



Indian Institute of Information Technology, Allahabad

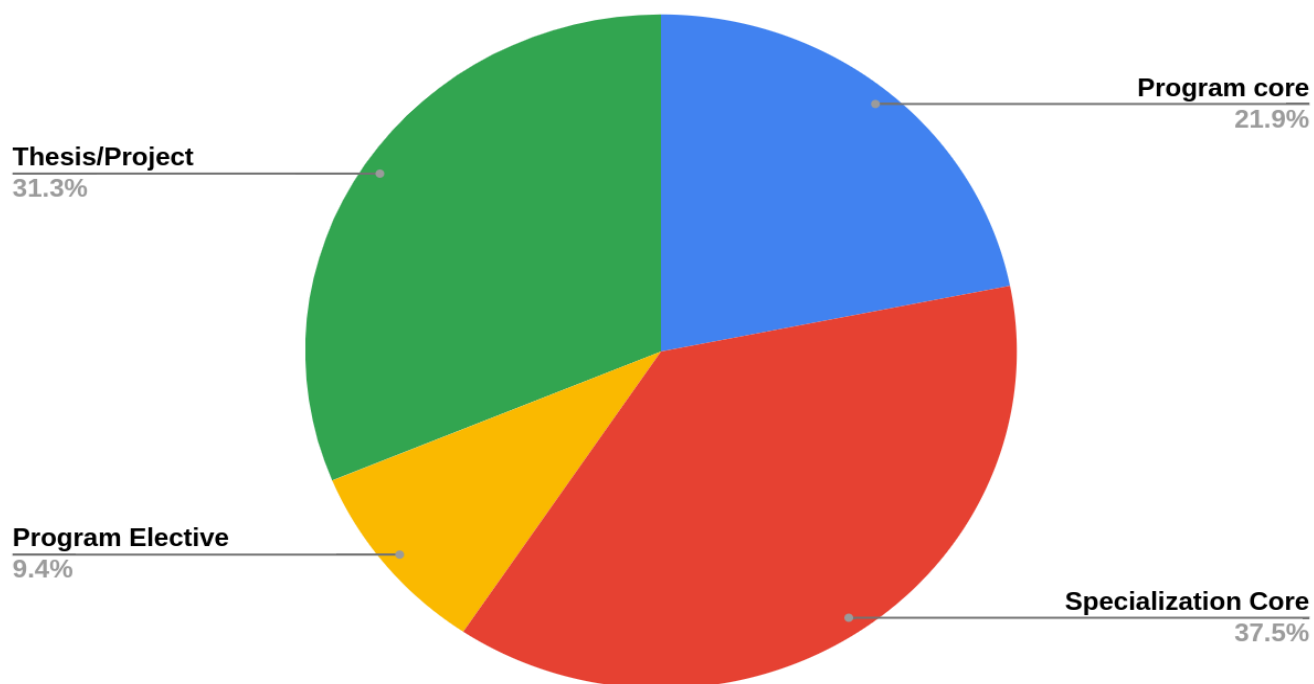
Deoghat, Jhalwa- 211015, Prayagraj, Uttar Pradesh

M. Tech. in Quantum Information & Technologies

M. Tech. in Quantum Information & Technologies

Department of Applied Sciences, IIIT Allahabad

M.Tech in QIT		I	II	III	IV	Total Credits	
	Program core	14	0	0	0	15	23.44%
	Specialization Core	4	16	4	0	21	32.8%
	Program Elective	0	0	6	0	6	9.37%
	Open Elective						
	Value Addition Course/ELC					2	3.1%
	Thesis/Project			6	14	20	31.25%



Course distribution for M. Tech. in Quantum Information & Technology

Table 1: First Semester

Sl. No.	Course Name	Code	Type	Credit	Hours
					L-T-P-S
1.	Mathematical Methods for Quantum Technologies	AS551	PCC	4	3-1-0-0
2.	Quantum Mechanics	AS552	PCC	4	3-1-0-0
3.	Nanoelectronic Devices	AS553	PCC	4	3-0-2-0
4.	Programming for Quantum Technologies	AI554	PCC	3	2-0-2-0
5.	Tools for Research	AS505	ELC	2	2-0-0-0
Total Credit:				17	13-2-4-0
Credit Hours:					21 Hrs./week

Table 2: Second Semester

Sl. No.	Course Name	Code	Type	Credit	Hours
					L-T-P-S
1.	Quantum Computation Essentials	AS556	PCC	4	3-1-0-0
2.	Quantum Information & Communication	AE557	PCC	4	3-1-0-0
3.	Classical & Quantum Machine Learning	IT558	PCC	4	3-0-2-0
4.	Quantum Materials	AS559	PCC	3	2-0-2-0
5.	Quantum Technology Lab	AS560	PCC	2	0-0-4-0
Total Credit:				17	11-2-8-0 21Hrs./week

- *** Hours to be read as Credit hours**

EXIT: After the end of the second Semester, after clearing all the papers, the M. Tech student may be eligible for a PG Diploma in Quantum Information & Technology. However, these students have to secure an **additional 4**

credits from the summer semester to be awarded a PG diploma, which is mandatory. For regular M. Tech students, there is no need for the summer semester.

Table 3: Exit Option- Summer Semester (for awarding PG-Diploma)

Sl. No.	Course Name	Code	Type	Credit	Hours
					L-T-P-S
1.	Summer Project	AS610	ELC	2	0-0-4-0
2.	Quantum Error Correcting Codes	AE670	PCCA	2	2-0-0-0
Total Credit:				4	2-0-4-0 6 Hrs./week

Table 4: Third Semester

Sl. No.	Course Name	Code	Type	Credit	Hours
					L-T-P-S
1.	Quantum Cryptography	IT691	PCC	4	3-1-0-0
2.	Program Elective I		PEC	3	3-0-0-0
3.	Program Elective II		PEC	3	3-0-0-0
4.	Dissertation	AS652	ELC	6	0-0-12-0
Total Credit:				16	9-1-12-0 22 hrs/per week

Table 5: Fourth Semester

Sl. No.	Course Name	Code	Type	Credit	Hours
					L-T-P-S
1.	Thesis	AS605	ELC	14	0-0-28-0
Total Credit:				14	28 Hrs./week

Table 6: Electives basket- I
Quantum Information & Computing

Sl. No.	Course Name	Code	Type	Credit	Hours
					L-T-P-S
1.	Quantum Algorithms in the NISQ era	AI653	PEC	3	3-0-0-0
2.	Quantum-safe Cryptography	IT692	PEC	3	3-0-0-0
3.	Advanced Quantum Information Theory	AS654	PEC	3	3-0-0-0
4.	Quantum Error Correcting Codes	EC691	PEC	3	3-0-0-0
5.	Advanced Quantum Computation	IT693	PEC	3	3-0-0-0
6.	Quantum Computing in Biology	AS655	PEC	3	3-0-0-0
7.	Materials Informatics	AS666	PEC	3	3-0-0-0

Table 7: Electives basket- II
Quantum Science & Technologies

Sl. No.	Course Name	Code	Type	Credit	Hours
					L-T-P-S
1.	Quantum Thermodynamics	AS656	PEC	3	3-0-0-0
2.	Quantum Optics	AS657	PEC	3	2-1-0-0
3.	Quantum Measurement and Sensing	AS658	PEC	3	3-0-0-0
4.	Photonics	AS659	PEC	3	2-0-2-0
5.	Spintronics	AS660	PEC	3	2-0-2-0
6.	Open Quantum Systems	AS661	PEC	3	3-0-0-0
7.	Quantum Many Body Physics	AS662	PEC	3	3-0-0-0
8.	Condensed Matter Physics	AE663	PEC	3	3-0-0-0
9.	Semiconductor Technology and Devices	EC664	PEC	3	2-0-2-0
10.	Black Holes and Quantum Information	AS665	PEC	3	3-0-0-0

More electives may be offered from time to time as approved by the competent authority. Students can also register to courses at NPTEL or SWAYAM portal subject to approval of the competent authority.