



Chief Patron

Prof. Laxmidhar Behera
(Director, IIT Mandi)



Chairperson of School

Prof. Suman Kalyan Pal
(SBS, IIT Mandi)

Newsletter Team

Dr. Ajay Soni,
Dr. Bhaskar Mondal
Dr. Muslim Malik
Dr. Prasad Kasturi

SBS Faculty Strength

Regular Faculty: 43
Professor: 5
Associate Professor: 25
Assistant Professor: 13
Ramalingaswami Fellow: 1

Publications : ~ 70

Patents: 4

External Funds : ~ 7.4 Cr

Student Strength

PhD Scholars: 168
M. Tech.: 12
M. Sc.: 238
B. Tech.: 133

SBS Staff

Anoop Kumar
Alka Thakur
Palvi Sharma
Aditi Thakur

Greetings of the New Year 2022, **Chairperson's Message**

We are pleased to bring to the readers the third edition of the SPECTRUM, a biannual newsletter of School of Basic Sciences (SBS), IIT Mandi. With this newsletter, we are disseminating the information relating to the activities of SBS for 2021 and brief details of the academic degree programs associated with SBS, IIT Mandi. I believe that this newsletter brings you the complete profile of the academic and co-curricular activities, achievements and progress made during 2021. In spite of severity of the pandemic situation, where the institute has to shut everything down for few months, we altogether grew and made a remarkable progress in terms of receiving research funds, research publications in highly reputed journals and recognitions at national and international levels. Our students and faculty members invested enormous effort to maintain high quality research. I thank the faculty members and teaching assistants of our school for making the online teaching interesting and keeping the academic activities resumed throughout the year. In the mid of the year 2021, we resumed our teaching and research activities in full swing by adopting a 'new normal', with high spirit. We are regularly organizing the SBS webinars by the eminent speakers across the globe. Our colleagues are also able to provide the right solutions and directions to address the delinquent problems of the pandemic Covid-19. I also welcome the eight new faculty members to our team of basic sciences. As the year 2022 has been marked as the International Year of Basic Sciences, we are committed to achieve new benchmarks in 2022, for sustainable development. At last, I would like to thank all my colleagues, staff and scholars for their tireless efforts which helped school to grow with excellent pace in 2021.

Prof. Suman K Pal

New Joining of Faculty Members



Dr. Nirmalya Kajuri Joined as Assistant Professor (Physics). He is a Ph.D. from Institute of Mathematical Science Chennai. He did post-doc from Indian Association for Cultivation of Science, Jadavpur. His area of specialization is theoretical High Energy Physics and quantum gravity from holography.



Dr. Harsh Soni Joined as Assistant Professor (Physics). Dr. Soni did his Ph.D. from IISc, Bangalore and postdoc from Brown University, USA. He also worked with Sankhyasutra Labs Ltd. His area of specialization is Soft Condensed Matter Physics.



Dr. Arko Roy Joined as Assistant Professor (Physics). Dr. Roy is a Ph.D. from PRL, Ahmedabad. He was a Guest Scientist at the Max Planck Institute for the Physics of Complex Systems in Dresden, Germany and has a post-doc from University of Trento, Italy. His area of specialization is Ultracold quantum gases.



Dr. Saswata Adhikari, Joined as Assistant Professor (Maths). He is a Ph.D. from IIT Madras and Post-Doc from Postdoctoral fellow at NISER Bhubaneswar. His area of specialization is Harmonic Analysis, frame theory on the Heisenberg group and Dunkl operators.



Dr. Moupriya Das, Joined as Assistant Professor (Chemistry). Dr. Das did Ph.D. from IACS, Jadavpur. She has done post-doc from University of Massachusetts Boston, USA, and Max Planck Institute for the Physics of Complex Systems, Dresden, Germany. She worked at NORDITA, Stockholm, Sweden. Her area of specialization is study of fluctuations in important and interesting physical, chemical and biological systems.



Dr. Deepak Prajapati, Joined as Assistant Professor (Maths). He is a Ph.D. from IIT Kanpur. He did post-doc from Indian Statistical Institute, Delhi, His area of Specialization is Reliability and Survival analysis, Bayesian Inference, Statistical Quality Control, Computational Statistics.



Dr. Samir Shukla, Joined as Assistant Professor (Maths). He is a Ph.D. from IIT Kanpur and post-doc from IIT Bombay and IISc Bangalore. He has worked as Visiting Scientist at ISI Bangalore. His area of specialization is Topological Combinatorics and Combinatorial Geometry.



Dr. Sampat Sharma, Joined as Assistant Professor (Maths). He is a Ph.D. from TIFR Mumbai. He did post-doc from IIT Bombay and IISc Bangalore. His area of specialization is Classical K-theory and its application to the theory of projective modules and Euler class groups.

Faculty Recognitions and Awards



Dr. Amit Jaiswal, Associate Professor (BioX) has received Indian National Science Academy (INSA) Medal for Young Scientists 2021. The award is a recognition of promise, creativity and excellence in a young scientist, below 40 years of age, for their independent research work done in India.



Dr. Sarita Azad, Associate Professor (Maths) has been awarded the Teaching Honor Roll Award on Teachers Day, 05.09.2021, by IIT Mandi.



Dr. Ajay Soni, Associate Professor (Physics) has been appointed as an Associate Editor of Journal Materials Lab and elected as the Young Leader Committee Member of Editorial Team, Wiley Journal of Energy and Environmental Materials.

Recently Commenced Projects (~ 740 Lakh INR)

DBT, PI: Dr. Baskar Bakthavachalu, Budget: Rs. 360 lakh, Duration: 5 years
ICMR, PI: Dr. Trayambak Basak, Budget: Rs. 90 Lakh, Duration: 3 years
SERB, PI: Dr. Satyajit Thakor, Co-PI: Dr. Syed Abbas, Budget: Rs. 37,13,677, Duration: 3 years
NBHM, PI: Dr. Muslim Malik, Budget: Rs. 15,15,900, Duration: 3 years
ICMR, PI: Dr. Rajanish Giri, Budget: Rs. 16,30,893, Duration: 3 years
ICMR, PI: Dr. Prosenjit Mondal, Co-PI: Dr. Trayambak Basak, Budget: Rs. 45,19,450, Duration: 3 years
SCL, PI: Prof. Subrata Ghosh, (1) Budget: Rs. 89,09,120, Duration: 3 years; (2) Budget: Rs. 85,93,288, Duration: 3 years

Recent Patents (2 granted and 2 filed)

A method for integrating bioprocessing with pyrolysis for valuable chemicals and carbon from Biomass, Shyam K. Masakapalli, Chandrakant Joshi and Swati Sharma (2021). Patent application no. 202111039582.
"BSA-dye bioconjugate probe as a lysotracker", Farhan Anjum, Chethana Rao, Pushpendra M. Mishra, Aditya Yadav, Chethana Rao, Kush Kaushik, Chayan K. Nandi, (2021). Patent application no. 202111049251.
A Novel EASAI method for preparing nanoparticles of energetic compounds, Raj Kumar, Prem Felix Siril, Pramod Soni (2021). Patent no. 376268 (Granted 01.09.2021)
Highly Sensitive MAPDSM-MAPDST Based Resist Technology for Next Generation Lithography Applications, Subrata Ghosh, Kenneth Gonsalves, Satinder Sharma (2021). Patent no. 383670 (Granted 03.12.2021)

Conferences/Workshops

National Symposium on BioX Advances from Cells to System (BACS-2021), held July 29th to 30th, 2021) Organizers: BioX Faculty members

International conference on Technology Readiness for High Volume Chip Manufacturing (ICTFAB-2021), held November 15th to 16th, 2021) Organizers: Prof Subrata Ghosh, Prof K. Gonsalves and Prof Satinder K Sharma (SCEE)

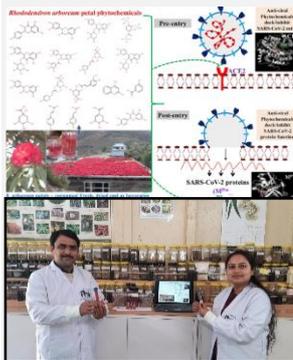
Scholars Achievements and Placements

Dr. Hari Vansh Rai Mittal, PhD Scholar, worked with Dr. Rajendra Ray has joined IIT-Palakkad as an Assistant Professor.
Dr. Sudev Majee, PhD Scholar, working with Dr. Rajendra Ray has joined postdoctoral position at Umea University, Sweden.
Dr. Ashish Kumar, PhD Scholar, working with Dr. Venkata Krishnan, received postdoctoral position at University of Gent, Belgium.
Dr. Abhinav Choubey, PhD Scholar, worked with Dr. Prosenjit Mondal, received postdoctoral position at Baylor College of Medicine, Texas, USA.
Dr. P. Vineeth Daniel, PhD Scholar, worked with Dr. Prosenjit Mondal, received postdoctoral position at Scripps Research Institute, California, USA.
Dr. Niraj Kumar Singh, PhD Scholar under Dr. Ajay Soni, received a postdoctoral position at Linköping University, Sweden.
Dr. Prem Singh, PhD Scholar, working with Dr. Amit Jaiswal, received postdoctoral position at Oregon State University, USA.
Dr. Ankur Sood, PhD Scholar working with Dr. Garima Agrawal, received a postdoctoral position at Yeungnam University, South Korea.
Ms. Kajal Sharma, Ph.D. student with Prof. Prem Felix got IGCS fellowship to visit TU Berlin, Germany for six months.
Ms. Aastha Gupta, PhD Scholar, working with Dr Garima Agrawal, won the best poster award at APA Bioforum International e-Conference 2021.
Mr. Shounak Roy and Mr. Praveen Kumar working with Dr. Amit Jaiswal, bagged the SRISTI GYTI appreciation award 2021.
Mr. Rituporn Gogoi & Ms. Astha Singh, Ph.D. students are visiting, University of Paris-Saclay and CNAM Paris respectively under the Indo-French SPARC Project for six months starting from December, 2021.
Mr. Prajnadipta Panda, PhD Scholar with Dr. Prasad Kasturi, received a DST-INSPIRE Fellowship.
Ms. Divya Rawat, PhD Scholar with Dr. Ajay Soni, won the best poster award at 65th DAE Solid State Symposium held at Bhabha Atomic Research Centre, Mumbai, during 15-19 December 2021.
Ms. Riya Nager, M Tech BioTech working with Dr. Ajay Soni, bagged the SRISTI BIIS-SITARE award 2021.

Scholars **Mr. Kumar Abhinav Mishra, Mr Kewal Singh and Mr Deepu Kumar** received the **Best Teaching Assistant Award** on Teachers Day IIT Mandi, 05.09.2021

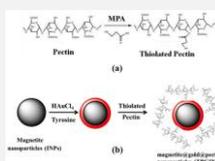
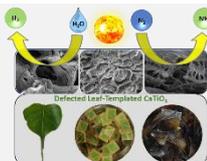
Highlights of the Research and Development Activities

Phytochemical rich Himalayan *Rhododendron arboreum* petals inhibit SARS-CoV-2 infection in vitro



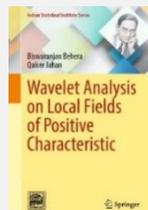
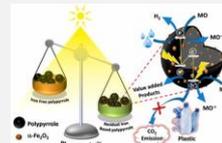
Dr. Shyam Kumar Masakapalli, with their collaborators have studied antiviral properties of locally called "Buransh" flowers. The extracts from the petals were found to be rich in quinic acid and its derivatives which showed stable interactions and binding affinity with SARS-CoV-2 Main protease (MPro; responsible for viral replication) and Human Angiotensin Converting Enzyme-2 (ACE2; mediate viral entry in the host). *J. Biomolecular Structure and Dynamics*, 2021 [DOI: 10.1080/07391102.2021.2021287]

Dr. Venkata Krishnan group unraveled the structural and morphological stability of oxygen vacancy engineered leaf-templated CaTiO₃ towards photocatalytic H₂ evolution and N₂ fixation reactions. *J. Mater. Chem. A* 9, 17006 (2021)



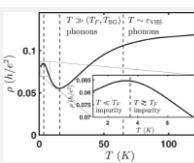
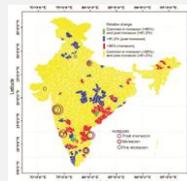
Dr. Garima Agrawal group developed 3 in 1 nanoparticles for combined MRI imaging, radio sensitization, and controlled drug delivery for efficient cancer therapy. *Int. J. Biol. Macromol.* 2021, 189, 443.

Prof Prem Felix group revealed the unexplored effect of residual iron oxide on the photoreforming activities of polypyrrole nanostructures on plastic waste and photocatalytic pollutant degradation. *J Environ Chemical Engg* 2021/10/24



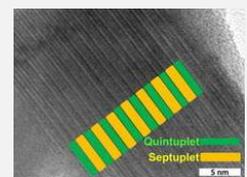
Dr. Qaiser Jahan published a book "Wavelet Analysis on Local Fields of Positive Characteristic" as part of the Indian Statistical Institute Series book series. This book discusses wavelet analysis on local fields of positive characteristic and provides a proof of the existence and uniqueness of Haar measures on locally compact groups. Publisher: Springer, Singapore. <https://doi.org/10.1007/978-981-16-7881-3>

Dr. Sarita Azad group published a work on the spread of pandemics in India and identify states with a high probability of being initial hotspots. For the COVID-19 pandemic, a spatial link has been established between seasons and disease progression. The spatio-temporal trajectory of COVID-19 in India: insight into past. *Current Science* 121 (2021).



Dr. Girish Sharma and his collaborators provide a rigorous theory for carrier transport in twisted bilayer graphene. Understanding superconductivity and the metallic state transport in twisted bilayer graphene will lead to crucial insights into the nature of high-T_c superconductors. *Nature Communications* 12, 5737 (2021).

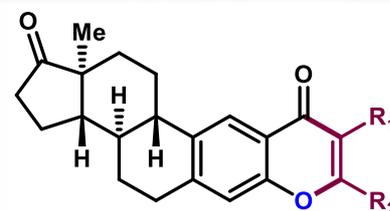
Dr. Ajay Soni group investigated the crystalline anharmonicity and ultra-low thermal conductivity in intrinsic heterostructure Bi₂Te₃-Bi₂GeTe₄ in quantum topological material Bi₄GeTe₇ for possible application as thermoelectric material. *Appl. Phys. Lett.* 119, 223903 (2021).



PG Students Achievements and Placements

Ms. Deepanshi Nara got a PhD position at Yale University, USA.
Ms. Shriya Srivastava got a PhD position at Weizmann Institute of Science.
Ms. Priyanka Jain got PhD position at University of Freiburg, Germany.
Mr. Narender Kumar got a PhD position at the University of Florida, USA.
Mr. Rohit Yadav got PhD position at Johannes Kepler Universität Linz, Austria.
Mr. Karun Gadge got PhD position at Gottingen University, Germany.

Masters of Science (MSc) in Chemistry



About the Program

MSc. in Chemistry is a two-year (4-semester) postgraduate program, which is the first master-level program offered in the School of Basic Sciences (SBS) at IIT Mandi started in August 2014. This program is aimed at providing fundamental knowledge in the broad areas of Chemistry through core courses and at the same time offers knowledge base in the allied areas and beyond through elective courses. The MSc. program is highly research-oriented that enables students to avail a "learn-by-doing" approach through research projects. A total of 14 faculty members from a diverse research background constitute the Program Faculty Group (PFG) for MSc. in Chemical Sciences. The current PFG chair and the MSc. program coordinator is Dr. Bhaskar Mondal.

Program Coordinator's Message



Dr. Bhaskar Mondal
Assistant Professor, SBS

We at the PFG Chemistry are determined to provide state-of-the-art learning and research experience to the young minds in academia. We believe in the "students come first" approach and try our best to nurture their career goals and aspirations. Success of students are our greatest reward. We are proud of the M.Sc. Chemistry program and our aspiration is our strength.

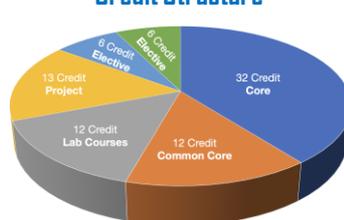
Salient Features, Program Credits, and Eligibility Criteria

The MSc. curriculum has been designed to prepare the students to pursue a research career either in academia or industry. The overall curriculum is divided into common core courses (15%), chemistry core courses (40%), elective courses (discipline and outside discipline, 15%), laboratory courses (15%), and research projects (15%). The total program credit is 81 and a minimum of 80 credits are to be earned for the M.Sc. degree. The current intake strength of M.Sc. Chemistry is 50 through joint admission test for masters (JAM) and the minimum eligibility criteria (MEQ) includes Mathematics as a subject in 10+2 level.

Program Faculty Group (PFG) Members

Prof. Chayan K Nandi
Prof. Pradeep Parameswaran
Prof. Prem Felix Siril
Prof. Subrata Ghosh
Dr. Aditi Halder
Dr. Amit B Pawar
Dr. Aniruddha Chakraborty
Dr. Bhaskar Mondal
Dr. Garima Agrawal
Dr. Moupriya Das
Dr. Venkata Krishnan
Dr. Ajay Soni
Dr. Amit Jaiswal
Dr. Prosenjit Mondal
Dr. Rik Rani Koner

Credit Structure



$$32 (\text{Core}) + 12 (\text{Common Core}) + 12 (\text{Lab}) + 13 (\text{Project}) + 12 (\text{Elective}) = 81$$

Course Details

Core courses include the fundamental courses in Chemistry and common core includes Mathematics for Chemists, Basic Mechanical and Electronics Workshop, Design and Innovation Practicum, and Computational Chemistry. Laboratory courses provide a wide knowledge of analytical techniques and instruments.

Student Spotlight

- Among the MSc. Chemistry students graduated so far, many of the students have qualified various competitive exams (JRF, NET, GATE, JEST, GRE, GMAT, TOEFL etc.) and have been able to get PhD positions in top institution in India and abroad.
- Also, few students avail international scholarships for visit/semester exchange to the foreign universities/labs.
- After MSc., most of the students were selected for higher studies in national and international institutes leading to Ph.D.

<https://www.iitmandi.ac.in/Schools/SBS/program.php>

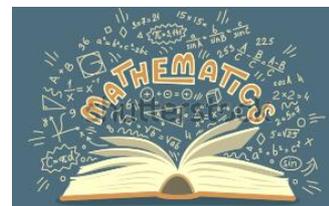
Teaching Labs



Contact: Chairperson, School of Basic Sciences, IIT Mandi, Kamand, H.P. – 175075, India

Phone: 01905-267169 (Chair), 01905-267812 (Office), Web: sbs.iitmandi.ac.in, E-mail: chairsbs@iitmandi.ac.in

Master of Science (MSc) in Applied Mathematics



About the Program

M.Sc. in Applied Mathematics is a two-year (4-semester) postgraduate program, is among the most successful degree program of IIT Mandi. The program, which began in 2016, is now more than five years old, and our graduates have been placed in prestigious institutions all over the world. The course curriculum has been constructed in a unique approach to educate the students to take up a research career either in academia or in industries on completion of the program. The program is designed in such a way that students will have enough choices to learn about the subjects of their interest by enrolling in a variety of elective courses both inside and outside of the discipline. This program features a year-long thesis work. Several faculty members from a diverse research background constitute the Program Faculty Group (PFG) for the MSc. Applied Mathematics. This diversity in PFG gives this program immense strength by inculcating strong collaborative work culture among students.

Program Coordinator's Message



Dr. Muslim Malik, Ph.D.
Associate Professor, SBS

We, the PFG MSc Applied Mathematics, have prepared the program to disseminate strong fundamental technical education. The PFG strive to produce future mathematicians needed for industry or academia with strong core values. This program aims at developing a delicate mathematical taste, nurture mathematical interests, stimulate mathematical science research, and motivate students to work on complex real-world problems. We have been able to attract some of the best talented students, and the PFG is putting sincere efforts for success of each student. We believe these students will be technological innovators and valuable assets in our nation-building effort.

Salient Features, Program Credits, and Eligibility Criteria

The curriculum for M.Sc. in Applied Mathematics program is directed towards the fundamental and practical understanding of core and applied areas of mathematics. In addition, students can also take electives from a variety of disciplines to gain interdisciplinary experience. The thesis project in the program enriches students with the skills required in the current research areas of mathematics and the current job market. A minimum of 80 program credits are required for the MSc. Applied Mathematics degree, among which open electives from outside the discipline of program should be at least of 6 credits. The current intake strength of M.Sc. in Applied Mathematics is 50 through Common Offer Acceptance Portal (COAP) based on IIT JAM (Mathematics) and the minimum eligibility criteria (MEQ) as per our senate.

Program Faculty Group (PFG) Members

Dr. Muslim Malik
Dr. Manoj Thakur
Dr. Nitu Kumari
Dr. Rajendra Kr. Ray
Dr. Syed Abbas
Dr. Samir Shukla
Dr. Deepak Prajapati
Dr. Sampat Kumar Sharma
Dr. Sarita Azad
Dr. Saswata Adhikari
Dr. Qaiser Jahan
Dr. Samar Agnihotri
Dr. Tushar Jain
Dr. Renu M. Rameshan

Course Details

The overall curriculum is divided into Core courses (38 credits), discipline electives (6 credits), open electives from outside the discipline (6 credits), postgraduate thesis project (21 credits), and other elective courses (9 credits). Discipline electives will be provided according to the requirement of the students and the availability of the faculties.

38 (Core courses) + 6 (discipline electives) + 6 (elective from outside the discipline) + 21 (postgraduate thesis project) + 9 (other electives) = 80

Student Spotlight

- Since inception, at least four or five students got placed in Top IT companies every year.
- Among the MSc. Maths students graduated so far, many of the students have qualified various competitive exams (JRF, NET, GATE, etc.) and able to get PhD positions in top institution in India and abroad.
- Also, few students avail international scholarships for visit/semester exchange to the foreign universities/labs.
- After MSc., most of our students were selected for higher studies in national and international institutes leading to Ph.D.



Contact: Chairperson, School of Basic Sciences, IIT Mandi, Kamand, H.P. – 175075, India

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Masters of Science (MSc) in Physics



About the Program

MSc. in Physics program is two-year (4-semester) postgraduate program offered by School of Basic Sciences (SBS) at IIT Mandi, started in Aug 2017, Program is designed for bright and young minds with the interest to pursue higher studies in physics at IIT Mandi. This program is aimed at providing fundamental knowledge in the broad areas of Physics through core courses and at the same time offers knowledge base in the allied areas and beyond through elective courses. A total of 16 faculty members from diverse research expertise constitute the Program Faculty Group (PFG) for the program

Program Coordinator's Message



Dr. Chandra Shekhar Yadav
Associate Professor, SBS

Study of physics gives an opportunity to understand the physical universe and provide answers to everything that we see around us. We are committed to help the student in their journey of understanding the concept of physics with the simple possible approach without diluting the nuances and intricacies of the subject.

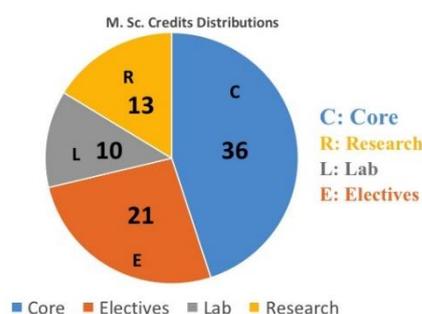
Salient Features, Program Credits, and Eligibility Criteria

The MSc. Physics curriculum is designed to provide students a strong foundation in the subject with the adequate exposure to the contemporary research activities. Candidates are selected through national level Joint Admission test for Masters (JAM) exam conducted by IIT bodies, with the current intake of 40 students per batch. Students are required to successfully complete a minimum of 80 credits for the degree. Unique feature of MSc (Physics) at IIT Mandi is that the students have option to choose any research topic of their interest available at IIT Mandi, besides the available specialization from physics disciplines (Statistical Mechanics, Quantum Optics, Atomic Physics, Condensed Matter Physics, Laser Spectroscopy, Nano Sciences, Astrophysics, and High Energy Particle Physics).

Program Faculty Group (PFG) Members

Dr. Ajay Soni
Dr. Arti Kashyap
Dr. Arko Roy
Dr. Bindu Radhmany
Dr. Chandra Shekhar Yadav
Dr. Girish Sharma,
Dr. Hari Varma
Dr. Harsh Soni
Dr. Nirmalya Kajuri
Dr. Nitu Kumari
Dr. Kaustav Mukherjee
Dr. Pradeep Kumar
Dr. Pradyumna Pathak
Dr. Prasanth Jose
Dr. Samar Agnihotri
Dr. Sudhir Kumar Pandey
Prof. Suman Kalyan Pal

Credit Structure



$$36 \text{ (Core)} + 10 \text{ (Laboratories)} + 13 \text{ (Research Project)} + 21 \text{ (Elective)} = 80$$

Course Details

Course structure is distributed in theory (45%), Research and laboratory practicums (29%) and free elective (26%) courses. The Program is equipped with the four laboratories along with good experimental and theoretical research facilities for the research practicum-based courses.

Student Spotlight

Among the MSc. Physics students graduated so far, many of the students have qualified various competitive exams (JRF, NET, GATE, JEST, GRE, GMAT, TOEFL etc.) and have been able to get PhD positions in top institution in India and abroad.

MSc. Physics students are enthusiastically running 'Physics Club'. They regularly conduct discussion sessions, and various technical and interactive events by inviting the researchers from other institutions.

<https://www.iitmandi.ac.in/Schools/SBS/program.php>

Contact: Chairperson, School of Basic Sciences, IIT Mandi, Kamand, H.P. – 175075, India

Phone: 01905-267169 (Chair), 01905-267812 (Office), Web: sbs.iitmandi.ac.in, E-mail: chairsbs@iitmandi.ac.in

B. Tech M.Tech Integrated Dual Degree in Bioengineering



About the Program

Bioengineering integrates physical, chemical, mathematical, computational, and life sciences with core engineering principles driving the technologies towards advances and applications in health, environment, agriculture, energy etc. thereby improving the quality of life. The discipline of bioengineering has evolved drastically over the past 50 years, seemingly encompassing all fields that include bioelectric phenomena, bioinformatics, biomaterials, biomechanics, bioinstrumentation, biosensors, bio-signal processing, biotechnology, computational biology, medical imaging, etc. The B.Tech. and M.Tech dual degree programme on Bioengineering strives to train the students in the field of physical, chemical, mathematical and biological sciences together with engineering principles for inculcating knowledge enabling them in developing and deploying Bioengineering technologies in various fields. MTech. allows the Bioengineers to specialise in four advanced focused areas: (a) Biomedical Engineering aimed at gaining expertise in the areas of diagnostics, therapeutic and assistive support for healthcare applications, (b) Agricultural Automation Technology aimed at providing automation and assistive support to agricultural practices, (c) Environmental Science and Engineering aimed at training bioengineers to develop environment friendly processing technologies involving bio-organisms, (d) Computational Bioengineering aimed at both developing algorithms and models to understand biological systems and processes.

Program Coordinator's Message



Dr. Shubhajit Roychowdhury
Associate Professor, SCEE

We at the PFG Bioengineering strive to educate the students with state-of-the-art knowledge and hands-on experience in Bioengineering at different levels, from fundamentals through advanced. The curriculum is designed in such a way that research is weaved with academics aiming to deliver the best quality education to the torch bearers of tomorrow. The curriculum is designed to offer enough flexibility to the students to plan their 5 years' academics in their way that gives them best possible opportunities to propel towards their goal.

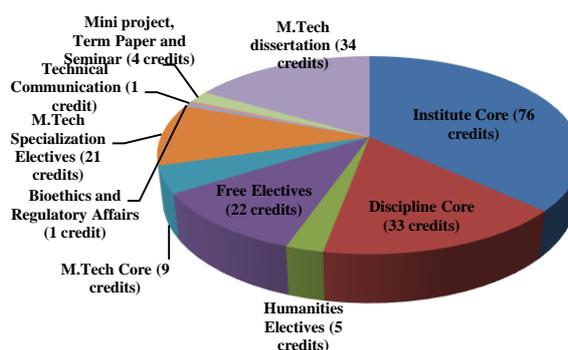
Salient Features, Program Credits, and Eligibility Criteria

The IDD Bioengineering curriculum has been designed to prepare the students to pursue a research career either in academia or industry. The overall curriculum is divided into institute core courses (37%), discipline core courses (16%), M.Tech core courses (4%), M.Tech specialization electives (10%), free electives (11%), humanities electives (2%), bioethics and regulatory affairs (0.5%), technical communication (0.5%), mini project, term paper and seminar (2%) and M.Tech dissertation (17%). The total program credits is 206-208 and a minimum of 206 credits must be earned for the B.Tech M.Tech integrated dual degree. The current intake strength of IDD Bioengineering is 28 through joint entrance examination (JEE) advanced and the minimum eligibility criteria (MEQ) includes 60% marks in Physics, Chemistry and Mathematics in the 10+2 level.

Program Faculty Group (PFG) Members

Dr. Shubhajit Roy Chowdhury
Dr. Amit Jaiswal
Dr. Amit Prasad
Dr. Arnav Bhavsar
Dr. Baskar Bakthavachalu
Dr. Erwin Fuhrer
Dr. Garima Agrawal
Dr. Kasturi Prasad
Dr. Prosenjit Mondal
Dr. Rajanish Giri
Dr. Rajesh Ghosh
Dr. Shyam Kumar Masakapalli
Dr. Srikanth Sugavanam
Dr. Trayambak Basak
Dr. Tulika Prakash Srivastava

Credit Structure



Uniqueness of IDD Programme

The curriculum will impart training to budding students that will cater to the requirements of Bio-based industries. At IIT Mandi, a student needs to complete 160 credits for B.Tech in 4 years and 70 credits for M.Tech in two years. The IDD programme allows the students to go through a rigorous framework of core courses at Bachelors and Masters level and a comprehensive and detailed project and dissertation work which allows a student to graduate in 5 years with a B.Tech-M.Tech integrated dual degree earning 206 credits.

M.Tech. Specializations

- Biomedical Engineering
- Agro-Technology
- Environmental Science and Engineering
- Computational Bioengineering

In a case a student remain across specializations, he/she will be awarded M.Tech. in Bioengineering without any specialization.

<https://www.iitmandi.ac.in/Schools/SBS/program.php>

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Masters of Technology (MTech) in Biotechnology



About the Program

MTech. in Biotechnology is a two-year (4-semester) postgraduate program, is among the most successful degree programs of IIT Mandi. The program commenced on 2016 and is now more than five-year-old and our alumni are placed in reputed institutes across the globe. The course curriculum of this program is designed in a unique way that trains the students to become leaders in industry or academia. The program makes all students well versed with various aspects of modern biology including cell biology, system biology, immunology, neurobiology, nanotechnology, proteomics and other allied fields. This program features a year-long thesis work. Several faculty members from a diverse research background constitute the Program Faculty Group (PFG) for MTech Biotechnology. This diversity in PFG gives this program immense strength by inculcating strong collaborative work culture among students.

Program Coordinator's Message



Amit Prasad, Ph.D.
Associate Professor, SBS

We, the PFG MTech Biotechnology, have created a robust course to disseminate strong fundamental based technical education. The PFG strive to produce future biotechnologists needed in industry or academia with strong core values. We have been able to attract some of the best talented students, and the PFG is putting sincere efforts for success of each student. We believe these students will be creator of technology and much needed assets for our nation building exercise.

Salient Features, Program Credits, and Eligibility Criteria

The curriculum of MTech. in Biotechnology programme at IIT Mandi is directed towards fundamental and practical understanding of the core biotechnology areas along with specialized fields in "Medical and Nano-biotechnology" and "Systems Biology". In addition, elective courses from other disciplines provide interdisciplinary exposure, hands on laboratory training along with the thesis project enrich students with right skills required in the current job market. The total program credit is 72 and a minimum of 70 credits are to be earned for the Mtech. degree. The current intake strength of MTech. in Biotechnology is 21 through Common Offer Acceptance Portal (COAP) based on GATE in Life sciences, Biotechnology or relevant subjects and the minimum eligibility criteria (MEQ) as per our senate guidelines.

Program Faculty Group (PFG) Members

Dr. Tulika Srivastava
Dr. Amit Jaiswal
Dr. Amit Prasad
Dr. Prosenjit Mondal
Dr. Shyam K Masakapalli
Dr. Rajanish Giri
Dr. Prasad Kasturi
Dr. Trayambak Basak
Dr. Baskar Bakthavachalu
Dr. Garima Agrawal
Dr. Shubhajit R. Chowdhury
Dr. Rajesh Ghosh
Prof. Chayan K Nandi
Prof. Prem Felix Siril
Prof. Subrata Ghosh

Course Details

The overall curriculum is divided into foundation course (3 credits), core courses (15 credits), core lab courses (3 credits), elective courses (9 credits) with scope for specialization in either "Systems Biology" and "Medical and Nano-biotechnology", other disciplinary electives (6 credits), few mandatory courses such as seminar, research methodology and IPR and Biosafety (2 credits) and Post Graduate project leading to thesis (33 credits).

3 (Foundation Core) + 15 (Core) + 3 (Lab) + 9/10 (elective) + 6 (other disciplinary electives) + 2 (Mandatory courses) + 33 (Post Graduate Project Thesis) = 72

Student Spotlight

- Since inception, every year at least one of our scholars successfully availed the Khorana fellowship and worked at top institutes of USA for few months.
- Also, few scholars' availed KOPSIE DAAD fellowship enabling to carry a part of their thesis work in a German universities.
- After MTech, most of our scholars got selected for higher studies in national and international institutes leading to PhD. Few scholars are also working in core Biotechnology Industries.



Teaching Labs

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