

EBA1107 Quantum Physics**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
EBA1110	1	2	2	0	2	3

COURSE AIM

Provides students to understand the fundamental concepts within quantum mechanics to gain the necessary foundation for studying quantum computation. Topics to be covered include black body radiation and Planck's hypotheses- photo-electric effect. Compton effect- wave properties of particles. A new model: The quantum particle- double slit experiment revisited- uncertainty principle- the wave function and probability- Analysis model: Quantum particle under boundary conditions The Schrodinger equation- Tunneling through a potential energy barrier- Applications of tunneling - Quantum harmonic oscillation- Quantum computing.

COURSE WEEKLY CONTENTS

- 1 Black body radiation and Planck's hypotheses- photo-electric effect
- 2 Compton effect- wave properties of particles
- 3 A new model: The quantum particle- double slit experiment revisited- uncertainty principle
- 4 Quantum mechanics (the wave function and probability)- momentum- kinetic energy
- 5 One dimensional wave functions and expectation values
- 6 Analysis model: Quantum particle under boundary conditions
- 7 Quantum particle
- 8 A particle in a box
- 9 The Schrodinger equation- The particle in a box Revisited.
- 10 A particle in a well of finite height
- 11 Tunneling through a potential energy barrier
- 12 Potential energy
- 13 Applications of tunneling- Resonant tunneling devices- Resonant tunneling transistors.
- 14 Quantum harmonic oscillation- Quantum computing
- 15 Final revision.

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	←		30	MARKS		→	30
8 to 12	←		20	MARKS		→	20
1 to 15	←		10	MARKS		→	10
16 or 17	40	Final					40

REFERENCES

Textbook Serway and Jewett, Physics for Engineers and Scientists, Thomson Brooks/Cole.