Program	BACHELOR OF TECHNOLOGY (B.Tech)	**Semester - 2**
Type of Course	-	
Prerequisite		
Rationale	-	
Effective From A.Y.	2024-25	

Teaching Scheme (Contact Hours)				Examination Scheme				
				Theory Marks		Practical Marks		
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE TH**	**IAT**	**SEE P**	**CCE**	**Total Marks**
2	-	2	3	70	30	30	20	150

***SEE** - Semester End Examination, **IAT** - Internal Assessment Test, **CCE** - Continues & Comprehensive Evaluation*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	Topics	T	W
1	**Crystal Structures** Classification of Solids, Crystalline Solids, Amorphous Solid, Crystal Structure Lattice points, Space lattice, Basis, Bravais lattice, unit cell and lattice parameters, Seven Crystal Systems with 14 Bravais lattices , Atomic Radius, Co-ordination Number and Packing Factor of SC, BCC, FCC, Miller Indices.	6	21
2	**Principles of Quantum Mechanics** Waves and Particles, de Broglie Hypothesis, Matter Waves, Davisson and Germer's Experiment, Heisenberg's Uncertainty Principle, Schrodinger's Time Independent Wave Equation.	7	21
3	**Semiconductor devices fabrication** Semiconductor device fabrication process: Oxidation, Diffusion, Lithography, Thin film deposition technique (e-Beam, PVD), Epitaxy, Examples: P-N junction device fabrication.	5	19
4	**Photonics** Properties of laser, Einstein's theory of matter radiation interaction (Spontaneous and stimulated emission), A & B coefficients, Types of lasers: solid-state laser (Neodymium), gas lasers (CO2), Applications of lasers.	5	19
5	**Quantum Computing** Principles of Quantum Information & Quantum Computing: Introduction to Quantum Computing, Moore's law & its end, Differences between Classical & Quantum computing. Concept of qubit and its properties. Quantum Computing : Application, Advantage and Limitation	6	20
	Total	29	100

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Analyze	Evaluate	Create
Weightage	30	40	30	0	0	0

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes

At the end of this course, students will be able to:	
CO1	Analyze the fundamental principles of crystal structure
CO2	Analyze the fundamental and the essential concepts of quantum mechanics.
CO3	Understanding the concept of Fabrication technique of Semiconductor devices
CO4	Understand the concepts of light interaction with matter and its applications.
CO5	Describe basics of Quantum computing and its Application

CO PO Mapping

CO	CO - 1	CO - 2	CO - 3	CO - 4	CO - 5
PO - 1	1	1	1	1	1
PO - 2	1	1	1	1	1
PO - 3					
PO - 4					
PO - 5	1	1	1	1	1
PO - 6					
PO - 7	1	1	1	1	1
PO - 8					
PO - 9					1
PO - 10					
PO - 11	1	1	1	1	1

List of Practical

1.	**Determine the wavelength of LASER**
2.	**Determine the divergence of LASER**
3.	**Virtual lab for made chip of using semiconductor** https://www.youtube.com/watch?v=Bu52CE55BN0
4.	**Virtual Lab : Lithography**
5.	**Virtual lab : Davisson and Germer's Experiment**
6.	**Virtual lab : Semiconductor Industries – Basic Detail** https://www.youtube.com/watch?v=WKHKy89QaV0
7.	**Virtual tour of quantum computing**
8.	**Developed animation of Amorphous, Polycrystalline and Crystalline structure**