



UNIVERSITY OF JAMMU

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

Academic Section

Email: academicsectionju14@gmail.com

NOTIFICATION (23/April/Adp./23)

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 IIIrd and IVth** 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-III	December 2023, 2024 and 2025
	Semester-IV	May 2024, 2025 and 2026

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

Sd/-

DEAN ACADEMIC AFFAIRS

No. F. Acd/II/23/1234-1254

Dated: 03/5/23

Copy for information and necessary action to:

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

Sumtasham
Deputy Registrar (Academic) 2/5/23

SS
01/05/23

QAR
28/4

M
1/28/04/23

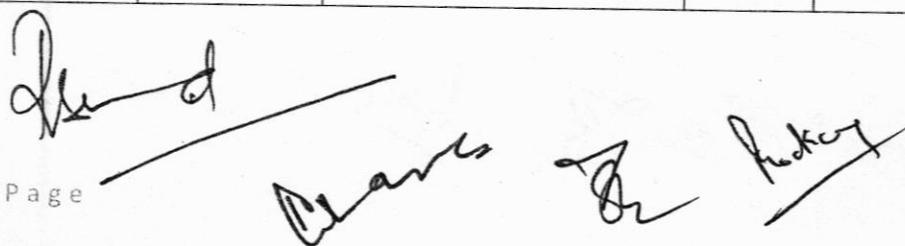
Syllabi and courses of studies in the subject of Electronics under CBCS at UG level for the examinations to be held in the years – 2023, 2024, and 2025.

University of Jammu
Syllabi of Electronics at FYUP under CBCS as per NEP-2020
Semester – III

Four Credits Courses									
S. No.	Course Type	Course No.	Course Title	Credits	Marks				Total Marks
					Theory		Practical/Tutorial		
1	Major	UMJELT301	Network analysis and synthesis	4 (3Th+1P)	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
2	Major	UMJELT302	Signals and transforms	4 (3Th+1P)	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
3	Minor	UMIELT303	Two-port networks	4 (3Th+1P)	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100

Three Credits Courses							
S. No.	Course Type	Course No.	Course Title	Credits	Marks		Total Marks
					Theory		
1	Multidisciplinary	UMDELT304	Basics of network analysis	3	Mid Sem: 15 marks	End Exam: 60 marks	75

Two Credits Courses							
SNo	Course Type	Course No.	Course Title	Credits	Marks		Total Marks
					Theory		
1	Skill Enhancement	USEELT305	Basic electronic circuits design	2	Mid semester: 10 marks	End Exam: 40 marks	50



Syllabi and courses of studies in the subject of Electronics under CBCS at UG level for the examinations to be held in the years – 2023, 2024, and 2025.

University of Jammu
Syllabi of Electronics at FYUP under CBCS as per NEP-2020
Semester – III
(Examination to be held December 2023, 2024, 2025)

Course Code: UMJELT301
Credits: 4

Major Course-I
Course Title: Network analysis and synthesis
Total no. of Lectures: Theory: 45 hours
Practical: 30 hours

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

Duration of Mid Sem Exam [Theory: 15 (1 hours) + Lab: 10 (daily assessment)]

End Sem Exam [Theory: 60 (3 hours) + Lab: 15 (2 hours)]

Theory (3-credits)

Unit I: Analysis of simple circuits

Voltage and current sources; ideal and practical voltage and current sources; transformation of voltage to current and current to voltage sources; star and delta connections; transformation of star to delta and delta to star connections; branch, loop, mesh, and node; mesh analysis; node analysis;

Unit II Network theorems

Thevenin's theorem; Norton's theorem; Superposition theorem; Maximum power transfer theorem; Millman's theorem; Reciprocity theorem; Compensation theorem.

Unit III: A.C. circuit analysis

Series resonance: Determination of resonant frequency and bandwidth, relation between bandwidth and quality factor, impedance variation, reactance variation, phase angle; Parallel resonance: Determination of resonant frequency and bandwidth, relation between bandwidth and quality factor, reactance curves; Determination of resonant frequency for tank circuit.

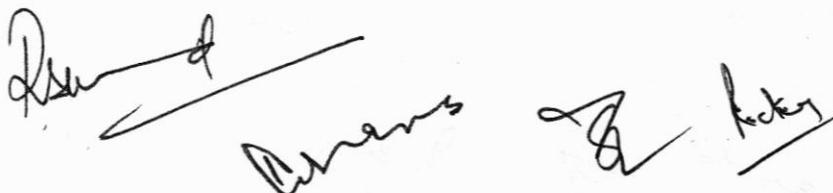
Unit IV: Two-port networks

Introduction of two-port network; two-port network parameters: open circuit impedance, short circuit admittance, transmission, inverse transmission, hybrid, and inverse hybrid; Inter-relationship between two-port network parameters: open circuit impedance and short circuit admittance parameters, transmission and inverse transmission parameters, hybrid and inverse hybrid parameters; determination of characteristic impedance of T and π networks.

Reference Books:

- Sudhakar and Shyam Mohan, **Network and Circuits: Analysis Synthesis**, Tata McGraw- Hill, NewDelhi
- M.E. VanValkenburg, **Network Analysis**, Prentice-Hall of India, NewDelhi
- Schaum's outline series, **Electric Circuits**, Tata McGraw Hill, NewDelhi
- T.F. Bogart Jr. **Electric Circuits**, Tata McGraw-Hill, NewDelhi

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

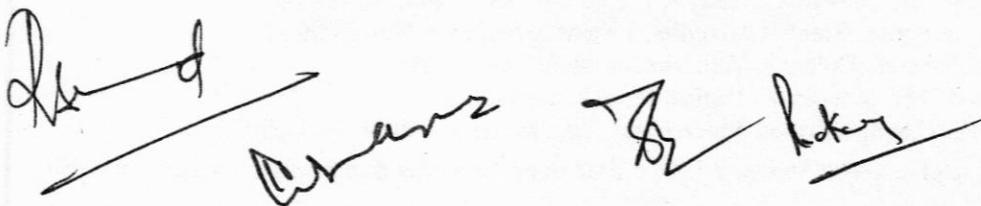


Syllabi and courses of studies in the subject of Electronics under CBCS at UG level for the examinations to be held in the years – 2023, 2024, and 2025.

Note for the examiner:

Mid Semester Examination (Theory: 15 marks, Lab: 10, 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 (01 hours)] will consist of two sections. Section-A (05 marks) will consist of 05 objective type questions and will be 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 at least one from each unit. The 10 marks for the Lab will be based on the continuous assessment.

End Semester Examination [Theory: 60 marks (03 hours), Lab: 15 (02 hours), from 100% syllabus] will be conducted by the Controller of Examinations. The question paper will consist of two sections. Section-A will consist Four short answer 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 eight long answer 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. The 15 marks for the lab will be based on the experiment conducted and the viva-voce examination.

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Syllabi and courses of studies in the subject of Electronics under CBCS at UG level for the examinations to be held in the years – 2023, 2024, and 2025.

University of Jammu
Syllabi of Electronics at FYUP under CBCS as per NEP-2020
Semester – III
(Examination to be held December 2023, 2024, 2025)

Course Code: UMJELT302
Credits: 4

Major Course-II
Course Title: Signals and transforms
Total no. of Lectures: Theory: 45 hours
Practical: 30 hours

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

Duration of Mid Sem Exam [Theory: 15 (1 hours) + Lab: 10 (daily assessment)]

End Sem Exam [Theory: 60 (3 hours) + Lab: 15 (2 hours)]

Theory (3-credits)

Unit-I Signals and their classifications

Continuous time and discrete time signals, deterministic and non-deterministic signals, even and odd signals, periodic and aperiodic signals, energy and power signals, real and imaginary signals; Definition and graphical representation of unit step, unit ramp, unit parabolic, real time and complex exponential, & sinusoidal continuous time and discrete time signals;

Unit II: Laplace transforms

Definition of Laplace transform and inverse Laplace transform; linearity and superposition properties of Laplace transform; Laplace transform calculation of unit impulse, unit step, unit ramp, unit parabolic, exponential, sine, and cosine functions; Laplace transform of differentiation and integration of time domain function; solution of series RL, RC, RLC circuits using Laplace transform;

Unit III: Fourier transforms

Definition of Fourier transform and inverse Fourier transform; Fourier transform calculation of unit impulse, unit step, exponential, sine, and cosine functions; properties of Fourier Transforms: linearity, scaling, symmetry, convolution, time shifting, frequency shifting, time differentiation, frequency differentiation, time integration, frequency integration, modulation, duality; statement and proof Parseval's theorem;

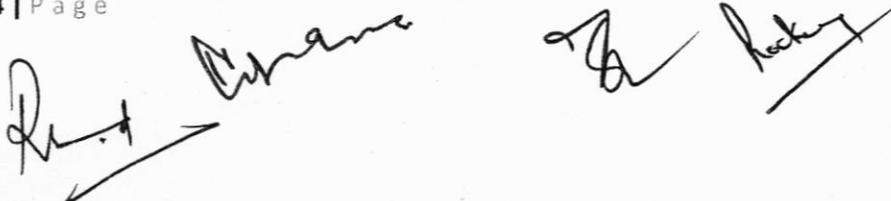
Unit IV: Z-transforms

Definition of Z-transform and inverse Z-transform; Z-transform calculation of unit impulse, unit step, unit ramp, exponential, sine, and cosine functions; properties of Z-transform: linearity, scaling, symmetry, convolution, time shifting, frequency shifting, time differentiation, frequency differentiation, time integration, frequency integration, modulation; Parseval's theorem;

Reference Books:

- Dwight F. Mix, **Fourier, Laplace, and z Transforms: Unique Insight into Continuous-Time and Discrete-Time Transforms. Their Definition and Applications**
- Sudhakar and Shyam Mohan, **Network and Circuits: Analysis Synthesis**, Tata McGraw- Hill, NewDelhi
- M.E.VanValkenburg, **Network Analysis**, Prentice-Hall of India, NewDelhi
- Schaum's outline series, **Electric Circuits**, Tata McGraw Hill, NewDelhi
- T.F. Bogart Jr. **Electric Circuits**, Tata McGraw-Hill, NewDelhi
- J.G Proakis, and D.G. Manolakis, **Digital Signal Processing**
- Millman and Halkias, **Integrated Electronics**, Tata McGraw-Hill, New Delhi

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

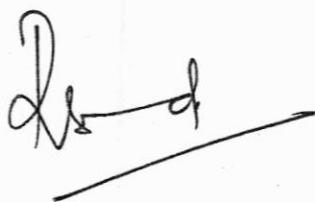


Syllabi and courses of studies in the subject of Electronics under CBCS at UG level for the examinations to be held in the years – 2023, 2024, and 2025.

Note for the examiner:

Mid Semester Examination (Theory: 15 marks, Lab: 10, 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 (01 hours)] will consist of two sections. Section-A (05 marks) will consist of 05 objective type questions and will be 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 at least one from each unit. The 10 marks for the Lab will be based on the continuous assessment.

End Semester Examination [Theory: 60 marks (03 hours), Lab: 15 (02 hours), from 100% syllabus] will be conducted by the Controller of Examinations. The question paper will consist of two sections. Section-A will consist Four short answer 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 eight long answer 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. The 15 marks for the lab will be based on the experiment conducted and the viva-voce examination.



Syllabi and courses of studies in the subject of Electronics under CBCS at UG level for the examinations to be held in the years – 2023, 2024, and 2025.

University of Jammu
Syllabi of Electronics at FYUP under CBCS as per NEP-2020
Semester – III
(Examination to be held December 2023, 2024, 2025)

Course Code: UMIELT303
Credits: 4

Course Title: Two-port networks
Total no. of Lectures: Theory: 45 hours
Practical: 30 hours

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

Duration of Mid Sem Exam [Theory: 15 (1 hours) + Lab: 10 (daily assessment)]

End Sem Exam [Theory: 60 (3 hours) + Lab: 15 (2 hours)]

Theory (3-credits)

Unit I: Analysis of simple circuits

Voltage and current sources; ideal and practical voltage and current sources; transformation of voltage to current and current to voltage sources; star and delta connections; transformation of star to delta and delta to star connections; branch, loop, mesh, and node; mesh analysis; node analysis;

Unit II Network theorems

Thevenin's theorem; Norton's theorem; Superposition theorem; Maximum power transfer theorem; Millman's theorem; Reciprocity theorem; Compensation theorem.

Unit III: A.C. circuit analysis

Series resonance: Determination of resonant frequency and bandwidth, relation between bandwidth and quality factor, impedance variation, reactance variation, phase angle; parallel resonance: Determination of resonant frequency and bandwidth, relation between bandwidth and quality factor, reactance curves; Determination of resonant frequency for tank circuit.

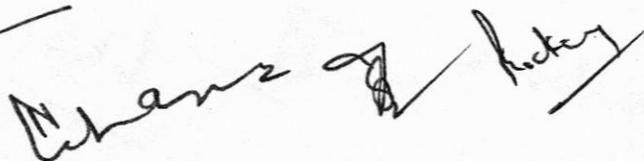
Unit IV: Two-port networks

Introduction of two-port network; two-port network parameters: open circuit impedance, short circuit admittance, transmission, inverse transmission, hybrid, and inverse hybrid; inter-relationship between two-port network parameters: open circuit impedance and short circuit admittance parameters, transmission and inverse transmission parameters, hybrid and inverse hybrid parameters; determination of characteristic impedance of T and π networks.

Reference Books:

- Sudhakar and Shyam Mohan, **Network and Circuits: Analysis Synthesis**, Tata McGraw- Hill, NewDelhi
- M.E.VanValkenburg, **Network Analysis**, Prentice-Hall of India, NewDelhi
- Schaum's outline series, **Electric Circuits**, Tata McGraw Hill, NewDelhi
- T.F. Bogart Jr. **Electric Circuits**, Tata McGraw-Hill, NewDelhi
- Millman and Halkias, **Integrated Electronics**, Tata McGraw-Hill, New Delhi

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



Syllabi and courses of studies in the subject of Electronics under CBCS at UG level for the examinations to be held in the years – 2023, 2024, and 2025.

Note for the examiner:

Mid Semester Examination (Theory: 15 marks, Lab: 10, 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 (01 hours)] will consist of two sections. Section-A (05 marks) will consist of 05 objective type questions and will be 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 at least one from each unit. The 10 marks for the Lab will be based on the continuous assessment.

End Semester Examination [Theory: 60 marks (03 hours), Lab: 15 (02 hours), from 100% syllabus] will be conducted by the Controller of Examinations. The question paper will consist of two sections. Section-A will consist Four short answer 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 Eight long answer 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. The 15 marks for the lab will be based on the experiment conducted and the viva-voce examination.

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Syllabi and courses of studies in the subject of Electronics under CBCS at UG level for the examinations to be held in the years – 2023, 2024, and 2025.

University of Jammu
Syllabi of Electronics at FYUP under CBCS as per NEP-2020
Semester – III
(Examination to be held December 2023, 2024, 2025)

Multidisciplinary Course

Course Code: UMDELT304

Course Title: Basics of network analysis

Credits: 3

Total no. of Lectures: Theory: 45 hours

Duration of Mid Sem Exam (Theory: 15): 1 hours

End Sem Exam (Theory: 60): 3 hours

Unit I: Analysis of simple circuits

Voltage and current sources: ideal and practical, transformation of voltage to current and current to voltage sources; transformation of star to delta and delta to star connections with examples; definition of branch, loop, mesh, and node with examples;

Unit II: Network theorems

Thevenin's theorem; Norton's theorem; Superposition theorem; Maximum power transfer theorem; Millman's theorem; Reciprocity theorem; Compensation theorem.

Unit III: A.C. circuit analysis

Series resonance: Determination of resonant frequency and bandwidth, relation between bandwidth and quality factor, impedance variation, reactance variation, phase angle; Parallel resonance: Determination of resonant frequency and bandwidth, relation between bandwidth and quality factor, reactance curves;

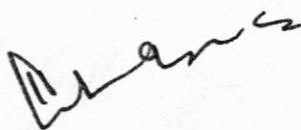
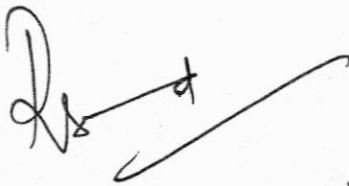
Unit V: Two-port networks

Introduction of two-port network; two-port network parameters: open circuit impedance, short circuit admittance, transmission, inverse transmission, hybrid, and inverse hybrid; Determination of characteristic impedance of T and π networks.

Reference Books:

- Sudhakar and Shyam Mohan, **Network and Circuits: Analysis Synthesis**, Tata McGraw- Hill, NewDelhi
- M.E. VanValkenburg, **Network Analysis**, Prentice-Hall of India, NewDelhi
- Schaum's outline series, **Electric Circuits**, Tata McGraw Hill, NewDelhi
- T.F. Bogart Jr. **Electric Circuits**, Tata McGraw-Hill, NewDelhi

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

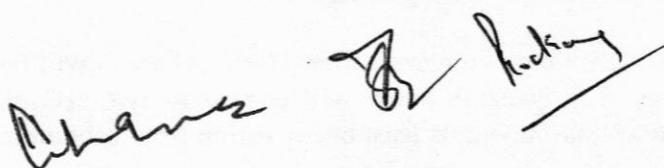
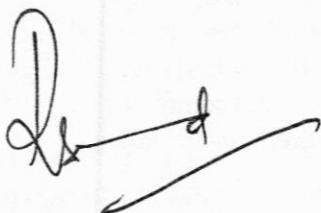


Syllabi and courses of studies in the subject of Electronics under CBCS at UG level for the examinations to be held in the years – 2023, 2024, and 2025.

Note for the examiner:

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 (01 hours)] will consist of two sections. Section-A (05 marks) will consist of 05 objective type questions and will be compulsory. Section-B will have four questions, two from each of the two units covered under 50% criterion and each of 5 marks. The students will have to attempt any two questions, selecting at least one from each unit.

End Semester Examination [Theory: 60 marks (3 hours), from 100% syllabus] will be conducted by the Controller of Examinations. The question paper will consist of two sections. Section-A will consist Four short answer 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 Eight long answer 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.



Syllabi and courses of studies in the subject of Electronics under CBCS at UG level for the examinations to be held in the years – 2023, 2024, and 2025.

University of Jammu
Syllabi of Electronics at FYUP under CBCS as per NEP-2020
Semester – III
(Examination to be held December 2023, 2024, 2025)

Skill Enhancement Course

Course Code: USEELT305

Course Title: Basic electronic circuits design

Credits: 2

Total no. of Lectures: 30 hours

Maximum Marks: 50

Duration of Mid Sem Exam (10 marks): 1 hours

End Sem Exam (40 marks): 2½ hours

Unit I: Analog circuits design

Definition of resistor, capacitor, inductor, rectifier, filter, and regulator; equivalent resistance for series and parallel combination; equivalent capacitance for series and parallel combination; equivalent inductance for series and parallel combination; design of power supply using rectifiers, filters, and regulators; design of series and parallel clipping circuits;

Unit II: Digital circuits design

Definition of LED, PN junction diode, NPN & PNP transistors; binary and decimal number systems; definition and truth table of basic and universal gates; circuit design and working of AND, OR, NOT, NAND, NOR gates using battery, resistors, LEDs, pn junction diodes, and bipolar junction transistors; design of Boolean expression using basic and universal gates;

Unit III: Operational amplifiers and 555 timers

Operational amplifier: circuit symbol and properties; difference between ideal and practical operation amplifier; design of inverting, non-inverting, comparator, adder, subtractor using operational amplifier; design of monostable multivibrator using IC555 timer;

Reference Books:

- V.K. Mehta and Rohit Mehta, **Principles of Electronics**, S. Chand & Company, Ram nagar, New Delhi
- Sudhakar and Shyam Mohan, **Network and Circuits: Analysis Synthesis**, Tata McGraw- Hill, NewDelhi
- R. A. Gayakwad, **Op-Amps and Linear IC's**, Pearson Education.

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

Note for the examiner:

Mid Semester Examination [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 question paper [10 marks (01 hours)] will consist of two sections. Section-A (05 marks) will consist of 05 objective type questions, all compulsory. Section-B (5 marks) will have two questions from the unit covered under 50% criterion. The students will have to attempt any one question.

End Semester Examination (2½ hours, 40 marks, from 100% syllabus) will be conducted by the Controller of Examinations. The question paper will consist of two sections. Section-A will consist four short answer questions having at least one question from each unit. The students are



Syllabi and courses of studies in the subject of Electronics under CBCS at UG level for the examinations to be held in the years – 2023, 2024, and 2025.

required to attempt all questions, each of 2½ marks. Section B shall consist six long answer 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.

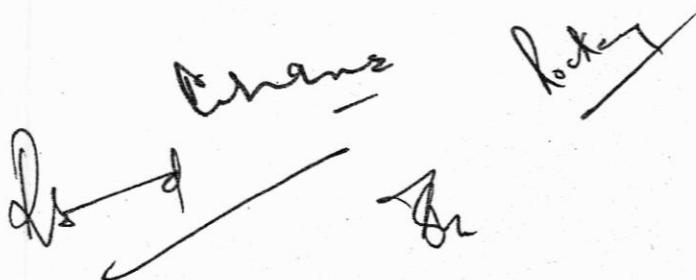
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Syllabi and courses of studies in the subject of Electronics under CBCS at UG level for the examinations to be held in the years – 2024, 2025 and 2026.

University of Jammu
Syllabi of Electronics at FYUP under CBCS as per NEP-2020
Semester – IV

Four Credits Courses									
S. No.	Course Type	Course No.	Course Title	Credits	Marks				Total Marks
					Theory	Practical/Tutorial	Assessment	Exam:	
1	Major	UMJELT401	Advanced semiconductor devices	4 (3Th+1P)	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
2	Major	UMJELT402	Electronic devices and circuits	4 (3Th+1P)	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
3	Major	UMJELT403	Analog communication	4 (3Th+1P)	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
4	Major	UMJELT404	Digital communication	4 (3Th+1P)	Mid Sem: 15 marks	End Exam: 60 marks	Assessment 10 marks	Exam: 15 marks	100
5	Minor	UMIELT405	Basics of electronic communication	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 under CBCS at UG level for the examinations to be held in the years – 2024, 2025 and 2026.

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

Semester – IV

(Examination to be held May 2024, 2025, 2026)

Major Course-I

Course Code: UMJELT401

Course Title: Advanced semiconductor devices

Credits: 4

Total no. of Lectures: Theory: 45 hours

Practical: 30 hours

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

Duration of Mid Sem Exam [Theory: 15 (1 hours) + Lab: 10 (daily assessment)]

End Sem Exam [Theory: 60 (3 hours) + Lab: 15 (2 hours)]

Theory (3-credits)

Unit-I: Special diodes

Light emitting diode (LED): definition, working, characteristics, applications; Photodiode: definition, working, characteristics, applications, Tunnel diode: definition, working, characteristics, applications; Varactor and schottky diodes; Solar cell: definition, working, characteristics;

Unit-II: JFET & MOSFET

Construction, operation, and characteristics of n-channel and p-channel JFET, Shockley equation; JFET parameters and their relationship, biasing of JFET: fixed bias, self bias, and voltage divider bias; small signal model of common source and common drain JFET amplifiers & their analysis; construction, operation, and characteristics of MOSFET (Depletion & enhancement);

Unit-III: UJT, SCR, DIAC, & TRIAC

Construction, working, characteristics, and equivalent circuit of unijunction transistor (UJT); working of UJT as relaxation oscillator; construction, working, characteristics, and equivalent circuit of silicon controlled rectifier (SCR); SCR as a switch and its advantages; working of SCR half-wave rectifier and SCR full-wave rectifier; construction, working, and characteristics of DIAC and TRIAC;

Unit-IV: h-parameter model of BJT and multivibrators

Introduction, hybrid model for common-emitter (CE), common-base (CB), and common-collector (CC) configuration with input impedance, current gain, voltage gain, and output impedance calculation; Miller theorem; multivibrator and their types; working of astable, monostable, and bistable multivibrators using BJT;

Reference Books:

- V.K. Mehta and Rohit Mehta, **Principles of Electronics**, S. Chand & Company, Ram nagar, New Delhi
- Robert Boylestad, **Electronic Devices and Circuit Theory**, Prentice-Hall of India, New Delhi
- David A. Bell, **Electronic Devices and Circuits**, Prentice-Hall of India, New Delhi
- Millman and Halkias, **Integrated Electronics**, Tata McGraw-Hill, New Delhi
- S.M. Sze, **Physics and Technology of Semiconductor Devices**, John-Wiley & Sons
- Sanjay Sharma, **Electronic communication system**, Prentice-Hall of India, New Delhi
- Malvino Leach, **Electronic Devices and Circuit Theory**, Prentice-Hall of India, New Delhi

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



Syllabi and courses of studies in the subject of Electronics under CBCS at UG level for the examinations to be held in the years – 2024, 2025 and 2026.

Note for the examiner:

Mid Semester Examination (Theory: 15 marks, Lab: 10, 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 (01 hours)] will consist of two sections. Section-A (05 marks) will consist of 05 objective type questions and will be 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 at least one from each unit. The 10 marks for the Lab will be based on the continuous assessment.

End Semester Examination [Theory: 60 marks (03 hours), Lab: 15 (02 hours), from 100% syllabus] will be conducted by the Controller of Examinations. The question paper will consist of two sections. Section-A will consist Four short answer 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 eight long answer 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. The 15 marks for the lab will be based on the experiment conducted and the viva-voce examination.

Handwritten signature: R. S. Chandra Reddy

Syllabi and courses of studies in the subject of Electronics under CBCS at UG level for the examinations to be held in the years – 2024, 2025 and 2026.

University of Jammu
Syllabi of Electronics at FYUP under CBCS as per NEP-2020
Semester – IV

(Examination to be held May 2024, 2025, 2026)

Major Course-II

Course Code: UMJELT402
Credits: 4

Course Title: Electronic devices and circuits
Total no. of Lectures: Theory: 45 hours
Practical: 30 hours

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

Duration of Mid Sem Exam [Theory: 15 (1 hours) + Lab: 10 (daily assessment)]

End Sem Exam [Theory: 60 (3 hours) + Lab: 15 (2 hours)]

Theory (3-credits)

Unit-I: Single and multistage amplifiers

Working of single stage BJT amplifier; need for cascading, two stage cascade amplifiers, N-stage cascade amplifiers, gain of multistage amplifiers in decibels; circuit, working, frequency response, advantages, and disadvantages of RC coupled, DC coupled, transformer coupled amplifiers; bandwidth of multistage amplifiers;

Unit-II: Oscillators

Introduction, necessity of oscillator, feedback and its types, Barkhausen criteria, essentials of oscillator, types of oscillators: Tuned collector oscillator, Phase shift oscillator, Wien bridge oscillator, Crystal oscillators, Colpitts Oscillator, Hartley Oscillator, Clapp oscillator:

Unit-III: Power amplifiers

Introduction, need for power amplifier; transistor audio power amplifier; small-signal and large-signal amplifiers; output power of amplifier; difference between voltage and power amplifiers; classification of power amplifiers: class A, B, and C amplifier; expression for collector efficiency and maximum collector efficiency of series-fed class A amplifier; maximum collector efficiency of transformer coupled class A power amplifier; maximum efficiency for class B power amplifier; thermal runaway; heat sink; stages of a practical power amplifier; push-pull amplifier;

Unit-IV: Voltage regulators

Introduction and necessity of voltage regulators, difference between unregulated and regulated power supply, need of regulated power supply; factor affecting unregulated power supply, voltage regulator and its types; zener diode voltage regulator; transistor series voltage regulator; series feedback voltage regulator: circuit details and operation; transistor shunt voltage regulator; shunt feedback voltage regulator: circuit details and operation; IC regulators (78XX, 79XX, LM317, LM337);

Reference Books:

- V.K. Mehta and Rohit Mehta, **Principles of Electronics**, S. Chand & Company, Ram nagar, New Delhi
- Robert Boylestad, **Electronic Devices and Circuit Theory**, Prentice-Hall of India, New Delhi
- David A. Bell, **Electronic Devices and Circuits**, Prentice-Hall of India, New Delhi
- Millman and Halkias, **Integrated Electronics**, Tata McGraw-Hill, New Delhi
- S.M. Sze, **Physics and Technology of Semiconductor Devices**, John-Wiley & Sons
- Sanjay Sharma, **Electronic communication system**, Prentice-Hall of India, New Delhi
- Malvino Leach, **Electronic Devices and Circuit Theory**, Prentice-Hall of India, New Delhi

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

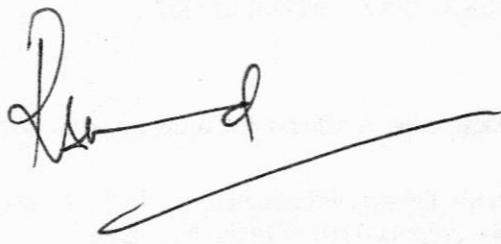
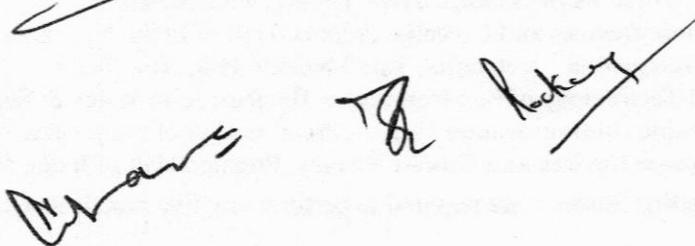


Syllabi and courses of studies in the subject of Electronics under CBCS at UG level for the examinations to be held in the years – 2024, 2025 and 2026.

Note for the examiner:

Mid Semester Examination (Theory: 15 marks, Lab: 10, 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 (01 hours)] will consist of two sections. Section-A (05 marks) will consist of 05 objective type questions and will be 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 at least one from each unit. The 10 marks for the Lab will be based on the continuous assessment.

End Semester Examination [Theory: 60 marks (03 hours), Lab: 15 (02 hours), from 100% syllabus] will be conducted by the Controller of Examinations. The question paper will consist of two sections. Section-A will consist Four short answer 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 eight long answer 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. The 15 marks for the lab will be based on the experiment conducted and the viva-voce examination.

Syllabi and courses of studies in the subject of Electronics under CBCS at UG level for the examinations to be held in the years – 2024, 2025 and 2026.

University of Jammu
Syllabi of Electronics at FYUP under CBCS as per NEP-2020
Semester – IV
(Examination to be held May 2024, 2025, 2026)

Course Code: UMJELT403
Credits: 4

Major Course-III
Course Title: Analog communication
Total no. of Lectures: Theory: 45 hours
Practical: 30 hours

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

Duration of Mid Sem Exam [Theory: 15 (1 hours) + Lab: 10 (daily assessment)]

End Sem Exam [Theory: 60 (3 hours) + Lab: 15 (2 hours)]

Theory (3-credits)

Unit I: Waves and antennas

Frequency spectrum; wave propagation and its types; ground wave or surface wave propagation; sky wave propagation; space wave propagation; troposphere, and ionosphere propagation; extra-terrestrial communication; antennas; radiation fields, polarization, power gain; hertzian dipole; skip distance; grounded and ungrounded antennas.

Unit II: Amplitude modulation

Modulation and its need; amplitude modulation (AM): definition, waveform, modulation index, advantages, and disadvantages; mathematical expression, frequency spectrum, bandwidth, and power calculation of AM wave; generation of AM using FET square law modulator and collector modulator; demodulation; detection of AM waves using envelop detector; single side band and its generation using phase-shift method and third method; balanced modulator;

Unit III: Frequency modulation

Frequency modulation (FM): definition, waveform, modulation index, advantages, and disadvantages; mathematical expression, frequency spectrum, and bandwidth of FM wave; pre-emphasis and de-emphasis; generation of FM using VCO and Armstrong method; detection of FM using simple slope detector, balanced slope detector, Foster-Seely discriminator and ratio detector;

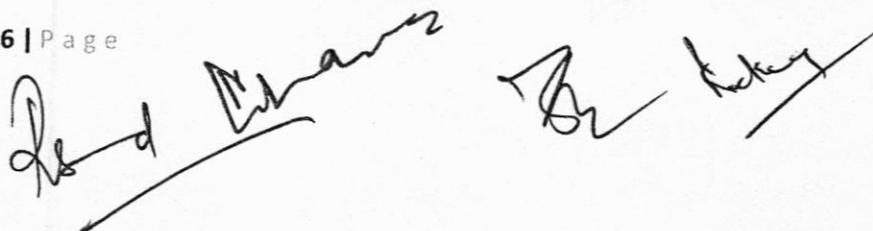
Unit IV: Phase modulation

Phase modulation (PM): definition, waveform, modulation index, advantages, disadvantages, and applications; mathematical expression, frequency spectrum, and bandwidth of PM wave; generation and detection PM signal; comparison between PM and AM; comparison between PM and FM;

Reference Books:

- D. Roddy and J. Coolen, **Electronic Communications**, Pearson Education India.
- **Sanjay Sharma**, **Electronic communication system**
- J.G. Proakis and D.G. Manolakis, **Digital Signal Processing Principles Algorithm & Applications**, Prentice Hall.
- Tomasi, **Advanced Electronics Communication Systems**, 6th Edn., Prentice Hall.
- B.P. Lathi, **Modern Digital and Analog Communication Systems**, Oxford Univ Press.
- G. Kennedy, **Electronic Communication systems**, 3rd Edn., Tata McGraw Hill.
- Frenzel, **Principles of Electronic communication systems** 3rd Edn, McGraw Hill S.
- Haykin, **Communication Systems**, Wiley India
- **Electronic Communication system**, Blake, Cengage.
- Andrea Goldsmith, **Wireless communications**, Cambridge University Press.

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



Syllabi and courses of studies in the subject of Electronics under CBCS at UG level for the examinations to be held in the years – 2024, 2025 and 2026.

Note for the examiner:

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End Semester Examination [Theory: 60 marks (03 hours), Lab: 15 (02 hours), from 100% syllabus] will be conducted by the Controller of Examinations. The question paper will consist of two sections. Section-A will consist Four short answer 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 eight long answer 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. The 15 marks for the lab will be based on the experiment conducted and the viva-voce examination.



Syllabi and courses of studies in the subject of Electronics under CBCS at UG level for the examinations to be held in the years – 2024, 2025 and 2026.

University of Jammu
Syllabi of Electronics at FYUP under CBCS as per NEP-2020
Semester – IV
(Examination to be held May 2024, 2025, 2026)

Course Code: UMJELT404
Credits: 4

Major Course-IV
Course Title: Digital communication
Total no. of Lectures: Theory: 45 hours
Practical: 30 hours

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

Duration of Mid Sem Exam [Theory: 15 (1 hours) + Lab: 10 (daily assessment)]

End Sem Exam [Theory: 60 (3 hours) + Lab: 15 (2 hours)]

Theory (3 credits)

Unit-I: Pulse modulation

Pulse modulation and its types; pulse amplitude modulation (PAM): definition, waveform, generation, detection, advantages, disadvantages, applications; pulse width modulation (PWM): definition, waveform, generation, detection, advantages, disadvantages, applications; pulse position modulation (PPM): definition, waveform, generation, detection, advantages, disadvantages, applications; comparison between PAM, PWM, and PPM;

Unit-II: Digital modulation-I

Digital modulation and its types; need for digital transmission; sampling, quantization, and encoding; statement and proof of sampling theorem; Nyquist criterion; pulse code modulation (PCM): definition, basic principle, generation, detection, advantages, disadvantages, applications; companding; multiplexing: time division, frequency division, and wavelength division;

Unit-III: Digital modulation-II

Digital Carrier Modulation Techniques; Amplitude shift keying (ASK): definition, waveform, generation, detection, advantages, disadvantages, applications; frequency shift keying (FSK): definition, waveform, generation, detection, advantages, disadvantages, applications; phase shift keying (PSK): definition, waveform, generation, detection, advantages, disadvantages, applications; Quadrature phase-shift keying: definition, waveform, generation, detection, advantages, disadvantages, applications;

Unit-IV: Satellite communication

Definition, purpose, types, advantages, disadvantages, and applications of satellite communication; block diagram and parts of satellite communication; need for satellite communication; working of satellite communication; satellite communications in India (satellite name, launch date, application); difference between orbital and escape velocity of satellite; satellite communication services; passive and active satellites; orbit: definition, types, and altitude; eclipse; satellite frequency bands; station keeping and its need;

Reference Books:

- D. Roddy and J. Coolen, **Electronic Communications**, Pearson Education India.
- **Sanjay Sharma**, **Electronic communication system**
- J.G. Proakis and D.G. Manolakis, **Digital Signal Processing Principles Algorithm & Applications**, Prentice Hall.
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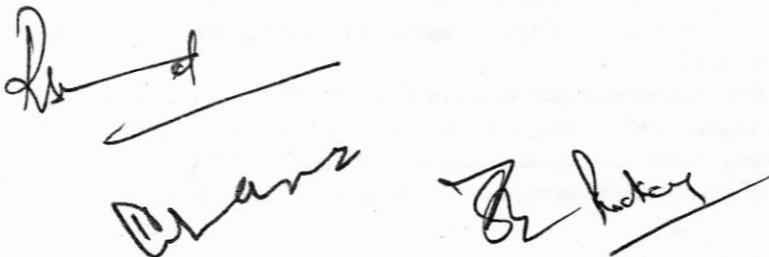
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University of Jammu
Syllabi of Electronics at FYUP under CBCS as per NEP-2020
Semester – IV
(Examination to be held May 2024, 2025, 2026)

Course Code: UMIELT405
Credits: 4

Course Title: Basics of electronic communication
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Practical: 30 hours

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A handwritten signature in black ink, appearing to be 'R. S. D.', with a long horizontal line underneath it.Two handwritten signatures in black ink, one on the left and one on the right, both with horizontal lines underneath them.