

Department of Electronics Proceedings of the BoS Meeting - Electronics

The meeting Board of Studies (BoS – U.G.) in Electronics was held on 15th June, 2024 at 11.30 A.M. in the Department of Studies in Physics, Davangere University, Shivagangothri, Davangere. The following are the members.

1. Prof. M. N. KALASAD	- Chairman, BoS (U.G.)
2. Prof. RAMALINGAPPA	- Member
3. Prof. K. M. ESHWARAPPA	- Member
4. Prof. K. MANJANNA	- Member

Agenda:

Sl. No.	Points for the Deliberation in the BoS Meeting
1	UG Syllabus and scheme (Curriculum Structure) for I & II Semester
_	B. Sc. Electronics as per the guidelines of State Education Policy (SEP).

PROCEEDINGS:

The members have discussed the detailed UG Syllabus and Curriculum Structure of B. Sc. Electronics I & II Semester and B. Sc. III to VI Semester Curriculum Structure as per the State Education Policy (SEP) in accordance with the guidelines of the Davangere University.

The meeting ended with thanks to the members by the Chair.

Signature of the Committee Members:

1. Prof. M. N. KALASAD

2. Prof. RAMALINGAPPA

3. Prof. K. M. ESHWARAPPA

4. Prof. K. MANJANNA

M. N. Kalasad

Chairman, BoS (U. G.)

Chairman
Board of Studies
Department of Physics
Davangere University
Chivagangotti, Davangere-07

T-inal copy



Shivagangothri, Davangere- 577007

SYLLABUS and COURSE STRUCTURE

of

ELECTRONICS

as per the Choice Based Credit System (CBCS) designed in accordance with of State Education Policy (SEP-2024)

Bachelor of Science (B. Sc. Electronics)

w.e.f.

Academic Year 2024-25 and onwards

Chairman

Board of Studies

Depart: of of Physics

Davan University

Dr. U.S. MAHABALESHWAR M.Sc., M.Phil., Ph.D. Professor & Dean, Science & Technology Davangere University, Shivagangotri, Davangere-577 007, Karnataka, India. Registrar
Davangere University
Shivagangotri, Davangere



Bachelor of Science (B. Sc.) Electronics Curriculum Structure for Undergraduate Programme for 2024-25

	Course/Paper Code	Title of the Paper	Subject Category	Teaching Hours/ week	Semester End Exam.	Interne! Assessment	Total Marks	Credits	Examination Duration
1	2	3	4	5	6	7	8	9	10
		Semeste							
	24SEP-ELET-I	Fundamentals of Electronics	MC-T	04	80	20	100	03	3 Hrs.
1	24SEP-ELEP-I	Fundamentals of Electronics Lab	MC-P	04	40	10	50	02	3 Hrs.
	· :	Total		08	120	30	150	05	
		Semeste	r-II						
2	24SEP-ELET-II	Semiconductor Devices and Circuits	MC-T	04	80	20	100	03	3 Hrs.
2	24SEP-ELEP-II	Semiconductor Devices and Circuits Lab	MC-P	04	40	10	50	02	3 Hrs.
		Total		08	120	30	150	05	
		Semester	r-III						*
	24SEP-ELET-III	Oscillators and Digital Electronics	MC-T	04	80	20	100	03	3 Hrs.
3	24SEP-ELEP-III	Oscillators and Digital Electronics Lab	MC-P	04	40	10	50	02	3 Hrs.
	Open Elective (Optional)	*1. Basics of Electronics 2. Domestic equipment maintenance	EL/OP-	02	40	10	50	02	2 Hrs.
		Total	ž	10	160	40	200	07	
		Semester	r-IV						
	24SEP-ELET-IV	Linear Integrated Circuits	MC-T	04	80	20	100	03	3 Hrs.
4	24SEP-ELEP-IV	Linear Integrated Circuits Lab	MC-P	04	40	10	50	02	3 Hrs.
	Open Elective (Optional)	*1. Industrial Electronics 2. Consumer electronics	OEL/O P-II	02	40	. 0	50	02	2 Hrs.
		Total		10	160	40	200	07	
		Semeste	r-V					-	
	24SEP-ELET-V	Digital Electronics and C- Programming	MC-T	04	80	20	100	03	3 Hrs.
5	24SEP-ELET-VI	Electronic Communication-I	MC-T	04	80	20	100	03	3 Hrs.
	24SEP-ELEP-V	Digital Electronics and C- Programming Lab	МС-Р	04	40	10	50	02	3 Hrs.
		Total		12	200	50	250	08	

Chairman Board of Studies Department of Physics Davangere University Shivagangum, Davangere-07

Dr. U.S. MAHABALESHWAR M.Sc., M.Phil., Ph.D.

Professor & Dean, Science & Technology Davangere University, Shivagangotri, Davangere-577 007, Karnataka, India. Davangere University Shivagangotri, Davangere.

	Semester-VI								
2	24SEP-ELET-VII	Microcontroller and Applications	MC-T	04	80	20	100	03	3 Hrs.
6	24SEP-ELET-VIII	Electronic Communication-II	MC-T	04	80	20	100	03	3 Hrs.
· · · · · · · · · · · · · · · · · · ·	24SEP-ELEP-VI	Microcontroller and Applications Lab	MC-P	04	40	10	50	02	3 Hrs.
	24 SEP-ELEP-VII	Project	MC-P	04	50	100 tipe 100	50	02	3 Hrs.
	Total		16	250	50	300	10		
	Grand Total		64	1010	240	1250	42		

MC: Major Course MC-T: Major Course Theory; MC-P: Major Course Practical;

El/Op: Elective/Optional; AEDP: Apprenticeship Embedded Degree Programme.

*In Semester-III and Semester-IV open elective papers are offered. There shall be 02 elective papers offered during each semester (Semester-III and Semester-IV) by every major subject offering Department, where a student shall choose/select/opt 01 elective paper out of two to study in each semester (Semester-III and Semester-IV).

Chairman

Board of Studies

Department of Physics

Dayanger University

Davanger University Shivaganger, Davangere-07 Dr. U.S. MAHABALESHWAR

M.Sc., M.Phil., Ph.D.
Professor & Dean, Science & Technology
Davangere University, Shivagangotri,
Davangere-577 007, Karnataka, India.

RegistrarDavangere University
Shivagangotri, Davangere.

DAVANAGERE UNIVERSITY

THEORY PAPER

SEMESTER-I

B.Sc.	Semester	I
Electronics		
Fundamentals		· · · · · · · · · · · · · · · · · · ·
of Electronics		
24SEP-ELET-I	No of credits	03
56 Hours	Duration of SEA/Exam	03 Hours
20	summative Assessment marks	80
	Electronics Fundamentals of Electronics 24SEP-ELET-I 56 Hours	Electronics Fundamentals of Electronics 24SEP-ELET-I No of credits 56 Hours Duration of SEA/Exam

Program Objectives:

- To understand basic passive electronic components, types, performance, specifications, and applications.
- > To understand network analysis and use of basic measuring instruments.
- > To acquire the knowledge of basic semiconductor theory, types and formation of devices with junctions.
- > To study the opto-electronic devices construction, working, characteristics and applications.
- To acquire knowledge of rectifiers, filters and regulators.

Course Outcomes:

On successful completion of the course, the student will able to:

- Explain the basic electronic components and their uses in building electronic circuits.
- Explain the importance of statements and proof of network theorems and solve the complicated network problems and able to handle the multimeters and CRO.
- Explain the importance of semiconductor and opto-electronic devices construction, working, characteristics and applications.
- > Describe the construction of regulated power supplies for driving different electronic circuits and instruments and also UPS.

	Contents	56 hours
:		
:	Unit-1	14 hours

Electronics Components:

Chapter:1 Resistors: -Resistance and resistor definition, symbols, types of resistors, wire wound resistors, carbon composition resistor, Color coding of resistor and specifications.

Chapter:2 Capacitors: - Definition, capacitance, factors affecting capacitance, symbol, types of capacitors, ceramic capacitor, electrolytic capacitor, specifications, energy stored across the capacitor.

Chapter:3 Inductors: - Definition, self-inductance, types of inductors, air-core, iron core, and ferrite core inductors, specifications, Energy stored in an inductor.

Unit-2 14 hours

Network analysis and measuring instruments:

Chapter:4 Network theorems: - Ohm's law, Kirchoff's laws, voltage and current divider rule. Thevenin's theorem, Norton's theorem, Maximum power transfer theorem (DC analysis only), examples.

Chapter:5 Multimeters: - Digital and Analog multimeters (brief)

Chapter:6 Cathode Ray Oscilloscope: - Block diagram of CRO, working of CRT and measurement of voltage, time period and frequency.

Unit-3

14 hours

Semiconductors Devices:

Chapter:7 Semiconductor basics: - Types, band theory, intrinsic and extrinsic semiconductors.

Chapter:8 Semiconductor Devices: - PN-junction diode and Zener diode – construction, working and characteristics.

Chapter:9 Opto-electronic devices: - Photo electric effect, Photo electric laws, Photo diode, Light emitting diode, Liquid cr. stal Display and Solar cell – construction, working, characteristics and their applications.

Unit-4

14 hours

Rectifiers, Filters and Regulators:

Chapter:10 Rectifiers: - Half-wave and Full wave (center tap and bridge) rectifiers. Expression for output voltage, ripple factor and efficiency.

Chapter:11 Filters: -Definition, types, shunt capacitor filter, inductor filter, LC-filter and π -filter.

Chapter:12 Regulators: - Block diagram of regulated power supply, Zener diode as voltage regulator, IC-voltage regulators-78xx, 79xx and LM317.

Reference Books:

- 1 Basic Electronics vol:1, Basavaraj B,2nd edition, Vikas publishers,2015.
- 2 Electronics I-semester by BVN Rao 1st edition, sapna book house-Bangalore (2009).
- 3 Principles of Electronics by V.K.Mehta and Rohit Mehta 11th edition, S Chand & Co LTD, 2009.
- 4 Basic Electronics by B.L.Theraja, 7th edition, S Chand & Co, 2007.
- 5 Electronic devices and circuits by G.J.Mithal, 20th edition, Khana Publishers, New Delhi-2014.
- 6 Electronic devices and circuits by David A. Bell, 5th Edition,, Oxford Univ. press, 2015.

Chairman
Roard of Studies
partment of Physics
avangere University
Shivagangotri, Davangere-07

Program Name	B. Sc. Electronics	Semester	I
Course Title	Fundamentals of Electronics lab		
Course Code:	24SEP-ELEP-I	No of Credits	02
Viva Voice marks	10	Experimentation marks	30
Attendance marks	05	Record marks	05
		Total Marks	50

- 1. RC series impedance.
- 2. RC parallel impedance.
- 3. RLC series resonant circuit.
- 4. RLC parallel resonant circuit.
- 5. Charging of a capacitor.
- 6. Discharging of a capacitor.
- 7. Verification of Superposition theorem.
- 8. Verification of Thevenin's theorem.
- 9. Verification of Maximum Power Transfer theorem.
- 10. V-I Characteristics of Semiconductor diode.
- 11. V-I Characteristics of Zener diode.
- 12. V-I Characteristics of LED.
- 13. CRO-Measurement of voltage, time period and frequency.
- 14. Half wave Full Wave Rectifiers.

SEMESTER-II

Program Name	B. Sc. Electronics	Semester	II
Course Title	Semiconductor devices and Circuits		
Course Code:	24SEP-ELET-II	No of Credits	03
Contact hours	56 Hours	Duration of SEA/Exam	03 Hours
Formative Assessment marks	20	summative Assessment marks	80

Program Objectives:

- > To understand Bipolar junction transistor basics, characteristics, transistor biasing and multistage amplifiers.
- To understand Unipolar devices (FET and MOSFET) and power electronic devices (SCR and UJT) their characteristics, comparison and applications.
- > To acquire knowledge of Emitter follower, darlington amplifier and wave-shaping circuits.
- > To study the power amplifiers, difference between voltage and power amplifiers and classification of power amplifiers.
- To acquire knowledge of feedback amplifiers and tuned amplifiers- types, circuits, advantages and disadvantages.

Course Outcomes:

On successful completion of the course, the student will able to:

- > Explain the importance of Bipolar junction transistors, transistor biasing circuits and multistage amplifiers.
- > Describe the construction, working, parameters, characteristics, comparison and applications of FET, MOSFET, SCR and UJT.
- Explain the importance of Emitter follower, Darlington amplifier and wave-shaping circuits.
- Describe the power amplifiers, feedback amplifiers and tuned amplifiers.

Contents	56 hours
Unit-1	14 hours

Bipolar junction transistors:

Chapter:1 Transistor be sics: - Introduction, construction working, and terminology. Configurations of CE, CB and CC. Definition of α , β , γ and relationship between them. Leakage currents, study of CE characteristics and different regions. DC load line analysis, transistor as an amplifier and transistor as a switch.

Chapter:2 Transistor biasing: - Definition, faithful amplification—conditions, stabilization—its need, types of transistor biasing, construction, working and circuit analysis of base resistor method and voltage divider biasing method- stability factor and advantages.

Chapter:3 Multistage amplifier: - Definition, gain of multistage amplifier, different methods and purpose of coupling, decibels gain. RC-coupled amplifier: construction, working, frequency response, bandwidth, gain bandwidth product, advantages, disadvantages and applications.

Department of Physics Davangere University Shivagangotri, Davangere-07 Unit-2 14 hours

UNIPOLAR DEVICES:

Chapter:4 FET: - P-channel and N-channel- construction, symbols, N-channel JFET-principles of operation, characteristics, parameters and their relation. Comparison of BJT and JFET.

Chapter:5 MOSFET: - Enhancement and depletion type - construction, symbols, principles of operation, characteristics, applications. Comparison of JFET and MOSFET.

Chapter:6 SCR and UJT: - Constructions, symbols, principles of operation, characteristics and applications.

Unit-3 14 hours

EMITTER FOLLOWER AND WAVE SHAPING CIRCUITS:

Chapter:7 EMITTER FOLLWER: - Construction and working, comparison with CE amplifier and mention the applications. Darlington pair- construction, working and advantages, comparison between Darlington pair and emitter follower.

Chapter:8 CLIPPING CIRCUITS: - Definition, types, positive and negative clippers- construction, working and input output wave forms.

Chapter:9 CLAMPING CIRCUITS: - Definition, types, positive and negative clampers- construction, working and input output waveforms.

Unit-4 14 hours

AMPLIFIERS:

Chapter:10 POWER AMPLIFIERS: - Difference between voltage amplifiers and power amplifiers, classification-class-A, class-B and class-C power amplifiers. performance quantities of power amplifiers-collector efficiency, distrotion and power dissipation capability. class-A power amplifier-construction, working and expression for maximum collector efficiency.

Chapter:11 FEEDBACK AMPLIFIERS: - Definition, types, principle of feedback amplifiers, advantages of feedback amplifiers (explanation of each).

Chapter:12 TUNED AMPLIFIERS: - Definition, types, construction and working of single tuned, double tuned amplifiers, and advantages

Reference Books:

- 1 Applied Electronics by R.S.Sedha, 3rd edition, S Chand &Co, 2013.
- 2 Principles of Electronics by V.K.Mehta and Rohit Mehta 11th edition, S Chand &Co.LTD.2009.
- 3 Basic Electronics by B.L.Theraja, 7th edition, , S Chand &Co.LTD.2007.
- 4 Electronic devices and circuits by G.J.Mithal, 20th edition, Khana Publishers, New Delhi-2014.
- 5 Power Electronics M.D. Singh and K.B.Khanchandani, 2nd Edition,TMH Pub.co.Ltd.2006.

SEMESTER - II

Program Name	B.Sc. Electronics	Semester	II
Course Title	Semiconductor Devices and Circuits Lab.	.:	
Course Code:	24SEP-ELEP-II	No of credits	02
Viva Voice marks	10	Experimentation marks	30
Attendance marks	05	Record marks	05
		Total Marks	50

- 1. Transistor characteristics in CE mode.
- 2. Transistor single stage CE amplifier.
- 3. Emitter follower circuit.
- 4. Voltage feedback amplifie-frequency response.
- 5. Two stage RC-coupled amplifier.
- 6. Audio frequency power amplifier.
- 7. Clipping circuits-positive and negative clippers.
- 8. Clamping circuits-positive and negative clampers.
- 9. FET characteristics and determination of parameters.
- 10. UJT characteristics.
- 11. SCR characteristics.
- 12. Single tuned voltage amplifier.

Chairman
Board of Studies
Department of Physics
Davangere University
Shivagangotri, Davangere-07

Dr. U.S. MAHABALESHWAR M.Sc., M.Phil., Ph.D. Professor & Dean, Science & Technology Davangere University, Shivagangotri, Davangere-577 007, Karnataka, India.

Registrar
Davangere University
Shivagangotri, Davang

Practical Proper Examination I-VI semesters

Duration: 3Hrs

		To	otal	40 Marks
•	Viva Voice	-		10 Marks
•	Experimentation (Major & Minor/Spotters)	-		30 Marks

Internal Assessment for Practical Paper I-VI semesters

		Total	10 Marks
•	Record/Journal	-	05 Marks
•	Attendance	-	05 Marks

Project Work/Internship during VI semester

Project work/Dissertation/Internship and preparation of Report -40 Marks Viva Voice 10 Marks **Total** 50 Marks

Chairman
Board of Studies
Department of Physics
Davangere University
Shivagangon, Davangere-07

Dr. U.S. MAHABALESHWAR M.Sc., M.Phil., Ph.D. Professor & Dean, Science & Technology Davangere University, Shivagangotri, Davangere University Davangere-577 007, Karnataka, India.

S. + Angotri, Dawangere.

Continuous Assessment Programme/Internal Assessment/Formative Assessment Major Papers/Courses & Languages

Sl. No.	Continuous Assessment Programme/Internal Assessment		Maximum Marks
(1)	(2)		(3)
01	Two Session Tests with proper record for assessment $(5+5=10)$: :	10
02	Assessment of Skill Development activities/Seminars/Group Discu Assignment etc., with proper record	ssion/	05
03	Attendance with proper record		05
	TOTAL MARKS	• •	20

• Attendance Marks-breakup

<75%	-	00 Marks
75-80%	_	01 Mark
80-85%	-	02 Marks
85-90%	-	03 Marks
90-95%	-	04 Marks
>95%	-	05 Marks

Continuous Assessment Programme/Internal Assessment/Formative Assessment Compulsory Papers/Courses & Elective or Optional Papers/Courses

Sl. No.	Continuous Assessment Programme/Internal Assessment	Maximum Marks
(1)	(2)	(3)
01	Two Session Tests with proper record for assessment $(2+2=4)$	04
02	O2 Assessment of Skill Development activities/Seminars/Group Discussion/ Assignment etc., with proper record	
03	Attendance with proper record	03
	TOTAL MARKS	10

• Attendance Marks-breakup

<75%	-	00 Marks
75-80%	-	01 Mark
85-90%	-	02 Marks
90-100%	_	03 Marks

THEORY EXAMINATION QUESTION PAPER PATTERN FOR MAJOR COURSES SUBJECTS (Semesters I –VI)

B. Sc. Semester-I Degree Examination; 2024-25 (Semester Scheme; New Syllabus: 2024-25) SUBJECT: SCIENCE MAJOR COURSES

	raper –	· Code:	
	1 aper	Couc.	
Time: 3 Hours			Max. Marks: 80
.	• •		
Instructions to cand			
	ctions are compulsory		
2) Draw i	near and labelled diagr	ams wherever necessary. SECTION-A	
1. Answer all the following	lowing questions:		$(2\times10=20)$
a)	<i>3</i> 1 ∴		
b)	· .		
c)	· ·		
ď)			
e)	•		
f)			
g)			
h)	· ·		
g) h) i) j)	*. *.		
j)			
		SECTION-B	
Answer any SIX of	the following:		(5×6=30)
2.			
3.			
4.	· ·		
5.			
6.	÷		
7.			
8.			
9.			
	•		
		SECTION -C	
Answer Any Three	of the following:		$(10 \times 3 = 30)$
10.	· · · · · · · · · · · · · · · · · · ·		From Unit-I
11.			From Unit-II
12.			From Unit-III
13.			From Unit-IV

THEORY EXAMINATION QUESTION PAPER PATTERN FOR COMPULSORY & ELECTIVE or OPTIONAL PAPERS/COURSES

(Semesters I - V)

B. Sc. Semester-I/II/III/IV/V Degree Examination; 2024-25 (Semester Scheme; New Syllabus: 2024-25)

SUBJECT: SCIENCE COURSES

Paper – CMPL & ELECTIVE/OPTION	NAL I-V:
Time: 2 Hours	Max. Marks: 40
Instructions to candidates:	
1) All sections are compulsory	
2) Draw neat and labelled diagrams wherever	ver necessary.
SECT	ION-A
SECI	ION-A
Answer all the following questions:	(2×5=10)
i.	
2.	
3.	
4.	
5.	
SECI	TION-B
CXXX C.1 C.11	(5×6=30)
Answer any SIX of the following:	(5×0=30)
6.	
7.	
8.	
9.	
10.	
11.	
12.	
13.	

Chairman

Board of Soudies

Department of Physics

Dava tere University

Shivagan and Davangere-07

Dr. U.S. MAHABALESHWAR
M.Sc., M.Phil., Ph.D.
Professor & Dean, Science & Technology
Davangere University, Shivagangotri,
Davangere-577 007, Karnataka, India.

Registrar
Davangere University
Davargangotri, Davargang