UNIVERSITY OF JAMMU

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

Academic Section
Email: academicsectionju14@gmail.com

NOTIFICATION
(23/June/Adp./44)

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 **Physics** 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**
Physics	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/23/4838-4877
Dated: 12-6-2023.

Copy for information and necessary action to:

1. Dean Faculty of Science
2. HOD/Convener, Board of Studies **Physics**
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

Sunita Sharma 12/6/23.
Deputy Registrar (Academic)

12/6/23 12/6 12/6/23

UNIVERSITY OF JAMMU

SYLLABII OF PHYSICS FOR FOUR YEAR UNDERGRADUATE PROGRAMME (FYUGP) UNDER CBCS AS PER NEP-2020 W.E.F.ACADEMIC SESSION 2023

List of Major, Minor, Multi-disciplinary and Skill Enhancement Courses in Physics for 3rd semester and Major, Minor Courses for 4th Semester of FYUGP (Four Year Undergraduate Program) as per NEP-2020

SEMESTER-III

S. No	Course Type	Course No.	Course Title	Credits	Marks				Total Marks
					Theory		Practical / Tutorial		
					Mid Semester	End Semester	Assessment	Exam	
1.	Major	UMJPYT301	Electronics-I	3Th+1P	15	60	10	15	100
2.	Major	UMJPYT302	Heat and Thermodynamics	3Th+1T	15	60	10	15	100
3.	Minor	UMIPYT303	Basic Electronics	3Th+1P	15	60	10	15	100
4.	Multi-disciplinary	UMDPYT304	Fundamentals of Modern Physics	3Th	15	60	------	-------	75
5.	Skill Enhancement	USEPYT305	Photography and video –audiography	2	25	25	-------	-------	50

SEMESTER-IV

S. No	CourseType	Course No.	Course Title	Credits	Marks				Total Marks
					Theory		Practical / Tutorial		
					Mid Semester	End Semester	Assessment	Exam	
1.	Major	UMJPYT401	Electronics-II	3Th+1P	15	60	10	15	100
2.	Major	UMJPYT402	Mathematical Physics-I	3Th+1T	15	60	10	15	100
3.	Major	UMJPYT403	Atomic Physics	3Th+1T	15	60	10	15	100
4.	Major	UMJPYT404	Waves and Optics	3Th+1P	15	60	10	15	100
5.	Minor	UMIPYT405	Optics	3Th+1P	15	60	10	15	100

UNIVERSITY OF JAMMU

SYLLABUS OF PHYSICS FOR 3RD SEMESTER OF FYUGP UNDER CBCS AS PER NEP-2020 FOR THE EXAMINATION TO BE HELD IN DECEMBER 2023, 2024, 2025

B.Sc.- Physics			
Semester:	III	**Type:**	Major
Course Name:	Electronics-I	**Course Code:**	UMJPYT301
Credits:	4	**L T P:**	3-0-1
Contact Hours	45 (Theory) + 30 (Practicals)	**Academic Session**	
Duration of Exam	3 Hours (Theory) 2 ½ Hours (Practicals)		
For Theory : End Semester Exam : 60 Marks Mid Term Exam: 15 Marks		For Practicals : Final Exam : 15 Marks Continuous Assessment: 10 Marks	

Syllabus for Theory (3 Credits)

Note: The Mid Semester Examination shall be conducted after completing 50% of Syllabus.

Course learning outcomes:

After completing this course content, student will be able to understand:

- Basic components and Circuit analysis
- Basics of Semiconductors and semiconductor diode as device and its applications

Unit-I

Basic concepts and components:

Concepts of electrical signal: analog, digital and their graphical and mathematical representation; signal sources: independent sources (voltage and current sources), dependent sources; discrete and integrated circuits, Circuit components: Resistors, Inductors and Capacitors (purpose in the electrical circuit, materials, and equivalent circuit) potentiometers.

Unit-II

Networks and theorems: DC and AC Circuit analysis of RC, RL circuits and RLC series and resonant circuits. (DC Transient analysis: RC Circuit- charging and discharging with initial charge, RL circuit with initial charge, Time constant, DC response of series RLC circuits; AC circuit analysis: LCR circuits- series and parallel resonance, condition of resonance, resonant frequency, bandwidth and Q- factor.)

Circuit Analysis: Superposition, Thevenin's, Norton's Maximum power transfer and Reciprocity theorems, Kirchhoff's Laws (KCL and KVL). Node analysis, Mesh analysis.

UNIVERSITY OF JAMMU

SYLLABUS OF PHYSICS FOR 3RD SEMESTER OF FYUGP UNDER CBCS AS PER NEP-2020 FOR THE EXAMINATION TO BE HELD IN DECEMBER 2023, 2024, 2025

B.Sc.- Physics			
Semester:	III	**Type:**	Major
Course Name:	Electronics-I	**Course Code:**	UMJPYT301
Credits:	4	**L T P:**	3-0-1
Contact Hours	45 (Theory) + 30 (Practicals)	**Academic Session**	
Duration of Exam	3 Hours (Theory) 2 ½ Hours (Practicals)		
For Theory : End Semester Exam : 60 Marks Mid Term Exam: 15 Marks		For Practicals : Final Exam : 15 Marks Continuous Assessment: 10 Marks	

Unit-III

Fundamentals of Semiconductors:

Energy levels of electrons in isolated atom, concept of energy bands in insulators, metals and semiconductors, electrical properties of semiconductors, intrinsic and extrinsic semiconductors, direct and indirect band gap semiconductors, qualitative idea of Fermi level, forbidden energy gap, free electron and holes, Energy band diagram in case of extrinsic semiconductors, mass action law, intrinsic carrier densities, Transport phenomenon in semiconductors, mobility and conductivity. Drift and diffusion currents

Unit-IV

Semiconductor pn-junction:

Junction diode – PN Junction (unbiased and biased). Formation of depletion layer in forward and reverse biased diode, Diode current equation, temperature effect on V-I characteristics of PN Junction. Application of diode as a switch, Rectifier, Types of rectifier and its applications (HWR and FWR). Ripple factor and efficiency of Rectifiers, avalanche and zener breakdown.

Special diodes: Zener diode, V-I characteristics and its application as voltage regulator, construction and working of: LED, LASER diode, Photodiode, Solar cell.

UNIVERSITY OF JAMMU

SYLLABUS OF PHYSICS FOR 3RD SEMESTER OF FYUGP UNDER CBCS AS PER NEP-2020 FOR THE EXAMINATION TO BE HELD IN DECEMBER 2023, 2024, 2025

B.Sc.- Physics			
Semester:	III	**Type:**	Major
Course Name:	Electronics-I	**Course Code:**	UMJPYT301
Credits:	4	**L T P:**	3-0-1
Contact Hours	45 (Theory) + 30 (Practicals)	**Academic Session**	
Duration of Exam	3 Hours (Theory) 2 ½ Hours (Practicals)		
For Theory : End Semester Exam : 60 Marks Mid Term Exam: 15 Marks		For Practicals : Final Exam : 15 Marks Continuous Assessment: 10 Marks	

Note for paper setters for End Semester Examination:

The question paper will be of 60 marks. There shall be 2 sections in the question paper with pattern as follows:

Section A shall comprise of 4 short answer type questions (of 3 marks each) with one question from each unit. The students have to attempt all the questions from Section A.

Section B shall comprise of a total of 8 questions with two questions selected from each unit. Each question shall be of 12 marks. The students have to attempt 4 questions by selecting only one question from each unit.

The numerical problems should not exceed more than 20% of the maximum marks.

Note for paper setters for Mid Semester Examination:

The Mid Semester Examination shall be conducted by the course coordinator after completion of 50% of the syllabus.

The question paper will be of 15 marks. There shall be 2 sections in the question paper with pattern as follows:

Section-A shall comprise of 3 questions (of 4 marks each) and the students are required to attempt any two questions.

Section-B shall comprise of 2 questions (of 7 marks each) and the students are required to attempt any one question.

UNIVERSITY OF JAMMU

SYLLABUS OF PHYSICS FOR 3RD SEMESTER OF FYUGP UNDER CBCS AS PER NEP-2020 FOR THE EXAMINATION TO BE HELD IN DECEMBER 2023, 2024, 2025

B.Sc.- Physics			
Semester:	III	**Type:**	Major
Course Name:	Electronics-I	**Course Code:**	UMJPYT301
Credits:	4	**L T P:**	3-0-1
Contact Hours	45 (Theory) + 30 (Practicals)	**Academic Session**	
Duration of Exam	3 Hours (Theory) 2 ½ Hours (Practicals)		
For Theory : End Semester Exam : 60 Marks Mid Term Exam: 15 Marks		For Practicals : Final Exam : 15 Marks Continuous Assessment: 10 Marks	

Text and Reference Books

1. S.M Sze, Semiconductor devices: Physics and technology, 2nd edition , Wiley India edition (2002)
2. Jasprit Singh, Semiconductor devices: Basic principles, John Wiley and Son (2001)
3. Basic Electronics by Albert Malvino David Bates and A.B Patil
4. S.A Nasar, Electric Circuits , Schaum's outline series Tata MacGraw Hill(2004)
5. S.N Ali, Basic Electronics, 2nd edition
6. B.G. Streetman, S.K. Banerjee, "Solid state Electronic Devices", Pearson Education India, 2015,7th ed.
7. J.D. Ryder, "Electronic Fundamentals and Applications", Prentice-Hall 0f India Pvt. Ltd, 1975, 5th ed.

Syllabus for Practicals(C.No.UMJPYT301)

Note: Perform any 05 of the following experiments as per availability of the apparatus

List of experiments:

1. Study of V-I characteristics of pn junction diode.
2. Study of V-I characteristics of zener diode.
3. Study of Ripple factor of HWR and FWR with and without filters.
4. Study of transistor characteristics in CB configuration.
5. Study of transistor characteristics in CE configuration.
6. Study of zener diode as voltage regulator.
7. Verification of Thevenin's theorem and Maximum Power Transfer Theorem.
8. Verification of superposition theorem.

Pattern of Exam for Practicals: Continuous Assessment: 10marks

Final Examination (To be conducted by the course Coordinator internally) :15marks

UNIVERSITY OF JAMMU

SYLLABUS OF PHYSICS FOR 3RD SEMESTER OF FYUGP UNDER CBCS AS PER NEP-2020 FOR THE EXAMINATION TO BE HELD IN DECEMBER 2023, 2024, 2025

B.Sc.- Physics			
Semester:	III	**Type:**	Major
Course Name:	Heat and Thermodynamics	**Course Code:**	UMJPYT302
Credits:	4	**L T P:**	3-1-0
Contact Hours	45 (Theory) + 15 (Tutorial)	**Academic Session**	
Duration of Exam	3 Hours (Theory) 1 Hour (Tutorials)		
For Theory : End Semester Exam : 60 Marks Mid Term Exam: 15 Marks		For Tutorials : Final Exam : 15 Marks Continuous Assessment: 10 Marks	

Syllabus for Theory (3 Credits)

Note: The Mid Semester Examination Shall be conducted after completing 50% of Syllabus.

Course learning outcomes:

After completing this course content, student will be able to understand:

- Basic concepts of Thermodynamics
- Basic concepts of Entropy
- Basic concepts of Heat Transfer Mechanisms
- Basic concepts of Temperature Scales

Unit-I

Concepts of Thermodynamics : Thermodynamic state of a system and zeroth law of thermodynamics, thermodynamic equilibrium, adiabatic and isothermal changes, work done during isothermal changes, adiabatic relations for perfect gas, work done during adiabatic change, indicator diagram, first law of thermodynamics, reversible and irreversible processes.

Unit-II

Second law of thermodynamics: Kelvin-Planck and Clausius statements and their equivalence, Carnot's theorem, thermodynamic scale of temperature and its identity with gas scale.

Entropy: Additive nature of entropy, Entropy changes in reversible and irreversible processes, Heat death of the universe, Impossibility of attaining absolute zero, Nernst heat theorem and Third law of thermodynamics. Temperature-entropy diagram,

UNIVERSITY OF JAMMU

SYLLABUS OF PHYSICS FOR 3RD SEMESTER OF FYUGP UNDER CBCS AS PER NEP-2020FOR THE EXAMINATION TO BE HELD IN DECEMBER 2023, 2024, 2025

B.Sc.- Physics			
Semester:	III	**Type:**	Major
Course Name:	Heat and Thermodynamics	**Course Code:**	UMJPYT302
Credits:	4	**L T P:**	3-1-0
Contact Hours	45 (Theory) + 15 (Tutorial)	**Academic Session**	
Duration of Exam	3 Hours (Theory) 1 Hour (Tutorials)		
For Theory : End Semester Exam : 60 Marks Mid Term Exam: 15 Marks		For Tutorials : Final Exam : 15 Marks Continuous Assessment: 10 Marks	

Unit-III

Heat Transfer Mechanisms: Heat Engines (Carnot's cycle and Carnot's heat engine and its efficiency, Otto cycle and its efficiency, Diesel cycle and its efficiency), Refrigerators (General principle and coefficient of performance of refrigerator, The Carnot refrigerator, Simple structure of vapour compression refrigerator), Air conditioning: principle and its applications.

Unit-IV

Maxwell's thermodynamic relations: Intensive and extensive parameters, Thermodynamic potentials- Internal energy, Enthalpy, Helmholtz free energy and Gibb's free energy. Maxwell's thermodynamic relations. T-dS equations,Cooling due to Adiabatic Expansion of gas. Clausius-Clapeyron latent heat equations. Joule-Thomson effect and its mathematical treatment. Cooling due to adiabatic demagnetization and production of very low temperature by it.

Note for paper setters for End Semester Examination:

The question paper will be of 60 marks. There shall be 2 sections in the question paper with pattern as follows:

Section A shall comprise of 4 short answer type questions (of 3 marks each) with one question from each unit. The students have to attempt all the questions from Section A.

Section B shall comprise of a total of 8 questions with two questions selected from each unit. Each question shall be of 12 marks. The students have to attempt 4 questions by selecting only one question from each unit.

The numerical problems should not exceed more than 20% of the maximum marks.

UNIVERSITY OF JAMMU

SYLLABUS OF PHYSICS FOR 3RD SEMESTER OF FYUGP UNDER CBCS AS PER NEP-2020FOR THE EXAMINATION TO BE HELD IN DECEMBER 2023, 2024, 2025

B.Sc.- Physics			
Semester:	III	**Type:**	Major
Course Name:	Heat and Thermodynamics	**Course Code:**	UMJPYT302
Credits:	4	**L T P:**	3-1-0
Contact Hours	45 (Theory) + 15 (Tutorial)	**Academic Session**	
Duration of Exam	3 Hours (Theory) 1 Hour (Tutorials)		
For Theory : End Semester Exam : 60 Marks Mid Term Exam: 15 Marks		For Tutorials : Final Exam : 15 Marks Continuous Assessment: 10 Marks	

Note for paper setters for Mid Semester Examination:

The Mid Semester Examination shall be conducted by the course coordinator after completion of 50% of the syllabus.

The question paper will be of 15 marks. There shall be 2 sections in the question paper with pattern as follows:

Section-A shall comprise of 3 questions (of 4 marks each) and the students are required to attempt any two questions.

Section-B shall comprise of 2 questions (of 7 marks each) and the students are required to attempt any one question.

Text and Reference Books

1. A Treatise on Heat, M.N. Saha, and B.N. Srivastava, 1973, Indian Press.
2. Thermodynamics, Enrico Fermi, 1956, Courier Dover Publications.
3. Heat and Thermodynamics, M.W.Zemasky and R. Dittman, 1981, McGraw Hill
4. Theory and experiment on Thermal Physics, P.K.Chakrabarti, New central Book Agency.
5. Thermal Physics, A. Kumar and S.P. Taneja, 2014, R. Chand and Co, New Delhi.
6. Thermal Physics, S. Garg, R. Bansal and C. Ghosh, 1993, Tata McGraw-Hill.

UNIVERSITY OF JAMMU

SYLLABUS OF PHYSICS FOR 3RD SEMESTER OF FYUGP UNDER CBCS AS PER NEP-2020FOR THE EXAMINATION TO BE HELD IN DECEMBER 2023, 2024, 2025

B.Sc.- Physics			
Semester:	III	**Type:**	Major
Course Name:	Heat and Thermodynamics	**Course Code:**	UMJPYT302
Credits:	4	**L T P:**	3-1-0
Contact Hours	45 (Theory) + 15 (Tutorial)	**Academic Session**	
Duration of Exam	3 Hours (Theory) 1 Hour (Tutorials)		
For Theory : End Semester Exam : 60 Marks Mid Term Exam: 15 Marks		For Tutorials : Final Exam : 15 Marks Continuous Assessment: 10 Marks	

Syllabus for Tutorials (C.No.UMJPYT302)

Equation of state: Equations of state, Andrew's experiment, Amagat's experiment, Vander Waal's equation of state, critical constants, reduced equation of state, Joule-Thomson porous plug experiment. Temperature of Inversion, Critical Temperature and Boyle's Temperature

Thermometry: Temperature scales (Centigrade, Fahrenheit and Kelvin scale), principle, construction and working of following thermometers:
Liquid and gas thermometers, Resistive type thermometers, Thermocouple as thermometer, Pyrometers.

Pattern of Exam for Tutorials: ContinuousAssessment:10marks

Final Examination (To be conducted by the course coordinator internally) :15marks

UNIVERSITY OF JAMMU

SYLLABUS OF PHYSICS FOR 3RD SEMESTER OF FYUGP UNDER CBCS AS PER NEP-2020 FOR THE EXAMINATION TO BE HELD IN DECEMBER 2023, 2024, 2025

B.Sc.- Physics			
Semester:	III	**Type:**	Minor
Course Name:	Basic Electronics	**Course Code:**	UMIPYT303
Credits:	4	**L T P:**	3-0-1
Contact Hours	45 (Theory) + 30 (Practicals)	**Academic Session**	
Duration of Exam	3 Hours (Theory) 2 ½ Hours (Practicals)		
For Theory : End Semester Exam : 60 Marks Mid Term Exam: 15 Marks		For Practicals : Final Exam : 15 Marks Continuous Assessment: 10 Marks	

Syllabus for Theory (3 Credits)

Note: The Mid Semester Examination shall be conducted after completing 50% of Syllabus.

Course learning outcomes:

After completing this course content, student will be able to understand:

- Introduction to basic electronic components and circuits.
- Semiconductors and its application

Unit-I

Basic concepts and components: Concepts of electrical signal: analog, digital and their graphical and mathematical representation; signal sources: independent sources (voltage and current sources), dependent sources; discrete and integrated circuits active and passive devices.

Circuit components: Resistors, Inductors and Capacitors (purpose in the electrical circuit, materials, equivalent circuit) , potentiometers.

Unit-II

Networks and theorems: DC and AC Circuit analysis of RC, RL circuits and RLC series and resonant circuits.(DC Transient analysis: RC Circuit- charging and discharging with initial charge, RL circuit with initial charge, Time constant, DC response of series RLC circuits; AC circuit analysis: LCR circuits- series and parallel resonance, condition of resonance, resonant frequency, bandwidth and Q- factor.)

UNIVERSITY OF JAMMU

SYLLABUS OF PHYSICS FOR 3RD SEMESTER OF FYUGP UNDER CBCS AS PER NEP-2020 FOR THE EXAMINATION TO BE HELD IN DECEMBER 2023, 2024, 2025

B.Sc.- Physics			
Semester:	III	**Type:**	Minor
Course Name:	Basic Electronics	**Course Code:**	UMIPYT303
Credits:	4	**L T P:**	3-0-1
Contact Hours	45 (Theory) + 30 (Practicals)	**Academic Session**	
Duration of Exam	3 Hours (Theory) 2 ½ Hours (Practicals)		
For Theory : End Semester Exam : 60 Marks Mid Term Exam: 15 Marks		For Practicals : Final Exam : 15 Marks Continuous Assessment: 10 Marks	

Unit-III

Semiconductor Physics: Fundamentals

Energy levels of electrons in isolated atom, concept of: energy bands in insulators, metals and semiconductors, electrical properties of semiconductors, intrinsic and extrinsic semiconductors, direct and indirect band gap semiconductors, Fermi level, forbidden energy gap, free electron and holes, Energy band diagram in case of extrinsic semiconductors, mass action law, Junction diode – PN Junction (unbiased and biased). Diode current equation, pn junction diode as half wave and full wave rectifier.

Unit-IV

Semiconductor devices

Junction diode – avalanche and Zener breakdown, Zener diode, V-I characteristics and its application as voltage regulator, Special diodes: construction and working of: LED, LASER diode, Photodiode, Solar cell.

Bipolar junction diode: pnp and npn transistor, basic transistor action, transistor amplifier configurations (CB, CE, CC) output characteristics and their comparison, DC load line and Q-point.

UNIVERSITY OF JAMMU

SYLLABUS OF PHYSICS FOR 3RD SEMESTER OF FYUGP UNDER CBCS AS PER NEP-2020 FOR THE EXAMINATION TO BE HELD IN DECEMBER 2023, 2024, 2025

B.Sc.- Physics			
Semester:	III	**Type:**	Minor
Course Name:	Basic Electronics	**Course Code:**	UMIPYT303
Credits:	4	**L T P:**	3-0-1
Contact Hours	45 (Theory) + 30 (Practicals)	**Academic Session**	
Duration of Exam	3 Hours (Theory) 2 ½ Hours (Practicals)		
For Theory : End Semester Exam : 60 Marks Mid Term Exam: 15 Marks		For Practicals : Final Exam : 15 Marks Continuous Assessment: 10 Marks	

Note for paper setters for End Semester Examination:

The question paper will be of 60 marks. There shall be 2 sections in the question paper with pattern as follows:

Section A shall comprise of 4 short answer type questions (of 3 marks each) with one question from each unit. The students have to attempt all the questions from Section A.

Section B shall comprise of a total of 8 questions with two questions selected from each unit. Each question shall be of 12 marks. The students have to attempt 4 questions by selecting only one question from each unit.

The numerical problems should not exceed more than 20% of the maximum marks.

Note for paper setters for Mid Semester Examination:

The Mid Semester Examination shall be conducted by the course coordinator after completion of 50% of the syllabus.

The question paper will be of 15 marks. There shall be 2 sections in the question paper with pattern as follows:

Section-A shall comprise of 3 questions (of 4 marks each) and the students are required to attempt any two questions.

Section-B shall comprise of 2 questions (of 7 marks each) and the students are required to attempt any one question.

UNIVERSITY OF JAMMU

SYLLABUS OF PHYSICS FOR 3RD SEMESTER OF FYUGP UNDER CBCS AS PER NEP-2020 FOR THE EXAMINATION TO BE HELD IN DECEMBER 2023, 2024, 2025

B.Sc.- Physics			
Semester:	III	**Type:**	Minor
Course Name:	Basic Electronics	**Course Code:**	UMIPYT303
Credits:	4	**L T P:**	3-0-1
Contact Hours	45 (Theory) + 30 (Practicals)	**Academic Session**	
Duration of Exam	3 Hours (Theory) 2 ½ Hours (Practicals)		
For Theory : End Semester Exam : 60 Marks Mid Term Exam: 15 Marks		For Practicals : Final Exam : 15 Marks Continuous Assessment: 10 Marks	

Text and Reference Books

1. S.M Sze, Semiconductor devices: Physics and technology, 2nd edition, Wiley India edition (2002).
2. Jasprit Singh, Semiconductor devices: Basic principles, John Wiley and Son (2001).
3. Basic Electronics by Albert Malvino David Bates and A.B Patil.
4. S.A. Nasar, Electric Circuits, Schaum's outline series Tata MacGraw Hill(2004).
5. S.N Ali, Basic Electronics, 2nd edition.
6. B.G. Streetman, S.K. Banerjee, "Solid state Electronic Devices", Pearson Education India, 2015, 7th ed.
7. J.D. Ryder, "Electronic Fundamentals and Applications", Prentice-Hall 0f India Pvt. Ltd, 1975, 5th ed.

Syllabus for Practicals (C.No.UMJPYT301)

Note: Perform any 05 of the following experiments as per availability of the apparatus

List of experiments:

1. Study of V-I characteristics of pn junction diode.
2. Study of V-I characteristics of zener diode.
3. Study of Ripple factor of HWR and FWR with and without filters.
4. Study of transistor characteristics in CB configuration.
5. Study of transistor characteristics in CE configuration.
6. Study of Zener diode as voltage regulator.
7. Verification of Thevenin's theorem and Maximum Power Transfer Theorem.
8. Verification of superposition theorem

UNIVERSITY OF JAMMU

SYLLABUS OF PHYSICS FOR 3RD SEMESTER OF FYUGP UNDER CBCS AS PER NEP-2020 FOR THE EXAMINATION TO BE HELD IN DECEMBER 2023, 2024, 2025

B.Sc.- Physics			
Semester:	III	**Type:**	Minor
Course Name:	Basic Electronics	**Course Code:**	UMIPYT303
Credits:	4	**L T P:**	3-0-1
Contact Hours	45 (Theory) + 30 (Practicals)	**Academic Session**	
Duration of Exam	3 Hours (Theory) 2 ½ Hours (Practicals)		
For Theory : End Semester Exam : 60 Marks Mid Term Exam: 15 Marks		For Practicals : Final Exam : 15 Marks Continuous Assessment: 10 Marks	

Pattern of Exam for Practicals: Continuous Assessment: 10marks

Final Examination (To be conducted by the course coordinator internally) :15marks

Suggested Books

1. B.Sc. Practical Physics by C.L Arora
2. Practical Physics by R.K Shukla
3. B.Sc. Practical Physics by Harnam Singh

UNIVERSITY OF JAMMU

SYLLABUS OF PHYSICS FOR 3RD SEMESTER OF FYUGP UNDER CBCS AS PER NEP-2020 FOR THE EXAMINATION TO BE HELD IN DECEMBER 2023, 2024, 2025

B.Sc.- Physics			
Semester:	III	**Type:**	Multi-disciplinary
Course Name:	Fundamentals of Modern Physics	**Course Code:**	UMDPYT304
Credits:	3	**L T P:**	3-0-0
Contact Hours	45 (Theory)	**Academic Session**	
Duration of Exam	3 Hours		
For Theory : End Semester Exam : 60 Marks; Mid Term Exam: 15 Marks			

Syllabus for Theory (3 Credits)

Note: The Mid Semester Examination shall be conducted after completing 50% of Syllabus.

Course learning outcomes:

After completing this course content, student will be able to understand:

- outline the de-Broglie's theory of matter waves
- distinguish between phase velocity and group velocity in wave motion
- know about the electromagnetic spectrum, its properties and various regions
- wave properties like frequency, energy wavelength and their relationship,
- basic concepts of relativity
- how x-rays are produced and their production
- Cosmic rays and their properties like energy, composition, latitude and altitude effect
- Fundamental concepts of relativity
- Nuclear radiations, their characteristics, fission, fusion and radioactivity

Unit-I

Wave properties and electromagnetic spectrum

Inadequacy of classical Mechanics, Black Body radiations, concept of Planck's hypothesis, Matter waves, the de Broglie wavelength, phase velocity of de Broglie waves, group velocity, Heisenberg uncertainty principle

The electromagnetic spectrum and its classification, characteristics of em radiations, characteristics and applications of various regions of em spectrum

Unit-II

X-rays and Cosmic-rays

Discovery of X-rays, Production and characteristics of X-rays, Bragg's law, X-ray spectra, characteristics of x-ray spectrum, Moseley's law

Origin of cosmic rays, Introduction to primary and secondary cosmic rays, Latitude effect, altitude effect, cosmic ray showers, discovery of positron