - Shape memory alloys - Nanomaterials - Carbon nanotubes

BOOK FOR STUDY

1. ENGINEERING PHYSICS - D.K. BHATTACHARYA & A. BHASKARAN

Section

UNIT	SECTION
Unit – 1	6.1 – 6.5
Unit – 2	8.1 – 8.8
Unit – 3	10.1 – 10.10
Unit – 4	9.1 – 9.8
Unit – 5	11.1 – 11.4

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gUtk: 4 **kz Neuk: 4**
14UGT410004 **Gssfs: 3**

nghJjjko-IV

Nehffqfs :

1. ehlfjjd Nehffk› mjd NghfF› cjjfs› ghjjug ghqF› ciuahly Kiw› fwgidjjwk Nghdwtwiw ntsggLjjy.
2. Gja ehlfqfisg gilfFk jwid khz tufsilNa cUthfFjy.

gadfs :

1. ehlftoo mofay czuTfis tsujjy.
2. ehlfqfisr r%fg gadghlbwF Vwg cUthfFjy.

myF : 1 **(12 kz Neuk)**

kNdhdkzak› ghauk› mqfk - 1› fsk 1 - 5 tiu.

myF : 2 **(12 kz Neuk)**

kNdhdkzak› mqfk - 2› fsk 1 - 3 tiu.
ciueil ehlfk (Kjy ,uzL ehlfqfs)

myF : 3 **(12 kz Neuk)**

kNdhdkzak› mqfk - 3› fsk 1 - 4 tiu.

myF : 4 **(12 kz Neuk)**

kNdhdkzak› mqfk - 4› fsk 1 - 5 tiu.

myF : 5 **(12 kz Neuk)**

kNdhdkzak› mqfk - 5› fsk 1 - 3 tiu.
ciueil ehlfk (3› 4Mk ehlfqfs)

ghlE}yfs :

1. Rejudhu› kNdhdkzak› jkohaTjJiw (gjgG)› J}a tsdhu fyY}u› jUrruhggs s-2. (mqfk : 3 fsk : 4 eqfyhf)
2. mz zhkiy.r. (njh.M.)› Nr. ,uhkhD [k ehlfqfs› fhtah ntsaL› nrdid

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SEM-IV **Hours/week: 5**
14UGE420104 **Credits: 3**

GENERAL ENGLISH-IV

Objectives:

- * To enable the students to comprehend the local and global issues through the lessons.
- * To enable the students to do the tasks centering on Skill Development and Grammar.
- * To empower the students with interactive skills.

Tasks Designed for Each Unit	Skills Focused to be Developed for Each Unit	Hours Allotted
1. Pre-reading Task	Listening and Reading Skills through teacher-led reading practice	2 Hours
2. Objectives	Listening and Reading Skills	
3. Text	Listening and Reading Skills through teacher-led reading practice	
4. Glossary (Using Words and Phrases in Sentences)	Referring and Language Using Skills	2 Hours
5. Reading Comprehension	Reading, Speaking, and Writing Skills	1 Hour
6. Critical Analysis	Critical Thinking and Speaking Skills	2 Hours
7. Creative Task	Creative Thinking and Speaking Skills	2 Hours
8. General Writing Skills	Writing Skill	1 Hour
9. Activities on Grammar	Grammar Using and Writing Skills	2 Hours

UNIT-I: Women through the Eyes of Media **12 Hrs**

Grammar: Present Perfect Tense

UNIT-II: Effects of Tobacco Smoking **12 Hrs**

Grammar: Present Perfect Continuous Tense

UNIT-III: The Impact of Liquor Consumption on the Society **12 Hrs**

Grammar: Past Perfect Tense

UNIT-IV: An Engineer Kills Self as Crow Sat on his Head: A News Paper Report **12 Hrs**

Grammar: Past Perfect Continuous Tense

UNIT-V: Traffic Rules **12 Hrs**

Grammar: Future Perfect Tense & Future Perfect Continuous Tense

Text Book:

Jayraj, S. Joseph Arul. et al. (2014). *Trend-Setter: An Interactive General English Textbook for Under Graduate Students*, New Delhi, Trinity.

Sem. IV **Hours/Week: 5**
14UEL430206 **Credits: 5**

DIGITAL ELECTRONICS

Objective

- To learn basic functioning of digital components.
- To learn the design procedure and methods of analysis of any digital circuits.

UNIT-I: NUMBER SYSTEMS, LOGIC GATES AND BOOLEAN ALGEBR

Number System: Binary, Decimal, Octal, Hexadecimal - Conversion - Complements - BCD codes - Gray codes - Alphanumeric codes - ASCII - Error detection and correction codes.

Logic Gates : Basic gates - AND, OR, NOT gates - Universal Gates - NAND, NOR gates - Exclusive-OR - Exclusive-NOR - Boolean operation and expression - Laws and rules of Boolean algebra - Demorgan’s theorem.

UNIT-II: MINIMIZTION TECHNIQUE AND DIGITAL INTEGRATED CIRCUITS

Boolean Expressions - K- map - SOP - POS - Minimization Technique: Quine Mccluskey method only - Implementation using universal gates.

Digital ICs: SSI, MSI, LSI and VLSI devices- TTL, ECL, MOSFET circuits.

UNIT-III: COMBINATIONAL LOGIC

Design Procedure - Adders - Subtractors - Decimal Adder - Multiplexer - Demultiplexer - Decoder - 4-bit decoder - BCD-to-seven segment Decoder / driver - Encoder - Parity Generators and Checkers - Code Converters: Binary-to- Gray converters - Gray-to-Binary converters.

UNIT-IV: SEQUENTIAL CIRCUIT

Flip-flops: S-R, J-K, T, D - triggering of flip-flops - Master-slave flip-flop - Counters: Asynchronous counter - 4-bit binary Up/down counter - Synchronous counter - Up/down counter - Design of synchronous counters - Shift registers.

UNIT-V: MEMORY DEVICES AND PROGRAMMABLE LOGIC

Introduction - RAM organization - Memory decoding - ROM organization - PROM - EPROM - EEPROM - EAPROM - Programmable logic devices: Programmable Logic Array (PLA) - Programmable Array Logic (PAL) - Sequential Programmable devices.

BOOKS FOR STUDY

1. Morris Mano. M, Michael D. Ciletti "Digital Design", 4th Edition, Prentice Hall of India Pvt. Ltd., New Delhi, Pearson Education (Singapore) Pvt. Ltd., New Delhi, 2008.
2. Thomas L. Floyd, "Digital Fundamentals, 8th Edition, Pearson Education, Inc, New Delhi.

BOOKS FOR REFERENCE

1. Donald P Leach, Albert Paul Malvino, Goutam Saha, "Digital Principles And Applications", 6th Edition, Tata McGraw- Hill publishing company limited, New Delhi, ninth reprint 2008.
2. Salivahanan. S, Arivahagan. S, "Digital Circuits and Design", 3rd Edition, Vikas Publishing House Pvt. Ltd., 2009.

Sections

Unit	Book	Sections
I	2	2.2, 2.3 – 2.5, 2.83 – 2.12, 3.1 – 3.6, 4.1, 4.2, 4.3
II	1	3.2, 3.3, 3.5, 3.6, 3.7, 3.10, 10.2, 10.5, 10.6, 10.7
	2	11.1
III	1	4.5, 4.6, 4.9 – 4.11
	2	6.5, 6.7, 6.9, 6.10
IV	2	7.1, 7.2, 7.3, 8.1, 8.2, 8.3, 8.4, 9.1– 9.5
V	1	7.1, 7.2, 7.3, 7.5, 7.6, 7.7, 7.8

Sem. IV **Hours/Week: 3**
14UEL430207 **Credits: 4**

Electronics Practicals-II

Semiconductor Circuits and Digital Experiment Simulation or Construction using P Spice & Model SIM

1. Study of transistor biasing, calculation of Q point and DC load line analysis {Fixed Bias and Voltage Divider for both NPN and PNP}
2. Study of FET biasing, calculation of Q point and DC load line analysis {Switching and Self Bias}
3. Study of MOSFET biasing, calculation of Q point and DC load line analysis
4. Half wave rectifier with and without filter.
5. Regulated power supply (Transistor & Zener diode).
6. Passive Filter circuits - low, high and band pass.
7. Voltage Multiplier Circuits.
8. RC coupled transistor amplifier.
9. FET amplifier.
10. Construction and study of differential amplifier based on transistor.
11. Construction and study of Power amplifier.
12. Construction and study of Hartley oscillator using Transistor.
13. Construction and study of Phase shift oscillator using Transistor.
14. Construction and study of Colpitt's oscillator using Transistor.
15. Construction of AND, OR and NOT gates using diode, NOT gate using transistor,
16. Construction of all the gates based on MOSFET {ON/OFF state voltage, current calculation}
17. Construction and study of Encoders and Decoders.
18. Construction and study of Multiplexers and Demultiplexers.
19. Construction and study of Shift registers.
20. Construction and study of Asynchronous counters.
21. Construction and study of Synchronous counters.
22. Construct the basic logic gate using NAND and NOR gates
23. Verification of Boolean laws using logic gates.
24. Construction and study of Adders and Subtractors.
25. Construction and study of JK,RS, D, T flip-flop using gates.
26. Construction and study of Parallel Binary adders and Subtractors.
27. Construction and study of BCD adders and BCD Subtractors.
28. Simplification of Boolean expression using K-Map
29. Quine McCluskey method of simplification of Boolean expression.

Sem. IV **Hours/Week: 3**
14UEL430301A **Credits: 3**

Core Elective-A:

HOME APPLIANCES SERVICING AND REPAIR

Objective

- To explain the operation and troubleshooting techniques of home appliacnes.

UNIT - I: Electronic components

Introduction - Passive components - Transformer - Working principle - Application - Active devices: Diode - Transistor - Analog IC - amplifier - Oscillators and Digital ICs - logic gates - Encoder-Decoder.

Unit - II: Equipments for servicing

Soldering Iron-Flux-lead-Zero defect soldering-Desoldering pump- Soldering station-Basics of Multimeter-Measurement of current, voltage and resistance using multimeter-Checking transistors and diodes-In circuit measurements.

Unit - III: Heating Appliances

Heater types-working principle- Heating Rod-Iron Box-Iron box with steamer-Toasters- Geysers- MicroWave Ovens- Oven -Disassembling and assembling procedure- Fault indicator-Testing and Troubleshooting methods.

Unit - IV: Motorised Appliances

Types of Motors-DC and AC motor- Fans- mixers- blenders-wet grinders-Circuit connection- Testing methods. Washing machine-Electrical connections-assembly- Dish washer -Electrical connection-Testing and Trouble shooting methods.

Unit - V: Refrigeration Appliances

Fridge- Electrical connection- Compressor-Coolants-Automatic defrost circuits -Testing and troubleshooting of refrigerators-Air coolers and Air conditioners-Mounting and fixing of Air Conditioners-Testing and troubleshooting methods.

BOOK FOR STUDY

1. Material prepared by the department.

Sem. IV **Hours/Week: 4**
14UEL430301B **Credits: 3**

Core Elective-B:

LAB EQUIPMENTS MAINTENANCE AND SERVICING

Objectives

- To induct the knowledge of basic lab equipments functioning.
- To learn common troubleshooting methods and testing methods of lab equipments.

Unit - I: Passive and Active components

Resistors - Types - Colorcode - Wattage - Tolerence-Capacitors - Types - Inductors - Transformer - Stepup and step down - Uses - Diode - Ratings - Operation - Transistor - npn and pnp - Switching - Amplifier - Diode and Transistor testing -MOSFET - Types - Testing MOSFET.

Unit - II: Power supply

AC power supply-Parameters-DC power supply design-Regulated power supplies-Single-Dual- Variable voltage-Switched mode power supply-Transformerless power supply design- Design of fuses-Testing and troubleshooting.

Unit - III: Analog Equipments

Variable Resistance Box - Variable Capacitance Box- Variable inductance box - Cathode Ray oscilloscope - Block diagram - Frequency measurement - Function generator - Range of frequencies - Amplitude - Types of waves - Meters - Ammeter-Voltmeter - Testing and trouble shooting.

Unit - IV: Digital Equipments

LED-Current limiting concept-Switches-Types-Logic module-Circuit diagram-Concept of common ground-Pulse generator-Circuit diagram - Active low and Active high pulses - Logic modules interfacing boards-Kits-Testing and troubleshooting methods.

Unit - V: Common chemistry lab equipments

Digital balance-Block diagram-Load cell sensors-pH meter-Electrode specifications-Stirrer-Centrifuge-Rotation Per Minute measurement-Magnetic stirrer with paddle-Block diagram-Ovan-Heating elements.

BOOK FOR STUDY

Material prepared by the department.

Sem. IV **Hours/Week: 4**

14UEL430404 **Credits: 4**

Allied:

APPLIED PHYSICS-II

UNIT - I:

QUANTUM PHYSICS

Introduction - Black body radiation - Compton effect - Matter waves - Hesienberg's Uncertainty principle - Schordinger's wave equation - The electron microscope

UNIT - II:

LASERS

Introduction - Principle of spontaneous emission and stimulated emission - Population inversion - Types of lasers - Industrial applications - Medical application - Holography

UNIT - III:

ULTRASONICS

Introduction - Production of ultrasonic waves - Detection of ultrasonic waves - Properties of ultrasonic waves - Cavitation - Acoustic grating - Industrial applications - SONAR - Non-destructive testing - Medical application

UNIT - IV:

FIBRE OPTICS AND APPLICATIONS

Introduction - Propagation of light in optical fibres - Numerical aperture and acceptance angle - Types of optical fibres - Double crucible technique of fiber drawing - Splicing - Power losses in optical fibres - Fibre optic communication systems - Light sources - Detectors - Fibre optic sensors - Endoscope.

UNIT V:

ELECTROCHEMICAL POWER SOURCES

Basic principles, chemical and electrical energies - inter conversion - changing and discharging - requirements for a good power source - Types of power sources. Primary Batteries: Description of primary cells - alkaline, manganese cells - silver oxide - zinc cells - lithium primary cells - applications. Secondary Batteries: Importance applications - charge discharge efficiency - cycle life - energy density - lead acid batteries for electric vehicles. Fuel Cells: Basic principles - Hydrogen, oxygen fuel cells - gas diffusion electrodes for fuel cells - alkaline fuel cells.

BOOK FOR STUDY

1. ENGINEERING PHYSICS - D.K. BHATTACHARYA & A. BHASKARAN
2. Hamann C.H. Hamnett A., and Vielstich W., Electrochemistry.
3. Hibbert D.B., Introduction to electrochemistry.

Section

UNIT	SECTION
Unit – 1	4.1 – 4.7
Unit – 2	2.1 – 2.7
Unit – 3	1.1 – 1.10
Unit – 4	3.1 – 3.12
Unit – 5	By Internet

Sem. IV **Hours/Week: 2**
14UPH430405 **Credits: 2**

Allied:
APPLIED PHYSICS PRACTICAL

Any 16 of the following

1. Spectrometer - Refractive index of a prism
2. Spectrometer - Grating - Minimum Deviation - Wavelength
3. Field along the axis of a coil - Field
4. Field along the axis of the coil - Moment of a magnet - TAN A
5. Convex lens
6. Concave lens
7. P.O Box - Temperature coefficient - Thermister
8. Carey Foster's Bridge - R and n
9. Potentiometer - Ammeter Calibration
10. Potentiometer - Resistance of a coil of wire R and n
11. BG - Figure of merit & Resistance of the Galvanometer
12. BG - Determination of C
13. Conversion of a Galvanometer into voltmeter
14. Conversion of a Galvanometer into Ammeter
15. Newton's law of cooling
16. K- Forbe's method
17. Resonaters
18. Air Wedge - Thickness of a wire
19. Newton's Rings - Determination of R
20. Sonometer - Frequency

Sem. V **Hours/Week: 5**
14UEL530208 **Credits: 4**

MICROPROCESSOR AND ITS APPLICATIONS

Objective

- To learn the architecture, programming and interfacing of 8085 and 8086 microprocessors in detail and learn briefly about advance processor.

UNIT - I: Architecture of Intel 8085

Architecture of 8085 - Pin description and functions - Instruction and Data flow - Machine cycle - Timing diagram for op-code fetch cycle, memory, I/O Read and write cycles -Interrupt structure and its operation.

UNIT - II: ASSEMBLY PROGRAMMING WITH 8085

8085 addressing modes - Instruction set classification and format - Stack and subroutine - Assembly language programming.

UNIT - III: Intel 8086 Architecture

Intel 8086 architecture - Pin description and function overview - Minimal & maximum mode - Bus activities during read/write operation - Interrupts structure and its operation.

UNIT - IV: INTEL 8086 PROGRAMMING AND advanced porcessors

Instruction set - Addressing modes - Assembly level language programming (ALP) - Comparative study of 286, 386,486 & Pentium processors - Memory Protection and Virtual Memory Concepts.

UNIT - V: Peripheral Interfaces

Address space partitioning - Memory and I/O interfacing - PPI 8255 - UART 8251 -8253 Timer - 8259 interrupt controller - 8237 programmable DMA - 8279 keyboard and display interface controller - Applications Stepper motor and traffic controller using 8085 microprocessor.

BOOK FOR STUDY

1. Ram. B, "Fundamentals of microprocessor and microcomputers", 4th Edition, Dhanpat Rai & Sons.
2. Douglas V. HALL, "Microprocessor and Interfacing", 2nd Edition.
3. Barry B. Brey, "THE INTEL MICROPROCESSORS", 8th Edition, Imprint of PEARSON.

Book for reference

1. Ramesh Goankar, "Microprocessors and its Application", 3rd Edition.

Sections

UNIT	BOOK	SECTION
I	1	3.1 – 3.3.5
II	1	4.1 – 4.6.5
III	3	9.1, 9.6, 9.3 – 9.4
III	2	2.12, 8.1 – 8.39
IV	3	3, 4, 5, 6 (instruction set & addressing modes), 3.1-3.19, 15.2-15.41, 16.2
V	1	7.2, 7.3, 7.6, 7.7, 7.10, 7.11, 7.9, 7.8, 7.12.5

Sem. V **Hours/Week: 5**
14UEL530209 **Credits: 4**

LINEAR INTEGRATED CIRCUITS

Objective

- To learn the principles of operations and applications of Operational amplifier.

UNIT-I: INTEGRATED CIRCUIT FABRICATION AND DIFFERENTIAL AMPLIFIER

Classification - IC chip size and circuit complexity - Fundamentals of Monolithic IC technology - Development of IC - Package types - Basic planar process - Fabrication of a typical circuit - Active and Passive components for ICs - Differential amplifier - Types of configuration - DC and AC analysis.

UNIT-II: OP-AMP THEORY & APPLICATIONS

Op-Amp: Block diagram - Symbol - Ideal Characteristics of an Op-Amp - DC analysis: Bias & offset currents - Offset voltages - CMRR - AC analysis: Slew rate - Frequency response - Basic application: Inverting amplifier - Non-inverting amplifier - Summing amplifier - Subtractors - Integrator - Differentiator - V-I converter - I-V converter - Instrumentation amplifier.

UNIT-III: COMPARATORS AND ITS APPLICATIONS

Comparator: Op-amp as comparator - Zero crossing detector - High-speed comparator - Comparator characteristics - Comparator applications: Schmitt trigger -Window detector - V/F and F/V converters - Peak detector - Clippers and Clampers - Positive and Negative clippers - Small-signal Half wave rectifiers - Positive and Negative clampers - Sample and Hold circuits.

UNIT-IV: WAVEFORM GENERATORS AND FILTERS

Oscillator: Phase shift oscillator - Wien's bridge oscillator - Square wave generator -Triangular wave - Saw tooth waveform generator - Active filter - First order Low-Pass Butter worth filter - First order High-Pass Butter worth filter - Band pass filters - Band reject filter.

UNIT-V: TIMER AND D/A, A/D CONVERTERS

555 Timer: Functional block diagram - Monostable Multivbrators - Astable Multivibrator - VCO - PLL -D/A converters - Binary weighted resistors method - R-2R ladder network method - A/D converters - Successive approximation A/D converter - Flash converter.

BOOKS FOR STUDY

1. Ramakant A. Gayakwad, "Op-amps & Linear Integrated Circuits", 3rd Edition, Prentice Hall India.
2. Roy D. Choudhury, Shail Jain, "Linear Integrated Circuits", 2002 Reprint, New Age International (P) Limited.

BOOK FOR REFERENCE

1. William D. Stanley, "Operational Amplifier with Linear Integrated Circuits", Pearson Education, 2004.
2. Robert F Coughlin, Fredrick, F. Drisold, "Op-amp and linear ICs", 4th Edition, Pearson education, 2002.
3. Albert Paul Malvino, "Electronic Principles", 7th Edition, TMH.

Sections

Unit	Book	Sections
I	1	1.1 –1.7,2.9, 2.10
	2	1.1 - 1.7
II	1	2.2,2.3,2.5,3.3,5.2 – 5.4, 5.11, 6.10, 6.2, 7.5,7.6 – 7.10, 7.12
III	1	9.1 – 9.5, 9.8, 9.9, 9.10, 9.12, 9.14, 9.15
IV	1	8.11 – 8.13, 8.15 – 8.17, 8.2,8.3, 8.5, 8.8, 8.9
V	1	10.4, 10.5, 10.5.1, 8.18, 9.11
	2	10.3.1

Sem. V **Hours/Week: 5**

14UEL530210 **Credits: 4**

MICROCONTROLLERS AND ITS APPLICATIONS

Objective

- To acquire the knowledge about microcontrollers and programming for various applications.

UNIT- I:

Introduction to 8051 Microcontroller

Introduction to Microcontroller - Comparison of Microcontrollers and Microprocessor - overview of 8051- Pin description of 8051 - Registers - Program counters - ROM & RAM space - Stack and PSW - SFR.

UNIT - II:

ON-CHIP PERIPHERALS OF 8051

Counters/Timers - Counter programming - Basics of serial communication - RS232 and MAX 232 IC connection - Serial communication registers - Serial communication - Interrupts - Interrupts registers - Internal and external interrupts programming.

UNIT- III:

8051 ASSEMBLY LANGUAGE programming

8051 addressing modes: Immediate - Register - Direct - Indirect - Instruction set: Arithmetic and logical operations - Call and jump instructions - Bit manipulation instructions -Simple assembly language programs - Data types and directives.

UNIT - IV:

Embedded C Programming with C51 compiler of Keil IDE

Introduction to embedded C - C51 Compiler basics - Compiler related differences from ANSI C - 8051 memory configurations - Local memory model specification - Variables and constants - Simple embedded C programs.

UNIT - V:

Applications of Microcontroller

Matrix keyboard - LCD - ADC - DAC - Temperature monitoring system - Traffic light control system - Stepper motor.

BOOK FOR SUTDY

1. Mazidi and Mazidi, "The 8051 Microcontroller and Embedded Systems", PHI, 2000.
2. Hitex (UK) Ltd. University of Warwick Science Park Coventry "C51 Primer - An Introduction to the Use of the Keil C51 Compiler on the 8051 Family".

BOOK FOR REFERENCES

1. A.V. Deshmuk, "Microcontrollers (Theory & Applications)", TMH, 2005.
2. John B. Peatman, "Design with PIC Microcontrollers", Pearson Education, 2005.

Sections

UNIT	BOOK NUMBER	CHAPTERS	SECTIONS
I	1	1,2	1.1,1.2,2.1-2.7, 5.2
II	1	9, 10, 11	9.1,9.2,10.1-10.3,11.1-11.5
III	1	2, 3, 5, 6	3.1-3.3, 5.1-5.3, 6.1-6.4, 2.2-2.5
IV	2	1,2,3	1,2.1,2.2,3.1,3.2
V	1	12,13	12.1,12.2, 13.1, 13.2, 13.3

Sem. V **Hours/Week: 6**
14UEL530211 **Credits: 4**

Electronics Practicals-III

Operational Amplifier, Communication, Power and Instrumentation, Microprocessor

1. Measurement of Op-amp parameters {Gain, input offset voltage, input offset current, bias current, CMRR, output voltage & slew rate}
2. Op-amp basic operation {Inverting, Non Inverting, Differential, Unity gain and Summing amplifiers}
3. Op-amp based Integrator, Differentiator and Peak Detector.
4. Voltage to Current and Current to Voltage converters using Op-amp.
5. Study of active filters using PSpice.
6. Study of 555 applications using PSpice {Square wave, saw tooth & VCO}
7. Construction and study of Comparators using Op-amp - Inverting, Non Inverting, Zero Cross and Window Detector
8. Solving simultaneous equation using Op-amp.
9. Design of instrumentation amplifier using Op-amp.
10. Full Wave Control of rectifier output using SCR, TRIAC and UJT
11. Construction and study of step up and step down choppers
12. PWM based motor speed control using IGBT.
13. Construction and study of voltage fed inverters using IGBT/SCR.
14. Construction and study of static circuit breakers.
15. Study of AM & FM.
16. Study of PAM, PWM, PPM and PCM.
17. Study of Transmission Line Characteristics.
18. Study of Klystron Oscillator - Microwave.
19. Construction and study of Balanced Modulator.
20. Study of ASK & FSK.
21. Fiber optic communication {NA, Losses, receiver sensitivity}
22. Study of Sensors - I {Thermal & Optical}
23. Study of Sensors - I {LVDT, Hall Effect, Strain Gauge, Flow and Level}.
24. Microprocessor 8085 - Programming I {Data transfer and rotate operations}.
25. Microprocessor 8085 - Programming II {addition, subtraction, multiplication and division}

26. Microprocessor 8085 - Programming III {Code conversion, Gray to Binary, Binary to BCD Binary to Gray, BCD to Binary etc.}
27. Microprocessor 8085 - Programming IV {largest, smallest, sorting in ascending order and descending order}
28. Microprocessor 8085 - Programming V {Using user routines in Monitor program}.

Sem. V **Hours/Week: 4**
14UEL530302A **Credits: 3**

Core Elective-IA

CONTROL SYSTEM

Objective

- To give basic ideas on designing a control system.

UNIT-I:

MATHEMATICAL MODELS OF CONTROL SYSTEM

Control system - Examples of control systems - Mathematical models of control systems - Electrical systems - Electrical analogous of mechanical translational systems (two nodes) - Electrical analogous of mechanical rotational systems - Block diagram - Signal flow graph.

UNIT - II:

COMPONENTS OF CONTROL SYSTEM

Components of Automatic control system - Potentiometer - Synchros - Controllers - Tachogenerators - Modulator and Demodulator - Example.

UNIT - III:

TIME RESPONSE ANALYSIS

Time response - Test signals - Order of a system - Response of first order system for unit step input - Second order system - Time domain specifications - Response with P, PI & PID controllers - Type number of control systems - Steady state error - Static error constants - Steady state error when input is unit step, unit ramp and unit parabolic signal - Generalized error coefficients - Correlation between static and dynamic error coefficients.

UNIT - IV:

FREQUENCY RESPONSE ANALYSIS

Frequency response - Frequency domain specifications - Estimation of frequency domain specifications for II order system - Correlation between time and frequency response - Frequency response plots - Bode plot - Polar plot - Nichols plot - M & N circles - Nichols chart.

UNIT - V:
CONCEPTS OF STABILITY AND ROOT LOCUS

Definitions of stability - Location of roots on the S-plane for stability - Routh Hurwitz criterion - Mathematical preliminaries for Nyquist stability criterion - Relative stability - Gain margin root locus.

BOOK FOR STUDY

1. Nagoor Gani. A, “Control system”, 1st Edition, RBA publications, 2006.

BOOKS FOR REFERENCE

1. M. Gopal, “Control system Principles and design”, TMH, 1998.
2. B.C. Kuo, “Automatic Control Systems”, 7th Edition, PHI,1995.

Sections

UNIT	BOOK	SECTIONS
I	1	1.1 – 1.3, 1.6,1.9 – 1.12
II	1	2.1 – 2.4, 2.9 – 2.10, EXAMPLE 2.4
III	1	3.1 – 3.3, 3.5 – 3.15, 3.17
IV	1	4.1 – 4.8, 4.10, 4.11
V	1	5.1 – 5.5, 5.7,5.8

Sem. V **Hours/Week: 4**
14UEL530302B **Credits: 3**

Core Elective-IB
DIGITAL SIGNAL PROCESSING

Objective

- To impart the algorithms of Signal Processing.

UNIT-I: DISCRETE TRANSFORMS

Introduction to Digital Signal Processing - Discrete Transforms - Discrete-Time Fourier Transform (DTFT), Discrete Convolutions: Linear, Circular and Sectioned Convolution - Discrete Fourier Transform - Properties - Frequency Analysis of Signals using DFT - Decimation-in-Time - FFT algorithms - Inverse FFT.

UNIT-II: FINITE IMPULSE RESPONSE (FIR) FILTERS

Symmetric and anti-symmetric FIR filters - Design of linear-phase FIR filters using windows: Rectangular - Blackman - Hamming - Hanning - Design of linear-phase FIR filters by frequency-sampling method - Optimum equi-ripple linear-phase FIR filter - Comparison of design methods for linear-phase FIR filter.

UNIT-III: INFINITE IMPULSE RESPONSE (IIR) FILTERS

IIR filter design by approximation of derivatives - Impulse invariance method - Bilinear transformation - Characteristics of analog filters: Butterworth - Chebyshev - Frequency transformation in the analog and digital domain.

UNIT-IV: ARCHITECTURE OF FIXED POINT PDSP

Multiplier and multiplier accumulator (MAC) - Modified bus structure and memory access schemes - Multiple access memory - Multi ported memory - VLIW architecture - Pipelining - Special addressing modes in PDSP’s - On-chip peripheral - Architecture of TMS 320 C5X.

UNIT-V: ASSEMBLY LANGUAGE INSTRUCTION AND PROGRAMMING

Syntax - Addressing modes - Load / Store instruction - Addition/Subtraction instruction - Move Instruction - Multiplication instruction - NORM instruction - Program control instruction - Peripheral control - Program for familiarization of the addressing modes - Program for familiarization of the arithmetic instruction - Real time signal processing program.

BOOKS FOR STUDY

1. Ramesh Babu P., "Digital Signal Processing", 4th Edition, Scitech Publication Pvt. Ltd, 2007.
2. Venkataramani B, Bhaskar M., "Digital signal processors - Architecture, Programming and Applications", 1st Reprint, TATA McGraw Hill, 2003.

BOOK FOR REFERENCE

1. John G. Proakis, Dimitris G. Manolakis, "Digital Signal Processing Principles, Algorithm and Applications", 4th Edition, PHI, 2007.
2. Alan V. Opphenehim, Ronald W. Schafer, "Digital Signal Processing", 2nd Edition, PHI, 2004.
3. Salivahanan S, Vallavaraj A, Gnanapriya C, "Digital Signal Processing", Tata McGraw Hill Publishing, 2003.
4. Poornachandra S., "Signals and System", Vijay Nicole imprints Pvt. Ltd., 2004.

Sections

Unit	Book	Sections
I	1	3.4,3.6 – 3.9, 4.1 - 4.4
II	1	6.1, 6.2, 6.6, 6.9, 6.10
III	1	5.1 – 5.13
IV	2	2.1-2.8,3.1-3.14
V	2	4.1- 4.9,6.2- 6.4

Sem. V **Hours/Week: 2**
14UEL540601 **Credits: 2**

Skill Based Elective-I
ENTREPRENEURIAL ELECTRONICS

Objective

- To empower the design and trouble shooting skills in electronics.

Unit - I: Introduction To Electrical Technology

Introduction to Electricity-Alternating Current Based System - Single Phase - 3 Phases - Dc Signal - Dc Source - Fundamentals - Voltage, Current and Power-Power Factor-Passive Components.

Unit - II: Measuring Instruments

Introduction to Multimeter - Analog Multimeter - Digital Multimeter - Voltage Measurement - Current Measurement -Resistance Measurement - Cathode Ray Oscilloscope - Frequency Calculation - Function Generator - Calibration.

Unit - III: Active Components

Diode - Half Wave Rectifier - Switching Circuits - Transistor - NPN testing - PNP testing - Transistor Amplifier-Oscillator - Metal Oxide Semiconductor Field Effect Transistor -Introduction - MOSFET Types - Testing MOSFET - Switching Circuits Based On MOSFET.

Unit - IV: Servicing and Trouble Shooting

Soldering and De-Soldering Techniques - Pretreatment-Precaution During Soldering And Desoldering - Dc Power Supply Design - Single - Dual - Variable Voltage - Printed Circuit Board - Layout Drawing.

Unit - V: Hobby Circuits

Circuit Design Basics - Amplifier Circuits - Applications - Oscillator Circuits - Automated Switching Circuits - Relay Based Circuits - Opto-Coupler Based Circuits - Timer / Counter Based Circuits.

BOOKS FOR STUDY

Material prepared by the department.

Sem. V **Hours/Week: 2**
14USS540701 **Credits: 2**

IDC:

SOFT SKILLS

Objectives

This course is aimed at introducing the students to the nuances of developing the basic skills that required of an educated youth; and to train them to present the best of themselves as job seekers.

Module 1:

Effective Communication & Resume Writing

Basics of communication - definition of communication, Barriers of Communication, Non-verbal Communication; Effective Communication - Johari Window, The Art of Listening, Conversation Techniques, Good manners and Etiquettes.

Module II:

Resume Writing & Interview skills

Resume Writing: What is resume? Types of Resume - Chronological, Functional and Mixed Resume, Steps in preparation of Resume. Interview Skills: Common interview questions, Attitude, Body Language, The mock interviews, Phone interviews, Behavioral interviews.

Module III:

Group Discussion

Group Discussion Basics, GD Topics for Practice, Points for GD Topics. Personal Effectiveness: Self Discovery; and Goal Setting

Module IV:

Numerical Ability

Average, Percentage; Profit and Loss, Simple Interest, Compound Interest; Time and Work, Pipes and Cisterns; Time and Distance, Problems on Trains, Boats and Streams; and Calendar, Rations and Proportions.

Module V:

Test of Reasoning

Verbal Reasoning: Series Completion, Analogy; Data Sufficiency, Assertion and Reasoning; and Logical Deduction. Non-Verbal Reasoning: Series; and Classification

References

1. Aggarwal, R.S. 2010. A Modern Approach to Verbal and Non Verbal Reasoning. S.Chand, New Delhi.
2. Covey, Stephen. 2004. 7 Habits of Highly effective people, Free Press. Egan, Gerard. (1994). The Skilled Helper (5th Ed). Pacific Grove, Brooks/Cole.
3. Khera, Shiv 2003. You Can Win. Macmillan Books , Revised Edition.
4. Murphy, Raymond. 1998. Essential English Grammar. 2nd ed., Cambridge University Press. Sankaran, K., & Kumar, M. Group Discussion and Public Speaking. M.I. Pub, Agra, 5th ed., Adams, Media.
5. Trishna's 2006. How to do well in GDs & Interviews, Trishna Knowledge Systems.
6. Yate, Martin. 2005. Hiring the Best: A Manager's Guide to Effective Interviewing and Recruiting.

Sem. VI **Hours/Week: 6**
14UEL630213 **Credits: 4**

POWER ELECTRONICS

Objectives

- To learn the operative principles of power electronic devices and their applications.

UNIT-I: POWER SEMICONDUCTOR DEVICES & CHARACTERISTICS

Power semiconductor devices: basic structure - Power diode - Power transistors - Power MOSFET - IGBT - physics of device operation and steady state characteristics.

Thyristor: Principle of operation -two transistor analogy - Protection against high di/dt and high dv/dt - turn on and turn off methods - gate triggering circuits - series and parallel operation of thyristors - methods to ensure proper current and voltage sharing- string efficiency.

UNIT-II: PHASE CONTROLLED RECTIFIERS

Principles of phase control - Single phase half wave circuit with R, RL and RLE load - freewheeling- Single-phase full wave controlled converters - single phase semi converters- estimation of load voltage, load current under continuous current conduction.

Three phase half controlled and fully controlled converter circuits - waveform and average load voltage for continuous current operation.

UNIT-III: CHOPPERS, AC VOLTAGE CONTROLLERS AND DUAL CONVERTERS

Chopper: Principle of chopper operations - Control strategies - step up and step down choppers-quadrant operation-estimation of load voltage and load current for continuous current operation.

AC voltage controllers: Principle of phase control & Integral cycle control - Single phase AC voltage controller with R,RL load -Two stage sequence control of Voltage controllers for R Load.

Dual-converters: Principles of operations - Ideal Dual converter - Practical dual converter.

UNIT-IV: INVERTERS AND DUAL CONVERTERS

Inverters: Classification of inverters- Voltage source inverters - single phase half bridge and full bridge inverters -Three phase voltage source inverters for 1200 and 1800 conduction mode-current source inverters - single phase CSI with ideal switches -Single phase capacitor commutated CSI with R load - series Inverter - Parallel inverter.

Cyclo-converters: Principles of operations - Single phase to single phase circuit step-up cyclo-converters - Single phase to single phase step-down converters.

UNIT-V: VOLTAGE CONTROL OF INVERTERS AND SOME APPLICATIONS

Voltage control- External control of ac output voltage- external control of dc input voltage - Internal control of Inverters- Pulse width modulated inverters. Applications-Switched mode power supply - UPS- Static switches - Static circuit breakers - solid state relays.

Book for study

1. Dr. Bimbhra, "Power Electronics", Khanna publishers, 4th edition, 2006.

BOOK FOR REFERENCES

1. Rashid , M H "Power Electronics" Pearson education.
2. MD singh "Power Electronics" Tata McGraw Hill, New Delhi.

Sections

UNIT	BOOK	CONTENTS
I	1	2.2,2.3,2.5,2.6,2.7 4.1,4.2,4.4,4.10
II	1	6.1,6.1.1-6.1.3,6.7.1.1-6.7.1.2,
III	1	7.1,7.2,7.3,7.4. 9.1,9.2,9.3.1,9.3.2,9.4.1 6.10,6.10.1-6.10.2
IV	1	8.1,8.2,8.4,8.8,8.8.1,8.8.2,8.9,8.10 10.1,10.1.1,10.1.2
V	1	8.5.1,8.5.2,8.5.3,8.6,11.1,11.2,11.4,11.6

Sem. VI **Hours/Week: 5**

14UEL630214 **Credits: 4**

COMMUNICATION SYSTEM

Objective

- To learn the various analog modulation techniques
- To get expertise on digital communication system based on digital modulation and error coding techniques

UNIT - I: AMPLITUDE MODULATION

Modulation - Types of modulation (AM, FM and PM) - Mathematical expression for AM wave - Side frequencies - Modulation index - power relationship - component phasor of AM signal - spectrum of AM wave.

Generation of AM waves - Linear modulation - collector, base and emitter modulation - Square law modulator - Balanced modulator - SSB - SC generation - VSB. Demodulation of AM waves - Envelope and synchronous detector.

UNIT- II: FREQUENCY AND PHASE MODULATION

Angle modulation - Phase and frequency modulation - Mathematical representation of FM and PM - Frequency spectrum of FM - Bandwidth of FM: Bessel's identity - Carson's rule - spectrum of Narrow Band and Wide Band FM. Generation of FM - Direct and indirect method - Relationship between FM and PM - Pre-emphasis and de-emphasis in FM. Demodulation of FM waves - Slope detector - Balanced slope detector - Foster - Seeley discriminator - Ratio detector - Amplitude limiter.

UNIT - III: TRANSMITTER AND RECEIVERS

Block schematic study of transmitters - AM transmitter - High level and low level AM transmitters - SSB-SC transmitter - FM transmitter - Direct and indirect FM transmitters. Block schematic study of receivers - Types - Superheterodyne receiver -Double conversion receiver - Choice of IF frequencies - Tracking - Alignment - AGC - AFC - Characteristics of receivers - communication receivers.

UNIT - IV: PULSE MODULATION

Sampling process - PAM - other forms of pulse modulation - Bandwidth - Noise trade off - Quantization - PCM - Noise considerations in PCM systems - TDM - Digital multiplexers - Virtues, limitation and modification of PCM modulation - Linear prediction - Differential pulse code modulation - delta modulation - Adaptive Delta Modulation.

UNIT - V: BASEBAND PULSE TRANSMISSION

Matched filter - Error Rate due to noise - Inter-symbol Interference - Nyquists's criterion for distortion less base band binary transmission - Correlative level coding - Base band M array PAM transmission - Adaptive equalization - Eye patterns.

BOOKS FOR STUDY

1. Kennedy and George Davis, "Electronic Communication Systems", 4th Edition, 1999.
2. Dennis Roddy and John Coolen, "Electronic Communications", 4th Edition, PHI, 1997.
3. Simon Hawkins, John Wiley, "Communication systems", 4th Edition, 2001.

BOOKS FOR REFERENCE

1. R.P. Singh and S.D. Sapre, "Communication Systems Analog and Digital",Tata McGraw Hill, 1995.
2. Anokh Singh, "Principles of communication Engineering", S. Chand and Co., Ltd., 1994.
3. Taub and Schilling, "Principles of communication", 2nd Edition, McGraw Hill, 1989.
4. B.P.Lathi, "Modern Digital and Analog Communication Systems", 3rd Edition, Oxford Series, 1998.
5. Bernard Sklar, Pearson education, "Digital communications Fundamentals and applications", 2nd Edition, 2001.
6. Sam K. Shanmugam, John Wiley, "Analog and Digital Communication".
7. John G. Proakis, "Digital Communication", McGraw Hill, 3rd Edition, 1995.

Sections

UNIT	BOOK	SECTIONS
I	2	CHAPTER 2,4
II	1	CHAPTER 4.1
III	1 2	CHAPTER 5.1 CHAPTER 11
IV	3	3.1 – 3.15
V	3	4.1– 4.7, 4.10, 4.11

Sem. VI **Hours/Week: 5**
14UEL630215 **Credits: 4**

SENSORS, TRANSDUCERS AND MEASUREMENTS

Objective

- To expose the fundamentals of instrumentation and the working principle of sensors and transducers.

Unit - I: Introduction to Measurements and Sensing Fundamentals

Measurements - Significance - Concept of Direct and Indirect Measuring Methods -Static and Dynamic Characteristics of Sensors - Mechanical, Thermal and Electrical Dynamic Models of Sensor Elements - Positions of Sensors in a Data Acquisition System - Advantages of Sensors - Classifications of Transducers - Primary and Secondary Transducers - Characteristics of Transducers.

UNIT-II: TRANSDUCERS AND PRIMARY SENSING ELEMENTS

Transducers - Electric transducers - Classification of transducers - Characteristics and choice of transducers - Factors influencing the choice of transducers - Resistive transducers - Strain gauges - Resistance thermometers - Thermistors - Thermocouples - Principle of LVDT - Capacitive transducers -Principle of peizo electric transducers - Principle of hall effect transducers - Magneto resistors.

Unit-III: Measurement of Non-Electrical Quantities

Measurement of pressure: using electrical transducers as secondary transducers - Low pressure: Pirani gauges - Measurement of linear velocity (moving magnet type) - Measurement of angular velocity (D.C. Tachometer generators and Digital methods) - Measurement of vibrations - Seismic transducers - Measurement of liquid level - Measurement of thickness - Measurement of Humidity - Gas analyzer.

Unit - IV: Electronic Instrumentation

DC Ammeter - Multirange ammeter - Ayrton Shunt - Basic Meter as DC voltmeter - DC Voltmeter - Multirange Voltmeter - Loading - Transistor Voltmeter - Micro Voltmeter - AC Voltmeter using rectifiers - Series Ohmmeter - Shunt Type Ohmmeter - Multimeter - Oscilloscopes - Basic principles - Block diagram of oscilloscopes - Vertical Amplifier - Horizontal deflecting system - Delay line triggered sweep.

Unit - V: Biomedical Instrumentation

Resting Potential - Action Potential - Human Physiological Systems - Electrocardiogram (ECG) - ECG Measurement Techniques - Defibrillators - Pacemakers - Electroencephalography (EEG) - Medical Imaging Techniques - Computer Tomography (CT) - Magnetic Resonance Imaging (MRI) - Endoscopy - Applications of Lasers in Medical Instrumentation.

BOOKS FOR STUDY

1. A. K. Sawhney, "Electrical and Electronics Measurements and Instrumentation", Dhanpat Rai and company, 2001.
2. H.S. Kalsi, "Electronics Instrumentation", 2nd Edition,TMH, 2004.
3. Dr. M. Arumugam, "Biomedical Instrumentation", 2nd Edition, Anuradha Publications.

Book FOR REFERENCE

1. Jacob Fraden, "Handbook of Modern sensors - Physics, Designs and applications", 3rd Edition, Springer, 2004.
2. Donald P. Eckman, "Industrial Instrumentation" - CBS Publishers, 2004.
3. D.Patrabnabis, "Principles of Industrial Instrumentation", 2nd Edition, Tata McGraw-Hill, 2000.
4. V.N.Bindal,"Transducers for Ultrasonic Flaw detection", Narosa Publishing House, 1999.
5. Leslie Cromwell, Fred J. Werbell and Eruch A. Pfeiffer - "Biomedical Instrumentation and Measurements", 2nd Edition, PHI, 2005.

Sections

UNIT	BOOK	SECTIONS
1	1	1.1– 1.3, 2.3,2.6, 2.7, 2.10, 2.11, 2.13, 2.15, 2.17, 2.18, 2.19, 4.1,4.4-4.6, 25.8,25.9
2	1	25.6 – 25.11, 25.16, 25.19, 25.20, (25.20.1, 25.20.2, 25.20.3), 25.21, 25.24, 25.28 – 25.31
3	1	29.17, 29.16.2, 29.21.1, 29.22.1, 29.22, 29.24, 29.25, 29.41, 29.43, 29.44, 29.47
4	2	3.1 – 3.5, 4.2 – 4.8, 4.12, 4.21 – 4.25, 7.2 – 7.4, 7.6, 7.7, 7.10
5	3	4.31, 5.5, 5.2, 10.7, 10.4

Sem. VI **Hours/Week: 6**
14UEL630216 **Credits: 4**

Electronics Practicals-IV

Microprocessor Interfacing, Microcontrollers VLSI & DSP

1. Microprocessor Interfacing - Input and Output using8255 PPI
2. Microprocessor Interfacing - 8253.
3. Microprocessor Interfacing - Traffic Controller.
4. Microprocessor Interfacing - Stepper Motor Controller.
5. Writing Keil C program and to study its equivalent disassembly codes in ASM.
6. Microcontroller program I {Data transfer}
7. Microcontroller program II {Arithmetic and Logical}
8. Microcontroller program III {Code conversion}
9. Interfacing microcontroller with LED for pattern generation
10. Interfacing matrix keypad with a microcontroller.
11. Study of Timers in 8051 microcontroller.
12. Study of Counters in 8051 microcontroller.
13. Study of interrupts in 8051 microcontroller.
14. Study of serial communication in 8051 microcontroller.
15. Interfacing ADC with 8051 microcontroller.
16. Interfacing LCD with 8051 microcontroller.
17. Interfacing RTC DS1307 with 8051 microcontroller
18. Interfacing printer with 8051 microcontroller.
19. Frequency measurement using 8051.
20. Implementing Full adder, Full subtractor, Multiplier, divider and ALU in FPGA.
21. Implementing clock divider, pulse counter (for delay program) shift register and barrel shifter.
22. Implementing soft-core processor in FPGA (NIOS-II, Microblaze, Picoblaze, Mico8)
23. Designing standalone CPLD system for interfacing stepper module using XC9572XC CPLD
24. MATLAB Programming I: Waveform/signal generation (sine wave, square wave, saw tooth wave, AM wave, unit impulse, unit step, Ramp signal and exponential)

25. MATLAB Programming II: Linear convolution, circular convolution, autocorrelation and cross correlation.
26. MATLAB Programming III: Discrete Fourier and inverse discrete Fourier, fast Fourier and inverse fast Fourier transform.
27. DSP programming I.
28. DSP programming II.
29. Study of IIR filter.
30. Study of FIR filter.

Sem. VI **Hours/Week: 4**
14UEL630303A **Credits: 3**

Core Elective-2A

EMBEDDED SYSTEM

Objective

- To learn about different processors, devices and RTOS.

UNIT - I : INTRODUCTION TO EMBEDDED SYSTEMS

Embedded system - Embedded hardware units and devices in a system - Embedded software in a system - Classification of embedded system - Introduction to advanced architectures - Processor and memory organization - Instruction level and parallelism - Performance metrics.

UNIT - II: DEVICES AND COMMUNICATION BUS

I/O types and examples - Serial communication device - Parallel device ports - Serial bus communication protocol - Internet enabled system - Network protocol - Wireless and mobile system protocol.

UNIT-III: MODELING AND INTERPROCESS COMMUNICATION

Program models - DFG models - UML modeling - Multiple process in application - Multi thread in application - Task - Task state - Task and data - Semaphores function - Message queue function - Mailbox function - Pipe function - Socket function

UNIT - IV: FUNDAMENTALS OF REAL TIME OPERATING SYSTEMS

Characteristics of RTOS & its types: key characteristics of RTOS - Concurrency Vs parallelism - Scheduling algorithm (round-robin - Preemptive priority) - Pseudo codes for IPC objects - Critical session - Deadlocks and its avoidance.

UNIT- V : SPECIFIC REAL TIME OPERATING SYSTEMS

Basic types and function of RTOSE S - Study of Windows CE - Windows CE features - Programming - memory management - Files and registry - database - Process, Threads and IPs - Inputs from keys, Touch screen or mouse - Communication and Network - Socket and communication function - API programming - Creating windows - Linux 2.6x and RT Linux - Real time Linux functions - RTLinux.

BOOKS FOR STUDY

1. Qing Li, “Real time Concepts for Embedded Systems”, CMP Books, 2003.
2. Rajkamal, “Embedded Systems Architecture, Programming and Design”, TATA McGraw-Hill, First reprint Oct. 2003.

BOOK FOR REFERENCE

1. Steve Heath, “Embedded Systems Design”, 2nd Edition, 2003, Newnes.
2. David E.Simon, “An Embedded Software Primer”, Pearson Education Asia, First Indian Reprint 2000.
3. Frank Vahid and Tony Givargis, “Embedded Systems Design - A unified Hardware / Software Introduction”, John Wiley, 2002.

Sections

UNIT	BOOK	SECTIONS
1	2	1.1-1.4, 1.8 -1.9, 1.11, 2.3-2.9
2	2	3.1- 3.10, 3.12, 3.13, 4.1-4.4, 4.6, 4.8, 4.9
3	2	6.1- 6.5, 7.1-7.15
4	1	4.1-4.8,5.1-5.7,7.1-7.8,8.1-8.3,11.2,11.3,11.5, 11.7
5	2	9.1,9.2,10.1,10.3,11.2,11.3,12.2, 12.3

Sem. VI **Hours/Week: 4**
14UEL630303B **Credits: 3**

Core Elective-2B

VLSI DESIGN AND VHDL PROGRAMMING

Objective

- To learn the basics of VLSI technology and VHDL programming.

UNIT - I: SEMICONDUCTOR DEVICES FOR VLSI TECHNOLOGY

Basic MOS transistor - enhancement and depletion mode transistor action - NMOS fabrication - CMOS fabrication - BICMOS technology - Pass transistor - nMOS inverter, CMOS and BICMOS inverter - latch-up in CMOS & BICMOS circuits - MOS layer - Stick diagram - design rules and layout diagram - Lambda based design rules - contact cuts - Double metal MOS process rules - CMOS lambda based design rules- symbolic diagram.

UNIT - II: SCALING AND TESTING FOR VLSI SYSTEM

Basic circuit concepts - Sheet resistance - Capacitance - delays - driving large capacitive loads - propagation delays - wiring capacitance -Scaling factor for device parameter factors - limitation of scaling - switch logic — Pass transistors and transmission gates - gate logic - the inverter -CMOS logic - Pseudo nMOS logic - Dynamic CMOS logic - Clocked CMOS - CMOS domino logic - n-p CMOS logic - real world VLSI design - Design styles and philosophy - The interface with the fabrication house - cad tools for design and simulation - aspects of design tools - Graphical entry layout - Design verification prior to fabrication - DRC - circuit extractors - test and test ability - System partitioning.

UNIT - III: DESIGN STYLES IN VHDL

Behavioral Modeling: Entity declaration - architecture body - process statement - variable assignment statement - Signal assignment statement - wait, if, case, null, loop, exit, next, assertion statement - more on signal assignment - other sequential statements - multiple process - postponed processes - Dataflow Modeling: concurrent signal assignment - Concurrent Vs Sequential signal assignment - delta delay revisited - multiple drivers - Conditional signal assignment - selected signal assignment - Structural Modeling: Component declaration - component instantiation.

UNIT - IV: GENERICS, SUBPROGRAM AND PACKAGES

Identifiers - data objects - data types - operators- generics - sub programs - package declaration - package body - design file - design libraries - implicit visibility - explicit visibility - attributes - writing a test bench - state machine modeling - interfacing state machines.

UNIT - V: CIRCUIT DESIGN AND SIMULATION USING QUARTUS-II IDE

Architecture of CPLD and FPGA - Survey of CPLD and FPGA - Introduction to Quartus II IDE- creating project - loading programs - compiling - functional and timing simulation -Using DE1 kit- Features of DE1kit - implementing the design in DE1 - interfacing a LCD with DE1 - Interfacing seven segments - interfacing ADC0808 with DE1 kit - Interfacing DE1 with switches.

BOOKS FOR STUDY

1. Douglas A. Pucknell & Kamran Eshraghian, “Basic VLSI Design”, 3rd edition, Prentice hall of India pvt Ltd, New Delhi
2. A VHDL Primer by J.Bhasker, third edition, PHI learning Private Limited, 2009, New Delhi.

BOOK FOR REFERENCE

1. Clive “Max” Maxfield,”Design Warriors Guide to FPGAs”, Elsevier, 2004.
2. Eugene D.Fabricius “Introduction to VLSI Design” McGraw Hill, 2002.
3. Randall L.Geiger, Phillip E.Allen and Noel R.Strader, “VLSI Design Techniques for Analog and Digital Circuits”, McGraw Hill, 2002.
4. Neil H.E.Weste and Kamran Eshraghian-”Principles of CMOS VLSI Design”-(2nd ed), 2004.
5. Douglas L. Perry, “VHDL programming by example”, 4th edition, Tata McGraw Hill, New Delhi.
6. Z.Nawabi, “VHDL Analysis and Modeling of Digital Systems” - McGraw Hill, 1998.
7. M.J.S.Smith, “Application Specific Integrated Circuits”, Addison Wesley, 1997.

Sections

UNIT	BOOK	SECTIONS
1	1	1.1 – 1.11, 2.5-2.10, 2.12.3- 2.14, 3.1-3.3.4, 3.8
2	1	4.1-4.11, 5.1-5.6, 6.1-6.3.4.5, 10.8-10.13.4.2
3	2	Chapter 4, 5.1 – 5.6, 6.2, 6.3
4	2	Chapter 3, 7.1, 8.1, Chapter 9, 10.7, 11.2, 12.8, 12.9
5		Material Prepared by the Department of Electronics

Sem. VI **Hours/Week: 2**
14UEL640602 **Credits: 2**

Skill Based Elective-II

PC ASSEMBLING

Objective

- To learn the organization of personal computer
- To learn assembling and installation

Unit 1: PC Organization

Introduction to computer hardware - Components of mother boards- Connectors types: onboard - Front panel -Back panel -ports- slots - Basics of add on cards-BIOS.

Unit 2: Power supply

Power supply unit - SMPS outputs - Voltage measurements- CPU connector - Motherboard connector and device connectors- cabinet types - AT, ATX, BTX, SFF, ITX and its form factor - Types of cases - Tower case - desktop case - portable case.

Unit 3: Memories

Semiconductor memory- ROM-PROM-EPROM- RAM-Virtual memory- Cache memory- Linear and Physical memory- video memory- Secondary memories: Floppy-HDD-CD Rom- CD-RW- DVD.

Unit 4: Input and Output devices

Input devices-keyboard- mouse- types of mouse- DIN/PS2 port- Serial port-parallel ports-USB ports- Output devices- monitor- Printer - Organization and connectors.

Unit 5: Assembling and Installation

PC Assembling -Bios setting - Booting sequence setting- Installation Menu-Selection- Partitioning- Formatting-Copying and installation- Account creation- Device driver installation.

BOOK FOR STUDY

Material prepared by the department.

Sem. VI

14UEL630218 **Credits: 2**

COMPREHENSIVE EXAMS

Unit I: Electric circuit theory

DC circuit analysis-KCL-KVL-Series and parallel circuits-Network theorem-Thevenin-Norton-Superposition-Reciprocity-Sinusoidal analysis-Terminologies-RLC series and parallel circuits-Different kinds of power-Transient analysis-RL-RC and RLC-Network topology-Tie set and cut set.

Unit II: Electronic Devices

Diodes-PN junction-Zener diode-Varactor diode-Tunnel-Schottky diode-PIN diode-Transistor configurations-a-b-g relationship-FET characterestics and amplifier- MOSFET-types-MOSFET Switches- UJT-characterestics-standoff ratio-SCR-TRIAC-DIAC-IGBT-LED-LCD.

Unit III: Digital electronics

Number system-Decimal-Octal-hexadecimal-Conversion-Logic gates-minimization technique-K-Map- Quine McCluskey-Combinational circuits-Adder-Subtractor-Encoder-Decoder-Sequential circuits-Latch-Flipflop-up/down counter-synchronous counter-Asynchronous counter-Shift register.Memory devices-RAM-ROM-PROM-EEPROM

Unit IV: Microprocessors and Mircrocontroller

Microprocessor 8085-Architecture-Instruction set-Assembly level programming-Interfacing Peripheral IC’s-8251-8253-8259-8237-8279-Microcontroller 8051-Architecture-Instruction set-Assembly level programming-ADC and DAC interfacing.

Unit V: Control system and communication system

Mathematical models of control system-Block diagram-Simplification-signal flow graph-Automatic control system-Feedback system-sensors-Time response of system-P,PI.PID controllers-Stability analysis-Routh Hurwitz-Root locus method-Bode plot-Nichols chart.

Modulation: AM, FM and PM techniques-Demodulation: AM and FM - Pulse modulation technique - Fibre optic communication - Single mode and multimode operation -Modulation techniques.

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