



KANNUR UNIVERSITY
കണ്ണൂർ സർവകലാശാല

(Abstract)

FYUG Electronics Programme in Affiliated Colleges - Syllabus of the SEC Courses in the Fifth and Sixth semesters -Approved and implemented with effect from 2024 Admission-- Orders issued

ACADEMIC C SECTION

ACAD C/ACAD C1/21843/2024

Dated: 16.06.2026

- Read:-1. U O No. ACAD C/ACAD C1/21843/2024 dated 26.11.2024
2. U.O. No .ACAD C/ACAD C1/21843/2024 dated 13.08.2025
3. U O. No. ACAD C/ACAD C1/21843/2024 dated 15.03.2026
4. E mail dated 19.05.2026 from Dr. Rohit K. Raj, former Chairperson, BoS in Electronics Cd).
5. E. mail dated 05.06.2026 from the Dean, Faculty of Science
6. Orders of the Vice-Chancellor in the file of even No. dated 09.06.2026

ORDER

As per paper read (1) above, the Scheme (full) and Syllabus (First and Second Semesters) of the FYUG Electronics Programme in affiliated colleges were implemented with effect from the 2024 admission.

As per papers read (2) and (3) above, the Third and Fourth Semester Syllabus and the Fifth to Eighth Semester Syllabus of the FYUG Electronics Programme in affiliated colleges under Kannur University were implemented with effect from the 2024 admission.

Dr. Rohit K. Raj, Associate Professor and Head, Department of Electronics, Government College, Mananthavady, who had resigned from the Chairmanship of the Board of Studies in Electronics (Cd), vide paper read (4) above, submitted the Syllabus of the SEC Courses for the Fifth and Sixth Semesters of the FYUG Electronics Programme for approval and implementation with effect from the 2024 admission.

Subsequently, the Syllabus of the SEC Courses in the Fifth and Sixth Semesters of the FYUG Electronics Programme was forwarded to the Dean, Faculty of Science, for verification.

The Dean, Faculty of Science, vide paper read (5) above, remarked that the SEC Courses in the Fifth and Sixth Semesters may be incorporated into the Syllabus and recommended approval of the same.

The Vice-Chancellor, after considering the urgency of the matter and in exercise of the powers of the Academic Council conferred under Section 11(1), Chapter III of the Kannur University Act, 1996, read together with all other enabling provisions, has approved the Syllabus of the SEC Courses in the Fifth and Sixth semesters of the FYUG Electronics Programme with effect from the 2024 admission onwards, subject to reporting to the Academic Council.

The Syllabus of the SEC Courses for the Fifth and Sixth Semesters of the FYUG Electronics



Programme in affiliated colleges under Kannur University, with effect from the 2024 admission, is appended herewith and uploaded on the University website.

Orders are issued accordingly.



Sd/-

Jisha K P

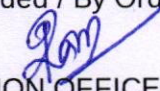
Assistant Registrar II

For REGISTRAR

- To:
1. The Controller of Examination (Through PA to CE)
 2. Dr. Rohit K. Raj, Associate Professor & Head, Department of Electronics, Government College, Mananthavady.
 3. The Principals of all affiliated colleges.

- Copy To:
1. The Examination Branch (through PA to CE)
 2. JR (Exam), AR VII (Exam)
 3. DR/AR (Academic)
 4. Computer Programmer
 5. The Web Manager I (For uploading in the website)
 6. SF/DF/FC

Forwarded / By Order


SECTION OFFICER



FYUGP “ELECTRONICS”



KANNUR UNIVERSITY

Four Year Undergraduate Programme ELECTRONICS

(OBE – Outcome Based Education)

2024 Admission onwards

Skill Enhancement Courses (SEC)- 5 & 6 Semesters



KU5SECELE110: Computer Aided Circuit design

Semester	Course Type	Course Level	Course Code	Credits (L+T+P)	Total Hours (L+T+P)
5	SEC	100	KU5SECELE110	3+0+0	45+0+0

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical	Tutorial	CE	ESE	Total	
3	0	0	25	50	75	1.5Hr

Course Description:

This course introduces students to modcomputer-aided electronic circuit design techniques using CAD tools. The course focuses on the analysis, design, and verification of electronic circuits through simulation environments such as MultiSim and PSpice. Students gain practical exposure to schematic capture, circuit simulation, waveform analysis, and performance evaluation of electronic systems including rectifiers, filters, oscillators, and transistor-based circuits.

Course Prerequisite: Basic knowledge in Electronic components and circuits

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	Understand the fundamentals of computer-aided electronic circuit design tools.	U
2	Design and simulate electronic circuits using software tools	A



3	Analyze the performance characteristics of electronic circuits	An
4	Interpret simulation results, optimize circuit parameters, and troubleshoot electronic circuits	An
5	Analyze and verify the performance of electronic circuits and semiconductor devices	An

***Remember (R), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C)**

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	2	1	2	1		3	
CO 2	3	3	2	3	1	3	1
CO 3	3	3	3	2		2	
CO 4	3	3	3	3	1	2	1
CO 5	3	3	3	3	1	3	1

COURSE CONTENTS

Contents for Classroom Transaction:

M O D U L E	U N I T	DESCRIPTION	HOUR S
1		Introduction to Multisim software:	10
	1.1	MultiSim Environment: Design Process	
	1.2	Setting environment preferences, Multisim GUI	
	1.3	Schematic capture of circuits: Placing components, wiring components, Measuring instruments in MultiSim and simulation	
	1.4	Result display in MultiSim	



	Electronics circuit design using Multisim:	10
2	2.1 Design of Resistive circuits	
	2.2 Design of Bridge rectifier, Half-Wave rectifier	
	2.3 clippers and clampers using a diode, DC transfer curve analysis, Transient analysis, simulation of digital circuits.	
	2.4 Designing RC Low pass filter using MULTISIM, Designing active RC Low pass filter (OpAmp based) using MULTISIM, Half wave rectifier using MULTISIM	

	Introduction to PSpice software	10
3	3.1 Understanding the SPICE Environment, Schematic Designing Brief Introduction of p spice simulator	
	3.2 Using Model Editor, Understanding the PSPICE Environment,	
	3.3 Using Magnetic Parts Editor, Using Stimulus Editor, Drawing a Circuit Preparation for Simulation: Preparing schematic for simulation, Understand the sources for simulation, Understand different markers and errors	
	3.4 Simulating high pass filter Circuit using PSPIC, Designing active RC High pass filter (OpAmp based) using PSPICE, Half wave rectifier using PSPICE	

	CAD Tools Silvaco, Synosis and NANO HUB (Overview only)	10
4	4.1 Introduction to Industry standard TCAD tools	
	4.2 Silvaco- ATLAS device simulation software	
	4.3 Synosis-SENTAURUS	
	4.4 Online Simulation resources-NANO HUB.	
5	Teacher Specific Module	5



Directions: Teacher can design this module based on their expertise and demand from the students

Space to fill the selected
area/ activity

Essential Readings:

1. Introduction To PSpice Using OrCADfor Circuits and Electronics, Muhammad H. Rashid,Paperback – Import,3rd Edition, 2003.
2. Electronic Devices and circuit theory, Robert Boylestead and Louis Nashelsky,PHI, 10th Edition, 2009.
3. <https://i.nanohub.org/resources/tools>
4. <https://www.silvaco.com/contentVkbase/device.pdf>

TEACHING LEARNING STRATEGIES

Lectures: Use online free softwares during the class to introduce the packages and to demonstrate each problem

ASSESSMENT RUBRICS

	Marks
End Semester Evaluation	50
Continuous Evaluation	25



KU6SECELE111: PCB Design and Fabrication

Semester	Course Type	Course Level	Course Code	Credits (L+T+P)	Total Hours (L+T+P)
6	SEC	100	KU6SECELE111	3+0+0	45+0+0

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical	Tutorial	CE	ESE	Total	
3	0	0	25	50	75	1.5Hr

Course Description:

The main objective of this course is to give a comprehensive understanding and hands-on exposure to the various processes, industrial tools, protocols, and design specifics which are involved in PCB Designing so that the students can design an electronic printed circuit board for a specific application using industry-standard software after going through the complete procedural steps of developing circuit schematic, board files, image transferring, assembly and soldering

Course Prerequisite: Basic knowledge in Electronic components and circuits

Course Outcomes:

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CO No.	Expected Outcome	Learning Domains
1	Understand the fundamentals, classification, components, and manufacturing processes of printed circuit boards (PCBs)	U
2	Apply schematic capture and PCB layout design techniques including routing, grounding, netlist generation, and component placement using PCB design software	A
3	Analyze PCB fabrication processes such as image transfer, etching, drilling, soldering, testing, and quality control techniques.	An
4	Design, fabricate, and test analog and digital electronic circuits using standard PCB design and assembly procedures	A
5	Understanding recent trends and industrial practices in PCB technology	U

***Remember (R), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C)**

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	2	1	2	1		2	
CO 2	3	3	3	3	1	3	1
CO 3	3	3	3	2		2	1
CO 4	3	3	3	3	1	3	2
CO 5	2	1	2	2	1	3	1

COURSE CONTENTS

Contents for Classroom Transaction:

M O D U L E	U N I T	DESCRIPTION	HOUR S
1	PCB Fundamentals		10
	1.1	PCB Advantages, components of PCB	
	1.2	Electronic components, Microprocessors and Microcontrollers, IC's,	



		Surface Mount Devices (SMD)	
	1.3	Classification of PCB – single, double, multilayer, and flexible boards, Manufacturing of PCB, PCB standards	
	1.4	Introduction to KiCAD (Open source) and EASY EDA (Online)	
		Schematic & Layout Design – Using KiCAD Or EASY EDA	10
2	2.1	Schematic diagram, General, Mechanical, and Electrical design considerations	
	2.2	Placing and Mounting of components	
	2.3	Conductor spacing, routing guidelines, heat sinks and package density	
	2.4	Net list, creating components for a library, Tracks, Pads, Vias, power plane, grounding	

		PCB Design Processes- Using KiCAD Or EASY EDA	10
3	3.1	Design automation, Design Rule Checking; Exporting Drill and Gerber Files; Drills	
	3.2	Footprints and Libraries Adding and Editing Pins, copper-clad laminates materials of copper-clad laminates, properties of laminates (electrical & physical), types of laminates	
	3.3	Soldering techniques. Film master preparation, Image transfer, photo printing, Screen Printing, Plating techniques,	
	3.4	Etching techniques, Mechanical Machining operations, Lead cutting and Soldering Techniques, Testing, and quality controls	

4		PCB Technology (Overview only)	10
	4.1	Introduction of PCB prototyping machines	
	4.2	Schematic Entry, PCB Parts creation	
	4.3	Auto Routing, Post Design	
	4.4	Brief overview of various models available, Recent Trends, and	



	environmental concerns in the PCB industry.	
	Teacher Specific Module	5
	<i>Design, fabrication, and testing of a 9 V power supply with Zener regulator</i>	
5	Space to fill the selected area/ activity	

Essential Readings:

1. Printed Circuit Board – Design & Technology, Walter C. Bosshart, Tata McGraw Hill, 2008.
2. Printed Circuit Board –Design, Fabrication, Assembly & Testing, R.S. Khandpur, First Edition, Tata Mcgraw-Hill Education Pvt. Ltd., 2005
3. Printed Circuit Board Design Using Autocad, Chris Schroeder, Newnes Publisher, 1998
4. Printed Circuits Handbook, Clyde F. Coombs, Jr, Happy T. Holden, Sixth Edition, Publisher: McGraw-Hill Education, 2016.

TEACHING LEARNING STRATEGIES

Lectures: Use free softwares in the class room for demonstration

ASSESSMENT RUBRICS

	Marks
End Semester Evaluation	50
Continuous Evaluation	25

