



<https://physics.iitd.ac.in/>

Welcome

Department of Physics

ABOUT US

2025 batch
M Tech Programme
in

Solid State and Quantum Materials
(PHM)

Orientation Session
(21 July 2025)

Programme Coordinator:
Prof. Rajendra S. Dhaka,
email ID: rsdhaka@physics.iitd.ac.in

Outline

- About the focus of MTech (SSQM) Programme
- Programme Structure
- Courses in the Current Semester
- Your Teachers for Current Semester
- Teaching, Evaluations & Grading
- Future Scope & Placement
- Cocurricular Activities at IIT Campus



About M Tech (SSQM) Programme

- **No of students: 10-30 typical (Vacancy : 40)**
- **Commenced in 1964**
- *Focus on Physics of Semiconductor device Physics & Semiconductor Devices & Technology, Quantum Materials/Technology*
- **Basics of Material science** – Electronic, Structural, Thermal & Optical properties
- **Energy Materials & Devices** - Solar Cells, Thermoelectric Coolers/Power Generators/battery research
- **Thin Film & Vacuum Technology** – Central to all Electronic Devices
- **Nano Technology** - Science & Applications
- **Spintronics** - Magnetism, Data Storage, New Device Functionalities
- **Materials Characterization** - Analytical Techniques to understand the Matter

Programme Structure

1. Name of the Programme and Code	Master of Technology in Solid State and Quantum Materials (code: PHM)	
Degree (UG/PG)	PG	
Minimum Duration of the Programme (Specify for FT and PT, if applicable)	FT: 4 semesters PT: 6 semesters	
Maximum Duration of the Programme (Specify for FT and PT, if applicable)	FT: 6 semesters PT: 10 semesters	
Minimum Credit Requirements for the Degree		61

Course Structure – Semester wise (PHM)

Sem.	Courses (Number, Abbreviated title, L-T-P, credits)							Lecture course	Contact h/week				Credits
									L	T	P	Total	
I	PYL7001 (3-0-0) 3	PYL7002 (3-0-0) 3	PYL7003 (3-0-0) 3	PYP7001 (0-0-6) 3	PE-1 (3-0-0) 3		Teaching / Research Practicum (0-0-8)	4	12	0	6	18	15
winter	Cornerstone Project, PYCxxx , (0-0-4) 2								0	0	4	4	2
II	PYL7004 (3-0-0) 3	PYL70xx (3-0-0) 3	PYP7002 (0-0-6) 3	PE-2 (3-0-0) 3	OE-1 (3-0-0) 3	PYCxxx (0-0-2) 1	Teaching / Research Practicum (0-0-8)	4	12	0	8	20	16
Summer	Summer training (ST), PYTxxx, (0-0-6) 3								0	0	6	6	3
III	OE-2 (3-0-0) 3		PYD8001 Major Project Part-I (0-0-18) 9		VEVxxx PESR (0-0-2) 1		Teaching / Research Practicum (0-0-8)	1	3	0	20	23	13
IV	PYD8002 Major Project Part-II (0-0-24) 12						Teaching / Research Practicum (0-0-8)		0	0	24	24	12

Essential for Assistantship: 75 % Attendance & SGPA of ≥ 7.0 (6.75 for SC/ST/PH) Total: 95 61

Programme credit structure

	22
10. Number of Programme Core Credits	(15 lecture credits + 6 lab credits + 1 for professional ethics course)
11. Number of Programme Elective Credits	6 (6 lecture credits)
12. Number of Open Credits	6 (6 lecture credits)
13. Number of Project Core Credits	27 (9 credits for Major Project - 1 + 12 credits for Major Project - 2 + 3 credits for cornerstone project + 3 credits for summer/mini project)

Programme: Learning outcomes

PLO1. Explain fundamental physical and technical basis of Solid-State Materials including energy materials, thin films and semiconductor device technology, nanostructures, etc.

PLO2. Develop hands-on knowledge by conducting various experiments in advanced laboratory and in winter/summer training as teamwork as well as handle instruments independently like vacuum and cryogenics as well as advanced characterization tools.

PLO3. Describe the basics of quantum materials including heterostructures, Spintronics, Topology, Superconductivity, etc.

PLO4. Analyse results, simulate outcomes, implement protocols to perform high-end experiments, and present them as reports/publications and oral presentations.

PLO5. Outline new advanced scientific experiments in emerging areas of electronic and Quantum Materials and their use in practical applications.

PLO6. Demonstrate team as well as independent researcher's capabilities as the institute as well as industry level.

Programme: All courses

Program Core:

1. PYL7001 Physical Foundations of Materials Science (3-0-0) 3
2. PYL7002 Physics of Semiconductor Devices (3-0-0) 3
3. PYL7003 Electronic Properties of Materials (3-0-0) 3
4. PYL7004 Science and Technology of Thin Films (3-0-0) 3
5. PYL70xx Introduction to Quantum Materials (3-0-0) 3
6. PYP7001 Electronic Materials Laboratory-I (0-0-6) 3
7. PYP7002 Quantum Materials Laboratory-II (0-0-6) 3
8. PYD8001 Major Project Part-I (0-0-18) 9
9. PYD8002 Major Project Part-II (0-0-24) 12

Programme: All courses

Program Electives:

1. PYL7107 Characterization Techniques for Materials (3-0-0) 3
2. PYL7123 Vacuum Science and Cryogenics (3-0-0) 3
3. PYL7124 Advances in Spintronics (3-0-0) 3
4. PYL7125 Surface Physics and Analysis (3-0-0) 3
5. PYL7126 Semiconductor Devices Technology (3-0-0) 3
6. PYL7127 Energy Materials and Devices (3-0-0) 3
7. PYL7128 Quantum Hetrostructures (2-0-0) 2
8. PYL7129 Nanoprobe Techniques (1-0-0) 1
9. PYL7150 Topology in Condensed Matter Physics (3-0-0) 3
10. PYV7159 Selected Topics in Solid State Materials (1-0-0) 1
11. PYL7105 Nanostructured Materials (3-0-0) 3
12. PYL7139 Computational Techniques for Solid State Materials (3-0-0) 3
13. PYL71xx. Applied Superconductivity (3-0-0) 3

Your Courses in 1st Semester (2025-26): commencement of classes (PG and PhD): 24 July

S. No.	Course Title	Core/ Elective	Course Code	Str (L-T-P)	Faculty	Slot	Day/Time
1	Physical Foundations of Materials Science	Core	PYL7001	3-0-0	RAJENDRA SINGH	D	TWF 09:00-10:00
2	Physics of Semiconductor Devices	Core	PYL7002	3-0-0	PRANABA KISHOR MUDULI	K	W12:00-13:00, TF 17:00-18:00
3	Electronic Properties of Materials	Core	PYL7003	3-0-0	SASWATA BHATTACHARYA	J	MTF 12:00-13:00
4	Characterization Techniques for Materials	Elective	PYL7107	3-0-0	SANTANU GHOSH	H	MW 11:00-12:00 Th 12:00-13:00
5	Vacuum Science and Cryogenics	Elective	PYL7123	3-0-0	SUJEET CHAUDHARY	A [#]	MTh 08:00-09:30
6	Surface Physics And Analysis	Elective	PYL7125	3-0-0	MARSHAL	C	TWF 08:00-09:00
7	Solid State Materials Laboratory I	Core	PYP7001	0-0-6	KAUSTUV MANNA	-	-

<https://physics.iitd.ac.in/>



Two lectures (each of 80 minutes) per week

E-Academic Portal

<https://eacademics.iitd.ac.in/sportal/login>

Researchn, Seminar etc.)

Web Links

- Academics Sys. New ERP (Students)
- Academic System
- Alumni Registration
- Course/Seminar Registration
- CEP Project Proposal
- e-Publishing of Tenders
- eoffice (for Old Daks only)
- Estate Complaint System
- Moodle System
- New e-Dak System
- Online Book Recommendation System
- Projects: Ideate-seek-collaborate
- Smart Notice Board
- Suggestion Box System
- Time-Table
- Works & Estate

SLA's

- Infrastructure SLA
- SLA for Networking Services
- SLA for Telephone Services
- SLA for Software

Faculty/Staff Specific

- Academics Sys. New ERP (Faculty)
- Brief CV for Faculty
- Faculty Information System
- ERP (Online Leave Mgmt. System/Guest House/HRMS/Investment Declaration for IT)
- IRD Online System (IRIS)
- Staff Information System
- Hall Booking System
- Class Room Booking

Important Information:

This Portal is only accessible from IITD Intranet. Students can create their own VPN keys from the below URL

[CLICK HERE TO CREATE YOUR VPN KEYS](#)

Please refer to CSC Website on how to configure VPN.

Important Emails:

UG Section - arugs@iitd.ac.in

PG Section - drpgsr@iitd.ac.in

Technical Queries related to sportal - eacadhelp@iitd.ac.in

Please contact UG/PG Section for any General Request related issues.

IF YOUR PORTAL IS REDIRECTING BACK TO THE LOGIN PAGE. PLEASE CHECK WITH ACADEMIC SECTION FOR ANY UNPAID DUES.

Close

IMAGINATION
LEARNING SYSTEMS

E-Academic Portal

9-page document FYI

<https://eacademics.iitd.ac.in/sportal/login>

<https://owncloud.iitd.ac.in/nextcloud/index.php/s/T4ej4Daz9KnFgSZ>

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Welcome to



Student Portal, IIT Delhi

Having issues? Feel free to contact at:

- ✉ sysadm@cc.iitd.ac.in (For Login Related issues)
- ✉ eacadhelp@iitd.ac.in (For Technical issues-Other than Login)
- ✉ arugs@iitd.ac.in (For other UG related issues)
- ✉ drpgsr@iitd.ac.in (For other PG related issues)

⚠ Note: Do not copy all issues to all

For Brief Instruction on Registration/Add-Drop Process/Audit-Withdrawal [Click here](#)

CLICK HERE TO LOGIN

IMAGINATION
LEARNING SYSTEMS



Time Table

Indian Institute of Technology Delhi



TIME TABLE ▾

ROOM BOOKING

ETSC SLA

CONTACT

Semester Schedule

Academic Year	Semester	Title	Updated on
2025-26	Semester I	First-year UG Semester Schedule for Sem. I, 2025-2026	18-07-2025
2025-26	Semester I	Semester schedule for Sem. I , 2025-2026	18-07-2025

Semester 1, 2025-2026

Teaching Activities					
S. No.	Event	From Date	Day	To Date	Day
1	Orientation and registration of new PG students	19/07/2025	Saturday	20/07/2025	Sunday
2	New UG students to report	21/07/2025	Monday	21/07/2025	Monday
3	Validation of Registration for continuing students	21/07/2025	Monday	21/07/2025	Monday
4	Welcome and orientation of new UG students	22/07/2025	Tuesday	22/07/2025	Tuesday
5	Registration of new UG students	21/07/2025	Monday	22/07/2025	Tuesday
6	Academic workshops for new UG students	23/07/2025	Wednesday	23/07/2025	Wednesday
7	Commencement of classes	24/07/2025	Thursday	24/07/2025	Thursday
8	Last date for submission of updates to E/I/X grades for sem-2 2024-2025	26/07/2025	Saturday	26/07/2025	Saturday
9	OCS internship weekend	09/08/2025	Saturday	10/08/2025	Sunday
10	Last date for course drop	07/08/2025	Thursday	07/08/2025	Thursday
11	Last date for Late Registration	07/08/2025	Thursday	07/08/2025	Thursday
12	Last day for adding courses in lieu of dropped courses	11/08/2025	Monday	11/08/2025	Monday
13	Finalization of roll lists	11/08/2025	Monday	11/08/2025	Monday
14	Last date for filling of mid-term course evaluation online	11/09/2025	Thursday	11/09/2025	Thurs
15	Mid-semester Examinations	12/09/2025	Friday	17/09/2025	Wednesday

Teaching, Evaluation & Grading

❑ Teaching tools

- teaching tools *Moodle* (<https://moodle.iitd.ac.in/login/index.php>)

(*Note*: Access to above and also to several other web-resources e.g., **library**, etc., will be via **INTRANET**. To have remote access to **INTRANET** (<https://internal.iitd.ernet.in>), you need to setup **VPN** (**V**irtual **P**rivate **N**etwork) in your laptop. For setting up and installations of VPN; visit **CSC website** for details of installation (<http://www.cc.iitd.ernet.in/CSC>)

❑ **Evaluation** – Two main Exams **MID-TERM** and **MAJOR (80%)**
(Other components: assignments, presentations, quizzes, etc.) **20%**

❑ **Grading** – **Valid pass grades** (A, A-, B, B-, C, C- & D; need to secure >30% marks)
If earned marks are less than 20-25%, **Fail-grade** (F) is awarded;
For 25%-29% marks, **E-grade** is awarded (**ReMajor** at the start of next sem)

<https://internal.iitd.ac.in>

Screenshot of INTRANET & Moodle

<https://moodle.iitd.ac.in/>

IIT Delhi Moodle for 2025-2026

[Home](#) ► [Log in to the site](#)

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Log in

Username / email

Password

☐ Remember username

Please subtract 25 - 71 =

[Forgotten your username or password?](#)

Cookies must be enabled in your browser ?

Some courses may allow guest access

Is this your first time here?

Moodle is now ready for the semester.

Login using your IIT Delhi Kerberos userid and password.

moodle_2025-26



Rajendra Dhaka

[Dashboard](#)

NAVIGATION

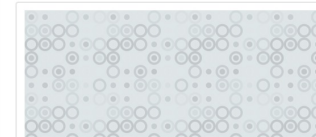
Dashboard

- Site home
- Site pages
- My courses
 - 2001-PYL101TD
 - 2001-PYL101
 - 2002-PYP563
 - 2002-PYP562
 - 2002-PYP561
 - 2002-PYL208
 - 2002-PYL201
 - 2101-PYP562
 - 2101-PYP561
 - 2101-PYL102
 - More...

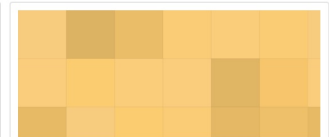
COURSE OVERVIEW

[Timeline](#) [Courses](#)

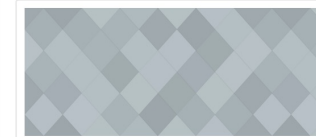
[In progress](#) [Future](#) [Past](#)



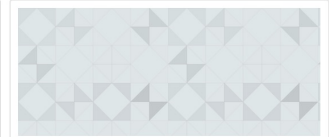
2104-POSHF26 Faculty POSH E-module



2501-PYP563 ADVANCED LABORATORY



2501-PYP561 LABORATORY I



2501-PYD801 MAJOR PROJECT PART-I

DAAD Fellowship

(to perform the thesis project in Germany)

- Awarded to one student from each of the M. Tech. batches of the Department (Total = 3), final selection by DAAD office.
- She/he will be doing M. Tech. Thesis Project in 3rd & 4th Sem in the Institutes/Universities identified under DAAD exchange programme
- The student has to choose a mentor Professor (@ IITD) and host Professor (in Germany) who would agree *a-priori* to supervise the students project in her/his lab there

Future Scope & Placements

❑ Higher studies (PhD)

❑ Academics:

Teaching - Faculty at different Universities/Colleges/Institutes

Research & Development - Scientists at DAE/DRDO/ISRO/CSIR, IUAC, etc.

❑ Industry/Entrepreneurship/Start-up:

○ *Western Digital, Singulus, TSMC, Applied Materials, Intel, Sandisk, Videocon, Samsung, Moser Baer, Global Foundries/Process Industries, etc.*

Student-Teacher Interaction

The Institute encourages students to come in close contact with teacher

STUDENT TEACHER INTERACTION COMMITTEE (STIC)

STIC encourages **healthy and informal interaction of students with their teachers** outside the boundaries of classrooms environment. Teacher can take their students to trip, for **get-together** and can have **informal interaction**. Dinners are organized in the hostel every semester where students can invite their teachers in their hostels. STIC also organizes **dinners exclusively for all freshers** with their teachers who were teaching in 1st semester of academic year and also with their teachers of the department. Departmental professional societies are encouraged **to organize informal activities** in their departments and STIC partially supports monetarily.

CLASS COMMITTEES

In order to bring about greater contact between students and teachers, Class Committees are constituted, comprising of both, students and faculty. **These committees discuss academic matters relating to the course or class concerned.**

PROGRAMME COORDINATORS

The administration of all postgraduate programmes is facilitated by a faculty member designated as the Programme Coordinator. **Programme Coordinator helps students regarding all registration and course related matters.**

Cocurricular Activities at IIT Campus

Board for Recreational and Creative Activities (BRCA)

- ❑ Beat your stress and indulge in various recreational and creative activities
- ❑ BRCA gives a **platform to nurture and showcase one's talent in co-curricular** hobbies

- **Dance Club**
- **Dramatics Club**
- **Debating Club**
- **Literary Club**
- **Hindi Samiti**
- **Quizzing Club**
- **Photography and Films Club**
- **Fine Arts and Crafts Club**
- **Music Club**
- **SPIC MACAY**
- **Wellness Club**

The Showstopper is **Rendezvous**, **IIT's annual cultural fest** which host variety of events -*pronates, choreography, dance, music and competitions on a national level*

Board for Sports Activities (BSA)

Responsible for the **coordination of the various sports activities** in the Institute

- **Cricket field** with 4 turf wickets, 4 flood-lit *cricket practice pitches*
- Flood-lit hockey and *football* grounds
- 3 flood-lit *volleyball* and 2 *Basketball* courts, 8 flood-lit tennis courts
- 2 *Squash* courts, 1 *badminton* hall, 2 *table tennis* halls, 1 *weight-lifting* hall
- Olympic size *swimming pool*
- 2 *multi-gyms*, a *flood-lit stadium* with *400 meters athletics track*
- Flood-lit *jogging track*
- A team of **Sports Officer, Physical training instructors (PTI), part-time coaches and ground staff** helps student

Friendly matches with the local colleges, *inter-hostel events*, the *annual IIT Delhi Inter-Collegiate event* ‘**Sportech**’, the **annual Inter-IIT Sports Meet** and in sporting activities organized by Institutes **outside Delhi**

Also, departmental level fest: various events including sports

Board for Students Publications (BSP)

Electronic and print media body of the college, run entirely by students

- "Inception"
 - "Muse"
 - "Elemental",
 - "Impulse"
 - "Inquirer"
-
- Annual literary festival, "Literati" which is recognized and appreciated as one of the best literary college festivals in North India

Board for Students Welfare (BSW)

Set up with an intention to look after the **Welfare of the Student Community**

- Smooth induction of the **Orientation process**, setting up of various camps such as cycle camp, book camp etc.,
- **Mentorship** of Fresh students, Alumni Mentorship, Academic Mentorship, Language Mentorship, etc
- **Student Counselling Service (SCS)**
- **Student Cooperation Society (SCOOPS)** which runs on a no-profit-no-loss philosophy. its provide students access *to buy good-quality subsidised stationary items, notebooks and related services.*
- **Socio-welfare fest** of IIT Delhi, **Speranza**. Each year Speranza welcomes a huge crowd of students with great enthusiasm (Talk shows, workshops, fun games and competitive events)

Physics Department Welfare committee (AUWC)

Set up with an intention to look after the **Welfare of the Student Community**

Composition of Academic Unit Wellness Committee (AUWC)

S.No.	Position	Members
1	AUWC Chairperson	Prof. R.S. Dhaka
2	One Staff Member (convenor)	Mr. Somvir
3	Head of the Academic Unit	Prof. Sujeet Chaudhary
4	AU Research Committee Chairperson	Prof. R.K. Varshney
5	AU Undergraduate Committee Chairperson	Prof. Sujin Babu
6	One Faculty member corresponding to each academic program	
	B.Tech.	Prof. Pradipta Ghosh
	M.Sc.	Prof. Deepak Kumar
	M.Tech. (AO)	Prof. Sunil Kumar
	M.Tech. (SSM)	Prof. Kaushik Sen
	M.Tech. (JOP)	Prof. Amartya Sengupta
	Ph.D.	Prof. Pintu Das
7	One student member corresponding to each academic program	
	B.Tech.	Ashish Meena (2022PH11879)
	M.Sc.	Ankit Kaushik (2024PHS7134)
	M.Tech. (AO)	Navdeep (2023PHA2043) Kavyasree K (2024PHA242)
	M.Tech. (SSM)	Rakesh Singla (2024PHM2175)
	M.Tech. (JOP)	Animesh Kumar Srivastava (2024JOP20270)
	Ph.D.	Nidhi Mehta (2021PHZ8059)
8	Time-table In-charge of AU	Prof. Abhishek Iyer
9	External Dept. Faculty (e.g. NRCVEE faculty)	Prof. Vamsi Krishna Komarala, DESE
10	One BSW representative (not overlapping with No.7)	Amol Gupta (2023CH10906)

Recent placements and PhD offers



Industrial internship:



Important

- For formalities related to [registration, Form-A, medical booklet, bank account, Institute email IDs, password](#), etc., please contact

Mr. Alan V. Sinate, Deputy Registrar | Ph. 011-2659-1737
(E-mail: drpgsr@admin.iitd.ac.in)

- For [account/fellowship](#) related queries, you may contact:

Mr. Shamim, Joint Registrar (Accounts) | 011-2659-1744
(E-mail: draccounts@admin.iitd.ac.in)

(For fellowship, Mr. HVK Chopra)
E-mail: a25904@admin.iitd.ac.in

Thank you!

&

Stay Happy and Keep Learning!