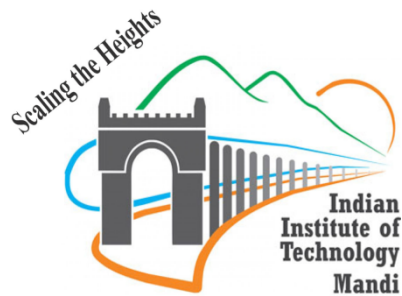


# Master of Science in Applied Mathematics



<b>Programme Level</b>	Post Graduate
<b>Year of Commencement</b>	2016
<b>Minimum Duration</b>	2 Years (4 Semesters)
<b>Maximum Duration</b>	3 Years (6 Semesters)
<b>Senate Meeting Reference</b>	9.3/18.5/20.4

**Preamble:** *M.Sc. in Applied Mathematics* programme at IIT Mandi is intended to give the students deep understanding of the principles of Mathematical sciences while expanding their knowledge in the allied areas through elective courses. The curriculum has been designed so as to prepare the students to take up a research career either in academia or in industries on completion of the program. The students will be equally equipped to take up professional career in Industries. The structure of the proposed programme has been designed drastically amended from the conventional M.Sc. (Mathematics) programs across the country by providing a balance among theory, application, and research components. The program is designed in such a way that students will have enough choices to learn their desired subjects by taking number of elective courses from and outside of the discipline. The curriculum focuses on an interdisciplinary approach wherein students learn theory and its applications (through fundamental core courses and engineering open elective courses) those are required for research in applied Mathematics and industry jobs:

- Broad based curriculum by the inclusion of a number of free and discipline electives, without compromising the core subjects.
- Theory and application oriented courses.
- Research oriented curriculum to increase thinking power’ and ‘Problem solving ability’.
- Adequate blend of theory and research.
- Learning of advanced Mathematical tools to solve engineering and real-life problems.
- Generates enough opportunities for industry jobs.

**Semester-wise credit distribution:**

<b><u>Semester I</u></b>	<b><u>Semester II</u></b>
<b>Real Analysis (MA 511) - 4 Credit</b>	<b>Functional Analysis (MA 521) - 4 Credit</b>
<b>Linear Algebra (MA 512) - 4 Credit</b>	<b>Partial Differential Equation (MA 522) - 4 Credit</b>
<b>Ordinary Different Equation (MA 513)- 4 Credit</b>	<b>Numerical Analysis (MA 523) - 4 Credit</b>
<b>Computer Programming (MA 514) - 3 Credit</b>	<b>Probability &amp; Statistics (MA 524) - 4 Credit</b>
<b>Computer Programming Lab (MA 514P) - 2 Credit</b>	<b>Discipline Elective – I - 3 Credit</b>
<b>Applied Mathematical Programming (MA 515) – 4 credit</b>	<b>Technical Communication (HS 541) - 1 Credit</b>
<b>Total - 21 Credit</b>	<b>Total - 20 Credit</b>

<b>Semester III</b>		<b>Semester IV</b>	
<b>Discipline Elective – II</b>	- 3 Credit	<b>Elective – V</b>	- 3 Credit
<b>Elective – III</b>	- 3 Credit	<b>Elective – VI</b>	- 3 Credit
<b>Elective – IV</b>	- 3 Credit	<b>Project (Part-2)</b>	- 12 Credit
<b>Elective – V</b>	- 3 Credit		
<b>Project (part-1)</b>	- 9 Credit		
<b>Total</b>	- 21 Credit	<b>Total</b>	- 18 Credit

**Credit Structure:** A student, to be awarded M.Sc. degree, must need to earn 80 credits.

**Open Electives:** Open electives from outside the discipline of program should be at least of 6 credits.

**Discipline Electives:** Discipline electives will be provided according to the requirement of the students and the availability of the faculties. The list of discipline electives are attached herewith.

**Discipline elective courses:** The following existing senate approved courses can be offered as discipline electives. More elective courses will be added time to time as required.

#### Pure Mathematics

Course Numbers	Course Titles	Credits
MA-549(3)	Abstract Algebra	3
MA-552(3)	Number Theory	3
MA 780 (3)	Topics in Semigroup Theory	3

#### Applied Mathematics

Course Numbers	Course Titles	Credits
MA-550(3)	Statistical Data Analysis	3
MA-553(3)	Mathematical Foundations of Financial Engineering	3
MA-565(3)	Numerical Methods in Quantitative Finance	3
MA-608(3)	Computational Fluid Dynamics	3
MA-609(3)	Numerics of Partial Differential Equation	3
MA-651(3)	Optimization Techniques	3

MA-652(3)	Stability Theory of Differential Equations	3
MA-653(3)	Computational Financial Modelling	3
MA-654(3)	Financial Engineering	3
MA-656(3)	Stochastic Calculus for Financial Engineering	3
MA-704(3)	Dynamical System	3
MA-705(3)	Modeling Population Dynamics	3
MA-709(3)	Numerical Linear Algebra	3
MA-765(4)	Fractional Differential Equations	4

**Project Evaluation:** A continuous evaluation process will be followed to evaluate the project/thesis work progress to award letter grades for the credits assigned to project/thesis component, as mentioned in the institute's Ordinance for M.Sc. programme.