



UNIVERSITY OF JAMMU

(NAAC ACCREDITED 'A' GRADE UNIVERSITY)
(Baba Salub Ambedkar Road, Jammu-180006 (J&K))

Academic Section

Email: academicsectionju14@gmail.com

NOTIFICATION (23/December/Adp.16)

It is hereby notified for the information of all concerned that the Vice-Chancellor, in anticipation of the approval of the Academic Council, is pleased to authorize the adoption of the Syllabi and Courses of Studies in the subject of **Electronics** of Semester Vth, VIth, VIIth and VIIIth for Four Year Under Graduate Programme (FYUGP) under the **Choice Based Credit System** as per NEP-2020 (as given in the annexure) for the examinations to be held in the years as per the details given below:

Subject	Semester	For the examinations to be held in the year
Electronics	Semester-V	December 2024, 2025 and 2026
	Semester-VI	May 2025, 2026 and 2027
	Semester-VII	December 2025, 2026 and 2027
	Semester-VIII	May 2026, 2027 and 2028

The Syllabi of the courses is also available on the University website: www.jammuuniversity.ac.in.

Sd/-

DEAN ACADEMIC AFFAIRS

No. F. Acd/II/23/12611-12631

Dated: 20/12/2023

Copy for information and necessary action to:

1. Dean Faculty of Science
2. HOD/Convener, Board of Studies Electronics
3. Sr. P.A. to the Controller of Examinations
4. All members of the Board of Studies
5. Confidential Assistant to the Controller of Examinations
6. Director, Computer Centre, University of Jammu
7. Deputy Registrar/Asstt. Registrar (Conf. /Exams. UG)
8. Incharge University Website for necessary action please




Sumitasharma
Deputy Registrar (Academics)

SS
19/12/23

Rala
19/12/23

Scheme of Four Year Under Graduate Programme (FYUGP) in Electronics in CBCS as per NEP-2020: Semesters V-VIII

Semester	Semester V	Semester VI	Semester VII	SEMESTER VIII	
Courses	UG Degree (3 Years)			4 Years UG Honours	4 Years UG Honours with Research
Major	Electronic Instrumentation and Measurement (4-Credits)	Linear Integrated Circuits (4-Credits)	Control Systems (4-Credits) Research Methodology and Research Ethics (4-Credits)	Circuit Simulation (4-Credits) Optoelectronic Devices (4-Credits)	Circuit Simulation and Analysis (4-Credits)
	C-programming (4-Credits)	8086 Microprocessor and Interfacing (4-Credits)	Semiconductor Devices (4-Credits) Python Programming (4-Credits)	Antenna and Microwaves (4-Credits) Microcontrollers (4-credits)	
	8085 Microprocessor and Interfacing (4-Credits)	C++ programming (4-Credits)	Introduction to Control Systems (4-Credits)	Introduction to C-language (4-Credits)	
	Numerical techniques in Electronics (2-Credits)	Biomedical Instrumentation (4-Credits)	Operational Amplifier and Applications (4-Credits)	Fundamentals of C-language (4-Credits)	
Minor	Introduction to Microprocessors (4-Credits)				
Courses from other Disciplines (Multidisciplinary)					
Ability Enhancement Course (AEC)					
Skill Enhancement Course (SEC)/Internship/ Dissertation	Summer Internship (2 Credits)				Research project/Dissertation/ Viva-Voce (12 Credits)
Value Added Courses (VAC)					

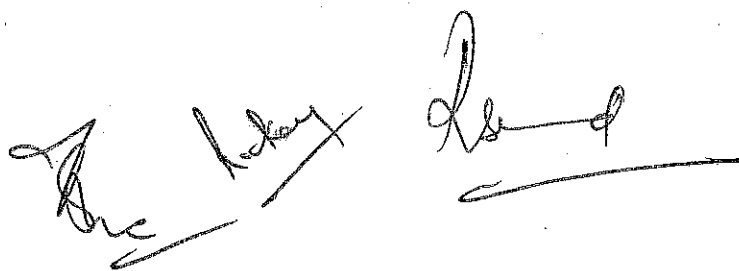




Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in December 2024, 2025, and 2026 as per NEP-2020

University of Jammu
Syllabi of Electronics at FYUGP under CBCS as per NEP-2020
Semester – V

PROPOSED COURSE SCHEME FOR SEMESTER-V

Four/Two credits courses									
S. No.	Course Type	Course No.	Course Title	Credits	Marks				Total Marks
					Theory		Practical/Tutorial		
1.	Major	UMJELT501	Electronic Instrumentation and Measurement	4 (3Th+1P)	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
2.	Major	UMJELT502	C-programming	4 (3Th+1P)	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
3.	Major	UMJELT503	8085 Microprocessor and Interfacing	4 (3Th+1P)	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
4.	Major	UMJELT504	Numerical techniques in Electronics	2 (2Th)	Mid Sem: 10 marks	End Exam: 40 marks	-	-	50
5.	Minor	UMIELT505	Introduction to Microprocessors	4 (3Th+1P)	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
6.	Skill Enhancement course	USEELT506	Summer Internship	2	-	-	-	-	50



Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in December 2024, 2025, and 2026 as per NEP-2020

University of Jammu
Syllabi of Electronics at FYUGP under CBCS as per NEP-2020
Semester – VI

PROPOSED COURSE SCHEME FOR SEMESTER-VI

Four credit courses									
S. No.	Course Type	Course No.	Course Title	Credits	Marks				Total Marks
					Theory	Practical/Tutorial	Assessment	Exam	
1.	Major	UMJELT601	Linear Integrated Circuits	4 (3Th+1P)	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
2.	Major	UMJELT602	8086 Microprocessor and Interfacing	4 (3Th+1P)	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
3.	Major	UMJELT603	C++ programming	4 (3Th+1P)	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
4.	Major	UMJELT604	Biomedical Instrumentation	4 (3Th+1P)	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
5.	Minor	UMJELT605	Operational Amplifier and Applications	4 (3Th+1P)	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100

Dr. Jockey *Dr. Jockey*

Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in December 2024, 2025, and 2026 as per NEP-2020

University of Jammu
Syllabi of Electronics at FYUGP under CBCS as per NEP-2020
Semester – VII

PROPOSED COURSE SCHEME FOR SEMESTER-VII

Four credits courses									
S. No.	Course Type	Course No.	Course Title	Credits	Marks				Total Marks
					Theory	Practical/Tutorial	Assessment	Exam:	
1.	Major	UMJELT701	Control Systems	4 (3Th+1P)	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
2.	Major	UMJELT702	Research Methodology and Research Ethics	4 (3Th+1P)	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
3.	Major	UMJELT703	Semiconductor Devices	4 (3Th+1P)	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
4.	Major	UMJELT704	Python Programming	4 (3Th+1P)	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
5.	Minor	UMIELT705	Introduction to Control Systems	4 (3Th+1P)	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100

Dr. J. K. Khandelwal
Head

Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in December 2024, 2025, and 2026 as per NEP-2020

University of Jammu
Syllabi of Electronics at FYUGP under CBCS as per NEP-2020
Semester – VIII (UG Honours)

PROPOSED COURSE SCHEME FOR SEMESTER-VIII

Four/Eight Credits Courses									
S: No	Course Type	Course No.	Course Title	Credits	Marks				Total Marks
					Theory		Practical/Tutorial		
1.	Major	UMJELT801	Circuit Simulation	4	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
2.	Major	UMJELT802	Optoelectronic Devices	4	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
3.	Major	UMJELT803	Antenna and Microwaves	4	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
4.	Major	UMJELT804	Microcontrollers	4	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
5.	Minor	UMIELT805	Introduction to C-language	4	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100

[Handwritten signatures]

Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in December 2024, 2025, and 2026 as per NEP-2020

University of Jammu
Syllabi of Electronics at FYUGP under CBCS as per NEP-2020
Semester – VIII (UG Honours with Research)

PROPOSED COURSE SCHEME FOR SEMESTER-VIII

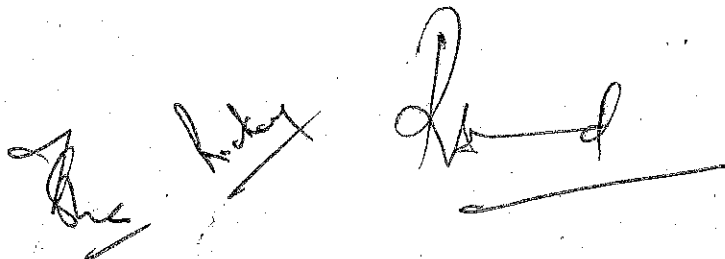
Four/Eight Credits Courses									
S. No	Course Type	Course No.	Course Title	Credits	Marks				Total Marks
					Theory	Practical/Tutorial			
1.	Major	UMJELT806	Circuit Simulation and Analysis	4	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
2.	Minor	UMIELT807	Fundamentals of C- language	4	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
3.	Skill Enhancement Course	USEELP808	Research Project/ Dissertation	8	200				300
			Viva-Voce	4	100				

Dr. J. K. Sharma *P. K. Sharma*

Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in December 2024, 2025, and 2026 as per NEP-2020

University of Jammu
Syllabi of Electronics at FYUGP under CBCS as per NEP-2020
Semester – V

Four/Two credits courses									
S. No.	Course Type	Course No.	Course Title	Credits	Marks				Total Marks
					Theory		Practical/Tutorial		
1.	Major	UMJELT501	Electronic Instrumentation and Measurement	4 (3Th+1P)	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
2.	Major	UMJELT502	C-programming	4 (3Th+1P)	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
3.	Major	UMJELT503	8085 Microprocessor and Interfacing	4 (3Th+1P)	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
4.	Major	UMJELT504	Numerical techniques in Electronics	2 (2Th)	Mid Sem: 10 marks	End Exam: 40 marks			50
5.	Minor	UMIELT505	Introduction to Microprocessors	4 (3Th+1P)	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
6.	Skill Enhancement course	USEELT506	Summer Internship	2					50



Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in December 2024, 2025, and 2026 as per NEP-2020

University of Jammu
Syllabi of Electronics at FYUGP under CBCS as per NEP-2020

Semester – V

(Examination to be held in December 2024, 2025, 2026)

Major Course-I

Course Code: UMJELTS01 Course Title: Electronic Instrumentation and Measurement

Credits: 4

No. of Hours: 75 (Theory: 45, Practical: 30)

Maximum Marks: 100 (Theory: 75 + Practical: 25)

Unit I: Measurement characteristics

Significant figures; static characteristics of instrument: accuracy, precision, resolution, repeatability, reproducibility, static error, sensitivity, drift and its types; dynamic characteristics of instrument: measuring lag, fidelity, speed of response, dynamic error; errors in measurement: gross errors, systematic errors, absolute & relative errors, and random errors.

Unit II Cathode ray and digital storage oscilloscopes

Cathode ray oscilloscope (CRO): definition, block diagram and function of each block, construction, working, advantages, disadvantages, and applications; measurement of amplitude, time period, and frequency using CRO; digital storage oscilloscope (DSO): definition, block diagram and working, construction, advantages, disadvantages, and applications; comparison of digital storage oscilloscope and conventional storage oscilloscope.

Unit III: Transducers

Transducer: definition, need, classification, efficiency, static & dynamic characteristics, comparison with sensor; definition, working, advantages, disadvantages, and applications of resistive transducer, capacitive transducer, inductive transducer, oscillation transducer, velocity transducer, piezoelectric transducer, and photoelectric transducer; strain gauge; gauge factor and their derivation.

Unit IV: DC and AC bridges

Bridges: definition and classification; definition, circuit diagram, mathematical derivation, advantages, disadvantages, and applications of Wheatstone bridge, Kelvin bridge, Maxwell inductance bridge, Hay's bridge, Anderson bridge, Schering bridge, Wien bridge, and De-Sauty's bridge.

Reference Books:

- W.D. Cooper and A.D. Helfrick, **Electronic Instrumentation and Measurement Techniques**, Prentice Hall.
- Rohit Khurana, **Electronic Instrumentation and Measurement**, vikas publishing house pvt ltd
- E.O. Doebelin, **Measurement Systems: Application and Design**, McGraw Hill.
- David A. Bell, **Electronic Devices and Circuits**, Oxford University Press.
- Alan S. Morris, **Measurement and Instrumentation Principles**, Elsevier (Butterworth Heinmann-2008).
- S. Rangan, G.R. Sarma and V.S. Mani, **Instrumentation Devices and Systems**, Tata Mcgraw Hill.
- Ghosh, **Introduction to measurements and instrumentation**, PHI Learning

Note:- Practical component (1-credit): Students are required to perform any **Five** practicals based on theory component.

Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in December 2024, 2025, and 2026 as per NEP-2020

Scheme of Evaluation

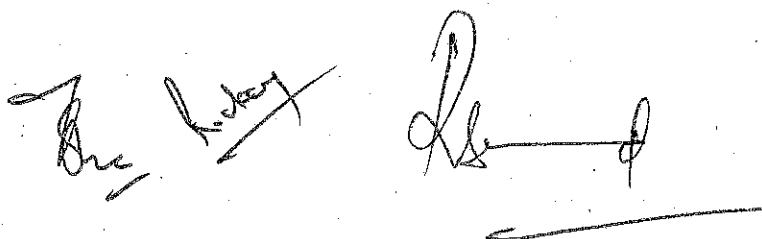
Evaluation of Theory component:

Mid Semester Examination (Theory: 15 marks from 50% syllabus) will be conducted by the Course Coordinator and result will be displayed on notice board at least one week before the commencement of End Semester Examination. The theory question paper (15 marks of 1.5 hour duration) will consist of two sections. Section-A (05 marks) will consist of 05 objective type questions and all questions are compulsory. Section-B will have four questions, two from each of the two units covered under 50% criterion. The students will have to attempt any two questions, selecting one from each unit.

End Semester Examination [Theory: 60 marks (03 hours) from 100% syllabus] will be conducted by the University of Jammu. The question paper will consist of two sections. Section-A will consist of four short answer type questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 marks. Section B shall consist of eight long answer type questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 marks.

Evaluation of Practical component:

Practical component shall be evaluated for 25 marks during the semester by the course coordinator internally. 10 marks shall be reserved day to day assessment and 15 marks shall be reserved for performance during the internal practical examination of 02 hours duration and viva-voce.



Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in December 2024, 2025, and 2026 as per NEP-2020

University of Jammu
Syllabi of Electronics at FYUGP under CBCS as per NEP-2020

Semester – V

(Examination to be held in December 2024, 2025, 2026)

Major Course-II

Course Code: UMJELT502

Course Title: C-programming

Credits: 4

No. of Hours: 75 (Theory: 45, Practical: 30)

Maximum Marks: 100 (Theory: 75 + Practical: 25)

Unit-I Fundamentals of C

The C character set, keywords, identifiers, constants, variables, data types and their size; operators: arithmetic, relational, logical, assignment, increment, decrement, conditional; operator precedence; associativity of operators, solving expressions using operator precedence and associativity; data input and output statements; simple programming examples.

Unit II: Loops and control statements

Syntax and working of if, if-else, and nested if-else statements with examples; syntax and working of while, do-while, and for loops with examples; special statements: switch, goto, break, and continue; programs to find the factorial of a number and to generate Fibonacci series using while and for loops; program to check whether the number is (a) even or odd, (b) prime or not prime; program for leap year and finding of roots of quadratic equation.

Unit III: Pointers, arrays, and strings

Qualifiers, storage classes, pointers: definition, declaration, and their use with example; arrays: definition and initialization of one and two dimensional arrays; programs using one dimensional array: calculation of sum and average of numbers, arrange numbers in ascending and descending orders, and find the maximum and minimum of numbers; programs using two dimensional array: addition, subtraction, & multiplication of two matrices, and transpose of a matrix; string handling functions: strlen(), strcpy(), strcat(), strcmp().

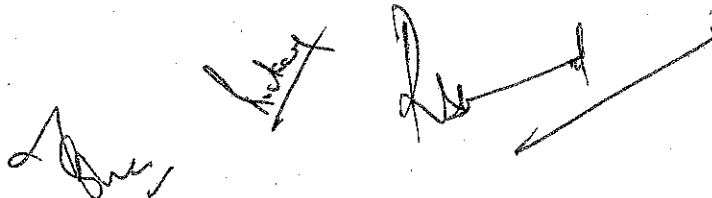
Unit IV: Functions, structures, and unions

Function: definition, declaration, calling; passing arguments to function (call by value and call by reference); recursion; passing array to function; passing string to function; scope, visibility and life time of variables; structures: definition, declaration, accessing and initialization of variables; unions: definition, declaration, and accessing of variables.

Reference Books:

- Y. Kanitkar, **Let us C**, BPB Publications.
- Schaum Series, **Programming in C**.
- E. Balaguruswamy, **Programming in C**, TMH.

Note:- Practical component (1-credit): Students are required to perform any Five practicals based on theory component.



Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in December 2024, 2025, and 2026 as per NEP-2020

Scheme of Evaluation

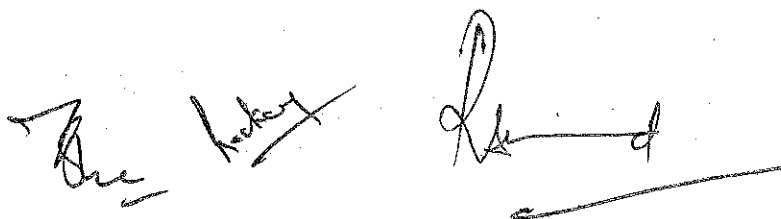
Evaluation of Theory component:

Mid Semester Examination (Theory: 15 marks from 50% syllabus) will be conducted by the Course Coordinator and result will be displayed on notice board at least one week before the commencement of End Semester Examination. The theory question paper (15 marks of 1.5 hour duration) will consist of two sections. Section-A (05 marks) will consist of 05 objective type questions and all questions are compulsory. Section-B will have four questions, two from each of the two units covered under 50% criterion. The students will have to attempt any two questions, selecting one from each unit.

End Semester Examination [Theory: 60 marks (03 hours) from 100% syllabus] will be conducted by the University of Jammu. The question paper will consist of two sections. Section-A will consist of four short answer type questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 marks. Section B shall consist of eight long answer type questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 marks.

Evaluation of Practical component:

Practical component shall be evaluated for 25 marks during the semester by the course coordinator internally. 10 marks shall be reserved day to day assessment and 15 marks shall be reserved for performance during the internal practical examination of 02 hours duration and viva-voce.



The Course Coordinator
University of Jammu

Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in December 2024, 2025, and 2026 as per NEP-2020

University of Jammu
Syllabi of Electronics at FYUGP under CBCS as per NEP-2020
Semester – V

(Examination to be held in December 2024, 2025, 2026)

Course Code: UMJELT503

Major Course-III

Credits: 4

Course Title: 8085 Microprocessor and Interfacing

No. of Hours: 75 (Theory: 45, Practical: 30)

Maximum Marks: 100 (Theory: 75 + Practical: 25)

Unit I: Introduction to 8085

8085: main features, pin diagram and function of each pin, block diagram and description of each block, programming model, bus organisation (data bus, address bus, control bus); demultiplexing AD_7-AD_0 and generation of control signals; peripheral-mapped I/O and memory-mapped I/O;

Unit II: 8085 machine cycles and programming techniques

Definition of instruction cycle, machine cycle, T-states, and timing diagram; machine cycles and their timings: opcode fetch cycle (4T), memory read cycle (3 T), memory write cycle (3 T), I/O read cycle (3 T), and I/O write cycle (3 T); programming techniques: looping, counting, and indexing; counter and time delays;

Unit III: Instruction set of 8085

Instruction format; addressing modes; classification of instructions with their description and examples: data transfer instructions, arithmetic instructions, logic instructions, branch instructions, stack operations, & machine control instructions; interrupts and types of interrupts; simple programming examples;

Unit IV: Interfacing

Multipurpose programmable device (8155): main features, pin diagram and function of each pin, block diagram and description of each block, control signals in handshake mode, timer, interfacing with 8085; programmable peripheral interface (8255): main features, pin diagram and function of each pin, block diagram and description of each block, I/O modes, BSR mode, interfacing with 8085;

Reference Books:

- R.S. Goankar, **Microprocessor Architecture Programming & applications with 8085**, Prentice Hall.
- Raj Kamal, **Embedded Systems: Architecture, Programming & Design**, Tata McGraw.
- N. Senthil Kumar, **Microprocessor and Microcontrollers**, Oxford University Press.
- A. P. Godse, and D. A. Godse, **Microprocessors and interfacing**, Technical publications pune

Note:- Practical component (1-credit): Students are required to perform any Five practicals based on theory component.

Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in December 2024, 2025, and 2026 as per NEP-2020

Scheme of Evaluation

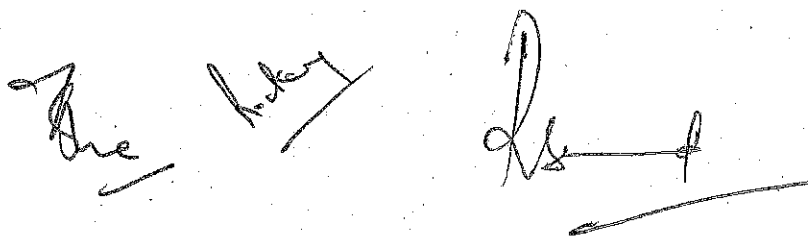
Evaluation of Theory component:

Mid Semester Examination (Theory: 15 marks from 50% syllabus) will be conducted by the Course Coordinator and result will be displayed on notice board at least one week before the commencement of End Semester Examination. The theory question paper (15 marks of 1.5 hour duration) will consist of two sections. Section-A (05 marks) will consist of 05 objective type questions and all questions are compulsory. Section-B will have four questions, two from each of the two units covered under 50% criterion. The students will have to attempt any two questions, selecting one from each unit.

End Semester Examination [Theory: 60 marks (03 hours) from 100% syllabus] will be conducted by the University of Jammu. The question paper will consist of two sections. Section-A will consist of four short answer type questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 marks. Section B shall consist of eight long answer type questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 marks.

Evaluation of Practical component:

Practical component shall be evaluated for 25 marks during the semester by the course coordinator internally. 10 marks shall be reserved day to day assessment and 15 marks shall be reserved for performance during the internal practical examination of 02 hours duration and viva-voce.



Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in December 2024, 2025, and 2026 as per NEP-2020

University of Jammu
Syllabi of Electronics at FYUGP under CBCS as per NEP-2020

Semester – V

(Examination to be held in December 2024, 2025, 2026)

Major Course-IV

Course Code: UMJELT504

Course Title: Numerical techniques in Electronics

Credits: 2

No. of Hours: 30

Maximum Marks: 50

Unit I: Complex variables

Review of complex algebra; functions of a complex variable; Cauchy- Riemann equations; Cauchy integral theorem; Cauchy integral formula, Taylor's and Laurent's series; Cauchy residual theorem; numerical problems.

Unit II: Differential equations

Series solution of differential equations: Legendre's differential equation; generating function of Legendre's differential equation $P_n(x)$; recurrence relation for Legendre's differential equation $P_n(x)$. Solution of non linear equations: Bisection and Newton-Raphson method.

Unit III: Numerical methods

Solution of system of linear equations: Gauss elimination and Gauss Jordan method; Matrix eigen value problems; Interpolation: Lagrange and Newton's Forward and backward difference formulae; Numerical solutions of differential equations: Euler's method and Runge-Kutta method (IInd Order).

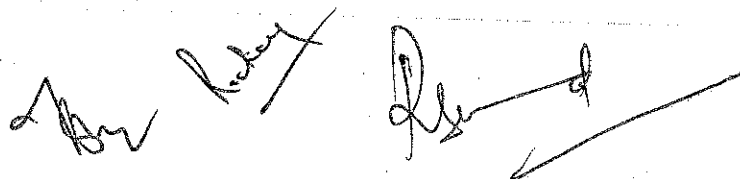
Reference Books:

- John Methew, **Numerical methods for mathematics science and engineering**, prentice-Hall of India, New Delhi.
- V. Rajaraman, **Computer oriented numerical methods**, prentice-Hall of India, New Delhi.
- M. K. Jain, S. R. K. Iyengar and R. K. Jain, **Numerical Methods: Problems and Solutions**, New age international, New Delhi.
- Louis A. Pipes, and Lawrence R. Harvill, **Applied mathematics for engineers and physicists**, McGraw Hill Book company, New Delhi.
- P. B. Patil, and U. B. Verma, **Numerical computational methods**, Narosa publishing house, New Delhi.

Scheme of Evaluation

Mid Semester Examination (Theory: 10 marks from 50% syllabus) will be conducted by the Course Coordinator and result will be displayed on notice board at least one week before the commencement of End Semester Examination. The theory question paper (10 marks of 1.5 hour duration) will consist of two sections. Section-A (05 marks) will consist of 05 objective type questions and all questions are compulsory. Section-B will have two questions, out of 50% syllabus. The students will have to attempt any one question.

End Semester Examination [Theory: 40 marks (2.5 hours) from 100% syllabus] will be conducted by the University of Jammu. The question paper will consist of two sections. Section-A will consist of four short answer type questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 2.5 marks. Section B shall consist of six long answer type questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 10 marks.



Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in December 2024, 2025, and 2026 as per NEP-2020

University of Jammu
Syllabi of Electronics at FYUGP under CBCS as per NEP-2020
Semester – V

(Examination to be held in December 2024, 2025, 2026)

Minor Course

Course Code: UMIELT505

Course Title: Introduction to Microprocessors

Credits: 4

No. of Hours: 75 (Theory: 45, Practical: 30)

Maximum Marks: 100 (Theory: 75 + Practical: 25)

Unit I: Introduction to 8085

8085: main features; pin diagram and function of each pin, block diagram and description of each block, programming model, bus organization (address, data and control buses); demultiplexing the bus AD₇-AD₀ and generation of control signals.

Unit II: Machine cycles and interrupts of 8085

Timing diagram, instruction cycle, machine cycle, T-state; machine cycles and its timing: opcode fetch cycle (4T), memory read cycle (3 T), memory write cycle (3 T), I/O read cycle (3 T), I/O write cycle (3 T); interrupts and types of interrupts.

Unit III: Introduction to 8085 instructions

Instruction format; addressing modes; classification of instructions with their description and examples: data transfer instructions, arithmetic instructions, logic instructions, branch instructions, machine control instructions; simple programming examples.

Unit IV: Interfacing

Main features and block diagram of 8155, and 8259; interfacing of 8155 with 8085; interfacing of 8255 with 8085; interfacing of 8259 with 8085.

Reference Books:

- R.S. Goankar, **Microprocessor Architecture Programming & applications with 8085**, Prentice Hall.
- Raj Kamal, **Embedded Systems: Architecture, Programming & Design**, Tata McGraw.
- N. Senthil Kumar, **Microprocessor and Microcontrollers**, Oxford University Press.

Note:- Practical component (1-credit): Students are required to perform any **Five** practicals based on theory component.

Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in December 2024, 2025, and 2026 as per NEP-2020

Scheme of Evaluation

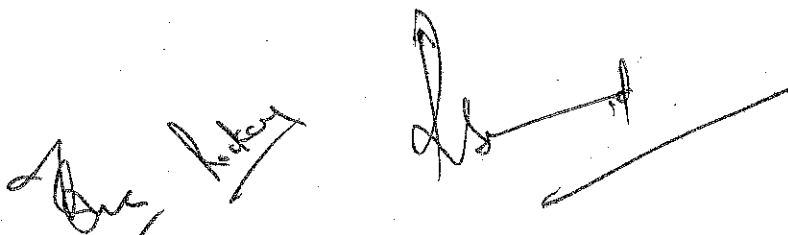
Evaluation of Theory component:

Mid Semester Examination (Theory: 15 marks from 50% syllabus) will be conducted by the Course Coordinator and result will be displayed on notice board at least one week before the commencement of End Semester Examination. The theory question paper (15 marks of 1.5 hour duration) will consist of two sections. Section-A (05 marks) will consist of 05 objective type questions and all questions are compulsory. Section-B will have four questions, two from each of the two units covered under 50% criterion. The students will have to attempt any two questions, selecting one from each unit.

End Semester Examination [Theory: 60 marks (03 hours) from 100% syllabus] will be conducted by the University of Jammu. The question paper will consist of two sections. Section-A will consist of four short answer type questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 marks. Section B shall consist of eight long answer type questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 marks.

Evaluation of Practical component:

Practical component shall be evaluated for 25 marks during the semester by the course coordinator internally. 10 marks shall be reserved day to day assessment and 15 marks shall be reserved for performance during the internal practical examination of 02 hours duration and viva-voce.

The image shows two handwritten signatures. The signature on the left is written in cursive and includes the name 'Rakesh' written below it. The signature on the right is also in cursive and appears to be 'Rakesh' with a long horizontal line extending to the right.

Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in December 2024, 2025, and 2026 as per NEP-2020

University of Jammu
Syllabi of Electronics at FYUGP under CBCS as per NEP-2020

Semester – V

(Examination to be held in December 2024, 2025, 2026)

Skill Enhancement Course

Course Code: USEELT506

Course Title: Summer Internship

Credits: 2

Maximum marks: 50

There shall be a short term internship of 15 days duration in 5th semester for a job or professional training in a suitable organisation or hands on training or activity based course at college level in order to gain work experience.

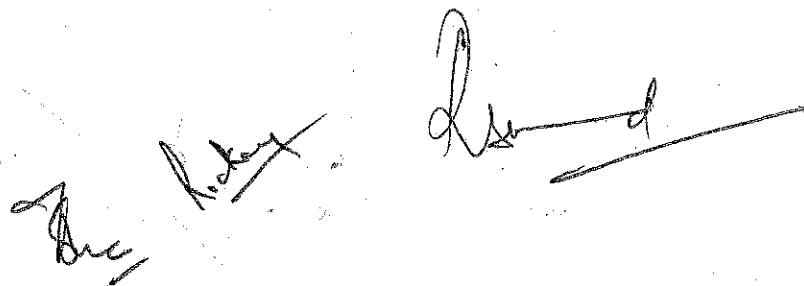
All students will undergo internships/apprenticeships in a firm, industry, or organisation or training in labs with faculty and researchers in their own or other HEIs/ research institutions during the summer term. Students will be provided with opportunities for internships with local industry, business organizations, health and allied areas, local governments (such as panchayats, municipalities), Parliament or elected representatives, media organizations, artists, crafts persons and a wide variety of organizations so that students may actively engage with the practical side of their learning and, as a by-product, further improve their employability.

Note: Students will have to produce **Course completion Certificate** from the concerned organization/ firm/ institute and submit report of work. Students are required to present their work after the end of internship through power point presentation and they will be evaluated for 50 marks based on the presentation and viva voce.

Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in May 2025, 2026, and 2027 as per NEP-2020

University of Jammu
Syllabi of Electronics at FYUGP under CBCS as per NEP-2020
Semester – VI

Four credit courses									
S. No.	Course Type	Course No.	Course Title	Credits	Marks				Total Marks
					Theory	Practical/Tutorial	Assessment	Exam:	
1.	Major	UMJELT601	Linear Integrated Circuits	4 (3Th+1P)	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
2.	Major	UMJELT602	8086 Microprocessor and Interfacing	4 (3Th+1P)	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
3.	Major	UMJELT603	C++ programming	4 (3Th+1P)	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
4.	Major	UMJELT604	Biomedical Instrumentation	4 (3Th+1P)	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
5.	Minor	UMIELT605	Operational Amplifier and Applications	4 (3Th+1P)	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100



Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in May 2025, 2026, and 2027 as per NEP-2020

University of Jammu
Syllabi of Electronics at FYUGP under CBCS as per NEP-2020

Semester – VI

(Examination to be held in May 2025, 2026, 2027)

Major Course-I

Course Code: UMJELT601

Credits: 4

Maximum Marks: 100 (Theory: 75 + Practical: 25)

Course Title: Linear Integrated Circuits

No. of Hours: 75 (Theory: 45, Practical: 30)

Unit-I: Basics of operational amplifier

Op-amp: definition, circuit symbol, and block diagram; characteristics of ideal and practical op-amps; open and closed loop configurations of op-amp; open loop and closed loop voltage gain, unity-gain frequency, input resistance, output resistance, input bias current, input offset current, input offset voltage, slew rate, common mode rejection ratio.

Unit-II: Analysis of voltage series and shunt feedback operational amplifiers

Block diagram of feedback configuration, analysis of voltage series feedback amplifier: closed loop voltage gain, bandwidth, I/P and O/P resistance with feedback; analysis of voltage shunt feedback amplifier: closed loop voltage gain, bandwidth, I/P and O/P resistance with feedback; comparison of voltage series and shunt feedback op-amps.

Unit-III: Applications of operational amplifier-I

Summing amplifier, scaling amplifier, averaging amplifier, Subtractor, Instrumentation amplifier, differential input and differential output amplifier, voltage to current and current to voltage converters, differentiator, integrator, zero crossing detector, Schmitt trigger.

Unit-IV: Applications of operational amplifier-II

Logarithmic amplifier, Antilogarithmic amplifier, Precision Rectifier: half-wave and full-wave, clipper: (unbiased and biased), clamper: positive and negative, Peak detector, S/H circuits, Wave generator: square, triangular, saw tooth; First order filters: low pass, high pass, band pass, band reject, all pass.

Reference Books:

- R. K. Gayakwad, **Op-Amps and Linear IC's**, Pearson Education.
- S. Franco, **Design with operational amplifiers and analog integrated circuits**, Tata McGraw Hill.
- R. F. Coughlin and F. F. Driscoll, **Operational amplifiers and Linear Integrated circuits**, Pearson Education.

Note:- Practical component (1-credit): Students are required to perform any Five practicals based on theory component.

Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in May 2025, 2026, and 2027 as per NEP-2020

Scheme of Evaluation

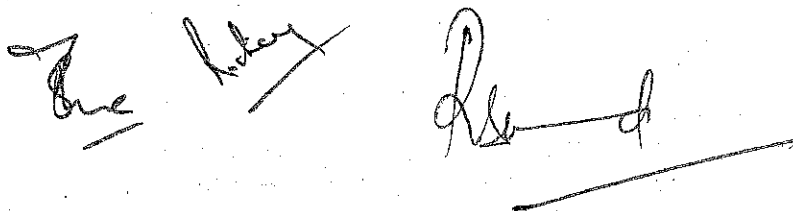
Evaluation of Theory component:

Mid Semester Examination (Theory: 15 marks from 50% syllabus) will be conducted by the Course Coordinator and result will be displayed on notice board at least one week before the commencement of End Semester Examination. The theory question paper (15 marks of 1.5 hour duration) will consist of two sections. Section-A (05 marks) will consist of 05 objective type questions and all questions are compulsory. Section-B will have four questions, two from each of the two units covered under 50% criterion. The students will have to attempt any two questions, selecting one from each unit.

End Semester Examination [Theory: 60 marks (03 hours) from 100% syllabus] will be conducted by the University of Jammu. The question paper will consist of two sections. Section-A will consist of four short answer type questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 marks. Section B shall consist of eight long answer type questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 marks.

Evaluation of Practical component:

Practical component shall be evaluated for 25 marks during the semester by the course coordinator internally. 10 marks shall be reserved day to day assessment and 15 marks shall be reserved for performance during the internal practical examination of 02 hours duration and viva-voce.

The image shows three handwritten signatures in black ink. The first signature on the left is 'Tare', the middle one is 'Ankur', and the right one is 'Rishi'. Each signature is written in a cursive style and is underlined with a single horizontal line.

Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in May 2025, 2026, and 2027 as per NEP-2020

University of Jammu
Syllabi of Electronics at FYUGP under CBCS as per NEP-2020

Semester – VI

(Examination to be held in May 2025, 2026, 2027)

Major Course-II

Course Code: UMJELT602

Course Title: 8086 Microprocessor and Interfacing

Credits: 4

No. of Hours: 75 (Theory: 45, Practical: 30)

Maximum Marks: 100 (Theory: 75 + Practical: 25)

Unit-I: Architecture of 8086

8086: main features, internal architecture: internal block diagram, bus interface unit (BIU) and execution unit (EU); register organisation: general purpose registers, segment registers, pointers and index registers, flag registers; memory segmentation, its rules and advantages.

Unit-II: 8086 assembly language-I

Instruction format; addressing modes; description and example of data transfer instructions: XCHG, LAHF, SAHF, XLAT, IN and OUT, MOV, PUSH and POP, LDS, LEA, LES; description and example of arithmetic instructions: addition instructions (ADD, ADC, INC), subtraction instructions (SUB, SBB, DEC, NEG), multiplication instructions (MUL, IMUL), division instructions (DIV, IDIV), BCD arithmetic (DAA, DAS), ASCII arithmetic (AAA, AAS, AAM, AAD).

Unit-III: 8086 assembly language-II

Description and example of logic instructions (AND, OR, NOT, XOR), shift instructions (SAL, SAR, SHL, SHR), rotate instructions (ROL, RCL, ROR, RCR), and string instructions (REP, MOVS, LODS, STOS, CMPS, SCAS); description of program execution transfer instructions (CALL, RET, JMP, J cond), iteration control instruction (LOOP, LOOPE, LOOPNE), processor control instructions (STC, CLC, CMC, STD, CLD, STI, CLI), interrupt instructions (INT, INTO, IRET), external hardware synchronization instructions (HLT, WAIT, ESC, LOCK, NOP); simple programming examples.

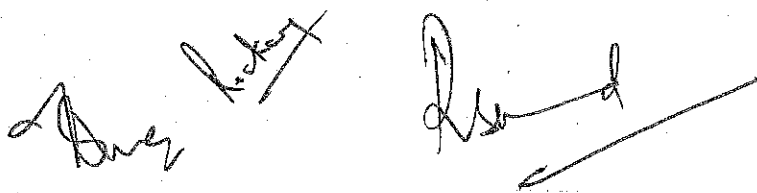
Unit-IV: Interfacing

Programmable keyboard/display interface (8279): main features, pin diagram and function of each pin, block diagram and description of each block, interfacing with 8086; 8284 (8283) programmable interval timer: main features, pin diagram and function of each pin, block diagram and description of each block, interfacing with 8086.

Reference Books:

- John Uffenbeck, **The 8086/8088 Family: Design, programming, and interfacing**, Prentice Hall.
- James W. Coffron, and M. Sambyal, **Programming the 8086/8088**, Sybex
- Barry B. Brey, **The intel microprocessor: architecture, programming, and interfacing**, Pearson/Prentice hall.

Note:- Practical component (1-credit): Students are required to perform any Five practicals based on theory component.



Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in May 2025, 2026, and 2027 as per NEP-2020

Scheme of Evaluation

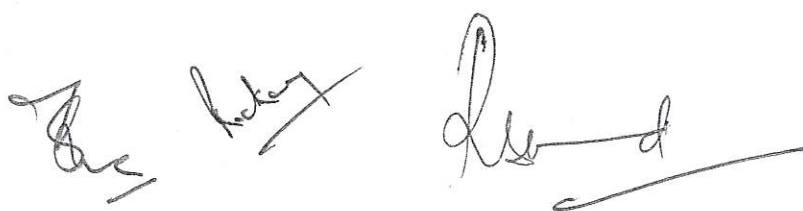
Evaluation of Theory component:

Mid Semester Examination (Theory: 15 marks from 50% syllabus) will be conducted by the Course Coordinator and result will be displayed on notice board at least one week before the commencement of End Semester Examination. The theory question paper (15 marks of 1.5 hour duration) will consist of two sections. Section-A (05 marks) will consist of 05 objective type questions and all questions are compulsory. Section-B will have four questions, two from each of the two units covered under 50% criterion. The students will have to attempt any two questions, selecting one from each unit.

End Semester Examination [Theory: 60 marks (03 hours) from 100% syllabus] will be conducted by the University of Jammu. The question paper will consist of two sections. Section-A will consist of four short answer type questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 marks. Section B shall consist of eight long answer type questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 marks.

Evaluation of Practical component:

Practical component shall be evaluated for 25 marks during the semester by the course coordinator internally. 10 marks shall be reserved day to day assessment and 15 marks shall be reserved for performance during the internal practical examination of 02 hours duration and viva-voce.



Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in May 2025, 2026, and 2027 as per NEP-2020

University of Jammu
Syllabi of Electronics at FYUGP under CBCS as per NEP-2020
Semester – VI

(Examination to be held in May 2025, 2026, 2027)

Major Course-III

Course Code: UMJELT603

Course Title: C++ programming

Credits: 4

No. of Hours: 75 (Theory: 45, Practical: 30)

Maximum Marks: 100 (Theory: 75 + Practical: 25)

Unit-I: Basics of Object Oriented Programming with C++

Object oriented programming: Concepts, Input and output statements in C++; Header files available in C++ for input/output operations; data types and their size; operator and its types; loops: for, nested for, while, do while; decision statements: if, if-else, nested if-else, switch; control statements: break, continue, goto; simple programming examples.

Unit II: Structures and Functions

Structures: simple structure, definition, defining a structure variable, accessing structure members, structures within structures; functions: declaration, calling, definition, passing arguments to functions: constants, variables, passing by value, structures as arguments, returning values from functions: return statement, returning structure variables; reference arguments: passing simple data types by reference; overloaded functions.

Unit III: Objects and Classes

Scope and storage class: local, global, and static local variables, simple class: classes and objects, defining the class, using the class, calling member functions; C++ objects as physical objects, C++ objects as data types, constructors, destructors, objects as function arguments; Array: definition, arrays as class member data, arrays of objects.

Unit IV: Operator overloading and Inheritance

Overloading unary operators, overloading binary operators; inheritance: derived class and base class, derived class constructors, overriding member functions, public and private inheritance, levels of inheritance, multiple inheritance, pointers: pointer variables, pointers and arrays, pointers and functions.

Reference books

- Robert Lafore, **Object Oriented Programming in C++**, Galgotia Publication.
- Balaguruswamy, **Object Oriented Programming and C++**, TMH.
- Herbert Schildt, **C++ The Complete Reference**, McGraw Hill.
- H.M. Deitel and P. J. Deitel, **C++: How to program**, Prentice Hall.
- Bjarne Stroustrup, **The C++ Programming Language**, (3rd Edn.), AddisonWesley.

Note:- Practical component (1-credit): Students are required to perform any Five practicals based on theory component.

Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in May 2025, 2026, and 2027 as per NEP-2020

Scheme of Evaluation

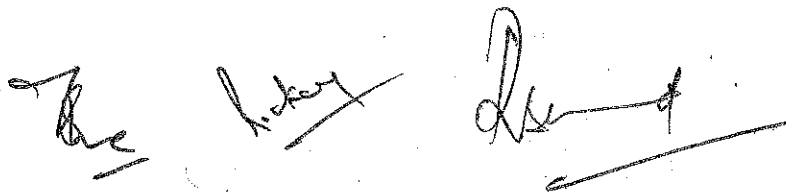
Evaluation of Theory component:

Mid Semester Examination (Theory: 15 marks from 50% syllabus) will be conducted by the Course Coordinator and result will be displayed on notice board at least one week before the commencement of End Semester Examination. The theory question paper (15 marks of 1.5 hour duration) will consist of two sections. Section-A (05 marks) will consist of 05 objective type questions and all questions are compulsory. Section-B will have four questions, two from each of the two units covered under 50% criterion. The students will have to attempt any two questions, selecting one from each unit.

End Semester Examination [Theory: 60 marks (03 hours) from 100% syllabus] will be conducted by the University of Jammu. The question paper will consist of two sections. Section-A will consist of four short answer type questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 marks. Section B shall consist of eight long answer type questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 marks.

Evaluation of Practical component:

Practical component shall be evaluated for 25 marks during the semester by the course coordinator internally. 10 marks shall be reserved day to day assessment and 15 marks shall be reserved for performance during the internal practical examination of 02 hours duration and viva-voce.



Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in May 2025, 2026, and 2027 as per NEP-2020

University of Jammu
Syllabi of Electronics at FYUGP under CBCS as per NEP-2020
Semester – VI
(Examination to be held May 2025, 2026, 2027)

Course Code: UMJELT604

Major Course-IV

Course Title: Biomedical instrumentation

Credits: 4

No. of Hours: 75 (Theory: 45, Practical: 30)

Maximum Marks: 100 (Theory: 75 + Practical: 25)

Unit-I: Biopotential amplifiers

Basic requirements; electrocardiograph: functional diagram, problems, transient protection; interference reduction circuits; amplifiers for other biopotential signals: EMG and EEG amplifiers, amplifiers for use with glass micropipet intracellular electrodes; example of biopotential preamplifier.

Unit II: Biomedical instruments

Cardiotachometers; electromyogram integrators; evoked potential and signal averagers; fetal electrocardiography; vector cardiograph; cardiac monitors; biotelemetry.

Unit III: Blood pressure measurements

Direct and indirect measurements; dynamic properties of pressure-measurement systems; system response: measurement, effects of system parameters, bandwidth requirement; typical pressure-waveform distortion; systems for measuring venous pressure; stethoscopes.

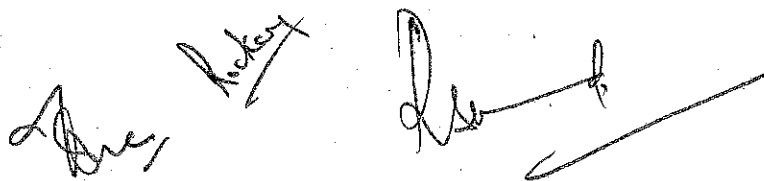
Unit IV: Medical imaging systems

Photography; radiography; computer radiography; computer tomography; magnetic resonance imaging; nuclear medicine; single-photon emission computed tomography; positron emission tomography; ultrasonography.

Reference books

- John G. Webster, **Medical instrumentation: application and design**, John Wiley & Sons, Inc, New York.
- R. S. Khandpur, **Handbook of biomedical instrumentation**, Tata McGraw-Hill Publishing Company Limited., New Delhi.

Note:- Practical component (1-credit): Students are required to perform any Five practicals based on theory component.



Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in May 2025, 2026, and 2027 as per NEP-2020

Scheme of Evaluation

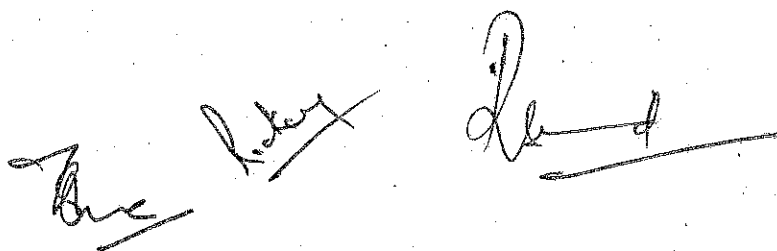
Evaluation of Theory component:

Mid Semester Examination (Theory: 15 marks from 50% syllabus) will be conducted by the Course Coordinator and result will be displayed on notice board at least one week before the commencement of End Semester Examination. The theory question paper (15 marks of 1.5 hour duration) will consist of two sections. Section-A (05 marks) will consist of 05 objective type questions and all questions are compulsory. Section-B will have four questions, two from each of the two units covered under 50% criterion. The students will have to attempt any two questions, selecting one from each unit.

End Semester Examination [Theory: 60 marks (03 hours) from 100% syllabus] will be conducted by the University of Jammu. The question paper will consist of two sections. Section-A will consist of four short answer type questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 marks. Section B shall consist of eight long answer type questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 marks.

Evaluation of Practical component:

Practical component shall be evaluated for 25 marks during the semester by the course coordinator internally. 10 marks shall be reserved day to day assessment and 15 marks shall be reserved for performance during the internal practical examination of 02 hours duration and viva-voce.



Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in May 2025, 2026, and 2027 as per NEP-2020

University of Jammu
Syllabi of Electronics at FYUGP under CBCS as per NEP-2020
Semester – VI
(Examination to be held May 2025, 2026, 2027)

Minor Course

Course Code: UMIELT605 Course Title: Operational Amplifier and Applications
Credits: 4 No. of Hours: 75 (Theory: 45, Practical: 30)
Maximum Marks: 100 (Theory: 75 + Practical: 25)

Unit-I: Basics of operational amplifier

Op-amp: definition, circuit symbol, and block diagram; characteristics of ideal and practical op-amps; open and closed loop configurations of op-amp; open loop and closed loop voltage gain, unity-gain frequency, input resistance, output resistance, input bias current, input offset current, input offset voltage, slew rate, common mode rejection ratio.

Unit-II: Analysis of voltage series and shunt feedback operational amplifiers

Block diagram of feedback configuration, analysis of voltage series feedback amplifier: closed loop voltage gain, bandwidth, I/P and O/P resistance with feedback; analysis of voltage shunt feedback amplifier: closed loop voltage gain, bandwidth, I/P and O/P resistance with feedback; comparison of voltage series and shunt feedback op-amps.

Unit-III: Applications of operational amplifier-I

Summing amplifier, scaling amplifier, averaging amplifier, subtractor, instrumentation amplifier, differential input and differential output amplifier, voltage to current and current to voltage converters, differentiator, integrator, zero crossing detector, Schmitt trigger.

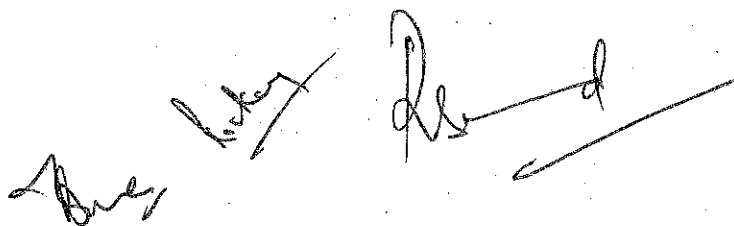
Unit-IV: Applications of operational amplifier-II

Logarithmic amplifier, antilogarithmic amplifier, precision Rectifier: half-wave and full-wave, clipper: (unbiased and biased), clamper: positive and negative, peak detector, S/H circuits, wave generator: square, triangular, saw tooth.

Reference Books:

- R. A. Gayakwad, **Op-Amps and Linear IC's**, Pearson Education.
- S. Franco, **Design with operational amplifiers and analog integrated circuits**, Tata McGraw Hill.
- R. F. Coughlin and F. F. Driscoll, **Operational amplifiers and Linear Integrated circuits**, Pearson Education.

Note:- Practical component (1-credit): Students are required to perform any Five practicals based on theory component.



Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in May 2025, 2026, and 2027 as per NEP-2020

Scheme of Evaluation

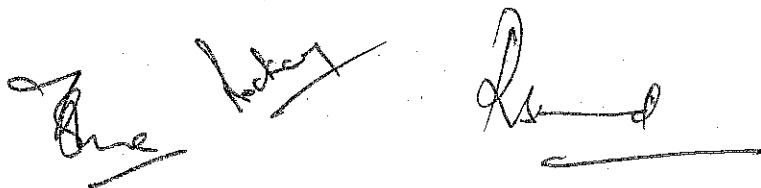
Evaluation of Theory component:

Mid Semester Examination (Theory: 15 marks from 50% syllabus) will be conducted by the Course Coordinator and result will be displayed on notice board at least one week before the commencement of End Semester Examination. The theory question paper (15 marks of 1.5 hour duration) will consist of two sections. Section-A (05 marks) will consist of 05 objective type questions and all questions are compulsory. Section-B will have four questions, two from each of the two units covered under 50% criterion. The students will have to attempt any two questions, selecting one from each unit.

End Semester Examination [Theory: 60 marks (03 hours) from 100% syllabus] will be conducted by the University of Jammu. The question paper will consist of two sections. Section-A will consist of four short answer type questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 marks. Section B shall consist of eight long answer type questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 marks.

Evaluation of Practical component:

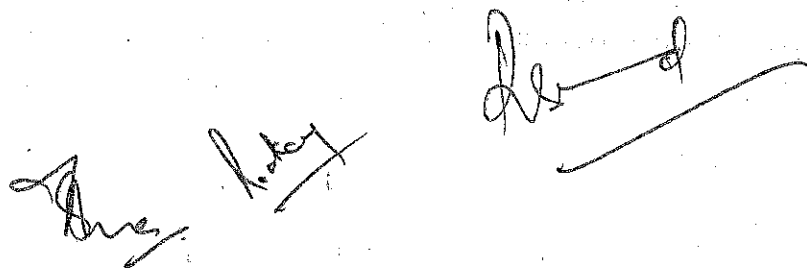
Practical component shall be evaluated for 25 marks during the semester by the course coordinator internally. 10 marks shall be reserved day to day assessment and 15 marks shall be reserved for performance during the internal practical examination of 02 hours duration and viva-voce.



Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in December 2025, 2026, and 2027 as per NEP-2020

University of Jammu
Syllabi of Electronics at FYUGP under CBCS as per NEP-2020
Semester – VII

Four credits courses									
S. No.	Course Type	Course No.	Course Title	Credits	Marks				Total Marks
					Theory	Practical/Tutorial			
1.	Major	UMJELT701	Control Systems	4 (3Th+1P)	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
2.	Major	UMJELT702	Research Methodology and Research Ethics	4 (3Th+1P)	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
3.	Major	UMJELT703	Semiconductor Devices	4 (3Th+1P)	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
4.	Major	UMJELT704	Python Programming	4 (3Th+1P)	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
5.	Minor	UMJELT705	Introduction to Control Systems	4 (3Th+1P)	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100



Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in December 2025, 2026, and 2027 as per NEP-2020

University of Jammu
Syllabi of Electronics at FYUGP under CBCS as per NEP-2020
Semester – VII
(Examination to be held in December 2025, 2026, 2027)

Course Code: UMJELT701

Credits: 4

Maximum Marks: 100 (Theory: 75 + Practical: 25)

Major Course-I

Course Title: Control Systems

No. of Hours: 75 (Theory: 45, Practical: 30)

Unit-I: Introduction to control system and transfer function

Comparison of open-loop and closed-loop control systems; transfer function; poles and zeros of a transfer function and their numerical problems; plot of pole-zero configuration in s-plane; relationship of transfer function with impulse response; procedure for determining the transfer function of a control system; determination of transfer function of RC network; open-loop transfer function: definition and classification.

Unit-II: Block diagram reduction techniques

Representation of a closed-loop control system by block diagram; rules for block diagram reduction; examples of block diagram reduction and determination of overall transfer function; signal flow graph: representation of a block diagram of control system by signal flow graph, rules for drawing signal flow graphs, and determination of overall transmittance.

Unit-III: Time domain response

Transient and steady state response; input test signals: time response of a first order control system for unit step, unit ramp, and unit impulse input functions; time response of a second order control system for unit step, unit ramp, and unit impulse input functions.

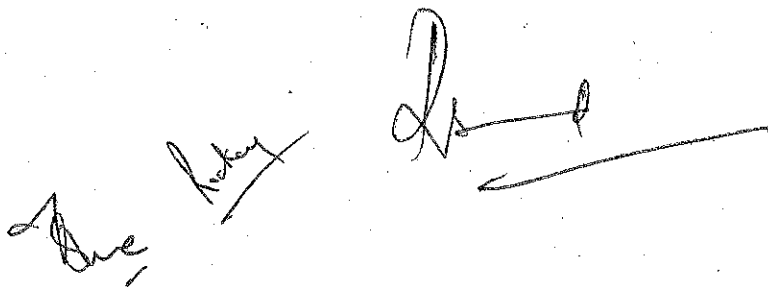
Unit-IV: Feedback control and stability analysis

Control objectives, Feedback control system characteristics, proportional mode of feedback control, derivative mode of feedback control, PID controller; Bounded input bounded output stability, Zero input stability, Routh and Hurwitz stability criterion.

Reference Books:

- B. S. Manke, **Linear control systems**, Khanna publishers, New Delhi.

Note:- Practical component (1-credit): Students are required to perform any Five practicals based on theory component.



Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in December 2025, 2026, and 2027 as per NEP-2020.

Scheme of Evaluation

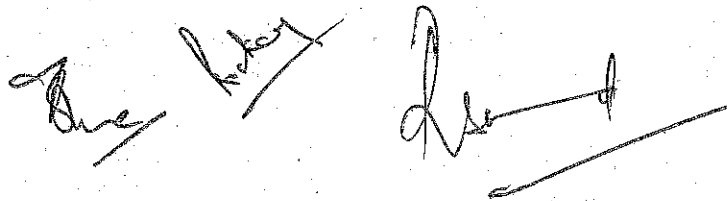
Evaluation of Theory component:

Mid Semester Examination (Theory: 15 marks from 50% syllabus) will be conducted by the Course Coordinator and result will be displayed on notice board at least one week before the commencement of End Semester Examination. The theory question paper (15 marks of 1.5 hour duration) will consist of two sections. Section-A (05 marks) will consist of 05 objective type questions and all questions are compulsory. Section-B will have four questions, two from each of the two units covered under 50% criterion. The students will have to attempt any two questions, selecting one from each unit.

End Semester Examination [Theory: 60 marks (03 hours) from 100% syllabus] will be conducted by the University of Jammu. The question paper will consist of two sections. Section-A will consist of four short answer type questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 marks. Section B shall consist of eight long answer type questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 marks.

Evaluation of Practical component:

Practical component shall be evaluated for 25 marks during the semester by the course coordinator internally. 10 marks shall be reserved day to day assessment and 15 marks shall be reserved for performance during the internal practical examination of 02 hours duration and viva-voce.



Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in December 2025, 2026, and 2027 as per NEP-2020

University of Jammu
Syllabi of Electronics at FYUGP under CBCS as per NEP-2020
Semester – VII
(Examination to be held in December 2025, 2026, 2027)

Major Course-II

Course Code: UMJELT702 Course Title: Research Methodology and Research Ethics
Credits: 4 No. of Hours: 75 (Theory: 45, Tutorial: 30)
Maximum Marks: 100 (Theory: 75 + Tutorial: 25)

Unit I: Nature and purpose of research

Meaning of research; aim, nature and scope of research; prerequisites of research; types of research: exploratory, descriptive and experimental; research methods: qualitative and quantitative.

Unit II: Review of literature and research report

Review of literature: purpose of the review, identification of the literature, organizing the literature; research report: structure and components of research report, types of report, characteristics of good research report, bibliographical entries, research ethics.

Unit III: Research problem and descriptive statistics

Research problem: types of research problems, characteristics of a good research problem, hypothesis: meaning and types of hypothesis, research proposal or synopsis; descriptive statistics: tabulation, organization, and graphical representation of quantitative data, measures of central tendencies: mean, median.

Unit IV: Data collection and analysis

Types of data, methods of data collection, sample and population, sampling techniques, characteristics of a good sample, tools of data collection: observation method, interview, questionnaire, various rating scales, characteristics of good research tools.

Scheme of Evaluation

Evaluation of Theory component:

Mid Semester Examination (Theory: 15 marks from 50% syllabus) will be conducted by the Course Coordinator and result will be displayed on notice board at least one week before the commencement of End Semester Examination. The theory question paper (15 marks of 1.5 hour duration) will consist of two sections. Section-A (05 marks) will consist of 05 objective type questions and all questions are compulsory. Section-B will have four questions, two from each of the two units covered under 50% criterion. The students will have to attempt any two questions, selecting one from each unit.

End Semester Examination [Theory: 60 marks (03 hours) from 100% syllabus] will be conducted by the University of Jammu. The question paper will consist of two sections. Section-A will consist of four short answer type questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 marks. Section B shall consist of eight long answer type questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 marks.

Evaluation of Tutorial component:

Tutorial component shall be evaluated for 25 marks during the semester by the course coordinator internally. 10 marks shall be reserved day to day assessment and 15 marks shall be reserved for performance during the internal practical examination of 02 hours duration and viva-voce.

Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in December 2025, 2026, and 2027 as per NEP-2020

University of Jammu
Syllabi of Electronics at FYUGP under CBCS as per NEP-2020
Semester – VII
(Examination to be held in December 2025, 2026, 2027)

Course Code: UMJELT703

Major Course-III

Course Title: Semiconductor Devices

Credits: 4

No. of Hours: 75 (Theory: 45, Practical: 30)

Maximum Marks: 100 (Theory: 75 + Practical: 25)

Unit-I: Carrier concentration & transport phenomena

Definition and energy band diagram of metal, semiconductor, and insulator; intrinsic carrier concentration; donors and acceptors; carrier drift: mobility and resistivity; Hall effect; carrier diffusion: diffusion process, Einstein relation, and current density equations.

Unit-II: Physics of P-N junction

Basic fabrication steps: oxidation, lithography, diffusion and ion implantation, metallization; thermal equilibrium condition: band diagram, equilibrium Fermi levels, space charge; depletion region: abrupt junction, linearly graded junction; depletion capacitance: C-V characteristics, varactor; V-I characteristics: ideal characteristics, high-injection effects, and temperature effects; diffusion capacitance.

Unit-III: Physics of bipolar transistor

Transistor action: operation in the active mode and current gain; static characteristics of bipolar transistor: carrier distribution in base, emitter & collector regions, ideal transistor currents for active mode operation, modes of operation, I-V characteristics of common-base and common-emitter configuration; frequency response and switching of bipolar transistor.

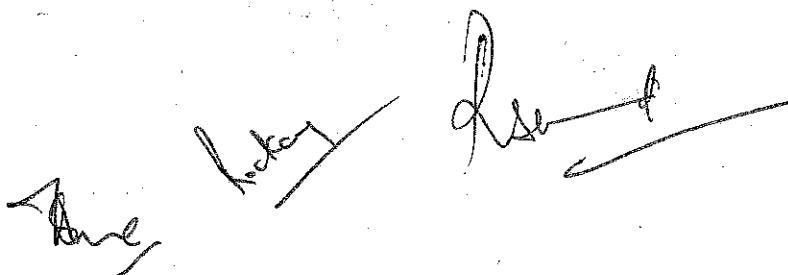
Unit-IV: Physics of MOS diode, MOSFET, and MESFET

MOS diode: cross-section, energy band diagram at $V=0$, energy band diagram and charge distribution of ideal MOS diode in accumulation, depletion, & inversion cases, and ideal MOS curves; MOSFET fundamentals: basic characteristics (linear, saturation and sub threshold regions), and threshold voltage control; MESFET: device structure, principles of operation, I-V characteristics, high-frequency performance.

Reference Books:

- S. M. Sze, **Semiconductor device physics and technology**, John Wiley and Sons, New Delhi.

Note:- Practical component (1-credit): Students are required to perform any **Five** practicals based on theory component.



Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in December 2025, 2026, and 2027 as per NEP-2020

Scheme of Evaluation

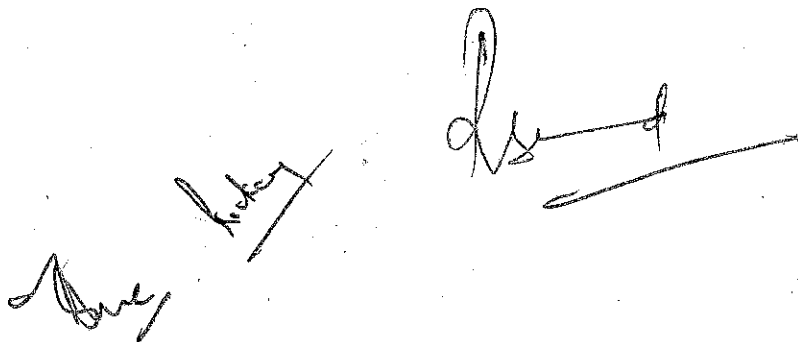
Evaluation of Theory component:

Mid Semester Examination (Theory: 15 marks from 50% syllabus) will be conducted by the Course Coordinator and result will be displayed on notice board at least one week before the commencement of End Semester Examination. The theory question paper (15 marks of 1.5 hour duration) will consist of two sections. Section-A (05 marks) will consist of 05 objective type questions and all questions are compulsory. Section-B will have four questions, two from each of the two units covered under 50% criterion. The students will have to attempt any two questions, selecting one from each unit.

End Semester Examination [Theory: 60 marks (03 hours) from 100% syllabus] will be conducted by the University of Jammu. The question paper will consist of two sections. Section-A will consist of four short answer type questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 marks. Section B shall consist of eight long answer type questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 marks.

Evaluation of Practical component:

Practical component shall be evaluated for 25 marks during the semester by the course coordinator internally. 10 marks shall be reserved day to day assessment and 15 marks shall be reserved for performance during the internal practical examination of 02 hours duration and viva-voce.



Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in December 2025, 2026, and 2027 as per NEP-2020

University of Jammu
Syllabi of Electronics at FYUGP under CBCS as per NEP-2020
Semester – VII
(Examination to be held in December 2025, 2026, 2027)

Course Code: UMJELT704

Credits: 4

Maximum Marks: 100 (Theory: 75 + Practical: 25)

Major Course-IV

Course Title: Python Programming

No. of Hours: 75 (Theory: 45, Practical: 30)

Unit-I: Introduction to python

Python overview; getting started with python; python identifiers; reserved keywords; variables; standard data types: numeric, string, list, tuple, dictionary, boolean, sets; operators: arithmetic, comparison, assignment, logical, bitwise, membership, identity; precedence of operators and associativity;

Unit II: Loop and control statements

Statement and expressions; string operations; boolean expressions; control statements: for loop, while loop, if elif else statements; alternative execution, conditional execution, iteration, input from keyboard;

Unit III: Functions

Functions: built-in function, composition of functions, user defined functions, parameters and arguments, function calls, the return statement, python recursive functions; the anonymous functions, writing python scripts;

Unit IV: Strings and lists

Strings: compound data type, len function, string slices, strings are immutable, string traversal, escape characters, string formatting operators, string formatting functions; lists: values and accessing elements, lists are mutable, traversing a list, deleting elements from list, built-in list operators, built-in list methods;

Reference books

- E. Balagyusamy, **Introduction to computing and Problem Solving Using Python**, McGraw-Hill, New Delhi.

Note:- Practical component (1-credit): Students are required to perform any **Five** practicals based on theory component.



Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in December 2025, 2026, and 2027 as per NEP-2020

Scheme of Evaluation

Evaluation of Theory component:

Mid Semester Examination (Theory: 15 marks from 50% syllabus) will be conducted by the Course Coordinator and result will be displayed on notice board at least one week before the commencement of End Semester Examination. The theory question paper (15 marks of 1.5 hour duration) will consist of two sections. Section-A (05 marks) will consist of 05 objective type questions and all questions are compulsory. Section-B will have four questions, two from each of the two units covered under 50% criterion. The students will have to attempt any two questions, selecting one from each unit.

End Semester Examination [Theory: 60 marks (03 hours) from 100% syllabus] will be conducted by the University of Jammu. The question paper will consist of two sections. Section-A will consist of four short answer type questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 marks. Section B shall consist of eight long answer type questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 marks.

Evaluation of Practical component:

Practical component shall be evaluated for 25 marks during the semester by the course coordinator internally. 10 marks shall be reserved day to day assessment and 15 marks shall be reserved for performance during the internal practical examination of 02 hours duration and viva-voce.

Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in December 2025, 2026, and 2027 as per NEP-2020

University of Jammu
Syllabi of Electronics at FYUGP under CBCS as per NEP-2020
Semester – VII
(Examination to be held in December 2025, 2026, 2027)

Minor Course

Course Code: UMIELT705

Course Title: Introduction to Control Systems

Credits: 4

No. of Hours: 75 (Theory: 45, Practical: 30)

Maximum Marks: 100 (Theory: 75 + Practical: 25)

Unit-I: Introduction to control system and transfer function

Comparison of open-loop and closed-loop control systems; transfer function; poles and zeros of a transfer function and their numerical problems; plot of pole-zero configuration in s-plane; relationship of transfer function with impulse response; procedure for determining the transfer function of a control system; determination of transfer function of RC network; open-loop transfer function: definition and classification.

Unit-II: Block diagram reduction techniques

Representation of a closed-loop control system by block diagram; rules for block diagram reduction; examples of block diagram reduction and determination of overall transfer function; signal flow graph: representation of a block diagram of control system by signal flow graph, rules for drawing signal flow graphs, and determination of overall transmittance.

Unit-III: Time domain response

Transient and steady state response; input test signals; time response of a first order control system for unit step, unit ramp, and unit impulse input functions; time response of a second order control system for unit step, unit ramp, and unit impulse input functions.

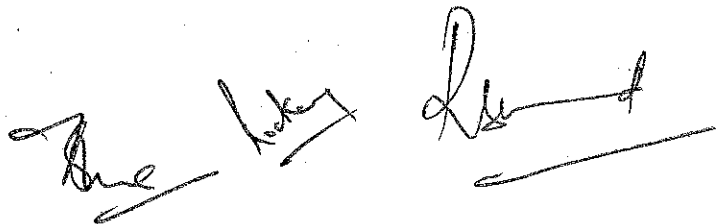
Unit-IV: Feedback control and stability analysis

Control objectives, Feedback control system characteristics, proportional mode of feedback control, derivative mode of feedback control, PID controller; Bounded input bounded output stability, Zero input stability, Routh and Hurwitz stability criterion.

Reference Books:

- B. S. Manke, **Linear control systems**, Khanna publishers, New Delhi.

Note:- Practical component (1-credit): Students are required to perform any Five practicals based on theory component.



Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in December 2025, 2026, and 2027 as per NEP-2020.

Scheme of Evaluation

Evaluation of Theory component:

Mid Semester Examination (Theory: 15 marks from 50% syllabus) will be conducted by the Course Coordinator and result will be displayed on notice board at least one week before the commencement of End Semester Examination. The theory question paper (15 marks of 1.5 hour duration) will consist of two sections. Section-A (05 marks) will consist of 05 objective type questions and all questions are compulsory. Section-B will have four questions, two from each of the two units covered under 50% criterion. The students will have to attempt any two questions, selecting one from each unit.

End Semester Examination [Theory: 60 marks (03 hours) from 100% syllabus] will be conducted by the University of Jammu. The question paper will consist of two sections. Section-A will consist of four short answer type questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 marks. Section B shall consist of eight long answer type questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 marks.

Evaluation of Practical component:

Practical component shall be evaluated for 25 marks during the semester by the course coordinator internally. 10 marks shall be reserved day to day assessment and 15 marks shall be reserved for performance during the internal practical examination of 02 hours duration and viva-voce.

[Handwritten signatures]

Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in May 2026, 2027, and 2028 as per NEP-2020

University of Jammu
Syllabi of Electronics at FYUGP under CBCS as per NEP-2020
Semester – VIII (UG Honours)

Four/Eight Credits Courses									
S. No	Course Type	Course No.	Course Title	Credits	Marks				Total Marks
					Theory	Practical/Tutorial	Assessment	Exam:	
1.	Major	UMJELT801	Circuit Simulation	4	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
2.	Major	UMJELT802	Optoelectronic Devices	4	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
3.	Major	UMJELT803	Antenna and Microwaves	4	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
4.	Major	UMJELT804	Microcontrollers	4	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
5.	Minor	UMIELT805	Introduction to C-language	4	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100

[Handwritten signatures]

Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in May 2026, 2027, and 2028 as per NEP-2020

University of Jammu
Syllabi of Electronics at FYUGP under CBCS as per NEP-2020
Semester – VIII (UG Honours with Research)

Four/Eight Credits Courses									
S. No	Course Type	Course No.	Course Title	Credits	Marks				Total Marks
					Theory	Practical/Tutorial	Assessment	Exam:	
1.	Major	UMJELT806	Circuit Simulation and Analysis	4	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
2.	Minor	UMIELT807	Fundamentals of C- language	4	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
3.	Skill Enhancement Course	USEELP808	Research Project/ Dissertation	8	200				300
			Viva-Voce	4	100				

[Handwritten signatures]

Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in May 2026, 2027, and 2028 as per NEP-2020

University of Jammu
Syllabi of Electronics at FYUGP under CBCS as per NEP-2020
Semester – VIII
(Examination to be held in May 2026, 2027, 2028)

Major Course-I

Course Code: UMJELT801

Course Title: Circuit Simulation

Credits: 4

No. of Hours: 75 (Theory: 45, Practical: 30)

Maximum Marks: 100 (Theory: 75 + Practical: 25)

Unit-I: Introduction to PSpice and Circuit Descriptions

Descriptions of Spice, Types of Spice, types of analysis, limitations of PSpice. Input files, element values, Nodes, Circuit elements, sources, types of analysis, output variables, PSpice output commands, format of circuit files, format of output files, examples of Spice simulations.

Unit-II: DC Circuit Analysis

Resistors, modelling of elements, operating temperature, independent DC sources, dependent sources, DC output variables, types of output, types of DC analysis.

Unit-III: Transient and AC Circuit Analysis

Transient Analysis: capacitors, inductors, modelling of transient sources, transient sources, transient output variables, transient output commands, transient response, switches. AC Circuit Analysis: AC output variables, independent AC sources, AC analysis, magnetic elements, transmission lines.

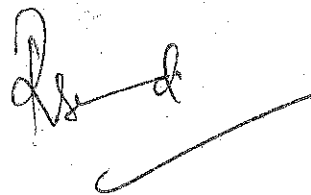
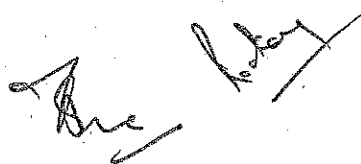
Unit-IV: Advanced Spice Commands and Analysis

Behavioral modelling: value, table, laplace, FREQ; description and example of commands: .SUBCKT, .ENDS, .FUNC, .GLOBAL, .INC, .LIB, .NODESET, .OPTIONS, .PARAM, .SENS, .STEP, .DC.

Reference Books:

- Mohammad H. Rashid, Introduction to PSPICE Using OrCAD, Pearson Education.

Note:- Practical component (1-credit): Students are required to perform any Five practicals based on theory component.



Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in May 2026, 2027, and 2028 as per NEP-2020

Scheme of Evaluation

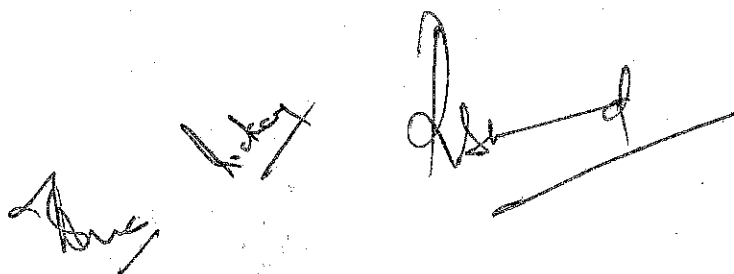
Evaluation of Theory component:

Mid Semester Examination (Theory: 15 marks from 50% syllabus) will be conducted by the Course Coordinator and result will be displayed on notice board at least one week before the commencement of End Semester Examination. The theory question paper (15 marks of 1.5 hour duration) will consist of two sections. Section-A (05 marks) will consist of 05 objective type questions and all questions are compulsory. Section-B will have four questions, two from each of the two units covered under 50% criterion. The students will have to attempt any two questions, selecting one from each unit.

End Semester Examination [Theory: 60 marks (03 hours) from 100% syllabus] will be conducted by the University of Jammu. The question paper will consist of two sections. Section-A will consist of four short answer type questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 marks. Section B shall consist of eight long answer type questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 marks.

Evaluation of Practical component:

Practical component shall be evaluated for 25 marks during the semester by the course coordinator internally. 10 marks shall be reserved day to day assessment and 15 marks shall be reserved for performance during the internal practical examination of 02 hours duration and viva-voce.



Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in May 2026, 2027, and 2028 as per NEP-2020

University of Jammu
Syllabi of Electronics at FYUGP under CBCS as per NEP-2020

Semester – VIII

(Examination to be held in May 2026, 2027, 2028)

Major Course-II

Course Code: UMJELT802

Course Title: Optoelectronic Devices

Credits: 4

No. of Hours: 75 (Theory: 45, Practical: 30)

Maximum Marks: 100 (Theory: 75 + Practical: 25)

Unit-I: Optical Processes

Transitions, direct and indirect band gap semiconductors; semiconductors suitable for optoelectronics, intrinsic band-to-band generation-recombination processes, electron-hole recombination, electron-hole generation, photon generation, heat generation, photoemission in a p-n diode, spontaneous emission.

Unit-II: Light Emitting Diode

Requirements of an optical source, LED: processes, power efficiency, basic theory of hetero-junction, types of LED structures, advantages, disadvantages and applications; phototransistor: principle, construction, circuit diagram, and applications;

Unit-III: Laser

Two requirements for lasing action and optical gain, basic components and the role of feedback, basic steps required to produce laser beam, Einstein relationships for stimulated emission, relationship between stimulated and spontaneous emission, advantages of lasers, population inversion, stimulated emission in a p-n junction, salient points about laser action, and operational parameter of lasers.

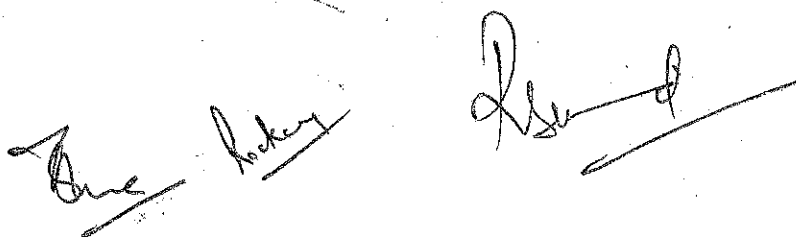
Unit-IV: Photodetector

Photodetection and steps involved in process of photodetection, p-n junction photodiode, V-I characteristics of a p-n junction photodiode, advantages, disadvantages, and applications of p-n junction photodiode, p-i-n photodiode, avalanche photodiode, OEIC: materials, types, and applications.

Reference Books:

- Angsuman Sarkar and Chandan Kumar Sarkar, Solid State Microelectronic and optoelectronic devices, Universities press pvt. Ltd, India.

Note:- Practical component (1-credit): Students are required to perform any **Five** practicals based on theory component.



Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in May 2026, 2027, and 2028 as per NEP-2020

Scheme of Evaluation


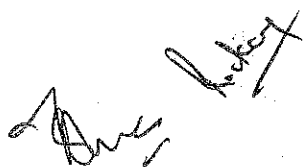
Evaluation of Theory component:

Mid Semester Examination (Theory: 15 marks from 50% syllabus) will be conducted by the Course Coordinator and result will be displayed on notice board at least one week before the commencement of End Semester Examination. The theory question paper (15 marks of 1.5 hour duration) will consist of two sections. Section-A (05 marks) will consist of 05 objective type questions and all questions are compulsory. Section-B will have four questions, two from each of the two units covered under 50% criterion. The students will have to attempt any two questions, selecting one from each unit.

End Semester Examination [Theory: 60 marks (03 hours) from 100% syllabus] will be conducted by the University of Jammu. The question paper will consist of two sections. Section-A will consist of four short answer type questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 marks. Section B shall consist of eight long answer type questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 marks.

Evaluation of Practical component:

Practical component shall be evaluated for 25 marks during the semester by the course coordinator internally. 10 marks shall be reserved day to day assessment and 15 marks shall be reserved for performance during the internal practical examination of 02 hours duration and viva-voce.



Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in May 2026, 2027, and 2028 as per NEP-2020

University of Jammu
Syllabi of Electronics at FYUGP under CBCS as per NEP-2020
Semester – VIII

(Examination to be held in May 2026, 2027, 2028)

Major Course-III

Course Code: UMJELT803

Course Title: Antenna and Microwaves

Credits: 4

No. of Hours: 75 (Theory: 45, Practical: 30)

Maximum Marks: 100 (Theory: 75 + Practical: 25)

Unit-I Antenna theory

Antenna as an element of wireless communication system, antenna radiation mechanism, types of antennas, fundamentals of EMFT; Maxwell's equations and their applications to antennas; antenna parameters: radiation pattern (polarization patterns, field and phase patterns), field regions around antenna.

Unit II: Antenna as a transmitter/receiver

Effective height and aperture, power delivered to antenna, input impedance, radiation from an infinitesimal small current element, power density and radiation resistance for small current element and half wave dipole antenna, monopole, dipole, folded dipole, loop antenna and biconical broadband antenna.

Unit III: Waveguides

Frequency allocations and frequency plans, rectangular waveguide and its mathematical analysis, power transmission, circular waveguide and its mathematical analysis, modes of propagation, dominant modes, cut off wavelength, excitation modes.

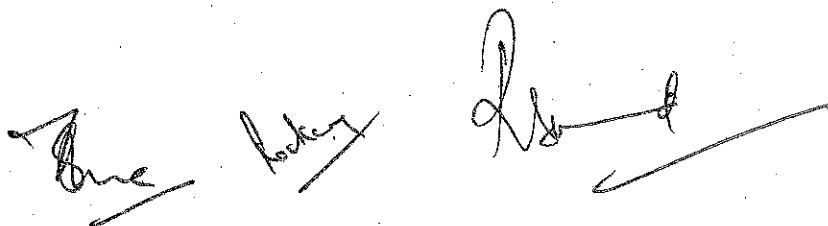
Unit IV: Microwave solid-state devices

Gunn diode and its modes of operation, avalanche IMPATT diode, TRAPATT diode, tunnel diode, schottky diode, backward diode, varactor diodes, PIN diode.

Reference Books:

- Ballanis, **Antenna Theory**, John Wiley & Sons.
- Yadava, **Antenna and Wave Propagation**, PHI Learning.
- R. E. Collins, **Foundations for Microwave Engineering**
- S. Y. Liao, **Microwave Devices and Circuits**
- M. Kulkarni, **Microwave and Radar Engineering**

Note:- Practical component (1-credit): Students are required to perform any **Five** practicals based on theory component.



Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in May 2026, 2027, and 2028 as per NEP-2020

Scheme of Evaluation

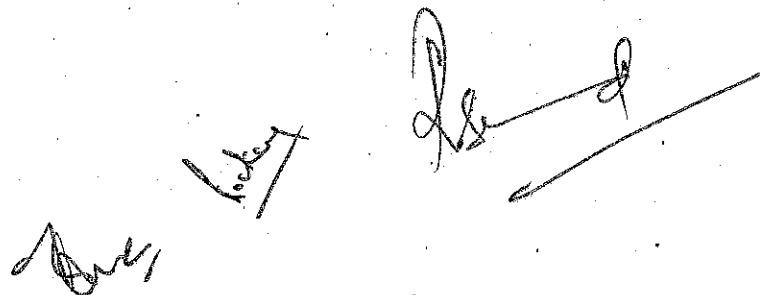
Evaluation of Theory component:

Mid Semester Examination (Theory: 15 marks from 50% syllabus) will be conducted by the Course Coordinator and result will be displayed on notice board at least one week before the commencement of End Semester Examination. The theory question paper (15 marks of 1.5 hour duration) will consist of two sections. Section-A (05 marks) will consist of 05 objective type questions and all questions are compulsory. Section-B will have four questions, two from each of the two units covered under 50% criterion. The students will have to attempt any two questions, selecting one from each unit.

End Semester Examination [Theory: 60 marks (03 hours) from 100% syllabus] will be conducted by the University of Jammu. The question paper will consist of two sections. Section-A will consist of four short answer type questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 marks. Section B shall consist of eight long answer type questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 marks.

Evaluation of Practical component:

Practical component shall be evaluated for 25 marks during the semester by the course coordinator internally. 10 marks shall be reserved day to day assessment and 15 marks shall be reserved for performance during the internal practical examination of 02 hours duration and viva-voce.

The image shows three handwritten signatures or initials in black ink. The first is on the left, the second is in the middle with the word 'History' written vertically next to it, and the third is on the right with a long horizontal line underneath it.

Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in May 2026, 2027, and 2028 as per NEP-2020

University of Jammu
Syllabi of Electronics at FYUGP under CBCS as per NEP-2020
Semester – VIII
(Examination to be held in May 2026, 2027, 2028)

Course Code: UMJELT804

Major Course-IV

Course Title: Microcontrollers

Credits: 4

No. of Hours: 75 (Theory: 45, Practical: 30)

Maximum Marks: 100 (Theory: 75 + Practical: 25)

Unit-I: Architecture, I/O ports, and special function registers of 8051

Main features, comparison with 8085, pin diagram and function of each pin, internal architecture, SFR map, SFR functions, processor status word, accumulator (register A), register B, stack and stack pointer, I/O ports: port0, port1, port2, port3; timer modes of operation.

Unit-II: Addressing modes, data move and arithmetic instructions

Addressing modes; description and example of data move instructions: MOV, MOVC, MOVX, PUSH, POP, XCH, XCHD; description and example of arithmetic instructions: ADD, ADDC, SUBB, INC, DEC, MUL, DIV, DAA; description and example of program branching instructions: LJUMP, AJMP, SJMP, JZ, JNZ, CJNE, DJNZ, NOP, LCALL, ACALL, RET, RETI, JMP; simple programming examples.

Unit-III: Logical and Boolean variable manipulation instructions

Description and example of logical instructions: ANL, ORL, XRL, CLR, CPL, RL, RLC, RR, RRC, SWAP; Boolean variable manipulation instructions: CLR, SETB, MOV, JC, JNC, JB, JNB, JBC, ANL, ORL, CPL; interrupts and types of interrupts; simple programming examples.

Unit-IV: Serial communication and interfacing

Serial communication: types of communication, overview, serial data format, baud rate; serial communication SFRs: SBUF, SCON, PCON; modes of serial communication, serial communication routines; interfacing of DAC, ADC, LED, and Seven-segment displays with 8051.

Reference Books:

- Kenneth K. Ayala, **The 8051 microcontroller**, West publishing company.
- Subrata Ghoshal, **8051 microcontroller**, Pearson, New Delhi.

Note:- Practical component (1-credit): Students are required to perform any Five practicals based on theory component.

Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in May 2026, 2027, and 2028 as per NEP-2020

Scheme of Evaluation

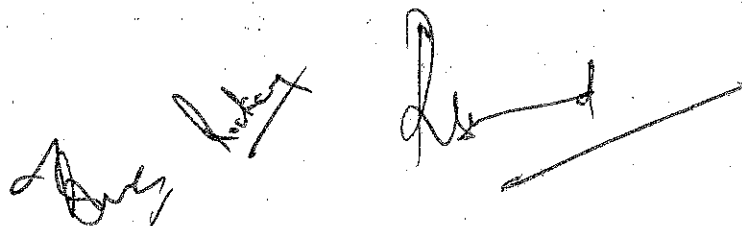
Evaluation of Theory component:

Mid Semester Examination (Theory: 15 marks from 50% syllabus) will be conducted by the Course Coordinator and result will be displayed on notice board at least one week before the commencement of End Semester Examination. The theory question paper (15 marks of 1.5 hour duration) will consist of two sections. Section-A (05 marks) will consist of 05 objective type questions and all questions are compulsory. Section-B will have four questions, two from each of the two units covered under 50% criterion. The students will have to attempt any two questions, selecting one from each unit.

End Semester Examination [Theory: 60 marks (03 hours) from 100% syllabus] will be conducted by the University of Jammu. The question paper will consist of two sections. Section-A will consist of four short answer type questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 marks. Section B shall consist of eight long answer type questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 marks.

Evaluation of Practical component:

Practical component shall be evaluated for 25 marks during the semester by the course coordinator internally. 10 marks shall be reserved day to day assessment and 15 marks shall be reserved for performance during the internal practical examination of 02 hours duration and viva-voce.



Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in May 2026, 2027, and 2028 as per NEP-2020

University of Jammu
Syllabi of Electronics at FYUGP under CBCS as per NEP-2020
Semester – VIII
(Examination to be held in May 2026, 2027, 2028)

Minor Course

Course Code: UMIELT805

Course Title: Introduction to C-language

Credits: 4

No. of Hours: 75 (Theory: 45, Practical: 30)

Maximum Marks: 100 (Theory: 75 + Practical: 25)

Unit-I Fundamentals of C

The C character set, keywords, identifiers, constants, variables, data types and their size; operators: arithmetic, relational, logical, assignment, increment, decrement, conditional; operator precedence; associativity of operators, solving expressions using operator precedence and associativity; data input and output statements; simple programming examples.

Unit II: Loops and control statements

Syntax and working of if, if-else, and nested if-else statements with examples; syntax and working of while, do-while, and for loops with examples; special statements: switch, goto, break, and continue; programs to find the factorial of a number and to generate Fibonacci series using while and for loops; program to check whether the number is (a) even or odd, (b) prime or not prime; program for leap year and finding of roots of quadratic equation.

Unit III: Pointers, arrays, and strings

Qualifiers, storage classes, pointers: definition, declaration, and their use with example; arrays: definition and initialization of one and two dimensional arrays; programs using one dimensional array: calculation of sum and average of numbers, arrange numbers in ascending and descending orders, and find the maximum and minimum of numbers; programs using two dimensional array: addition, subtraction, & multiplication of two matrices, and transpose of a matrix; string handling functions: strlen(), strcpy(), strcat(), strcmp().

Unit IV: Functions, structures, and unions

Function: definition, declaration, calling; passing arguments to function (call by value and call by reference); recursion; passing array to function; passing string to function; scope, visibility and life time of variables; structures: definition, declaration, accessing and initialization of variables; unions: definition, declaration, and accessing of variables.

Reference Books:

- Y. Kanitkar, **Let us C**, BPB Publications.
- Schaum Series, **Programming in C**.
- E. Balaguruswamy, **Programming in C**, TMH.

Note:- Practical component (1-credit): Students are required to perform any **Five** practicals based on theory component.

Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in May 2026, 2027, and 2028 as per NEP-2020

Scheme of Evaluation

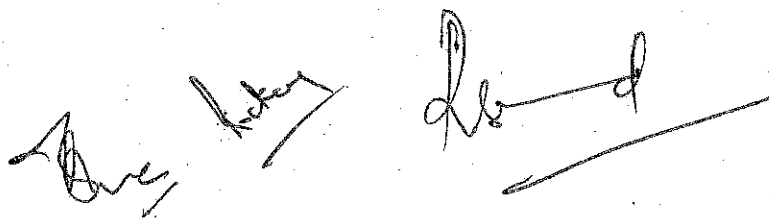
Evaluation of Theory component:

Mid Semester Examination (Theory: 15 marks from 50% syllabus) will be conducted by the Course Coordinator and result will be displayed on notice board at least one week before the commencement of End Semester Examination. The theory question paper (15 marks of 1.5 hour duration) will consist of two sections. Section-A (05 marks) will consist of 05 objective type questions and all questions are compulsory. Section-B will have four questions, two from each of the two units covered under 50% criterion. The students will have to attempt any two questions, selecting one from each unit.

End Semester Examination [Theory: 60 marks (03 hours) from 100% syllabus] will be conducted by the University of Jammu. The question paper will consist of two sections. Section-A will consist of four short answer type questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 marks. Section B shall consist of eight long answer type questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 marks.

Evaluation of Practical component:

Practical component shall be evaluated for 25 marks during the semester by the course coordinator internally. 10 marks shall be reserved day to day assessment and 15 marks shall be reserved for performance during the internal practical examination of 02 hours duration and viva-voce.

The image shows two handwritten signatures in black ink. The signature on the left is more stylized and appears to be 'Arun Kumar'. The signature on the right is simpler and appears to be 'D. D.'.

Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in May 2026, 2027, and 2028 as per NEP-2020

University of Jammu
Syllabi of Electronics at FYUGP under CBCS as per NEP-2020
Semester – VIII
(Examination to be held in May 2026, 2027, 2028)

Major Course-I

Course Code: UMJELT806

Course Title: Circuit Simulation and Analysis

Credits: 4

No. of Hours: 75 (Theory: 45, Practical: 30)

Maximum Marks: 100 (Theory: 75 + Practical: 25)

Unit-I: Introduction to PSpice and Circuit Descriptions

Descriptions of Spice, Types of Spice, types of analysis, limitations of PSpice, Input files, element values, Nodes, Circuit elements, sources, types of analysis, output variables, PSpice output commands, format of circuit files, format of output files, examples of Spice simulations.

Unit-II: DC Circuit Analysis

Resistors, modelling of elements, operating temperature, independent DC sources, dependent sources, DC output variables, types of output, types of DC analysis.

Unit-III: Transient and AC Circuit Analysis

Transient Analysis: capacitors, inductors, modelling of transient sources, transient sources, transient output variables, transient output commands, transient response, switches. AC Circuit Analysis: AC output variables, independent AC sources, AC analysis, magnetic elements, transmission lines.

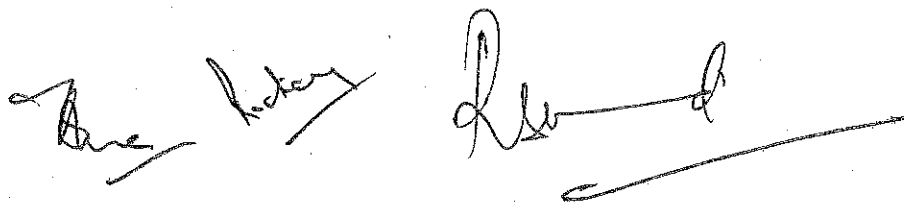
Unit-IV: Advanced Spice Commands and Analysis

Behavioral modelling: value, table, laplace, FREQ; description and example of commands: .SUBCKT, .ENDS, .FUNC, .GLOBAL, .INC, .LIB, .NODESET, .OPTIONS, .PARAM, .SENS, .STEP, .DC.

Reference Books:

- Mohammad H. Rashid, Introduction to PSPICE Using OrCAD, Pearson Education.

Note:- Practical component (1-credit): Students are required to perform any Five practicals based on theory component.



Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in May 2026, 2027, and 2028 as per NEP-2020

Scheme of Evaluation

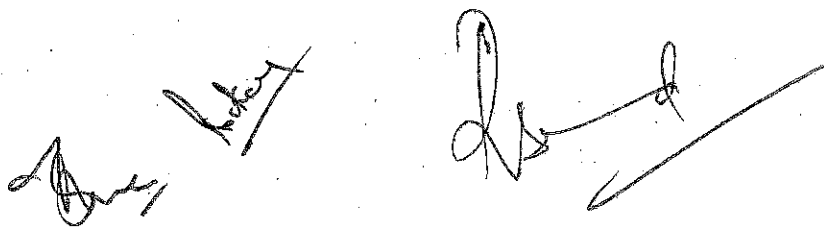
Evaluation of Theory component:

Mid Semester Examination (Theory: 15 marks from 50% syllabus) will be conducted by the Course Coordinator and result will be displayed on notice board at least one week before the commencement of End Semester Examination. The theory question paper (15 marks of 1.5 hour duration) will consist of two sections. Section-A (05 marks) will consist of 05 objective type questions and all questions are compulsory. Section-B will have four questions, two from each of the two units covered under 50% criterion. The students will have to attempt any two questions, selecting one from each unit.

End Semester Examination [Theory: 60 marks (03 hours) from 100% syllabus] will be conducted by the University of Jammu. The question paper will consist of two sections. Section-A will consist of four short answer type questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 marks. Section B shall consist of eight long answer type questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 marks.

Evaluation of Practical component:

Practical component shall be evaluated for 25 marks during the semester by the course coordinator internally. 10 marks shall be reserved day to day assessment and 15 marks shall be reserved for performance during the internal practical examination of 02 hours duration and viva-voce.

The image shows two handwritten signatures in black ink. The signature on the left is written in a cursive style and appears to be 'A. Singh'. The signature on the right is also in cursive and appears to be 'R. Singh'. Both signatures are slanted upwards to the right.

Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in May 2026, 2027, and 2028 as per NEP-2020

University of Jammu
Syllabi of Electronics at FYUGP under CBCS as per NEP-2020
Semester – VIII
(Examination to be held in May 2026, 2027, 2028)

Course Code: UMIELT807

Course Title: Fundamentals of C-language

Credits: 4

No. of Hours: 75 (Theory: 45, Practical: 30)

Maximum Marks: 100 (Theory: 75 + Practical: 25)

Minor Course

Unit-I Fundamentals of C

The C character set, keywords, identifiers, constants, variables, data types and their size; operators: arithmetic, relational, logical, assignment, increment, decrement, conditional; operator precedence; associativity of operators, solving expressions using operator precedence and associativity; data input and output statements; simple programming examples.

Unit II: Loops and control statements

Syntax and working of if, if-else, and nested if-else statements with examples; syntax and working of while, do-while, and for loops with examples; special statements: switch, goto, break, and continue; programs to find the factorial of a number and to generate Fibonacci series using while and for loops; program to check whether the number is (a) even or odd, (b) prime or not prime; program for leap year and finding of roots of quadratic equation.

Unit III: Pointers, arrays, and strings

Qualifiers, storage classes, pointers: definition, declaration, and their use with example; arrays: definition and initialization of one and two dimensional arrays; programs using one dimensional array: calculation of sum and average of numbers, arrange numbers in ascending and descending orders, and find the maximum and minimum of numbers; programs using two dimensional array: addition, subtraction, & multiplication of two matrices, and transpose of a matrix; string handling functions: strlen(), strcpy(), strcat(), strcmp().

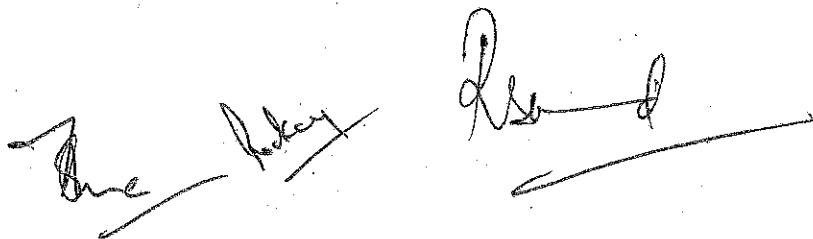
Unit IV: Functions, structures, and unions

Function: definition, declaration, calling; passing arguments to function (call by value and call by reference); recursion; passing array to function; passing string to function; scope, visibility and life time of variables; structures: definition, declaration, accessing and initialization of variables; unions: definition, declaration, and accessing of variables.

Reference Books:

- Y. Kanitkar, **Let us C**, BPB Publications.
- Schaum Series, **Programming in C**.
- E. Balaguruswamy, **Programming in C**, TMH.

Note:- Practical component (1-credit): Students are required to perform any **Five** practicals based on theory component.



Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in May 2026, 2027, and 2028 as per NEP-2020

Scheme of Evaluation

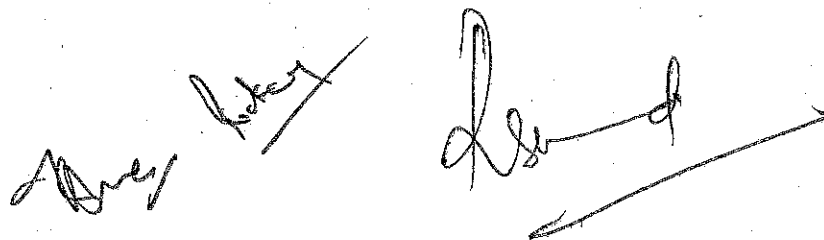
Evaluation of Theory component:

Mid Semester Examination (Theory: 15 marks from 50% syllabus) will be conducted by the Course Coordinator and result will be displayed on notice board at least one week before the commencement of End Semester Examination. The theory question paper (15 marks of 1.5 hour duration) will consist of two sections. Section-A (05 marks) will consist of 05 objective type questions and all questions are compulsory. Section-B will have four questions, two from each of the two units covered under 50% criterion. The students will have to attempt any two questions, selecting one from each unit.

End Semester Examination [Theory: 60 marks (03 hours) from 100% syllabus] will be conducted by the University of Jammu. The question paper will consist of two sections. Section-A will consist of four short answer type questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 marks. Section B shall consist of eight long answer type questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 marks.

Evaluation of Practical component:

Practical component shall be evaluated for 25 marks during the semester by the course coordinator internally. 10 marks shall be reserved day to day assessment and 15 marks shall be reserved for performance during the internal practical examination of 02 hours duration and viva-voce.



Syllabi and Courses of studies in the subject of Electronics for Four Year Under Graduate Programme (FYUGP) under CBCS for the examinations to be held in May 2026, 2027, and 2028 as per NEP-2020

University of Jammu
Syllabi of Electronics at FYUGP under CBCS as per NEP-2020
Semester – VIII
(Examination to be held in May 2026, 2027, 2028)

Skill Enhancement Course

Course Code: USEELP808

Course Title: Research Project/Dissertation

Credits: 12 (Dissertation=08, Viva/presentation=04)

Maximum Marks: 300 (Dissertation=200, Viva/presentation =100)

Research Project/Dissertation is a course involving application of knowledge in solving/analyzing/exploring real life situation/difficult problems/data analysis etc. The students pursuing Four Year Under Graduate Programme (Honours with Research) shall be required to undertake a Research Project/Dissertation of 12 credits (300 marks) in 8th semester on topics that fall in the domain of Electronics under the supervision of a faculty member from the college. This course shall comprise of Dissertation of 08 credits (200 marks) and Viva/presentation of 04 credits (100 marks).

At the end of the 8th semester, the students shall be required to submit the project report for evaluation. The Research Project/Dissertation shall be evaluated by the external experts from University/College nominated by the Principal. During evaluation/examination, the students shall demonstrate and present their work in the form of power point presentation followed by viva-voce examination. The research outcomes of the project work may be published in peer-reviewed journals or may be presented in conferences/seminars or may be patented.

