



## **M. Tech on “Quantum and solid state devices”**

**Mode: MoE and Self sponsored**

### **Unique features**

- ✓ Special courses which can balance theory and hands on
- ✓ Training for students in all verticals related to Quantum and solid state devices in line with industry
- ✓ Hands-on experimental experience
- ✓ Computation
- ✓ Expert lectures by industry professionals
- ✓ Internships/Projects (2 semester long)

### **Eligibility:**

- Candidates eligible to appear for GATE in PH/CH/EE/ECE/ES/MS
- M.Sc in Physics, astronomy, applied physics, electronics; B.TECH in Engineering Physics, EE, ECE, Engineering Science, Material Science, Chemical Engineering and other relevant area with CGPA  $\geq 6$
- MoE students will be selected based on GATE score and interview.
- Self sponsored candidates will be selected based on interview
- Candidates will be selected as per COAP process

Interested Candidates should fill in the application form at <https://iith.ac.in/mtechadmissions> on or before the deadline



## M. Tech on “Quantum and solid state devices”

### About the department

Department of physics, IIT Hyderabad has total of 28 full time faculty and conducts world class research in the fields of condensed matter experiment, condensed matter theory, Optics, Lasers and spectroscopy, high energy physics, astrophysics and cosmology. Department consists well equipped laboratories to make devices and materials pertinent to spintronics, optoelectronics, semiconducting devices, nanoelectronics. Department also conducts world class research in the area of quantum communication and computing.

### Motivation for M. Tech program

Devices which work based on quantum mechanical principles would be of great interest in future technological devices such as communications, spintronics, optoelectronics, semiconducting devices, nanoelectronics and biosciences. On the other hand, worldwide race to harness the power of quantum correlation is underway to build powerful quantum computers for encrypted communications certified by quantum theory. Undoubtedly there is a huge demand of trained professionals who can develop future quantum devices.

### Objectives of the M. Tech program

- To produce the trained professionals for future quantum & solid state technologies
- To fill the gap between theory and experiment that may cater to state-of-the-art technologies
- To provide hands on experience in terms of experiments and simulations related to quantum and solid state devices



What student will learn?



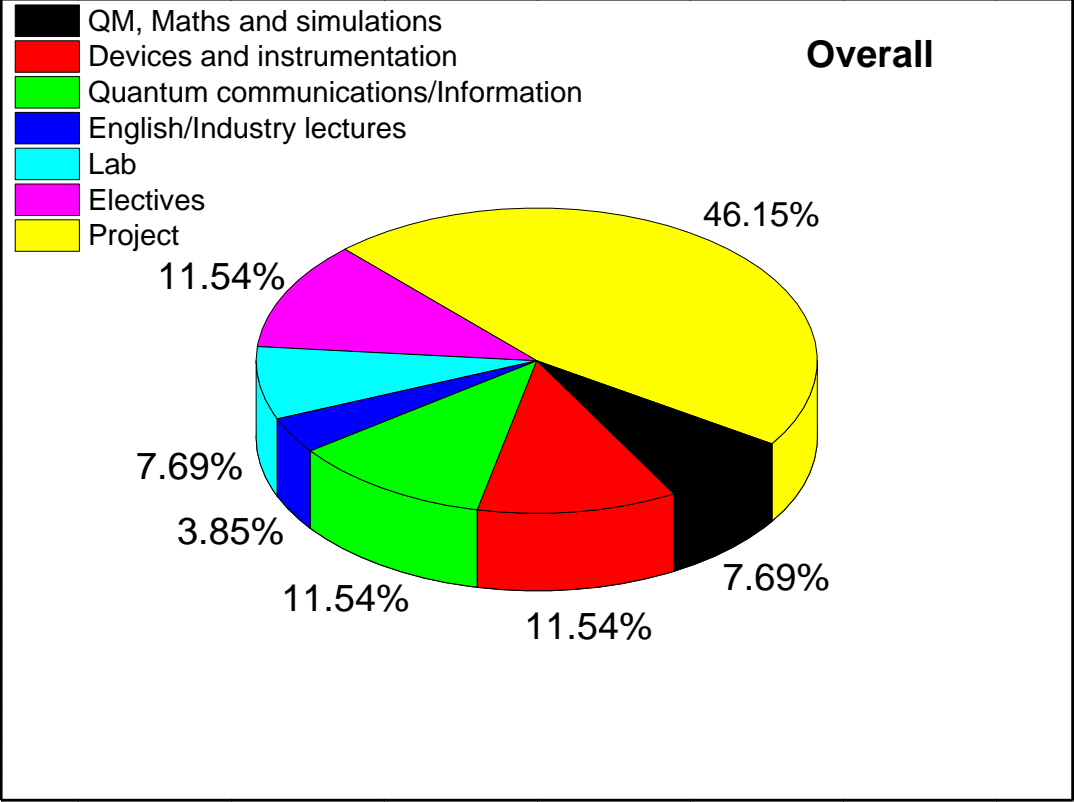
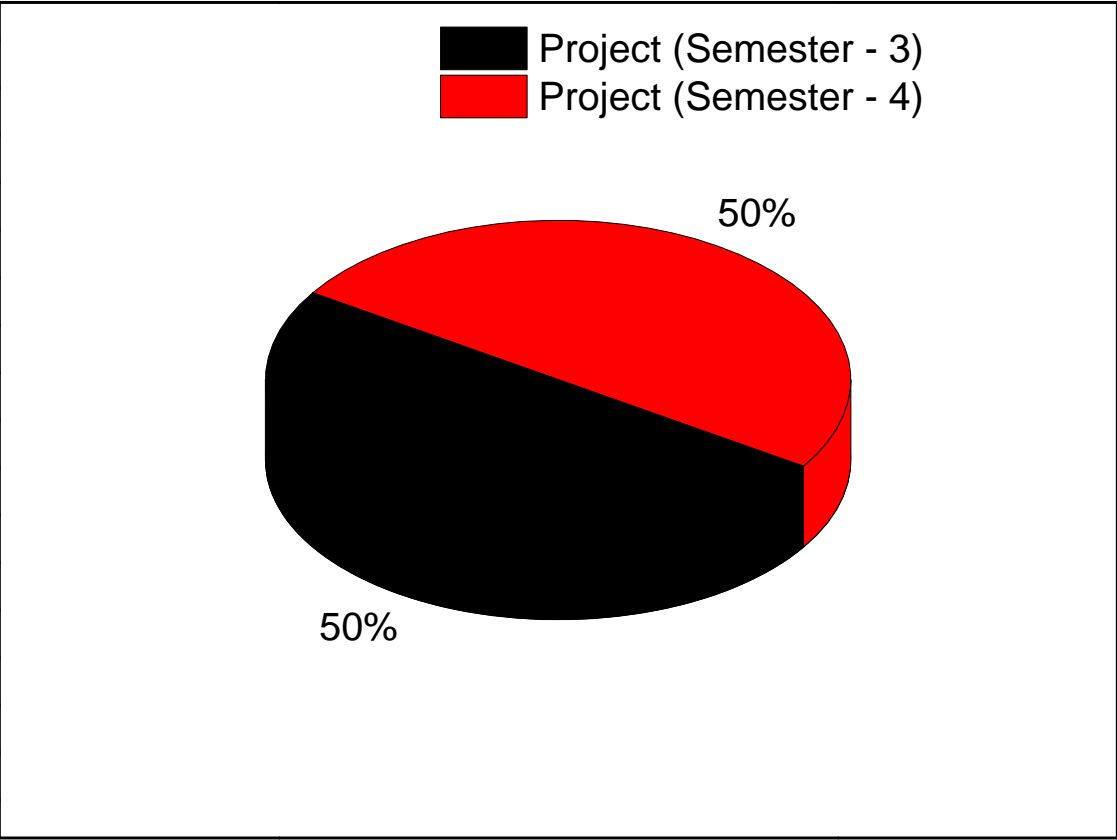
# Courses

Semester - I	No. of Credits
Quantum physics for engineers	2
Mathematical and Computational methods for Quantum devices	2
Electronic Materials and Quantum Devices	2
Quantum optical devices	2
Solid State Devices	2
English communications (LA)	1
Lab - 1	2
<b>Total</b>	<b>13</b>

Semester - II	Credits
Quantum measurement and sensing	2
Introduction to quantum communication and computation	2
Industrial Lectures	1
Electives	8
Laboratory – 2	2
<b>Total</b>	<b>15</b>

Semester - III	Semester - IV
Project - 12 Credits	Project - 12 Credits

# Overall syllabus (Semester I – IV)



## Electives

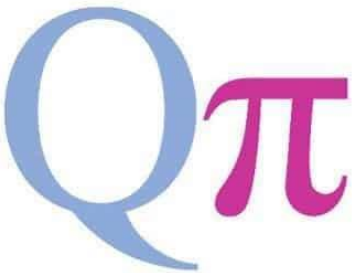
1	Advanced quantum information, communications and Computation
2	Fabrication and characterization of Quantum Devices
3	Spintronics
4	Optoelectronic Devices and applications/ Laser Material Processing
5	Terahertz Devices and Applications
6	Nano photonics
7	Guide Wave Components and Devices
8	ML/Data Science/Statistics
9	Optical Devices for imaging
10	Quantum sensors, and atomic clocks
11	Quantum transport in nanoscale systems and devices
12	Solid state high energy (X-ray and gamma-ray) detectors
14	MEMS and Microsystem Technology
15	Advanced Functional materials
16	Advanced numerical techniques for quantum many body physics
17	Spin logic systems

## Faculty Involved for this program

- Prof. Anjan Giri
- Prof. Prem Pal
- Prof. Narendra Sahu
- Prof. Manish Niranjana
- Prof. Saket Asthana
- Dr. J. Suryanarayana
- Dr. J. Mohanty
- Dr. Vandana Sharma
- Dr. Sai Santosh Raavi
- Dr. Bhuvanesh
- Dr. Alok Pan
- Dr. Shantanu Desai
- Dr. Anupam Gupta
- Dr. Sourav Sandilya
- Dr. Satish
- Dr. Mayukh Pahari
- Dr. Archak
- Dr. Nityanandan



Support from Industries



QUSIDE

