KUVEMPU UNIVERSITY
DEPARTMENT OF P.G.STUDIES & RESEARCH IN ELECTRONICS

PROCEEDINGS OF PG B O S MEETING IN ELECTRONICS

The Meeting of the UG Board of Studies in Electronics was held on 28th June 2024 (Friday) at 11.00 A.M. in the Dept. of UG Studies & Research in Electronics, Jnana Sahyadri, Shankaraghatta.

MEMBERS PRESENT:

1 **Dr. Madhuri.G.R,**   Chairman
Assistant Professor**,**
Dept. of Electronics, Kuvempu University,
Jnanasahyadri, Shankaraghatta-577451.

2. **Dr. Manjunath Reddy**   Member
Associate Professor
Smt. Saraladevi Satishchandra Agarwal,
Govt. First Grade College, Bellary.

3. **Dr. M. S. Sethsandi**   Member
Asst. Professor
Dept. of Electronics,
P.C. Jabin College, Hubballi.

4. **Mr. Umesha**   Member
Associate Professor
Dept. of Electronics,
DVS College Science, Shimoga

The Board resolved the following:

Board has Discussed and approved the UG Syllabus in Electronics according to the SEP guidelines for the academic year 2024-25.

Note: Due to personal emergency, Dr. B. N. Jagadale is unable to attend the meeting. Meeting is presided by Dr. Madhuri G R.

Meeting was concluded with vote of thanks

KUVEMPU NIVERSITY
BOARD – ELECTRONICS
UG SYLLABUS 2024-25

SEM	TITLE	UNIT	THEORY TOPICS	PRACTICAL TOPICS
1st	ELECTRONIC DEVICES AND CIRCUITS	1	AC, DC CIRCUIT AND CIRCUIT THEOREMS	ELECTRONIC DEVICES AND CIRCUITS LAB
		2	SEMI CONDUCTOR DEVICE AND ITS APPLICATION	
		3	TRANSISTOR, FET, MOSFET	
		4	SINGLE STAGE AMPLIFIER , POWER ELECTRONICS	
2nd	ELECTRONIC CIRCUITS AND APPLICATIONS	1	MULTISTAGE AMPLIFIER AND POWER AMPLIFIER	ELECTRONIC CIRCUITS AND APPLICATIONS LAB
		2	TUNED AND FEED BACK AMPLIFIER	
		3	OSCILLATOR AND MULTIVIBRATOR	
		4	OPAMP AND ITS APPLICATIONS	
3rd	DIGITAL ELECTRONICS AND IC FABRICATION	1	DIGITAL ELECTRONICS FUNDAMENTALS	DIGITAL ELECTRONICS LAB
		2	COMBINATIONAL CIRCUITS	
		3	SEQUENCIAL CIRCUITS	
		4	IC FABRICATION TECHNIQUES AND VLSI	
		5	BASIC ELECTRONICS AND COMPUTERS (OPEN ELECTIVE)	
4th	COMPUTER FUNDAMENTALS AND C PROGRAMMING	1	COMPUTER FUNDAMENTALS	C PROGRAMMING LAB
		2	C PROGRAMMING CONCEPTS AND C OPERATOR	
		3	EXPRESSIONS AND CONTROL STRUCTURES	
		4	ARRAYS, USER DEFINED FUNCTIONS AND STRUCTURES	
		5	APPLICATIONS OF ELECTRONICS (OPEN ELECTIVE)	
5th	MICRO CONTROLLER AND EMBEDDED SYSTEM	1	INTRODUCTION TO 8051 ARCHITECTURE	MICRO CONTROLLER LAB
		2	8051 INSTRUCTION SET AND 8051 PROGRAMMING	
		3	TIMERS / COUNTERS AND INTERRUPTS	
		4	SERIAL I/O AND EMBEDDED SYSTEM	
6th	ADVANCED COMMUNICATION	1	ANALOG COMMUNICATION	PROJECT
		2	DIGITAL COMMUNICATION	
		3	RADAR, SATELLITE COMMUNCATION	
		4	MOBILE COMMUNCATION	

Date: **28.06.2024**

MODEL SYLLABUS FOR B.Sc. ELECTRONICS, SEMESTERS I AND II

2024-25

SEMESTER: I

Course Code		Course Title	**ELECTRONIC DEVICES AND CIRCUITS**
Course Credits	**03**	Hour of Teaching / Week	**03**
Total Contact Hours	**48**	Formative Assessment Marks	**20**
Exam Marks	**80**	Exam Duration	**3 Hours**

Course Content

Content		Hours
UNIT – 1	**AC, DC CIRCUIT AND CIRCUIT THEOREMS**	
AC - AC applied to Series RC and RL circuits: Impedance of series RC & RL circuits. **DC** analysis of RL & RC Series circuits – theory (charging and discharging) **RLC circuits** - AC analysis of RLC series and parallel Resonant Circuits. **Network Theorems**: KCL,KVL, Thevenin's and Maximum Power Transfer theorem		**12**
UNIT – 2	**SEMI CONDUCTOR DEVICE AND ITS APPLICATION**	
Semi conductor theory: Types, PN junction diode - theory, characteristics. Zener diode - theory, characteristics. **Rectifiers** - Half wave and Full wave (centre tap and bridge) rectifiers, expressions for output voltage, ripple factor and efficiency **Filters –** types, shunt capacitor filter. **Voltage regulator**: Block diagram of regulated power supply, Line and Load regulation, Zener diode as voltage regulator. **Wave shaping circuits:** Clippers and clampers		**12**
UNIT – 3	**TRANSISTOR, FET, MOSFET**	
Bipolar Junction Transistor: Construction, types, CE, CB and CC configurations. VI characteristics of a transistor in CE mode, Regions of operation, Current gains and their inter-relations.**JFET**–Types, n-channel JFET – construction, working and I-V characteristics. JFET parameters and their relationships. **MOSFET**:E – MOSFET, Construction, working, drain and transfer characteristics.		**12**
UNIT – 4	**SINGLE STAGE AMPLIFIER , POWER ELECTRONICS**	
Single stage amplifier: Transistor biasing - types. DC load line, Operating point, Thermal runaway, stability and stability factor. Fixed and voltage divider biasing – expression for Q-point.Transistor as a switch – circuit and working. Darlington pair and its applications **UJT** - construction, working, equivalent circuit and I-V characteristics and applications. **SCR**- construction, working, equivalent circuit and I-V characteristics and applications.		**12**

Note: Sufficient number of numerical problems should be solved in each unit.

Reference Books:
1. Robert L Boylestad, "Introductory circuit analysis", 5th edition.,Universal Book
2. R.S.Sedha, "A Text book of Applied Electronics", 7th edition., S. Chand and Company
3. A.P. Malvino, "Principles of Electronics", 7th edition .TMH, 2011.
4. Electronic devices and circuit theory by Boylestad, Robert Nashelsky
5. David A. Bell " Electronic Devices and Circuits", 5th Edition, Oxford Uni. Press, 2015
6. S. A. Nasar," Electrical Circuits", Schaum's outline series, Tata McGraw Hill, 2004
7. J. Millman and C. C. Halkias, "Integrated Electronics", Tata McGraw Hill, 2001
8. A.S. Sedra, K.C. Smith, A.N. Chandorkar "Microelectronic circuits", 6th Edition

Course Code		Course Title	**ELECTRONIC DEVICES AND CIRCUITS LAB**
Course Credits	**02**	Hour / Week	**04**
Total Contact Hours		Formative Assessment Marks	**10**
Exam Marks	**40**	Exam Duration	**3 Hours**

Lab Content

	Minimum of **TEN** Experiments to be performed

1	Study of Series and Parallel RC circuits - determination of impedance
2	Study of Series RC circuits - determination of time constant during charging and discharging
3	Study of Series and Parallel Resonance circuits – determination of its Resonant frequency Bandwidth and Quality Factor
4	Verification of Thevenin's theorem
5	Maximum Power Transfer Theorem
6	Study of the I-V Characteristics of (a) p-n junction Diode, and (b) Zener diode.
7	Study of Half wave rectifier -determination of ripple factor
8	Study of full wave bridge rectifier without and with shunt capacitor filter – determination of ripple factor
9	Study of Zener diode as a Voltage Regulator - Load and line regulation.
10	Study of Clipping and Clamping circuits(Positive and negative).
11	Study of Transistor characteristics in CE configuration – determination Ri, Ro and β.
12	Single stage CE amplifier study of frequency response curve and bandwidth
13	Study of JFET characteristics – determination of parameters.
14	UJT as relaxation oscillator
15	Study of SCR Characteristics

Course Code		Course Title	**ELECTRONIC CIRCUITS AND APPLICATIONS**
Course Credits	**03**	Hour of Teaching / Week	**03**
Total Contact Hours	**48**	Formative Assessment Marks	**20**
Exam Marks	**80**	Exam Duration	**3 Hours**

Course Content

Content	Hours
UNIT – 1 **MULTISTAGE AMPLIFIER AND POWER AMPLIFIER**	
Multistage Amplifier: Need, Methods of coupling- circuit analysis of RC coupled amplifier, Frequency response and applications. **Power Amplifier**: Performance quantifies of power amplifier classification, circuit operation of different type, expression of efficiency, comparison and mention of applications.	**12**
UNIT – 2 **TUNED AND FEED BACK AMPLIFIER**	
Tuned Amplifier: Types, circuit operation single and double stage amplifiers, Frequency response, applications. **Feedback Amplifier**: Principle of feedback, different feedback techniques, Comparison between the types. Negative feedback: expression for gain stability, distortion and bandwidth. Mention of applications	**12**
UNIT – 3 **OSCILLATOR AND MULTIVIBRATOR**	
Oscillators: Classification, oscillatory circuit, condition for sustained Oscillation, circuit operation of different oscillator, expression frequency of oscillation, comparisons, applications. **Multivibrators**: Types, circuit operation of different multivibrators, expression for frequency, comparisons & applications	**12**
UNIT – 4 **OPAMP AND ITS APPLICATIONS**	
OPAMP: Introduction, block diagram, pin configurations of IC 741, circuit symbol. Inverting & non inverting amplifier with feedback- expression for closed loop voltage gain. **OP AMP applications:** Voltage follower circuit. Current to voltage converter, differential amplifier, Adder, subtractor. Integrator, Differentiator: circuit operation, derivation of output response. Frequency filters using op amp: Types of active filters, First order Low pass, High pass circuit- operation, derivation for cut-off frequency. Basic comparator using OP AMP.	**12**

Note: Sufficient number of numerical problems should be solved in each unit.

Reference Books:

1. Robert L Boylestad, "Introductory circuit analysis", 5th edition., Universal Book

2. Op-Amps and Linear IC' s - R.A. Gayakwad, , Pearson Education (2003)

3. Basic Electronics(solid state)- B.L.Theraja - S Chand & Co

4. Electronic devices and circuits - G.K.Mithal, Khana publishers, New Delhi

5. Integrated Circuits – Deboo and Burrous - McGraw Hill.

6. Linear ICs – D. Roy Choudhury, Sherif, Jain – Wiley Eastern.

7. Integrated Circuits - K.R. Botkar – Khanna Publishers.

Course Code		Course Title	**ELECTRONIC CIRCUITS AND APPLICATIONS LAB**
Course Credits	**02**	Hour / Week	**04**
Total Contact Hours		Formative Assessment Marks	**10**
Exam Marks	**40**	Exam Duration	**3 Hours**

Lab Content

	Minimum of **TEN** Experiments to be performed

1	Single stage RC coupled Amplifier – frequency response and determination of bandwidth
2	Double stage RC coupled Amplifier – frequency response and determination of bandwidth
3	Tuned Amplifier – frequency response and determination of resonant frequency and bandwidth
4	Feedback Amplifier – frequency response and determination of bandwidth
5	Collpitts Oscillator – determination of frequency of oscillation
6	Hartely Oscillator – determination of frequency of oscillation
7	RC phase shift Oscillator – determination of frequency of oscillation
8	Astable Multivibrator – determination of frequency of oscillation
9	Determine the Slew rate using OPAMP
10	OPAMP as Inverting & Non-inverting amplifier determination of voltage gain of the amplifier.
11	OPAMP as Inverting amplifier - frequency response and determination of bandwidth.
12	Op amp as Integrator/differentiator
13	OPAMP as Wein bridge oscillator
14	OPAMP as voltage to current & current to voltage converter
15	OPAMP as Low pass filter and High pass filter
16	OP AMP as comparator