

**CMS COLLEGE OF SCIENCE & COMMERCE**  
(AUTONOMOUS)

An ISO 9001:2008 certified institution and accredited at the 'A' level by NAAC  
Chinnavedampatti, Coimbatore-641 049.

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**DEPARTMENT OF ELECTRONICS**

**B.Sc., Electronics and Communication Systems**



**SYLLABUS**

**SCHEME OF EXAMINATION (CBCS)**

2010 Batch

# **DEPARTMENT OF ELECTRONICS**

## **B.Sc., Electronics and Communication Systems**

### **REGULATION**

#### **INTRODUCTION**

An organization requires Industry specific engineers for research, service and promotion of sales. Challenging professions requires young dynamic people who are more than “subject tuned”. We in CMS have realized this and claim ourselves as a unique Institution bringing forth Industry tuned Executives and Engineers.

The Department of Electronics was set up in the year 1993 has been offering UG programme in Electronics ever since its inception and PG programme from 2004. The Department of Electronics has the state – of – the art facilities. It has all modern gadgets to impart the latest in Electronics to the students. At the PG level we impart training to get hands on experience in Micro-controllers, VLSI Design & VHDL, Embedded Systems and Digital Signal Processing.

The uniqueness of our system is that we provide practical training to make them priggish in their trade. We provide advanced information through Guest Lecturers drawing resources persons from the corporate world and industry.

#### **OBJECTIVES**

1. To mould the overall personality of the students.
2. To enable and strengthen the technical skills of students to face the Industry.
3. To meet the professionalism of Industry.
4. Giving placement Assistance.

## **ELIGIBILITY: UG COURSE**

- a) A pass in Higher Secondary Examination with Mathematics, Physics, Chemistry as subjects of study or any other examination accepted as equivalent there by the syndicate or A pass in I or II Group or Vocational Group in Higher Secondary Examination with Mathematics /Physics/Chemistry and any other subject related to Electronics.
- b) A pass in Higher Secondary Examination with Physics/Botany/Zoology.
- c) A pass in Higher Secondary Examination with Mechanist or Electrical Motor Winding.
- d) A pass in Higher Secondary Examination.

## **DURATION OF UG COURSE**

The course shall extend over a period of three years comprising or six semesters, with two semesters per year.

There shall not be less than ninety instructional days during each semester. Examination shall be conducted at the end of each semester for the respective subject.

## **EXAMINATIONS**

Students of **UG** course are valuated in each theory and practical paper through **Five Components**

### **Component - I (For THEORY of 100 Marks)**

- a) Continuous Internal Assessment (CIA) carrying a maximum of **25** marks.
- b) End of Semester Examinations (ESE) carrying a maximum of **75**marks.

### **Component – II (For THEORY of 75 Marks)**

- a) Continuous Internal Assessment (CIA) carrying a maximum of **20** marks.
- b) End of Semester Examinations (ESE) carrying a maximum of **55** marks.

### **Component - III (For PRACTICAL)**

- a) Continuous Internal Assessment (CIA) carrying a maximum of **40** marks.
- b) End of Semester Examinations (ESE) carrying a maximum of **60** marks.

### **Component – IV (For PROJECT)**

- a) Continuous Internal Assessment (CIA) carrying a maximum of **30** marks.
- b) End of Semester Examinations (ESE) carrying a maximum of **120** marks.

### **Component - V (Both Theory and Practical)**

- a) **Credits** are allotted to each subjects based on the Marks allotted for the subject.
- b) The total credits allotted for UG is **140**.

#### **Note:**

1. The Continuous Internal Assessment marks are not allotted for **Non-Major Elective** Subjects and Evaluation is done only though End Semester Examination.
2. The Continuous Internal Assessment marks are not allotted for **Environmental Studies** subjects and Evaluation is done only through End Semester Examination.
3. The Continuous Internal Assessment marks are not allotted for **Value Education Subject** and Evaluation is done only through End Semester Examination.
4. The Continuous Internal Assessment marks are not allotted for **Extension Activity** and Evaluation is done only through Participation in **Sports /NSS/NCC etc.,**

**CMS COLLEGE OF SCIENCE AND COMMERCE**  
**DEPARTMENT OF ELECTRONICS**  
**Distribution of the Marks and Credits under CBCS for UG Programme**

<b>PART</b>	<b>SUBJECT</b>	<b>No of Papers</b>	<b>Marks @</b>	<b>Credits</b>
<b>I</b>	<b>Language –I</b> Tamil /Malayalam/Hindi/French	2	200	8
<b>II</b>	<b>Language –II</b> English	2	200	8
<b>III</b>	<b>Core</b> Subjects	19\$	1700	68
	<b>Allied</b> Subjects	4**	400	16
	<b>Skill Based</b> Subjects	4	300	12
	<b>Elective</b> Subjects	3	300	12
	<b>Project viva – voce</b>	1	150	6
<b>IV</b>	<b>1-Non-Major Elective</b>			
	<b>Elective –I</b> Tamil/Advanced Tamil/ Communicative English	2	100#	4
	<b>Elective –II</b> Tamil/Advanced Tamil/ Communicative English			
	<b>2- Environmental Studies</b>	1	50#	2
	<b>3-Value Education- Ethics &amp; Culture</b>	1	50#	2
<b>V</b>	<b>Extension Activities</b>	-	50!!	2
	<b>Total</b>	-	<b>3500</b>	<b>140</b>

**Note: I**

\$ In core subjects both theory and practical should be included wherever applicable.

\*\* In allied subjects both theory and practical should be included wherever applicable.

@ Includes 25 or 20 for theory and 40 for practical as continuous internal assessment marks.

# No Continuous Internal assessment for these subjects.

!! The Evolution of extension activities will be based on NSS/NCC/SPORTS

The following parameters are considered throughout study period.

- i. Regularity of Attendance
- ii. Active participation in classes/Camps/Games  
(College/District/University)
- iii. Exemplary awards/certificates/prizes
- iv. Other Social Components (Blood Camp, Fine Arts etc)

**DISTRIBUTION OF MARKS FOR EXTERNAL EXAMINATION (ESE) & CIA- Theory**

UG	Total Marks	ESE		CIA		Total (ESE+CIA)
		Max Marks	Min Marks	Max Marks	Min Marks	Min Marks
	100	75	30	25	----	40
	75	55	22	20	----	30

**DISTRIBUTION OF MARKS FOR EXTERNAL EXAMINATION (ESE) & CIA- Practical**

UG	Total Marks	ESE		Distribution of ESE		CIA		Total (ESE+CIA)
		Max Marks	Min Marks	Record	Practical	Max Marks	Min Marks	Min Marks
	100	60	24	6	54	40	----	40

**DISTRIBUTION OF MARKS FOR EXTERNAL EXAMINATION (ESE) & CIA- Project Work**

UG	Total Marks	ESE	CIA
	150	120	30

**CONTINUOUS INTERNAL ASSESSMENT (CIA) -COMPONENTS AND BREAK UP**

**I. Theory: 100 (75:25), 75(55:20), Practical: 100 (60:40) & Project: 150 (120:30)**

UG	Theory		Practical	
	Component	Mark	Component	Mark
	<b>For 25 Marks</b>		One Internal Exam	05
	One Internal Exam	05	One Model Exam	10
	One Model Exam	10	Experiment (For Min 15 Nos.)	20
	Assignment	05	Record	05
	Overall Performance	05	<b>Total</b>	<b>40</b>
	<b>Total</b>	<b>25</b>	<b>Total</b>	<b>40</b>
	<b>For 20 Marks</b>		<b>Project</b>	
	One Internal Exam	04		
	One Model Exam	08	<b>Component</b>	<b>Mark</b>
	Assignment	04	First review	10
	Overall Performance	04	Second review	10
			Third review	10
	<b>Total</b>	<b>20</b>	<b>Total</b>	<b>30</b>

## **PROJECT WORK - RULES AND REGULATIONS**

1. Group Project work is allotted to the students in the 6<sup>th</sup> semester. The group consists of 3 to 6 students. Project work can be carried out at reputed industries / govt. organization / project institutions / College Laboratory.
2. There will be a minimum of three reviews for the project.
3. Internal Marks are awarded based on the review status (attendance & performance).



CMS COLLEGE OF SCIENCE &amp; COMMERCE, COIMBATORE – 641006

(Autonomous)

B.Sc Electronics and Communication Systems

SCHEME OF EXAMINATION - CBCS PATTERN

(For the students admitted during the academic year 2010 - 2011)

Part	Sub code	Subject	Ins.hrs/ week	Examinations				
				Durof Exam. in hrs	CIA	ESE	Total marks	Credit
<b>Semester I</b>								
I		Language – I	6	3	25	75	100	4
II		English – I	6	3	25	75	100	4
III	13A	Core Paper I – Principles of Electronics	5	3	20	55	75	3
		Pract – I Basic Electronics Lab	3	-	-	-	-	-
		Pract – II Electronic Circuits Lab	3	-	-	-	-	-
	1AA	Allied I : Mathematics – I	5	3	25	75	100	4
IV		Environmental Studies #	2	3	-	50	50	2
<b>Total</b>			<b>30</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>425</b>	<b>17</b>
<b>Semester II</b>								
I		Language – II	6	3	25	75	100	4
II		English – II	6	3	25	75	100	4
III	23A	Core Paper II – Electronic Circuits	5	3	20	55	75	3
	23P	Pract – I : Basic Electronics Lab	3	3	40	60	100	4
	23Q	Pract – II : Electronic Circuits Lab	3	3	40	60	100	4
	2AA	Allied II : Mathematics – II	5	3	25	75	100	4
IV		Value Education : Human Rights #	2	3	-	50	50	2
<b>Total</b>			<b>30</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>625</b>	<b>25</b>

CMS COLLEGE OF SCIENCE & COMMERCE, COIMBATORE – 641049.  
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**B.Sc Electronics and Communication Systems**  
**SCHEME OF EXAMINATION - CBCS PATTERN**  
(For the students admitted during the academic year 2010 only)

Part	Sub code	Subject	Ins.hrs/ week	Examinations				
				Dur of Exam. in hrs	CIA	ESE	Total marks	Credit
<b>Semester III</b>								
III		Core Paper III - Digital Electronics	4	3	20	55	75	3
		Core Paper IV- Principles of Communication Systems	5	3	20	55	75	3
		Pract – III Digital Electronics lab	3	-	-	-	-	-
		Pract – IV Communication Lab – I	3	-	-	-	-	-
		Pract – V Microprocessor and Interfacing Lab	3	-	-	-	-	-
		Pract – VI C & Visual Basic Programming Lab	3	-	-	-	-	-
		<b>Allied Paper – III</b> C programming	4	3	25	75	100	4
IV		<b>SBS - I</b> 8085 Microprocessor	3	3	20	55	75	3
		Non Major Elective – I Tamil /Advanced Tamil / Communicative English	2	3	-	50	50	2
<b>Total</b>			<b>30</b>	-	-	-	<b>375</b>	<b>15</b>
<b>Semester IV</b>								
III		Core Paper V – Visual Technology	5	3	20	55	75	3
		Core Paper VI - Electronic Instrumentation	4	3	20	55	75	3
		Pract – III Digital Electronics lab	3	3	40	60	100	4
		Pract – IV Communication Lab – I	3	3	40	60	100	4
		Pract – V Microprocessor and Interfacing Lab	3	3	40	60	100	4
		Pract – VI C & Visual Basic Programming Lab	3	3	40	60	100	4
		<b>Allied paper – IV</b> Visual Basic Programming	4	3	25	75	100	4
IV		<b>SBS - II</b> 8085 Microprocessor Interfacing & its Applications	3	3	20	55	75	3
		Non Major Elective – II Tamil/Advanced Tamil/General Awareness	2	3	-	50	50	2
<b>Total</b>			<b>30</b>	-	-	-	<b>775</b>	<b>31</b>

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**SCHEME OF EXAMINATION - CBCS PATTERN**  
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Part	Sub code	Subject	Ins.hrs/ week	Examinations				
				Dur. Exam in hrs	CIA	ESE	Total marks	Credit
<b>Semester V</b>								
III		Core Paper VII - Integrated circuits	4	3	20	55	75	3
		Core Paper VIII - Fibre Optic & Network Communication Systems	4	3	20	55	75	3
		Pract – VII Communication Lab – II	3	-	-	-	-	-
		Pract –VIII Integrated Circuits Lab	3	-	-	-	-	-
		Pract – IX Micro controller and Interfacing Lab	3	-	-	-	-	-
		Pract – X Power Electronics Lab	3	-	-	-	-	-
		Pract – XI Circuit Simulation & PCB Design Lab	3	-	-	-	-	-
		<b>Elective – I</b> Biomedical Instrumentation	4	3	25	75	100	4
		<b>SBS - III</b> 8051 Microcontroller & Its Applications	3	3	20	55	75	3
<b>Total</b>			<b>30</b>	-	-	-	<b>325</b>	<b>13</b>

Part	Sub code	Subject	Ins.hrs/ week	Examinations				
				Dur. Exam in hrs	CIA	ESE	Total marks	Credit
<b>Semester VI</b>								
III		<b>Elective – II</b> Industrial and Power Electronics	6	3	25	75	100	4
		<b>Elective – III</b> Advanced Communication Systems	6	3	25	75	100	4
		Pract – VII Communication Lab – II	3	3	40	60	100	4
		Pract - VIII Integrated Circuits Lab	3	3	40	60	100	4
		Pract – IX Micro controller and Interfacing Lab	3	3	40	60	100	4
		Pract – X Power Electronics Lab	3	3	40	60	100	4
		Pract - XI - Circuit Simulation & PCB Design Lab	3	3	40	60	100	4
		<b>SBS -IV</b> Digital & Cellular Communication Systems	3	3	20	55	75	3
	Project Viva - Voce	-	-	30	120	150	6	
V		Extension Activity	-	-	-	-	50	2
Total			<b>30</b>	-	-	-	<b>975</b>	<b>39</b>
<b>Grand Total</b>							<b>3500</b>	<b>140</b>

<b>List of Elective Papers ( Can Choose any one of the paper)</b>		
<b>Elective - 1</b>	A	Biomedical Instrumentation
	B	Process Control Instrumentation
	C	Virtual Instrumentation
<b>Elective – 2</b>	A	Industrial and Power Electronics
	B	Power Drives and Controls
	C	Hydraulic and Pneumatic control
<b>Elective – 3</b>	A	Advanced Communication Systems
	B	Neural Networks
	C	Remote Sensing

## SEMESTER I

### **SUBJECT TITLE: PRINCIPLES OF ELECTRONICS**

### **SUBJECT CODE: 13A**

**SUBJECT DESCRIPTION:** This subject presents the basic principles of Electronics and the operation of commonly used components in Electronic circuits

**GOALS:** To provide an in-depth knowledge of Basic Electronics.

**OBJECTIVES:** Upon completion of the subject the student should know the basic components and its operations, the laws and theorems used in Electronics and basic semiconductor devices.

### **CONTENTS**

#### ***UNIT-I Passive Components***

Resistors: Wire Wound resistors – Carbon Composition resistors – Potentiometer – Rheostat. Capacitors: paper, mica and ceramic capacitors – Electrolytic capacitor. Inductors: Air Core, Iron Core and Ferrite Core Inductors. Color coding and tolerance, Series and parallel connections of Resistors, Inductors and Capacitors.

#### **UNIT-II Laws and Theorems**

Ohm's law, Kirchoff's current and voltage law, Analysis of series, parallel and series parallel circuit, Superposition theorem, Thevenin's theorem, Norton's theorem, Millmann's Theorem Maximum power transfer theorem

#### **UNIT-III AC Circuits**

Introduction to Sinusoidal wave – RMS Value – Average value – AC circuits with resistance alone – Circuits with XL alone –Circuits with XC alone – Series reactance and resistance – Parallel reactance and resistance –Series Resonance circuit – Parallel Resonance circuit.

#### **UNIT-IV Semi Conductors & Diodes**

Conductors – Insulators –Semi conductors – Types of Semiconductors: Intrinsic and Extrinsic – PN Junction Diode – Forward and Reverse bias conditions – VI Characteristics – Zener Diode – VI Characteristics –Clipping and Clamping Circuits.

## **UNIT-V Transistor & Semi Conductor Devices**

Introduction to Transistor – Operation of NPN and PNP Transistors – Transistor circuit configuration: CE, CB and CC: Operation and characteristics of FET, SCR, Diac and UJT.

### **TEXT BOOKS**

1. B.L.Theraja, **“BASIC ELECTRONICS”**, S.CHAND & Publications.
2. R.S.Sedha, **“A TEXT BOOK OF APPLIED ELECTRONICS”**. S.CHAND & Publications.
3. Bernard Grob **“BASIC ELECTRONICS**, Tata Mc Graw Hill Publishers, Fourth Edition

## **SEMESTER-I**

**SUBJECT TITLE: MATHEMATICS-I**

**SUBJECT CODE: 1AA**

**SUBJECT DESCRIPTION:** This subject presents the basic Mathematical concepts of Vector Calculus, Matrices, Laplace transforms, Fourier series and probability theorems

**GOAL:** To make the students thorough with the basic Mathematical Techniques.

**OBJECTIVE:** The students will be able to perform the aptitude required for the present technology.

**CONTENTS:**

### **UNIT-I Vector Calculus**

Concepts of vector and scalar fields-the Del operator-the divergence of a vector-curl of a vector-Laplacian Operator-Gauss theorem, Green's theorem and Stoke's theorem-Simple problems.

### **UNIT-II Matrices**

Different types of matrices-Inverse of matrix-Properties of a Unitary and Orthogonal matrices-Characteristics equation and Characteristic roots-Solution of simultaneous equations of matrix by matrix inversion method-simple problems

### **UNIT-III Laplace transforms**

Definition of Laplace transforms-Properties of Laplace transforms-Inverse Laplace transforms-Convolution Theorem-simple problems

### **UNIT-IV Fourier series**

Dirchlet's conditions-General Fourier series-Change of length of interval – Fourier Cosine and Sine series-Half range series-simple problems.

### **UNIT-V Concept of probability**

Addition theorem-Multiplication theorem-simple problems-random variable-probability distributions-Binomial, Poisson, Normal distribution (no derivation)-simple problems-Curve fitting: Method of Least squares-fitting straight line-simple problems.

## TEXT BOOKS

1. M.K.Venkataraman, "**Engineering Mathematics**", vol.II-2006  
**Unit-I:** "Vector Calculus"-Chapter I (sec-1.1 to 1.6); Chap 3 (sec-3.1 to 3.7, .9, 3.11 to 3.15); Chap 4(sec-4.1-4.3, 4.9, 4.10, 4.13)  
**Unit-II:** "Matrices"-Chapter I (sec 1.1 to 1.13); Chap 2 (sec 2.1 to 2.7, 2.11, 2.12) And Chap 5(sec 5.3 to 5.5).  
**Unit-III: "Laplace Transforms"**-sec-1, 3,4,5,8 to 28.
2. M.K.Venkataraman, "**Engineering Mathematics**" 3<sup>rd</sup> year-Part-B-1985  
**Unit-IV:** "Fourier series"-sec-1, 2, 6 to 10.
3. S.C.Gupta "**Introduction to Mathematical Statistics**"  
**Unit-V:** Chap 4 (sec 4.1, 4.3, 4.3.1, 4.6, 4.6.3, 4.7, 4.7.3, 4.7.4, 4.7.5); Chap 7 (sec 7.2, 7.2.1, 7.3, 7.3.2); Chap 8 (sec 8.2); Chap 9 (sec 9.1,9.1.1)



## SEMESTER II

**SUBJECT TITLE: ELECTRONIC CIRCUITS**

**SUBJECT CODE: 23A**

**SUBJECT DESCRIPTION:** This subject presents the basic operation of Electronic Circuits commonly used.

**GOAL:** To familiarize the student with the analysis and design of basic transistor Amplifier circuits and power supplies.

**OBJECTIVE:** At the end of the subject, the students would be able to analyze, design and troubleshoot amplifiers, oscillators, and power supplies and filter circuits

**CONTENTS:**

### **UNIT-I Small Signal Amplifier**

Transistor Biasing: Base Bias -Collector Feedback Bias-Voltage Divider Bias-  
Classification of Amplifiers: RC Coupled Amplifier-Non-Linear Distortion-Input and Output  
Impedance-Current and Voltage Gain-Gain Frequency Response-Band Width-Two Stage RC  
Coupled Amplifiers.

### **UNIT-II Power Amplifier**

Classification of Power Amplifiers-Operation and Efficiency of Class A, Class B and  
Class C Power Amplifiers-Cross Over Distortion-Complementary Symmetry Amplifier-  
Common Collector Amplifier

### **UNIT-III Feedback Amplifier**

Basic Concepts of Feedback-Effect of Negative Feedback on Gain- Input Impedance-  
Output Impedance-Distortion-Bandwidth and Noise-Voltage Series Feedback and Current  
Series Feedback

### **UNIT-IV Oscillators**

Barkhausen Criterion- Hartley Oscillator-Colpitts Oscillator-Phase Shift Oscillator-  
Wein Bridge Oscillator-Crystal Oscillator

### **UNIT-V Power Supplies**

**Rectifier** : HW and FW Rectifier-Calculation of Ripple Factor and Efficiency-  
Bridge Rectifier.

**Filters** : Inductor Filter-Capacitor Filter-LC Filter and PI Filter.

**Regulator** : Zener Diode Regulator-Transistor Series Regulator- Overload Protection.

### **TEXT BOOKS**

1. Salivaghanan, Suresh Kumar, Vallavaraj, “**Electronic Devices and Circuits**”, Tata Mc Graw Hill Publication.
2. Malvino,”**Electronic Principles**”, Tata Mc Graw Hill Publication.
3. V.K.Metha,” **Principles of Electronics**”, Chand & Company, New Delhi, II Edition.

## SEMESTER-II

**SUBJECT TITLE: MATHEMATICS-II**

**SUBJECT CODE: 2AA**

**SUBJECT DESCRIPTION:** This subject presents the basic Mathematical concepts of Differential Equations, Fourier transforms, Numerical Methods etc

**GOAL:** To familiarize the students to the achievements in Mathematics applicable to electronics

**OBJECTIVE:** Up to completion of subject, the students will be able to apply the Mathematics tools such as to analyze the signals in a processor.

**CONTENTS:**

### **UNIT-I Differential Equations**

Second and Third Order Linear Differential Equations with Constant Co-Efficient-Laplace Equations-Applications of Electric Circuits RL, RC, RLC-Simple Problems.

### **UNIT-II Numerical Methods**

Solving Simultaneous Equations using Gauss Elimination Method-Gauss Jordan Method-Gauss Seidel Method-Interpolation-Newton's Forward and Backward Interpolation-Numerical Integration-Trapezoidal Rule-Simpson's 1/3 Rule-Simple Problems.

### **UNIT-III Fourier Transforms**

Definition of Fourier Transform-Properties of Fourier Transform-Inverse Fourier Transform-Convolution Theorem-Fourier Sine and Cosine Transform-Parseval's Theorem-Simple Problems

### **UNIT-IV Z Transforms**

Z Transforms: Z Transform-Elementary Properties-Inverse Z-Transform-Convolution Theorem-Simple Problems.

### **UNIT-V Complex Numbers**

Definition of Complex Numbers-Argand Diagrams-Rectangular Form-Polar Form-Conversion-Demoivre's Theorem-Expansion of  $\sin n\theta$ ,  $\cos n\theta$ ,  $\tan n\theta$ ,  $\sin^n \theta$ ,  $\cos^n \theta$ ,  $\sin \theta$  and  $\cos \theta$  in Powers of  $\theta$ -Simple Problems.

**TEXT BOOKS:**

1. M.K.Venkataraman “**Engineering Mathematics**”, vol.II-2006.  
**Unit-I:** “Ordinary differential equations”-Chap 3 (sec-3.1 to 3.22); Chap 7 (secII sec-9,10,11)
2. M.K.Venkataraman ,“**Numerical Methods in Science and Engineering**”.  
**Unit-II:** Chap IV (sec-1,2,3,6); Chap VI(sec-1,3,4); Chap IX (sec-7,8,10)
3. Kandasamy and Thilagavathy , “**Engineering Mathematics**”-vol.3,III sem,2006”  
**Unit-III:** Chapter IV- Page 273 – 303.  
**Unit-IV:** Chapter V – Page 371 – 406.
4. S.Narayanan & T.K.Manicavachagam Pillai , “**Trigonometry**” .  
**Unit-V:** Chap 2 (sec-1, 1.1,1.2,2,3,4); Chap 3 (sec 1 to 5)

## SEMESTER – I & II

### PRACTICAL – I

**SUBJECT TITLE: BASIC ELECTRONICS LAB**

**SUBJECT CODE: 23P**

#### **List of Experiments (Any 15 Experiments)**

1. Study of CRO.
2. Multimeter and Colour Coding of Resistors and Capacitors.
3. Measurement of Resistance and Capacitance in series and parallel.
4. Verification of Ohm's Law.
5. Verification of Kirchoff's Laws.
6. Verification of Norton's Theorem.
7. Verification of Thevenin's Theorem.
8. Verification of Millman's Theorem.
9. Verification of Maximum Power Transfer Theorem.
10. Verification of Series Resonance.
11. Verification of Parallel Resonance.
12. Verification of Superposition Theorem.
13. Characteristics of PN junction diode.
14. Characteristics of Zener diode.
15. Characteristics of Transistor-CE Configuration.
16. Characteristics of J FET.
17. Characteristics of UJT.
18. Characteristics of SCR.
19. Characteristics of DIAC.
20. Band Gap energy of Silicon.
21. Band Gap energy of Germanium.

## SEMESTER – I & II

### PRACTICAL –II

**SUBJECT TITLE: ELECTRONIC CIRCUITS LAB**

**SUBJECT CODE: 23Q**

#### List of Experiments (Any 15 Experiments)

1. Half Wave and Full Wave Rectifier.
2. Bridge Rectifier.
3. Clipping Circuits.
4. Clamping Circuits.
5. Voltage Doubler.
6. DC Regulated power supply using Zener Diode.
7. DC Regulated power supply using IC 7805
8. Low Pass, High Pass and Band Pass filters using Passive Components.
9. Transistor Base bias.
10. Emitter Follower.
11. RC Coupled Amplifier.
12. Negative Feedback Amplifier.
13. Astable Multivibrator
14. Phase shift Oscillator.
15. Wein Bridge Oscillator.
16. Colpitts Oscillator.
17. Hartely Oscillator.
18. Schmitt Trigger.

## SEMESTER III

### **SUBJECT TITLE: DIGITAL ELECTRONICS**

### **SUBJECT CODE:**

**SUBJECT DESCRIPTION:** This subject presents the basic principle of digital electronics.

**GOAL:** To familiarize the fundamentals of digital components and digital circuits.

### **OBJECTIVE:**

- To learn the principle of functioning of digital components.
- To learn the design procedure for digital circuits and methods for any digital circuits.

### **CONTENTS:**

#### **UNIT-1 NUMBER SYSTEM AND CODES**

Decimal numbers, binary numbers, binary arithmetic, 1's and 2's complements, octal numbers, hexadecimal numbers inter conversions of number systems, digital codes: binary coded decimal-graycode-excess-3 code-ASCII and ISCII code-EBCDIC codes-parity bit- error detection and correction codes-hamming code.

#### **UNIT-II LOGIC GATES AND BOOLEAN ALGEBRA**

Logic gates: OR, AND, NOT, NAND, NOR and EX-OR gates. Boolean laws and theorem –simplification of logic circuit - designing of logic circuit: sum of product and product of sum method - karnaugh map techniques (up to 4 variables).

#### **UNIT-III COMBINATIONAL LOGIC CIRCUITS**

Half adder - full adder - half subtractor - full subtractor – parallel binary adder - 4 bit binary adder / subtractor- multiplexer- demultiplexer- decoder- encoder-parity generator / checkers.

#### **UNIT-IV SEQUENTIAL LOGIC CIRCUITS**

Flip flops: RS, Clocked RS, D flip flop, JK flip flop- JK master slave-T flip flops-edge triggered flip flop- latches - memory : RAM – ROM – Static RAM - Dynamic RAM - EPROM- EEPROM- shift register: SISO, SIPO, PISO, PIPO - ripple counter- up down

counters- ring counter- asynchronous and synchronous counter- johnson's counter- mod 3, mod 5 counter- decade counter.

#### **UNIT-V DIGITAL TO ANALOG AND ANALOG TO DIGITAL CONVERTERS**

Digital to analog converters: resistive divider type - ladder type- D/A accuracy and resolution- analog to digital converters: simultaneous type- successive approximation type- counter ramp type-dual slope type-A/D accuracy and resolution.

#### **TEXT BOOK**

1. Malvino & Leach –“**Digital Principles & Applications**”- Tata Mc Graw Hill, Edition 2002.

#### **REFERENCE BOOK**

1. M.Mooris Mano- “**Digital Design**”- PHI 3<sup>rd</sup> edition.



## SEMESTER – II

### **SUBJECT TITLE: PRINCIPLES OF COMMUNICATION SYSTEMS**

#### **SUBJECT CODE:**

**SUBJECT DESCRIPTION:** This subject presents the basic fundamentals of electronic communication systems.

**GOAL:** To study the basic principles of electronic communication systems.

**OBJECTIVE:** Upon completion of the subject, the student understands the concepts and techniques used in modulation & detection, propagation of waves.

#### **CONTENTS**

##### **UNIT-I BASICS OF COMMUNICATION SYSTEMS**

Introduction to communication systems – components of communication systems: information – transmitter- channel – noise- receiver- modulation- need for modulation-types of modulation- introduction to electro magnetic waves –electromagnetic spectrum- generation of EM waves –properties of EM waves –energy contained in EM waves

##### **UNIT-II ANTENNA & WAVE PROPAGATION**

Wave propagation: surface wave propagation – sky wave propagation: layers of ionosphere -- virtual height –critical frequency-critical angle-MUF, LUF and OWF– skip distance - fading. - space wave propagation- antenna: definition and function of an antenna-current and voltage distributions in antenna- radiation pattern -radiation resistance- antenna gain-bandwidth and beam width-polarization – Folded dipole – yagi-uda antenna-parabolic reflector antenna.

##### **UNIT-III GENERATION & CHARACTERISTICS OF AMPLITUDE MODULATION & DETECTION**

Amplitude modulation: introduction –definition- frequency spectrum of AM wave-representation of AM -power and current relations in AM- modulation factor – generation of AM: suppression of carrier: balanced modulator- methods of suppressing unwanted sideband - block

diagram and explanation of basic AM transmitter. Receivers: block diagram & working of super heterodyne receiver- block diagram& working of SSB receiver.

#### **UNIT-IV GENERATION & CHARACTERISTICS OF ANGLE MODULATION**

Angle modulation: Introduction –definition of frequency modulation and phase modulation-mathematical representation of FM- frequency spectrum of FM wave-frequency modulation vs amplitude modulation-pre emphasis and de emphasis- generation of FM: reactance modulator- varactor modulator –AFC - Armstrong method - block diagram and explanation of basic FM transmitter.

#### **UNIT-V PULSE COMMUNICATION**

Pulse communication: Introduction to pulse modulation – PAM- PTM- sampling theorem –generation and detection of PWM – generation and detection of PPM - PCM principles- quantizing noise- companding - advantages and applications of PCM.

#### **TEXT BOOKS**

1. George Kennedy, “**Electronic Communication Systems**”, Tata McGraw Hill Publishers, 4<sup>th</sup> Edition
2. K.D.Prasath,“**Antenna & Wave Propagation**”, Sathya Prakashan Publishers, 3<sup>rd</sup> Edition

#### **REFERENCE BOOKS**

1. Dennis Roddy, John Coolen, “**Electronic Communication**”, Prentice Hall of India Publishers, Fourth Edition
2. Anok Singh,A.K.Chhabra, “**Principles Of Electronic Communication Engineering**”, S.Chand & Publishers, First Edition.

## SEMESTER – III

### **SUBJECT TITLE: C PROGRAMMING**

### **SUBJECT CODE:**

**SUBJECT DESCRIPTION:** This subject presents the programming techniques in C programming

**GOAL:** Knowledge on programming solving techniques and how to develop a project using C

### **OBJECTIVE:**

- To inculcate knowledge on programming and project development using C
- To efficiently implement solution for specific problems

### **CONTENTS:**

#### **UNIT – I INTRODUCTION TO C**

Introduction to computers – algorithm – flowchart – program development steps – introduction to C – structure of C program – programming rules – character set – identifiers and keywords - data types – constants – escape sequence – variables and arrays – expressions – declarations – statements – symbolic constants.

#### **UNIT – II OPERATOR & EXPRESSION**

Arithmetic operator – unary operator – relational and logical operator – assignment operator – the conditional operator – comma operator - library functions.

#### **UNIT – III DATA INPUT AND OUTPUT & CONTROL STATEMENT**

Preliminaries – single character input – single character output – entering input data – writing output data – the gets and puts functions – control statements : branching: if – else, looping : the while statement, do – while statement - for statement – nested loop – switch statement – break statement – continue statement – goto statement.

#### **UNIT – IV FUNCTION & ARRAYS**

Functions : defining a function – accessing a function – function prototypes – passing arguments – recursion – arrays: defining an array – processing an array – passing array to function – multi dimensional array.

## **UNIT V POINTER, STRUCTURE & UNIONS**

Pointers: fundamentals – declarations – passing pointers to functions – pointers and one dimensional array.

Structure & unions: defining a structure – processing a structure user-defined data types – structures and pointers – passing structures to functions – unions.

### **TEXT BOOKS**

1. Bryon Gottfried, “**Programming With C**” Schaum’s outline series.
2. E.Balagurusamy, “**Programming In ANSI And Turbo C**”, TMH publications.

### **REFERENCE BOOK**

1. Henry Mulish & Herbert L. Cooper, “**The Sprit of C**” Jai co Pub. House

## SEMESTER III

### **SUBJECT TITLE: 8085 MICROPROCESSOR**

#### **SUBJECT CODE:**

**SUBJECT DESCRIPTION:** This Subject presents the architecture of 8085 microprocessor and programming techniques using 8085.

**GOALS:** To learn the architecture, instruction and programming of 8085 microprocessors.

**OBJECTIVES:** On successful completion of the subject, the students would write programs in assembly language.

#### **CONTENTS:**

##### **UNIT - I MICROPROCESSOR ARCHITECTURE**

Intel 8085 – ALU – timing and control unit – register – data and address bus – pin configuration – generation of control signals - op-code and operands- instruction word size – instruction cycle – fetch operation- execute operation – machine cycle and state – instruction and data flow – timing diagram – timing diagram for op-code fetch cycle - memory read – I/O read – memory write – I/O write.

##### **UNIT -II INSTRUCTION SET FOR INTEL 8085**

Instruction and data formats – addressing modes – direct – register – register indirect – immediate and implicit addressing – status flags – Intel 8085 instructions – data transfer group – arithmetic group – logical group – branch group – stack I/O and machine control groups.

##### **UNIT -III ASSEMBLY LANGUAGE PROGRAMMING**

Machine language – assembly language – one pass and two pass assembler - high level language — stacks – subroutines – MACRO – micro programming – data transfer and data manipulation programs – addition - subtraction – complements.

##### **UNIT- IV ASSEMBLY LANGUAGE PROGRAMMING**

Shift operation - mask – look up table – larger – smaller - array – sorting - sum of series- multiplication - division – block of data transfer.

## **UNIT -V INTERRUPTS & TIME DELAYS**

Interrupts of INTEL 8085 – hardware and software interrupts – interrupts call locations- INTR CALL Locations – RST 7.5, 6.5, 5.5- triggering levels – pending interrupts.

Time delay: time delay using single register – register pair – loop within loop technique – time delay calculations.

### **TEXT BOOK**

1. B. Ram –“**Fundamental of Microprocessor and Microcomputers** “- Delhi Dhanpat Rai & Sons, 2003

### **REFERENCE BOOK**

1. Ramesh. S. Goankar- “**Microprocessors and Its Application**”- Tata Mc Graw Hill, 3<sup>rd</sup> Edition.

## SEMESTER-IV

### **SUBJECT TITLE: VISUAL TECHNOLOGY**

#### **SUBJECT CODE:**

**SUBJECT DESCRIPTION:** This subject covers the basic fundamentals of television signal transmission and reception and the basic operation of image capturing and processing devices .

**GOAL:** To obtain the fundamental knowledge of television signal transmission and receptions.

**OBJECTIVE:** Upon completion of the subject, the student acquires knowledge about the television standards, transmitter, receiver section and advanced television systems .

#### **CONTENTS:**

#### **UNIT- I FUNDAMENTALS OF TELEVISION**

Introduction- elements of television system- basic block schematic of a television transmitter and receiver- analysis of television pictures: gross structure- image continuity: scanning: horizontal and vertical scanning- number of scanning lines- flicker: interlaced scanning – fine structure – tonal gradation – vestigial side band transmission – complete channel bandwidth - positive and negative modulation.

#### **UNIT-II MONOCHROME TELEVISION TRANSMITTER AND RECEIVER**

Block diagram of TV transmitter – TV transmission antennas: turnstile array-dipole panel antenna system-combining network– block diagram of monochrome TV receiver – balun - RF tuners: VHF and UHF tuners- IF stage- IF response- wave traps- video detector : principle and operation- basic principle of sync separator - sync separator using a transistor - operation of AFC-vertical output stage- horizontal output stage - EHT generation- sound section.

#### **UNIT-III IMAGE CAPTURING & PROCESSING DEVICES**

Television camera principles –camera lenses-autofocus systems- - camera tube types: image orthicon- plumbicon - vidicon- saticon-newvicon-chalnicon-silicon diode array Vidicon- CCD image sensors-night vision camera-comparison of TV camera tubes-video processing of camera pick up signal

#### **UNIT-IV REMOTE CONTROL CIRCUITS**

Block diagram of a digital color TV receiver – schematic diagram of a remote control IR Transmitter and IR receiver – synthesis of remote control signals – synchronization of

receiver – Functions of remote transmitter and receiver IC – M 50463p and M 50142p – function of system control IC MN15287- Modern cable TV system schematic diagram – scrambling – descrambling – basic block diagram of descrambler

### **UNIT -V ADVANCED TELEVISION SYSTEMS**

TV via satellite technology - closed circuit television (CCTV)-cable TV (CATV) – Flat panel display – Large screen display methods - Plasma display –3D TV –EDTV- SDTV-high definition television (HDTV)-television with LED display-advantages of LED display

### **TEXT BOOKS**

1. R.R.Gulati, “**Monochrome Television Practice, Principles, Technology and Servicing**”, New age International Publishers.
2. A.M Dhake, “**Television and Video Engineering**”, Second edition, Tata McGraw Hill Publishers, 2003 Edition.
3. R.G.Gupta, “ **Television Engineering and Video Systems**”, Tata McGraw Hill Publishers, First Edition

### **REFERENCE BOOKS**

1. A.K. Maini, “**Color television and Video technology**”
2. S.P.Bali, “**Colour Television, Theory and Practice**”, TMH, 1994



## SEMESTER IV

### **SUBJECT TITLE: ELECTRONIC INSTRUMENTATION**

#### **SUBJECT CODE:**

**SUBJECT DISCRIBTION:** This subject deals with the basic information about the electronic instruments.

**GOALS:** To learn the fundamental concepts of instrumentation & measurement techniques.

**OBJECTIVES:** Upon completion of the subject the student will understand the electrical & electronic instruments and measurement techniques used in industries.

#### **CONTENTS:**

##### **UNIT-I MEASUREMENTS**

Definitions –accuracy and precision – significant figures-types of errors – probability of errors-limiting errors -system of units- electric and magnetic units- international system of units-electrical standards – absolute ampere –resistance standards- voltage standards- capacitance standards – inductance standards- temperature and luminous intensity- IEEE standard.

##### **UNIT- II MEASUREMENTS OF ELECTRICAL QUANTITIES**

DC ammeters – multi range ammeter- DC voltmeter - multi range voltmeter – voltmeter sensitivity – series type ohmmeter –shunt-type ohmmeter- multimeter or VOM - oscilloscope – basic principle – block diagram of oscilloscope – CRT - vertical amplifier – horizontal deflecting system – delay line in triggered sweep.

##### **UNIT -III TRANSDUCERS**

Classification of transducers –selecting a transducer- strain gages- displacement transducers- capacitive – inductive –variable differential transformer transducer – oscillation – piezoelectric- potentiometric – velocity- temperature measurements- resistance thermometers - thermocouples- thermistor characteristics- photosensitive devices- multiplier phototubes- photo voltaic cell.

#### **UNIT -IV MEASUREMENTS OF NON - ELECTRICAL QUANTITIES**

Measurement of torque – tachometers – stroboscope – measurements of vibration – measurements of flow - measurements of liquid level – measurements of thickness – measurements of pH value – gas analyzer.

#### **UNIT -V SIGNAL CONDITIONING CIRCUITS AND RECORDERS**

Signal conditioning – operational amplifier circuits used in instrumentation – common mode signals- instrumentation amplifier – log and anti log amplifier – strip chart recorder – XY recorder – UV recorder – magnetic tape.

#### **TEXT BOOKS**

1. A.K.Sawhney - **“Electrical And Electronic Measurements And Instrumentation”**- Dhanpat Rai & Co.
2. Albert D. Helbrick and William D Cooper – **“Modern Electronic Instrumentation and Measurement Techniques”**- New Delhi Prentice Hall of India, 1995.

#### **REFERENCE BOOKS**

1. Kalsi H.S – **“Electronics Instrumentation”** -Tata Mc Graw Hill Publishing Ltd, 1995.

## **SEMESTER – IV**

### **SUBJECT TITLE: VISUAL BASIC PROGRAMMING**

#### **SUBJECT CODE:**

**SUBJECT DESCRIPTION:** This subject presents the front tool for the designer.

**GOAL:** Knowledge on visual programming and how to develop a project using visual basic.

#### **OBJECTIVE:**

- To inculcate knowledge on programming and project development using visual basic
- To introduce the GUI programming concepts.

#### **CONTENTS:**

### **UNIT-I INTRODUCTION TO VISUAL BASIC**

Introduction to visual basic – steps in VB application – integrated development environment (IDE) – menu bar – tool bars – project explorer window – property window – form layout window – code window – properties, methods and events –event driven programming –working with forms

### **UNIT- II TYPE DECLARATIONS , FUNCTIONS AND ARRAYS**

Variables – scope of variables – constants – data types – functions – procedures – control structures – arrays – control arrays – user defined data types – string, date and time functions – adding short keys

### **UNIT - III STANDARD TOOLS**

Creating and using standard controls – text box – command button – check box – combo box – list box – option button – timer control – frame, label, shape and line controls – picture box – image controls – scroll bars – data controls – DB grids.

### **UNIT- IV SDI, MDI AND REPORT CREATION**

Single document interface – multiple document interface – menu editor – data report – data environment designer- connection object – command object –section of the data report designer – data report controls – creating a simple data report.

## **UNIT – V CONNECTION TYPES AND IT FUNCTIONS**

ODBC - using ODBC with DAO- using data control – remote data objects – RDO  
Hierarchy – establishing connection – executing SQL statements – insert / update / delete  
records.

### **TEXT BOOKS**

1. Visual Basic 6 Programming ,“ **Content Development Group**”, Tata Mc Graw Hill Publishers, First Edition, 2004.

### **REFERENCE BOOKS**

1. Scott Warner “**Teach Yourself Visual Basic 6**”, TATA McGraw Hill, First Edition, 2000.

## SEMESTER IV

**SUBJECT TITLE: 8085 MICROPROCESSOR INTERFACING AND ITS APPLICATIONS**

**SUBJECT CODE:**

**SUBJECT DESCRIPTION:** This subject presents the interfacing concepts, devices and applications of 8085 Microprocessor.

**GOALS:** To learn the programming and interfacing of 8085 microprocessors and its applications.

**OBJECTIVES:** On successful completion of the subject, the students would understand the Interfacing concepts & data communications between Microprocessor and real world.

**CONTENTS:**

### UNIT – I INTERFACING CONCEPTS

Peripherals I/O instructions – device selection and data transfer: I/O mapped I/O - memory mapped I/O - absolute addressing - partial addressing – Input Interfacing: interfacing I/P using decoders – interfacing O/P display: LED display – 7 segment LED Display – Interfacing Memory : bus contention - memory access time - wait states.

### UNIT – II DATA TRANSFER SCHEMES

Data transfer schemes – programmed data transfer - synchronous data transfer, asynchronous data transfer, interrupt driven data transfer - multiple interrupts - enabling, disabling and masking of interrupts - direct memory access data transfer - serial data transfer – IC 8251 USART.

### UNIT – III PROGRAMMABLE PERIPHERAL INTERFACES

The 8255A programmable peripheral interface: block diagram of 8255A - mode 0: simple I/O - BSR mode - mode 1: handshake I/O - mode 2: bi-directional data transfer – the 8259A programmable interrupt controller: block diagram of 8259A - interrupt operation - programming the 8259A - priority modes and other features – additional features of the 8259A.

### UNIT – IV PROGRAMMABLE PERIPHERAL INTERFACES

Programmable interval timer/counter 8254: block diagram of 8254 - programming the 8254 - the 8254 as a counter - 8279 keyboard/display interface: block diagram of 8279 –

concepts related to keyboard and display – command words of 8279- interfacing 8279 with 8085.

#### **UNIT – V APPLICATION OF MICROPROCESSORS**

Application of microprocessors: system requirements, overall system design and software design: temperature monitoring system – traffic control system - stepper motor control -digital clock –washing machine control.

#### **TEXT BOOKS**

1. R.S.Gaonkar, “**Microprocessor Architecture, Programming and its Applications with 8085**” –, Penram International Publishers, II Edition.
2. Aditya P Mathur, “**Introduction to Microprocessors**” –, Tata McGraw Hill, III Edition.

#### **REFERENCE BOOKS**

1. R.Theagarajan, S.Dhanasekaran, S.Dhanapal, “**Microprocessor and its Applications**” New age International (P) Limited Publishers, New Delhi.

## SEMESTER-III & IV

**SUBJECT NAME: DIGITAL ELECTRONICS LAB**

**SUBJECT CODE:**

### **LIST OF EXPERIMENTS (Any 15 Experiments)**

1. Verification of basic gates.
2. Verification of De Morgan's theorem.
3. 2-bit comparator using gates.
4. Half adder and full adder.
5. Half subtractor and full subtractor.
6. Binary to gray and gray to binary conversion.
7. BCD to 7 segment display.
8. Parity checker and generator.
9. Realization of basic gates operations using universal gates.
10. Multiplexer and demultiplexer.
11. Encoder and decoder.
12. Construction of RS & JK flip flops.
13. UP-DOWN decade counters.
14. Shift register
15. Digital to analog converter.
16. Analog to digital converter.
17. 4-bit binary adder.
18. Binary counter.

### **Case Study**

1. BCD Counter.
2. Arithmetic/Logic Unit (ALU)
3. Random Access Memory

### **Software Simulation**

1. Any one of the above list

**SEMESTER – III & IV**

**SUBJECT TITLE: COMMUNICATION LAB I**

**SUBJECT CODE:**

**LIST OF EXPERIMENTS (Any 15 Experiments)**

1. High voltage regulated power supply using IC LM 723
2. Low voltage regulated power supply using IC LM723
3. Loud speaker characteristics
4. Generation and detection of AM
5. Generation of FM using IC 555
6. Frequency discriminator
7. Generation and detection of PAM
8. Generation of PWM
9. Generation of PPM
10. Tone control circuit.
11. Pre amplifier using condenser mike.
12. IR intruder alarm.
13. Opto coupler isolation.
14. Low pass filter & high pass filter using RC network
15. Band pass filter & band rejection filter using RC network.

**Case Study**

1. Amplitude Modulation transmitter.
2. Frequency Modulation transmitter.
3. Remote control sensor.

**Software Simulation**

1. Any one of the above list



## SEMESTER III & IV

**SUBJECT TITLE: 8085 MICROPROCESSOR AND INTERFACING LAB**

**SUBJECT CODE:**

### **LIST OF EXPERIMENTS (Any 15 Experiments)**

- 1) Arithmetic operation
- 2) Logical operation
- 3) Masking of bits MSB, LSB & block data transfer
- 4) Code conversion
- 5) Smallest / largest of N numbers
- 6) Ascending / descending order of N numbers
- 7) Sum of N 8-bit numbers (Binary / Decimal)
- 8) 1's and 2's complement of an array
- 9) Packed to unpacked
- 10) Multi-byte addition (binary / decimal)
- 11) Data transfer using 8255 ( PPI )
- 12) Square wave generation
- 13) DAC interface
- 14) ADC interface
- 15) Multiplexed display interface
- 16) Stepper motor interface
- 17) Traffic light controller
- 18) Square wave generation using 8253
- 19) Display a character using 8279

### **Case Study**

1. Calculator
2. Frequency counter
3. Washing machine

### **Hardwar Simulation**

1. Any one of the above list

**SEMESTER – III & IV**

**SUBJECT TITLE: 'C' AND VISUAL BASIC PROGRAMMING LAB**

**SUBJECT CODE:**

**'C' - PROGRAMMING:**

**LIST OF EXPERIMENTS (Any 10 Experiments)**

1. Write a program to compute sum of N numbers.
2. Write a program to arrange the numbers in ascending and descending order.
3. Write a program to perform matrix addition /matrix subtraction/matrix multiplication.
4. Write a program to find factorial of a given number.
5. Write a program to check whether given string is palindrome or not.
6. Write a program to compute the Fibonacci series.
7. Write a program to compute real roots of quadratic equations.
8. Write a program to find the biggest/smallest numbers from N numbers.
9. Write a program to calculate the standard deviation.
10. Write a program to identify the pointer as function parameter
11. Write a program for file operations.
12. Write a program to convert Celsius into Fahrenheit and vice versa
13. Write a program convert the given decimal number into corresponding  
(i) hex decimal (ii) octal (iii) binary and vice versa.
14. Write a program to find the ASCII value.
15. Write a program to change the string into uppercase and vice versa.

## **VISUAL BASIC PROGRAMMING:**

### **LIST OF EXPERIMENTS (Any 10 Experiments)**

1. Design and develop a simple calculator.
2. Design and develop an application to find the whether given numbers is single digit or more.
3. A VB application to draw a circle and fill it with color combinations using scroll bar.
4. A VB application that draws a smiling face.
5. Design and develop a simple editor to do bold, italic, underline, uppercase and lowercase operations on text.
6. Develop code to display the course in your college using menus.
7. Design and develop an application using com control
8. Design and develop application to animate object.
9. Design and develop application to embed or link a word file using OLE.
10. Design a database to store the subject marks, total and result status of students and write code to navigate the database through VB.
11. Display individual marks sheets of the students using data reports

### **Case Study**

1. Library Management System
2. Students attendance maintainer
3. College automation

Int	Ext	Total
20	55	75

## SEMESTER – V

**SUBJECT TITLE: INTEGRATED CIRCUITS**

**SUBJECT CODE:**

**SUBJECT DESCRIPTION:** This subject deals with the basic information about the IC fabrication technology, digital integrated circuits and integrated circuits

**GOAL:**

- To learn the basic concepts in the design using integrated circuits and their applications in the processing of analog signals.
- To learn the fundamental concepts of IC fabrication technology.

**OBJECTIVE:**

- On completion of the subject the students will be able to understand the operation of IC fabrication technology, digital integrated circuits, 555 timer, PLL, operational amplifiers and applications.

**CONTENTS:**

### UNIT - I: IC FABRICATION TECHNOLOGY

Introduction- Fundamentals of monolithic IC technology- Basic Planar Process: Wafer Preparation- Epitaxial growth- Oxidation- Photolithography- Diffusion- Ion Implantation- Isolation technique-Metallization- Assembly processing and packaging-Thin and Thick film technology.

### UNIT - II: DIGITAL INTEGRATED CIRCUITS

Introduction- Classification of IC-Digital IC Characteristics-Digital IC Families: DTL-HTL- TTL- Medium speed and Schottky TTL -ECL- MOS IC-CMOS IC- Comparison of digital IC.

### UNIT - III: OPERATIONAL AMPLIFIERS

Introduction – Operational Amplifier- Block diagram representation of typical op amp- Characteristics of op amp- Ideal op amp- Equivalent circuit for an op amp- Open loop op amp configuration: Differential, Inverting, Non-inverting amplifier- Introduction to feedback- Block diagram representation of feedback configuration.

#### **UNIT - IV: OPERATIONAL AMPLIFIER APPLICATIONS**

Subtractor- Summing amplifier- Instrumentation amplifier- V to I & I to V Convertors- Log and antilog amplifier- Integrator- Differentiator- Filters: LPF-HPF-BPF-BRF- Oscillator: Phase shift Oscillator- Wien bridge Oscillator- Square wave generator- Triangular wave generator- Saw tooth wave generator- Comparator-Schmitt trigger.

#### **UNIT - V: 555 TIMERS, PLL AND VOLTAGE REGULATORS**

Introduction- Description of functional diagram of IC555 - Modes of 555 Timer: Monostable multivibrator- Applications: Missing Pulse Detector- PWM- Astable multivibrator- Application: PPM- FSK Generator.

PLL: Basic Principles- Analog Phase detector- Digital phase detector- VCO- LPF- Application: Frequency Multiplication/Division- AM Detection

IC Voltage Regulator: 78XX series- IC723: Functional block diagram- Low voltage regulator using IC723.

#### **TEXT BOOKS**

1. D.Roy Choudhury and Shahil B Jain, “**Linear Integrated Circuits**”, Second Edition New Age International Publishers 2004.
2. Ramkant.A.Gayakwad,” **Opamp and Linear Integrated Circuits**”- Prentice Hall of India Publishers,Fourth Edition 2006.
3. B.S.Sonde,”**Introduction to system design using Integrated circuits**”, Second Edition New Age International Limited Publishers 2003.

#### **REFERENCE BOOKS**

1. Robert.F.Coughlin and Fredrick.F.Driscol .” **Operational Amplifiers and Linear Integrated Circuits**”- Prentice Hall of India Publishers,Fourth Edition 2006.
2. William .D.Staneley, “ **Opamps with LIC**”- IV edition ,Pearson Education 2004.

## SEMESTER – V

Int	Ext	Total
20	55	75

### **SUBJECT TITLE: FIBRE OPTICS AND NETWORK COMMUNICATION SYSTEMS**

#### **SUBJECT CODE:**

#### **SUBJECT DESCRIPTION:**

- This course presents the networks and fiber optic communications.

#### **GOAL:**

- To enable the students to learn Network systems and fiber optic communication Systems.

#### **OBJECTIVE:**

- After successful completion of the course, the students should have understood the concept of network system and optical fiber communication systems.

#### **CONTENTS:**

#### **UNIT- I: REFRACTIVE INDEX AND VELOCITY OF LIGHT**

Importance of fibre optics – propagation of light in different media – propagation of light waves in optical fibre – basic structure of an optical fibre – acceptance angle and acceptance cone of a fibre – numerical aperture – numerical aperture of a graded index fibre – modes of propagation – applications of fibres

#### **UNIT -II: CLASSIFICATION OF OPTICAL FIBRES & FIBER LOSSES**

Classification of optical fibre : stepped index – stepped index multimode – graded index multimode – single mode – plastic fibre – fibre strength – mechanical strength – measurement of fibre – Fibre Losses: Attenuation in optic fibers – Material losses – Rayleigh Scattering loss - absorption loss – Leaky Mode – Bending losses – Core & Cladding Losses

#### **UNIT - III: LIGHT SOURCES AND DETECTORS**

Introduction – LED process – characteristics of LED – structure of LED – LED material – white LED – organic LED - Fundamental of LASER: spontaneous and simulated

emission - Types of LASER: Ruby – He –Ne Laser – semiconductor laser - Photo detector: introduction – characteristics of photo detectors – PIN Photo diode – Avalanche Photo diode – Photo transistor – Photo Darlington.

#### **UNIT - IV: DATA COMMUNICATION**

Introduction – components – data representation – data flow – networks – distributed processing – network criteria - Physical structures: types of connection – physical topology: mesh – star – Bus – Ring – Hybrid - Network model: Local Area Network (LAN) – Wide Area Network (WAN) – Metro Area Network (MAN) - Internet Brief History – protocols and standards.

#### **UNIT -V: NETWORK MODEL AND TRANSMISSION MEDIA**

OSI Model – Layered architecture – peer to peer process – TCP/IP protocol suit – Addressing - Transmission media – guide media: twisted pair cable – coaxial cable – fibre optic cable – fibre optic cable connector - unguided media: wireless – radio wave – microwave – infrared

#### **TEXT BOOKS**

1. Subir Kumar Sarkar “**Optical Fibre and Fibre optic communication system**”, S.CHAND & Company Limited, Fourth Revised Edition, 2007.
2. Behrouz A Forouzan “**Data Communication & Networking**” 4<sup>th</sup> edition Tata Mc Grawhill Publications, 2006.
3. Dr. M. Arumugam, “**Semiconductor Physics and Optoelectronics**” Anuradha Publications, 2003.

#### **REFERENCE BOOKS**

1. William Stallings “**Data and computer communication**” 6th edition, Pearson education, 2000.
2. Andrew S.Tanenbaum “**Computer Networks**”, 3rd edition, PRENTICE HALL OF INDIA, 1996.
3. John M.Senior “**Optical Fiber Communications**” Second Edition, PRENTICE HALL OF INDIA, 2003.

## SEMESTER-V

Int	Ext	Total
25	75	100

**SUBJECT TITLE: BIO- MEDICAL INSTRUMENTATION**

**SUBJECT CODE:**

**SUBJECT DESCRIPTION:** This subject deals with the principles and operations of bio-medical instruments used in the hospital industry.

**GOAL:** To give a complete exposure of various Medical Instruments used for diagnostic application and therapy.

**OBJECTIVES:**

- To enable the students to understand bio-potential recording, bio-amplifiers and to impart the knowledge of bio-telemetry and imaging systems.

**CONTENTS:**

### UNIT- I BIO ELECTRIC POTENTIALS AND BIO POTENTIAL ELECTRODES

Basic Anatomy of Human Body - Cells and their structure-transport of ions through the cell membrane-resting and action potentials – characteristics of resting potential- bio electric potentials – Necessity of Instrumentation - Design of medical instrument - components of the bio-medical instrument system -electrodes: half cell potential- purpose of the electrode paste- electrode material- types of electrodes: micro electrodes: metal micro electrode, micro pipet - depth and needle electrodes- surface electrodes.

### UNIT- II BIO POTENTIAL RECORDERS

Introduction – Need for Bio-potential Recorders - characteristics of recorders-writer and pen damping- ECG lead configuration-block diagram and detailed operation of electro cardio graph (ECG) - phono cardio graph (PCG) - electro encephalo graph (EEG) – analysis of EEG- electro myo graph (EMG)-electro retino graph (ERG)-electro oculo graph (EOG).



### **UNIT- III THERAPEUTIC EQUIPMENTS**

Pacemakers: need for pacemaker -methods of stimulation- internal vs. external pacemakers- modes of pacemakers: atria synchronous pacemaker - ventricular synchronous pacemaker, ventricular asynchronous pacemaker, ventricular inhibited pacemaker, atrial sequential ventricular inhibited pacemaker- defibrillator: Need for Defibrillator - DC defibrillator - synchronized DC defibrillator-square wave DC defibrillator

### **UNIT- IV DIATHERMY AND BIO TELEMETRY**

Diathermy: Need for Diathermy-surgical diathermy techniques-short wave diathermy-microwave diathermy- ultrasonic therapy unit- anesthesia machine - bio telemetry: Need for bio telemetry-elements of bio telemetry- design of bio telemetry-radio telemetry systems: single and multi channel telemetry-problems in implant telemetry-uses of telemetry.

### **UNIT- V MEDICAL IMAGING SYSTEMS**

Need for imaging systems - endoscope- endoscopic laser coagulator - X-Ray machine-computerized tomography (CT scanner) - magnetic resonance imaging (MRI Scanner): MRI instrumentation- ultra sonography: principle and modes of operation: A mode, B mode, - positron emission tomography (PET)- digital subtraction angiography (DSA)- comparison of imaging systems.

### **TEXT BOOKS**

1. Dr. M. Arumugam, "**Bio Medical Instrumentation**" Anuradha Agencies, II Edition, 1994.
2. R.S.Khandpur, "**Hand Book Of Bio Medical Instrumentation**" Tata McGraw Hill Publishers, II Edition 2003.

### **REFERENCE BOOKS**

1. Leslie, Cromwell, Fred.J. Weibell, Erich.A. Pfeiffer, "**Bio-Medical Instrumentation and Measurements**", Prentice Hall of India Publishers, Second Edition, 1980.
2. John.G. Webster, "**Medical Instrumentation**" Wiley Publishers, Second Edition, 2007.

## SEMESTER – V

Int	Ext	Total
20	55	75

### **SUBJECT TITLE: 8051 MICROCONTROLLER AND ITS APPLICATIONS**

#### **SUBJECT CODE:**

**SUBJECT DESCRIPTION:** This subject presents 8051 microcontroller and its applications

**GOAL:** To create an in depth knowledge in the field of embedded systems

#### **OBJECTIVE:**

- The subjects provide a technical knowledge in embedded applications

#### **CONTENT**

##### **UNIT-I MICROCONTROLLER OVERVIEW**

Introduction to microcontroller – comparison of  $\mu p$  &  $\mu c$  - 8051 microcontroller hardware- 8051 oscillator and clock – program counter & data pointer – A & B CPU registers– flag & PSW – special function registers – internal memory & internal RAM – stack & stack pointer – SFR – internal ROM – input/output pins & ports.

##### **UNIT – II PERIPHERALS**

Counter and timer : timer/counter interrupts – timing – timer modes of operation – counting- serial data input/output: serial data interrupt – data transmission – data reception – serial data transmission modes – interrupts: timer flag interrupt – serial port interrupt – external interrupt – reset – interrupt control – interrupt priority – interrupt destination – software generated interrupts.

##### **UNIT – III ARITHMETIC AND LOGICAL INSTRUCTIONS**

Introduction – addressing modes – byte level logical operations – bit level logical operations – rotate and swap operations – simple programs – arithmetic operations: incrementing and decrementing instructions – addition – subtraction – multiplication and division – simple programs.

##### **UNIT – IV DATA TRANSFER AND BRANCH OPERATIONS**

Introduction – internal data move - external data move – code memory read only data move – push & pop - op codes – data exchanges – simple programs – jump and call

instructions: long jump – short jump – relative jump operations – conditional and unconditional jump instructions – calls and subroutine – interrupt and returns – simple programs.

### **UNIT –V REAL TIME APPLICATIONS**

Interfacing of LCD – LCD operation – pin descriptions – command & data to the LCD – code & data to the LCD – LCD data sheet – ADC devices – ADC 804 chip – testing ADC 804 – LM34 temperature sensor – steps to programme the ADC0808/ 809 – stepper motor – step angle – motor speed – torque – wave drive four steps sequence – interfacing key board – scanning & identifying the keys – grounding rows & reading columns. Case Study: Antilock Breaking System

### **TEXT BOOKS**

1. Kenneth J. Ayala, **“The 8051 Microcontroller Architecture, Programming and Application”** Penram International Publishers, Second Edition, 2000.
2. Mohamed Ali Maszidi & Janice Gillispie Maszidi, **“The 8051 Microcontroller and Embedded System”**, Pearson Publishers, Revised Edition, Second Edition, 1999.

### **REFERENCE BOOK**

1. Myke predko, **“Programming And Customizing The 8051 Microcontroller”**, Tata McGraw Hill, First Edition, 1999.

## SEMESTER –VI

**SUBJECT TITLE: INDUSTRIAL AND POWER ELECTRONICS**

Int	Ext	Total
25	75	100

**SUBJECT CODE:**

**SUBJECT DESCRIPTION:** This subject presents the working knowledge on industrial and power electronics.

**GOAL:** To develop the knowledge in electronics to meet industrial standards

**OBJECTIVE:**

- During the end of the subjects the students acquire the skills of inverters, power control circuits design.

**CONTENTS:**

### UNIT – I POWER DEVICES

Introduction: SCR, DIAC & TRIAC – operation and characteristics of SCR, TRIAC, DIAC, UJT & PUT – two transistor analogy of SCR – circuits for gate triggering: simple R triggering – RC triggering – pulse triggering – triggering with UJT – comparison between thyristor & UJT – speed control of dc motor using SCR & TRIAC - rectifier circuits using SCR.

### UNIT – II COMMUTATION & POWER CONTROL

Introduction to commutation: natural – forced commutation - series & parallel capacitor- line side commutation external pulse commutation - self commutation & auxiliary commutation load side commutation – static circuit breaker – zero voltage switches – over voltage protection.

### UNIT – III INVERTER AND CHOPPER

Introduction to inverter – inverter operation – single phase and three phase bridge inverter – introduction to chopper – principles of step down operation - step up operation – switch mode regulators: buck, boost – basic principles of power supplies - UPS – SMPS.

### UNIT – IV APPLICATIONS IN INDUSTRIAL SYSTEM

Thermistor control of quench oil temperature – strip tension controller – control of relative humidity in a tensile moistening process – ware housing humidity controller

ultrasonic: generation: piezo electric and magnetostriction methods Heating: Induction heating – dielectric heating – overview of applications

#### **UNIT – V INDUSTRIAL ROBOTIC SYSTEMS**

Parts of robotic systems – classification of robotic systems – robotic systems configurations – programming robotic systems – degree of freedom of robotic system – motion of robotic systems – sensors for robotic systems – mechanical parts – control systems.

#### **TEXT BOOKS**

1. M.Ramamurthi,“**An Introduction to Thyristor’s and its Applications**”, East west press ltd. Second Edition
2. S.K. Bhattacharya, S.Chatterjee , “**Industrial Electronics And Control**” Tata McGraw Hill, Third Edition
3. Muhammad H. Rashid, “**Power Electronics**”, Prentice- Hall of India, Third Edition 2004.
4. Timothy J.Maloni – “**Industrial Solid State Electronics**”, Tata McGraw Hill, New Edition.
5. G.K Mithal -“**Industrial Electronics** ”, Khanna Publishers, Third Edition 1978.
6. Mikell Groover, Mitchell Weiss, Roger Nagel, Nicholas Odrey – “**Industrial Robotics**”, Tata McGraw Hill, Edition 2008.

#### **REFERENCE BOOK**

1. Timothy J.Skavarenina, “ **The Power Electronics Handbook**”, CRC Press

## SEMESTER – VI

Int	Ext	Total
25	75	100

**SUBJECT TITLE: ADVANCED COMMUNICATION SYSTEM**

**SUBJECT CODE:**

**SUBJECT DESCRIPTION:** This subject presents the methods used in advanced communication.

**GOAL:** To create an in depth knowledge in the field of satellite and microwave communications.

**OBJECTIVE:**

- The subject provides a technical knowledge in communication with satellite and microwave.

**CONTENTS:**

### **UNIT - I MICROWAVE & RADAR FUNDAMENTALS**

Introduction – history of microwaves – microwaves bands –military bands – US bands advantage and applications – introduction to radar – pulsed radar system: block diagram & operation – RADAR range equation - CW radar and MTI radar – block diagram & operation.

### **UNIT – II MICROWAVE SOLID STATE DEVICES**

Operation and characteristics of microwave transistor – varactor diode – pin diode - schottky diode – tunnel diode – GUNN diode – IMPATT & TRAPATT devices.

### **UNIT - III MICROWAVE TUBES**

Introduction- operation and characteristics of two cavity klystron- reflex klystron- multi cavity klystron – traveling wave tube and magnetron

### **UNIT – IV OVERVIEW OF SATELLITE COMMUNICATION**

Introduction – kepler’s first law - kepler’s second law - kepler’s third law – orbits – geo stationary orbits – earth station – satellite station keeping – limits of visibility – transponders.

### **UNIT - V COMMUNICATION SATELLITE SUB SYSTEM**

Introduction – electric power supply – altitude & orbit control system – antenna systems – telemetry tracking & command – power systems- introduction to DTH home receiver.

### **TEXT BOOKS**

1. Roddy Collen, “**Electronics Communications**”, Prentice Hall of India Publication Fourth Edition, IV Edition 2002.
2. Dr.D.C.Agarwal, “**Satellite Communication**”,Khanna Publishers VI Edition 2006.
3. M.Kulkarni, “**Microwave & Radar Engineering**”, Umesh Publication, III Edition 2003.
4. Kennedy, Davis, “**Electronic Communication Systems**” – Tata Mc Graw Hill Publishing Company Limited, IV Edition, 1999.

### **REFERENCE BOOKS**

1. Timothy Dratt, Charles Bostiar, Jeremy Allnecct, “**Satellite Communication**”Publisher Wiley 1986.
2. George Kennedy, “**Electronic Communication Systems**”, Tata McGraw Hill Publishers, 4<sup>th</sup> Edition 2002.

## SEMESTER VI

Int	Ext	Total
20	55	75

### **SUBJECT TITLE: DIGITAL AND CELLULAR COMMUNICATION SYSTEMS**

#### **SUBJECT CODE:**

**SUBJECT DESCRIPTION:** This subject deals with data transmission in method of communication & telecommunication system.

**GOAL:** Enable the students to learn the digital and cellular communication system

#### **OBJECTIVE:**

- After successful completion of the course the students understand the wireless transmission, gain knowledge about cellular systems.

#### **CONTENTS:**

##### **UNIT – I DATA TRANSMISSION**

Introduction – representation of data signal – parallel and serial data transmission – 20 milli amps loop and line drivers – transient noise – data signal – signal shaping and speed – noise and error analysis - repeaters.

##### **UNIT – II COMMUNICATION SYSTEM**

Model of communication system – elements of digital communication system: information source, source encoder/decoder, communication channel, modulator demodulator, channel encoder/ decoder, other functional blocks – analysis of communication system – design of communication system.

##### **UNIT – III WIRELESS TRANSMISSION**

Introduction to wireless transmission - frequencies for radio transmission – regulations - signals - antennas – signal propagation – path loss of radio signals – additional signal – propagation effects – multipath propagations – multiplexing: phase division multiplexing – frequency division multiplexing – time division multiplexing – code division multiplexing – modulation: amplitude shift keying – frequency shift keying – phase shift keying – introduction to spread spectrum and cellular system - Bluetooth protocol



#### **UNIT – IV MEDIUM ACCESS CONTROL**

Introduction to medium access control - motivation for a specialized medium access control – hidden & exposed terminal – near & far terminals – SDMA – FDMA - TDMA- fixed TDMM - CDMA - comparison of S/T/F/CDMA.

#### **UNIT –V TELECOMMUNICATION SYSTEM**

Introduction to GSM - mobile service – bearer service – teleservice- supplementary service– system architecture of GSM – radio sub system – network & switching subsystem – operation subsystem – hand over – security – introduction to GPRS, UMTS & IMT – 2000.

#### **TEXT BOOKS**

1. Sam. K. Shanmugam, “**Digital & Analog Communication System**” John Wiley Publication 2005 Edition.
2. Jochen Schiller, “**Mobile Communication**” Pearson Education Asia Publishers, Second Edition 2004.

#### **REFERENCE BOOKS**

1. W.C. Y. Lee, “**Mobile Cellular Telecommunication**” Tata Mc Graw Hill Publication 1995 Reprint.
2. John G.Proakis , “**Digital Communication**” TataMc Graw Hill International Publishers,2001Edition.

**SEMESTER V & VI**

Int	Ext	Total
40	60	100

**SUBJECT TITLE: COMMUNICATION LAB II**

**SUBJECT CODE:**

**LIST OF EXPERIMENTS (Any 15 Experiments)**

1. Voltage Controlled Oscillator (VCO).
2. Generation of FSK.
3. Pre Amplifier.
4. Log and Antilog Amplifiers.
5. Power Amplifier.
6. PLL using NE/SE565.
7. Frequency Multiplier using PLL
8. Generation of ASK.
9. Converter Stage of a Radio Receiver
10. Tuned Amplifier.
11. Function Generator using IC 8038.
12. Sync Separator.
13. Pre Emphasis and De Emphasis networks.
14. Audio Mixer Circuit.
15. Generation of PSK.
16. Study of Television System.
17. Study of DTH.
18. Study of GSM.
19. Study of Blue tooth.
20. Study of Wi - Fi System.

## SEMESTER V & VI

Int	Ext	Total
40	60	100

**SUBJECT TITLE: INTEGRATED CIRCUITS LAB**

**SUBJECT CODE:**

**LIST OF EXPERIMENTS (Any 15 Experiments)**

1. Voltage to current converter
2. Current to voltage converter
3. Integrator & Differentiator
4. Instrumentation Amplifier
5. Low pass filter
6. High pass filter
7. Band pass filter
8. Triangular wave generator
9. Square wave generator
10. Schmitt trigger
11. Colpitts oscillator
12. Phase shift oscillator
13. Wein bridge oscillator
14. Study of op-amp characteristics
15. Inverting amplifier
16. Non - inverting amplifier
17. Saw tooth waveform generator.
18. Differential amplifier
19. Power amplifier

## SEMESTER V & VI

Int	Ext	Total
40	60	100

**SUBJECT TITLE: MICRO CONTROLLER AND INTERFACING LAB**

**SUBJECT CODE:**

### **LIST OF EXPERIMENTS (Any 15 Experiments)**

1. Addition & Subtraction of 8 Bit data
2. Multiplication & Division of 8 Bit data
3. Smallest & Largest in an array
4. Ascending & Descending order
5. Block Data Transfer
6. Addition of 'n' numbers
7. Searching a number in an array
8. Time Delay Generation using register
9. Waveform Generation I (Square & Triangle)
10. Waveform Generation II (Saw tooth & Sine)
11. Counter I (Up & Down)
12. Counter II (Ring & Shift)
13. Conversion of ASCII numbers to Hexadecimal
14. Seven Segment Interfacing
15. Relay Interfacing
16. Stepper Motor Interfacing
17. ADC Interfacing
18. DAC Interfacing
19. Sensor Interfacing
20. LCD Interfacing

**SEMESTER V & VI**

Int	Ext	Total
40	60	100

**SUBJECT TITLE: POWER ELECTRONICS LAB**

**SUBJECT CODE:**

**LIST OF EXPERIMENTS (Any 15 Experiments)**

1. Characteristics of LDR
2. Characteristics of Photo Diode
3. Characteristics of Photo Transistor
4. Characteristics of LASCR
5. Characteristics of SCS
6. Characteristics of SBS
7. Relay driver using Photo Diode
8. Firing angle control of SCR
9. Relay driver using Photo Device (LDR)
10. Burglar alarm
11. Smoke detector
12. Forced commutation
13. Sequencer Timer
14. Speed control of DC motor using Thyristor
15. Fan control using Triac
16. Power Inverter
17. Over Voltage Indicator
18. Thyristor Chopper
19. Spike Buster
20. Solid state relay
21. SCR Triggering using UJT

## SEMESTER V & VI

Int	Ext	Total
40	60	100

**SUBJECT TITLE: CIRCUIT SIMULATION & PCB DESIGN LAB**

**SUBJECT CODE:**

**LIST OF EXPERIMENTS (Any 15 Experiments)**

### **CIRCUIT SIMULATION LAB**

1. Ohm's Law
2. Sinusoidal Voltage Source: SIN (wt)
3. Sinusoidal Voltage Source: COS (wt)
4. Thevenin's Theorem
5. Norton's Theorem
6. Diode Characteristics
7. Power supply
8. Transistor Characteristics
9. SCR Characteristics
10. UJT Characteristics
11. Half wave rectifier
12. Full wave rectifier
13. Bridge Rectifier
14. Clipping Circuits
15. Clamping Circuits
16. Common Emitter Amplifier

### **PCB DESIGN LAB**

17. Power supply Design
18. Drawing of circuit in PCB board
19. Etching
20. Drilling, Mounting components & testing