THAPAR INSTITUTE
OF ENGINEERING & TECHNOLOGY
(Deemed to be University)

THAPAR INSTITUTE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MATHEMATICS

- **Feedback From**
  - ✓ **Students**
  - ✓ **Alumni**
  - ✓ **Employer**
  - ✓ **Faculty**
- **PG Program**
- **Evaluation Process (Courses & Dissertation)**
- **Program Outcomes Attainment Process**
- **Program outcomes mapping with the courses**
- **Course Revision Process (on recommended by Faculty)**

Head, DOM

Survey form to assess the level of attainment of student outcomes-Alumni

Dear Alumni

It is wonderful to reconnect with you after a few years. We hope you have been doing exceedingly well in your career. We are sure that your stay with TIET has enabled you to imbibe the process of life-long learning and to take up challenging careers. We are sure you were sufficiently equipped not only to take on the real world but also make it a better place to live in through responsible and innovative use of technology. We need your support to keep the TIET flag flying high.

We solicit your feedback on attainment of the student outcomes (the knowledge, skills and attitude that you developed during the course of study at TIET and subsequent work experience) of the MSc Program. Please answer the following questions on a scale of 1 to 5 where 1 indicates little achievement or skill, and 5 indicates great deal of achievement.

	Survey questionnaire	**Level of attainments (answer on a scale of 1 to 5)**				
	I achieved an ability to:	**1**	**2**	**3**	**4**	**5**
1	acquire the knowledge and explaining of the pure mathematics covering analysis and algebra and ability to apply this knowledge in other fields.				✓	
2	use of applied mathematics courses such as Numerical Analysis, Operations Research, Probability and Statistics; and Mechanics to solve real life problems.			✓		
3	join software and IT industry with sound knowledge of programming and mathematics-based computing.				✓	
4	pursue research as a career in mathematics, computing and inter-disciplinary fields.					✓

Note: Cross-out whichever not applicable

(1) GATE/NET exam after MSC: Passed/Failed/Not taken

(2) Promotion since graduation: Yes/No

(3) Enrollment in higher studies: Yes/No, if yes please answer following

(i) Name of program: M Sc (ii) Year of completion: 2020

(4) Involvement in professional societies as a NA

(5) Community service, if any: NA

(6) Overall how satisfied are you with MSc program at TIET and in your opinion how well is the MSc program meeting its stated educational objectives: Excellent/V. good/Good/Avg./Poor

Survey form to assess the level of attainment of student outcomes-Alumni

Dear Alumni

It is wonderful to reconnect with you after a few years. We hope you have been doing exceedingly well in your career. We are sure that your stay with TIET has enabled you to imbibe the process of life-long learning and to take up challenging careers. We are sure you were sufficiently equipped not only to take on the real world but also make it a better place to live in through responsible and innovative use of technology. We need your support to keep the TIET flag flying high.

We solicit your feedback on attainment of the student outcomes (the knowledge, skills and attitude that you developed during the course of study at TIET and subsequent work experience) of the MSc Program. Please answer the following questions on a scale of 1 to 5 where 1 indicates little achievement or skill, and 5 indicates great deal of achievement.

	Survey questionnaire	**Level of attainments (answer on a scale of 1 to 5)**				
	I achieved an ability to:	**1**	**2**	**3**	**4**	**5**
1	acquire the knowledge and explaining of the pure mathematics covering analysis and algebra and ability to apply this knowledge in other fields.				✓	
2	use of applied mathematics courses such as Numerical Analysis, Operations Research, Probability and Statistics; and Mechanics to solve real life problems.			✓		
3	join software and IT industry with sound knowledge of programming and mathematics-based computing.					✓
4	pursue research as a career in mathematics, computing and inter-disciplinary fields.					✓

Note: Cross-out whichever not applicable

(1) GATE/NET exam after MSC: Passed/Failed/~~Not taken~~ ✓

(2) Promotion since graduation: ~~Yes~~/No ✓

(3) Enrollment in higher studies: Yes/~~No~~, if yes please answer following ✓

(i) Name of program: MSc (ii) Year of completion: 2022

(4) Involvement in professional societies as a NA

(5) Community service, if any: NA

(6) Overall how satisfied are you with MSc program at TIET and in your opinion how well is the MSc program meeting its stated educational objectives: Excellent/V. good/Good/Avg./Poor ✓

Survey form to assess the level of attainment of student outcomes-Alumni

Dear Alumni

It is wonderful to reconnect with you after a few years. We hope you have been doing exceedingly well in your career. We are sure that your stay with TIET has enabled you to imbibe the process of life-long learning and to take up challenging careers. We are sure you were sufficiently equipped not only to take on the real world but also make it a better place to live in through responsible and innovative use of technology. We need your support to keep the TIET flag flying high.

We solicit your feedback on attainment of the student outcomes (the knowledge, skills and attitude that you developed during the course of study at TIET and subsequent work experience) of the MSc Program. Please answer the following questions on a scale of 1 to 5 where 1 indicates little achievement or skill, and 5 indicates great deal of achievement.

	Survey questionnaire	**Level of attainments (answer on a scale of 1 to 5)**				
	I achieved an ability to:	**1**	**2**	**3**	**4**	**5**
1	acquire the knowledge and explaining of the pure mathematics covering analysis and algebra and ability to apply this knowledge in other fields.			✓		
2	use of applied mathematics courses such as Numerical Analysis, Operations Research, Probability and Statistics; and Mechanics to solve real life problems.				✓	
3	join software and IT industry with sound knowledge of programming and mathematics-based computing.				✓	
4	pursue research as a career in mathematics, computing and inter-disciplinary fields.				✓	

Note: Cross-out whichever not applicable

(1) GATE/NET exam after MSC: Passed/Failed/Not taken ✓

(2) Promotion since graduation: Yes/No ✓

(3) Enrollment in higher studies: Yes/No, if yes please answer following

(i) Name of program: MSc (ii) Year of completion: 2020

(4) Involvement in professional societies as a NA

(5) Community service, if any: NA

(6) Overall how satisfied are you with MSc program at TIET and in your opinion how well is the MSc program meeting its stated educational objectives: Excellent/V. ~~good~~/Good/Avg./Poor ✓

Survey form to assess the level of attainment of student outcomes-Alumni

Dear Alumni

It is wonderful to reconnect with you after a few years. We hope you have been doing exceedingly well in your career. We are sure that your stay with TIET has enabled you to imbibe the process of life-long learning and to take up challenging careers. We are sure you were sufficiently equipped not only to take on the real world but also make it a better place to live in through responsible and innovative use of technology. We need your support to keep the TIET flag flying high.

We solicit your feedback on attainment of the student outcomes (the knowledge, skills and attitude that you developed during the course of study at TIET and subsequent work experience) of the MSc Program. Please answer the following questions on a scale of 1 to 5 where 1 indicates little achievement or skill, and 5 indicates great deal of achievement.

	Survey questionnaire	**Level of attainments (answer on a scale of 1 to 5)**				
	I achieved an ability to:	**1**	**2**	**3**	**4**	**5**
1	acquire the knowledge and explaining of the pure mathematics covering analysis and algebra and ability to apply this knowledge in other fields.				✓	
2	use of applied mathematics courses such as Numerical Analysis, Operations Research, Probability and Statistics; and Mechanics to solve real life problems.			✓		
3	join software and IT industry with sound knowledge of programming and mathematics-based computing.				✓	
4	pursue research as a career in mathematics, computing and inter-disciplinary fields.					✓

Note: Cross-out whichever not applicable

(1) GATE/NET exam after MSC: Passed/Failed/Not taken

(2) Promotion since graduation: Yes/No

(3) Enrollment in higher studies: Yes/No, if yes please answer following

(i) Name of program: M Sc (ii) Year of completion: 2020

(4) Involvement in professional societies as a NA

(5) Community service, if any: NA

(6) Overall how satisfied are you with MSc program at TIET and in your opinion how well is the MSc program meeting its stated educational objectives: Excellent/V. good/Good/Avg./Poor

Survey form to assess the level of attainment of student outcomes-Alumni

Dear Alumni

It is wonderful to reconnect with you after a few years. We hope you have been doing exceedingly well in your career. We are sure that your stay with TIET has enabled you to imbibe the process of life-long learning and to take up challenging careers. We are sure you were sufficiently equipped not only to take on the real world but also make it a better place to live in through responsible and innovative use of technology. We need your support to keep the TIET flag flying high.

We solicit your feedback on attainment of the student outcomes (the knowledge, skills and attitude that you developed during the course of study at TIET and subsequent work experience) of the MSc Program. Please answer the following questions on a scale of 1 to 5 where 1 indicates little achievement or skill, and 5 indicates great deal of achievement.

	Survey questionnaire	**Level of attainments (answer on a scale of 1 to 5)**				
	I achieved an ability to:	**1**	**2**	**3**	**4**	**5**
1	acquire the knowledge and explaining of the pure mathematics covering analysis and algebra and ability to apply this knowledge in other fields.				✓	
2	use of applied mathematics courses such as Numerical Analysis, Operations Research, Probability and Statistics; and Mechanics to solve real life problems.			✓		
3	join software and IT industry with sound knowledge of programming and mathematics-based computing.					✓
4	pursue research as a career in mathematics, computing and inter-disciplinary fields.					✓

Note: Cross-out whichever not applicable

(1) GATE/NET exam after MSC: Passed/Failed/~~Not taken~~ ✓

(2) Promotion since graduation: ~~Yes~~/No ✓

(3) Enrollment in higher studies: Yes/~~No~~, if yes please answer following ✓

(i) Name of program: MSc (ii) Year of completion: 2022

(4) Involvement in professional societies as a NA

(5) Community service, if any: NA

(6) Overall how satisfied are you with MSc program at TIET and in your opinion how well is the MSc program meeting its stated educational objectives: Excellent/V. good/Good/Avg./Poor ✓

Survey form to assess the level of attainment of student outcomes-Alumni

Dear Alumni

It is wonderful to reconnect with you after a few years. We hope you have been doing exceedingly well in your career. We are sure that your stay with TIET has enabled you to imbibe the process of life-long learning and to take up challenging careers. We are sure you were sufficiently equipped not only to take on the real world but also make it a better place to live in through responsible and innovative use of technology. We need your support to keep the TIET flag flying high.

We solicit your feedback on attainment of the student outcomes (the knowledge, skills and attitude that you developed during the course of study at TIET and subsequent work experience) of the MSc Program. Please answer the following questions on a scale of 1 to 5 where 1 indicates little achievement or skill, and 5 indicates great deal of achievement.

	Survey questionnaire	**Level of attainments (answer on a scale of 1 to 5)**				
	I achieved an ability to:	**1**	**2**	**3**	**4**	**5**
1	acquire the knowledge and explaining of the pure mathematics covering analysis and algebra and ability to apply this knowledge in other fields.			✓		
2	use of applied mathematics courses such as Numerical Analysis, Operations Research, Probability and Statistics; and Mechanics to solve real life problems.				✓	
3	join software and IT industry with sound knowledge of programming and mathematics-based computing.				✓	
4	pursue research as a career in mathematics, computing and inter-disciplinary fields.				✓	

Note: Cross-out whichever not applicable

(1) GATE/NET exam after MSC: Passed/Failed/Not taken ✓

(2) Promotion since graduation: Yes/No ✓

(3) Enrollment in higher studies: Yes/No, if yes please answer following

(i) Name of program: MSc (ii) Year of completion: 2020

(4) Involvement in professional societies as a NA

(5) Community service, if any: NA

(6) Overall how satisfied are you with MSc program at TIET and in your opinion how well is the MSc program meeting its stated educational objectives: Excellent/V. ~~good~~/Good/Avg./Poor ✓

Survey form to assess the level of attainment of student outcomes-Employer

Dear Sir

We express our sincere thanks for continually employing our post graduate students over the years. We are sure our student are sufficiently equipped not only to take on the real word but also make a better place to live in throughout responsible and innovative use of technology.

We solicit your feedback on attainment of the student outcomes (the knowledge, skills and attitudes that students develop during the course of study at THET) of the MSc program. Please answer the following questions on a scale of 1 to 5 where 1 indicates little achievement or skill, and 5 indicates great deal of achievement.

	Survey questionnaire	Level of attainments (answer on a scale of 1 to 5)				
	The successful completion of this program will enable the students to	1	2	3	4	5
1	acquire the knowledge and explaining of the pure mathematics covering analysis and algebra and ability to apply this knowledge in other fields.				●	
2	use of applied mathematics courses such as Numerical Analysis, Operations Research, Probability and Statistics; and Mechanics to solve real life problems.					●
3	join software and IT industry with sound knowledge of programming and mathematics-based computing.					●
4	pursue research as a career in mathematics, computing and inter-disciplinary fields.					●
	Your Name and Signature with Date..... NAVEEN PRAKASH 30/01/24					
	Organization Name..... MOTHERSON TECHNOLOGY SERVICES LIMITED (MTSL)					

(M.K. Sharma)
Head, Department of Mathematics

PG Program

Department of Mathematics offered two programs at PG Level:

- MSc Mathematics & Computing
- MSc Mathematics

The duration for both programs is two years (4 semesters) and number of seats are 20 in each program

Eligibility Criteria: The candidates seeking admission to M.Sc. in the Department of Mathematics, TIET, Patiala must have a Bachelor degree with Mathematics as a major subject. The qualifying degree must be from a recognized University by the University Grants Commission with minimum duration of three years. The candidate must have at least 60% (55% for SC/ST) marks in qualifying degree. Admissions shall be made by merit which will be made by combining the percentages of marks obtained in 10th, 12th and graduation level. The degree marks will be considered up to second year/four semesters.

MSc (Mathematics & Computing)

Introduction: Mathematics and Computing Programme is combination of mathematics with computer science. Covering the major areas in demand today, this programme is of utmost value to the aspiring graduate students with Mathematics background. The course provides students with comprehensive theoretical knowledge and also practical training in computer science and numerical computing. This programme has been introduced due to the need for sophisticated mathematics for modern scientific investigations and technological developments. The curriculum is designed to provide students with in depth theoretical background and practical training in computer science and numerical computing so that a student become competent to take challenges in mathematics at national and international levels.

Program Outcomes (POs): The successful completion of this program will enable the students to

PO1: acquire the knowledge and explaining of the pure mathematics covering analysis and algebra and ability to apply this knowledge in other fields.

PO2: use of applied mathematics courses such as Numerical Analysis, Operations Research, Probability and Statistics; and Mechanics to solve real life problems.

PO3: join software and IT industry with sound knowledge of programming and mathematics-based computing.

PO4: pursue research as a career in mathematics, computing and inter-disciplinary fields.

Program outcomes mapping with the courses (MSc Mathematics & Computing)

S. No	Course Name	Course Code	PO1	PO2	PO3	PO4
1.	Real Analysis	PMA 107	✓	✓	✓	✓
2.	Algebra I	PMA 108	✓		✓	✓
3.	Ordinary Differential Equations	PMA109	✓	✓		✓
4.	Mechanics	PMA110		✓		✓

5.	Computer Programming	PMA111			✓	✓
6.	Discrete Mathematical Structures	PMC105	✓	✓		
7.	Measure Theory and Integrations	PMA204	✓			✓
8.	Algebra II	PMA205	✓			✓
9.	Database Management System	PMC205			✓	✓
10.	Complex Analysis	PMA207	✓	✓		✓
11.	Numerical Analysis	PMA208	✓	✓		✓
12.	Data Structure and Algorithms	PMC212			✓	✓
13.	Functional Analysis	PMA301	✓			✓
14.	Operating Systems	PMC206			✓	
15.	Probability and Statistics	PMA303		✓		✓
16.	Mathematical Programming	PMA304		✓		✓
17.	Computer Network	PMC303			✓	✓
18.	Number Theory	PMA401	✓			✓
19.	Mathematical Methods	PMA402		✓		✓
Electives						
20.	Computer & Network Security	PMC328			✓	✓
21.	Parallel and Distributed Computat	PMC329			✓	✓
22.	Interactive Computer Graphics	PMC330			✓	✓
23.	Machine Learning and Applicatio	PMC331			✓	✓
24.	Data Analysis and Visualization	PMC434			✓	✓
25.	Principles of Secure Coding	PMC435			✓	✓
26.	GPU Programming	PMC436			✓	✓
27.	Computer Vision: Algorithms Applications	PMC437			✓	✓

Scheme:

First Semester

S.No.	Course No.	Course Name	L	T	P	Credits
1.	PMA107	Real Analysis	3	1	0	3.5
2.	PMA108	Algebra I	3	1	0	3.5
3.	PMA109	Ordinary Differential Equations	3	1	0	3.5
4.	PMA110	Mechanics	3	1	0	3.5
5.	PMA111	Computer Programming	3	0	2	4.0
6.	PMC105	Discrete Mathematical Structures	3	1	0	3.5
		Total	18	5	2	21.5

Second Semester

S.No.	Course No.	Course Name	L	T	P	Credits
1.	PMA204	Measure Theory and Integration	3	1	0	3.5
2.	PMA205	Algebra II	3	1	0	3.5
3.	PMC205	Database Management System	3	0	2	4.0
4.	PMA207	Complex Analysis	3	1	0	3.5
5.	PMA208	Numerical Analysis	3	1	2	4.5
6.	PMC212	Data Structure and Algorithms	3	0	4	5.0
		Total	18	4	8	24

Third Semester

S.No.	Course No.	Course Name	L	T	P	Credits
1.	PMA301	Functional Analysis	3	1	0	3.5
2.	PMC206	Operating Systems	3	0	2	4.0
3.	PMA303	Probability and Statistics	3	1	2	4.5
4.	PMA304	Mathematical Programming	3	1	2	4.5
5.	PMC303	Computer Network	3	0	2	4.0
6.		Elective-I	3	0	2	4.0
		Total	18	3	6	24.5

Fourth Semester

S.No.	Course No.	Course Name	L	T	P	Credits
1.	PMA401	Number Theory	3	1	0	3.5
2.	PMA402	Mathematical Methods	3	1	0	3.5
3.		Elective II	3	0	2	4
4.	PMC492	Dissertation				10
		Total	9	2	2	21

Total Credit 91

Electives: the student may select a course of his/her choice as Elective-I and Elective-II in the 3rd and 4th semester from the below list approved by the BoS and Senate.

Elective I [4 Credits]

S.No.	Course No.	Course Name
1.	PMC328	Computer & Network Security
2.	PMC329	Parallel and Distributed Computation
3.	PMC330	Interactive Computer Graphics
4.	PMC331	Machine Learning and Applications

Elective II [4 Credits]

S.No.	Course No.	Course Name
1.	PMC434	Data Analysis and Visualization
2.	PMC435	Principles of Secure Coding
3.	PMC436	GPU Programming
4.	PMC437	Computer Vision: Algorithms and Applications

MSc (Mathematics)

Introduction: Mathematics programme is of utmost value to the aspiring graduate students with Mathematics background. Study of mathematics enables students to take up a variety of careers ranging from academic research, education, development, and quantitative applications in industry. The course provides students with ability to apply analytical and theoretical skills to model and solve mathematical problems. This programme has been introduced due to the need for sophisticated mathematics for modern scientific investigations and technological developments. The curriculum is designed to provide students with in depth pure as well applied mathematics so that a student become competent to take challenges in Mathematics at National and International levels.

Program Outcomes (POs): At the end of the program, the students will be able to:

PO1: acquire the knowledge and understanding of pure and applied mathematics and communicate mathematics effectively.
PO2: innovate, invent and solve complex mathematical problems using the knowledge of pure and applied mathematics.
PO3: pursue research career in mathematics and inter-disciplinary fields.

PO4: have the ability to assess and interpret complex situation, enabling them to choose successful career in education and industry.

Program outcomes mapping with the courses (MSc Mathematics)

S. No.	Course Name	Course Code	PO1	PO2	PO3	PO4
1.	Real Analysis	PMA 107	✓	✓	✓	✓
2.	Algebra I	PMA 108	✓	✓	✓	✓
3.	Ordinary Differential Equations	PMA109	✓	✓		✓
4.	Mechanics	PMA110		✓		✓
5.	Computer Programming	PMA111			✓	✓
6.	Measure Theory and Integrations	PMA204	✓			✓
7.	Algebra II	PMA205	✓			✓
8.	Partial Differential Equations	PMA206		✓		✓
9.	Complex Analysis	PMA207	✓	✓		✓

10.	Numerical Analysis	PMA208	✓	✓		✓
11.	Functional Analysis	PMA301	✓			✓
12.	Topology	PMA302				
13.	Probability and Statistics	PMA303		✓		✓
14.	Mathematical Programming	PMA304		✓		✓
15.	Number Theory	PMA401	✓			✓
16.	Mathematical Methods	PMA402		✓		✓
Electives						
17.	Numerical Methods for Partial Differential Equations	PMA331		✓		✓
18.	Finite Element Methods	PMA332		✓		✓
19.	Introduction to Astronomy Astrophysics	PMA333		✓		✓
20.	Wavelet and Applications	PMA334		✓		✓
21.	Mathematical Biology and Linear Dynamics	PMA335		✓		✓
22.	Operator Theory	PMA336		✓		✓
23.	Enumerative Combinatorics	PMA337	✓	✓		✓
24.	Fuzzy Sets and Applications	PMA338				✓
25.	Fluid Mechanics	PMA339		✓		✓
26.	Discrete Mathematical Structures	PMA340		✓	✓	✓
27.	Modelling of Stellar Structure	PMA432		✓		✓
28.	Asymptotic Methods and Perturb Theory	PMA433		✓		✓
29.	Theory of Elasticity	PMA434		✓		✓
30.	Algebraic Coding Theory	PMA435	✓			✓
31.	Topological Vector Space	PMA436	✓	✓		✓
32.	Fixed Point Theory	PMA437	✓			✓
33.	Statistical Simulation Computation	PMA438		✓		✓
34.	Financial Mathematics	PMA439		✓	✓	✓
35.	Combinatorial Programming	PMA440		✓	✓	✓
36.	Stochastic Calculus	PMA441		✓		✓
37.	Advanced Numerical Optimiz Techniques	PMA442		✓		✓

Scheme:

First Semester

S.No.	Course No.	Course Name	L	T	P	Credits
1.	PMA107	Real Analysis	3	1	0	3.5
2.	PMA108	Algebra I	3	1	0	3.5
3.	PMA109	Ordinary Differential Equations	3	1	0	3.5
4.	PMA110	Mechanics	3	1	0	3.5
5.	PMA111	Computer Programming	3	0	2	4.0
		Total Credits				18.0

Second Semester

S.No.	Course No.	Course Name	L	T	P	Credits
1.	PMA204	Measure Theory and Integration	3	1	0	3.5
2.	PMA205	Algebra II	3	1	0	3.5
3.	PMA206	Partial Differential Equations	3	1	0	3.5
4.	PMA207	Complex Analysis	3	1	0	3.5
5.	PMA208	Numerical Analysis	3	1	2	4.5
		Total Credits				18.5

Third Semester

S.No.	Course No.	Course Name	L	T	P	Credits
1.	PMA301	Functional Analysis	3	1	0	3.5
2.	PMA302	Topology	3	1	0	3.5
3.	PMA303	Probability and Statistics	3	1	2	4.5
4.	PMA304	Mathematical Programming	3	1	2	4.5
5.		Elective I				4
		Total Credits				20

Fourth Semester

S.No.	Course No.	Course Name	L	T	P	Credits
1.	PMA401	Number Theory	3	1	0	3.5
2.	PMA402	Mathematical Methods	3	1	0	3.5
3.		Elective II				4
4.	PMA491	Dissertation				10
		Total Credits				21

Electives: the student may select a course of his/her choice as Elective-I and Elective-II in the 3rd and 4th semester from the below list approved by the BoS and Senate.

Elective I [4 Credits]

S.No.	Course No.	Course Name	L	T	P
1.	PMA331	Numerical Methods for Partial Differential Equations	3	0	2
2.	PMA332	Finite Element Methods	3	0	2
3.	PMA333	Introduction to Astronomy and Astrophysics	3	2	0
4.	PMA334	Wavelet and Applications	3	0	2
5.	PMA335	Mathematical Biology and Non-Linear Dynamics	3	2	0
6.	PMA336	Operator Theory	3	2	0
7.	PMA337	Enumerative Combinatorics	3	2	0
8.	PMA338	Fuzzy Sets and Applications	3	2	0
9.	PMA339	Fluid Mechanics	3	2	0
10.	PMA340	Discrete Mathematical Structures	3	2	0

Elective II [4 Credits]

S.No.	Course No.	Course Name	L	T	P
1.	PMA432	Modelling of Stellar Structure	3	2	0
2.	PMA433	Asymptotic Methods and Perturbation Theory	3	2	0
3.	PMA434	Theory of Elasticity	3	2	0
4.	PMA435	Algebraic Coding Theory	3	2	0
5.	PMA436	Topological Vector Space	3	2	0
6.	PMA437	Fixed Point Theory	3	2	0
7.	PMA438	Statistical Simulation and Computation	3	0	2
8.	PMA439	Financial Mathematics	3	0	2
9.	PMA440	Combinatorial Programming	3	2	0
10.	PMA441	Stochastic Calculus	3	2	0
11.	PMA442	Advanced Numerical Optimization Techniques	3	2	0

Dissertation

The Dissertation for both the programs MSc Mathematics and MSc Mathematics & Computing is compulsory in the 4th semester of the program. The duration of this dissertation course is six months (January to June) and the credit of this course is 10. The objective of this dissertation is to provide the basic knowledge of the research in Mathematics and Computing

Evaluation Process (Courses & Dissertation)

Courses: The evaluation scheme for the courses is designed in the following table

S. No	Evaluation Elements	Weightage (%)
1	Mid Semester Test (MST)	30
2	End Semester Test (EST)	45
3	Sessionals(may include assignments/quizzes/Lab evaluation)	25

Dissertation: MSc dissertation is evaluated by a panel consisting of following

1.	Chairman	Nominated by Dean Academic
2.	External Expert	One external expert from top universities or IITs
3.	Supervisor	Provided to the student in the beginning of the dissertation by Head of the Department
4.	Internal Expert	One expert from the same area nominated by Head of the Department.

The distribution of the marks for evaluation of dissertation are as under:

I. Dissertation (50 Marks)
- Introduction 10
- Literature review 10
- Methodology 10
- Results (Novelty of Research) 10
- Discussion 10

II. Presentation (40 Marks)
- Presentation Skills 10
- Description of contents/figures/tables/data 10
- Response to questions 10
- Significance of work 10

III. Overall perception by Chairman 10

Total Marks (I+II+III) 100

Process of Program outcome attainment:

The Program Outcomes (POs) are achieved through curriculum that offers a number of mandatory courses as well as elective courses. Each course in the curriculum has defined course outcomes that

are mapped to the program outcomes and a set of performance criteria that are used to provide quantitative measurement of how well course outcomes are achieved. The process of POs attainment level is shown by the following flowchart:

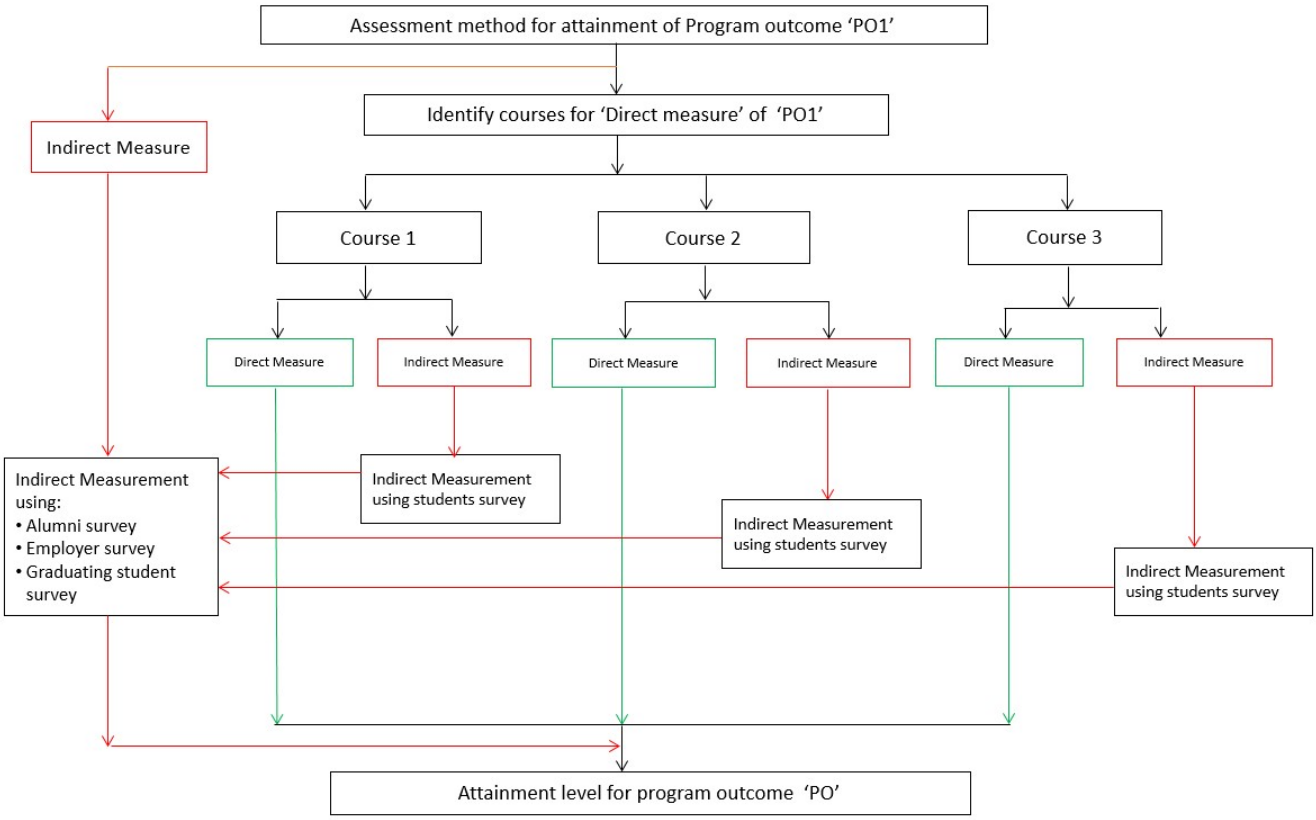

Figure 1 Flowchart showing the process of P attainment level

As shown in the flowchart given above, each of the PO are assessed using a direct and an indirect method. This assessment is carried out using the following measurable and quantitative parameters and survey/questionnaire techniques/tools.

A. Assessment Tools used for measurement of Program Outcome attainment:

In the Outcome Based Education (OBE), the course outcome attainment scores measured using direct and indirect assessment tools is eventually used for measuring the attainment of Program Outcomes. Thus, POs assessment process uses both direct and indirect measures to measure the attainment of each outcome. The examples of such measures are given below:

1. Direct Assessment tools:

After evaluating the attainment of course outcomes using direct assessment tools (as mentioned in Table2. (a)), average direct CO score for each course is computed. Direct assessment score for attainment of PO is computed by mapping the direct CO scores for all

courses with corresponding PO's as defined in the Program articulation matrix. Following direct assessment tools are employed for measuring PO attainment:

- Mid Semester Examinations [Once during 8th or 9th week of a semester]
- End semester Examination [once during 15th week of the semester]
- Tutorial Assignments [Varies depending on the tutorial engagement]
- Quizzes [Mostly once during semester, Varies and is decided by course coordinator]
- Projects [Mostly once during semester, Varies and is decided by course coordinator]

2. Indirect Assessment tools:

This includes feedbacks from all the stakeholders such as course exit survey, Graduating student survey, alumni feedback, Employer feedback etc.

Table: **Indirect Assessment Tools**		
S. No.	**Indirect Assessment Tool**	**Method Description**
1	Course Survey [Twice before MST and EST]	Course Survey is completed for every course in each semester to get a formal feedback from students for the courses offered in a semester and provide objective information to the faculty for self-appraisal, self-improvement & development. The course survey is focussed on attainment of course outcomes. Formal student feedback is obtained online and it is mandatory for all students to participate in such surveys. The course survey results are compiled by the individual course instructors for his feedback.
2	Graduating student's survey [Once per year for the graduating batch]	A questionnaire survey is used to measure the level of achievement of expected program outcomes/program specific outcomes. It is mandatory for all graduating students to participate in this questionnaire. Each participant is asked to rate his/her perception of achievement of the program outcomes/program specific outcome on a scale of 1 to 5 where 1 signifies a poor outcome and 5 signifies a high level of achievement of objectives. The indirect CO scores measured through this tool are mapped to Likert scale of 1 to3. The assessment results are documented and discussed in the meeting of department faculty to make action points for initiating corrective and preventive actions. A sample filled copy of graduating students' survey form is provided in Annexure-I
3	Alumni survey	It is believed that the perception of students changes from the time of

	[Once in three years]	graduation to some point in their respective careers as they get more mature and have learnt tricks of the trade on the job. At this point of time, they are in a better position to provide more valuable and objective feedback on the learning in their undergraduate program and also how much of the program outcomes (on some scale) have actually been possible. To obtain this information, a survey is conducted for practicing alumni who graduated during the last 2 to 5 years. This survey like the graduating student survey is targeted at the program outcomes & program specific outcomes achieved during the last 2 to 5 years. Again, the respondents are asked to rate each PO on a scale of 1 to 5. The indirect CO scores measured through this tool are mapped to Likert scale of 1 to3. The findings of the survey are processed and used for effecting improvements in the program to achieve the program educational objectives and program outcomes.
4	Employer survey [Once in three years]	All the students of program to be accredited are required to spend a full six month's semester in the industry completing an industrial project under the joint supervision of industry supervisors and TIET faculty. All the faculty members are required to visit one or two organizations two times during their six month's semester in the industry for evaluation of students placed for their work term in these organizations. This provides an opportunity to take feedback of our graduated students working in these organizations. During the course of interaction with the employer of our students, the employers provide information on their performance against POs through survey form. This form, like the other forms, has questions related to the POs. The rating is again given on a scale of 1 to 5 with 5 representing the best performance. The indirect CO scores measured through this tool are mapped to Likert scale of 1 to 3. A sample copy of filled employer survey form is provided in Annexure-I

B. <u>Processes used for measurement of Program Outcome attainment:</u>

CO Attainment scores for each subject obtained by direct assessment tools is mapped to correlated PO using the course articulation matrix. Similarly, CO attainment scores achieved through indirect assessment tools are also mapped with the correlated PO.

PO Attainment (Direct Assessment) $= \left[\frac{\text{PO \_CO Mapping}}{3} \times CO\ Attainment\ (Direct\ Assessment)\right]$

PO/PSO Attainment (Indirect Assessment) $= \left[\frac{\text{PO \_CO Mapping}}{3} \times CO\ Attainment\ (Indirect\ Assessment)\right]$

Attainment for a program outcome is finally computed by taking weighted average of contributions of participating courses towards that particular PO or PSO.

Finally, program outcomes for entire course is assessed by taking weighted sum of direct and indirect assessment as

Overall PO = 80% weightage of direct PO Score + 20% weightage of Indirect PO Score

Table 1 below shows the frequency of data collection of each form.

Table 1: Assessment tools, frequency of data collection and weightage

Assessment Tool	When data is collected	Frequency of Data Analysis	Weightage
Course Portfolio	During the semester	Once in a year	**5**
Course Survey	End of the semester	Once in a year	**4**
Graduating Student's Survey	End of the program	Once in a year	**3**
Alumni Survey	After 2-5 year of graduation	Once in 3 years	
Employer Survey		Once in 3 years	

On the basis of results of assessment tools, the assessment of level of attainment of each PO outcome is carried out. The assessment loop for each program outcomes is shown in Figure 2.2

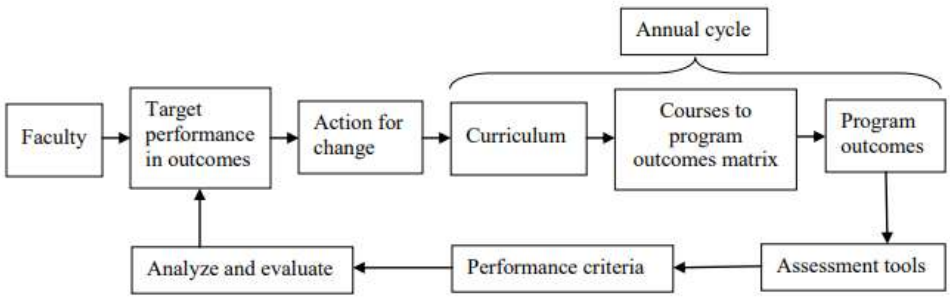

Figure 2 Assessment loop for PO

Actions taken based on the results of evaluation of each of the COs and POs

Based on the CO and PO attainment levels, subjects were identified whose CO attainment level was low but weightage towards calculation of a PO level was high. For such subjects, the concerned faculty prepared an Action Taken Report (ATR), providing details of reasons for the low attainment level and the actions to improve upon the same.

Table 2: POs Attainment Levels and Actions for improvement (If any)(2022-23)(MSc Mathematics & Computing)

POs	Target Level	Attainment Level	Observations
PO1: The successful completion of this program will enable the students to acquire the knowledge and explaining of the pure mathematics covering analysis and algebra and ability to apply this knowledge in other fields.			
PO1	**3.5**	**4.23**	The scale of 1 to 5 is taken for COs calculations. For PO1, the target level has been achieved. A total number of 7 courses (PMA107, PMA108, PMA109, PMC105, PMA204, PMA207, PMA301) were considered for calculating the attainment level of PO1. The attainment level was higher than the set target and as of now no action is required to improve the same.
PO2: The successful completion of this program will enable the students to use of applied mathematics courses such as Numerical Analysis, Operations Research, Probability and Statistics; and Mechanics to solve real life problems.			
PO2	**3.5**	**4.20**	The scale of 1 to 5 is taken for COs calculations. For PO2, the target level has been achieved. A total number of 5 courses (PMA107, PMA108, PMC105, PMA207, PMA402) were considered for calculating the attainment level of PO2. The attainment level was higher than the set target and as of now no action is required to improve the same.
PO3: The successful completion of this program will enable the students to join software and IT industry with sound knowledge of programming and mathematics-based computing.			

PO3 .	**3.5**	**4.099**	The scale of 1 to 5 is taken for COs calculations. For PO3, the target level has been achieved. A total number of 6 courses (PMA107, PMA108, PMA111, PMC105, PMC206, PMC303) were considered for calculating the attainment level of PO3. The attainment level was higher than the set target and as of now no action is required to improve the same.
PO4: The successful completion of this program will enable the students to pursue research as a career in mathematics, computing and inter-disciplinary fields.			
PO4	**3.5**	**4.14**	The scale of 1 to 5 is taken for COs calculations. For PO4, the target level has been achieved. A total number of 10 courses (PMA107, PMA108, PMA109, PMA111, PMA204, PMA207, PMA301, PMC206, PMC303, PMA402) were considered for calculating the attainment level of PO4. The attainment level was higher than the set target and as of now no action is required to improve the same.

Table 3: POs Attainment Levels and Actions for improvement (If any)(2022-23)(MSc Mathematics)

POs	**Target Level**	**Attainment Level**	**Observations**
PO1: The successful completion of this program will enable the students to acquire the knowledge and understanding of pure and applied mathematics and communicate mathematics effectively.			
PO1	**3.5**	**4.24**	The scale of 1 to 5 is taken for COs calculations. For PO1, the target level has been achieved. A total number of 7 courses (PMA107, PMA108, PMA109, PMA204, PMA207, PMA301, PMA302) were considered for calculating the attainment level of PO1. The attainment level was higher than the set target and as of now no action is required to improve the same.

PO2: The successful completion of this program will enable the students to innovate, invent and solve complex mathematical problems using the knowledge of pure and applied mathematics.			
PO2	**3.5**	**4.26**	The scale of 1 to 5 is taken for COs calculations. For PO2, the target level has been achieved. A total number of 6 courses (PMA107, PMA108, PMA109, PMA207, PMA402, PMA439) were considered for calculating the attainment level of PO2. The attainment level was higher than the set target and as of now no action is required to improve the same.
PO3: The successful completion of this program will enable the students to pursue research career in mathematics and inter-disciplinary fields			
PO3 .	**3.5**	**4.14**	The scale of 1 to 5 is taken for COs calculations. For PO3, the target level has been achieved. A total number of 5 courses (PMA107, PMA108, PMA111, PMA402, PMA439) were considered for calculating the attainment level of PO3. The attainment level was higher than the set target and as of now no action is required to improve the same.
PO4: The successful completion of this program will enable the students to have the ability to assess and interpret complex situation, enabling them to choose successful career in education and industry.			
PO4	**3.5**	**4.14**	The scale of 1 to 5 is taken for COs calculations. For PO4, the target level has been achieved. A total number of 10 courses (PMA107, PMA108, PMA109, PMA111, PMA204, PMA207, PMA301, PMA302, PMA402, PMA439) were considered for calculating the attainment level of PO4. The attainment level was higher than the set target and as of now no action is required to improve the same.

Program Outcomes once mapped to the learning outcomes of a particular course gives us an insight of the level of achievement of students in that particular PO. Given this broaden picture of new understanding, we get an opportunity to improvise through initiatives and also implement certain changes that can be lead us to have better performances. All faculty from the department have been completed the basic course of New Direction Program and benefitted through this workshop. Faculty was trained to adopt academic practices such as outcome based learning, creative thinking, introducing assessment methods involving students, and many more. With these approaches, students were more open to creatively formulate problem.

Processes for Setting and Reviewing the Curriculum

the statutory bodies of the university, the Senate, or the planning and monitoring board oversee the curriculum design and development process so that the activity is carried out in a planned manner. The detailed planning for this activity is the responsibility of the Department Head. the systematic process of design and development includes the activities and sub-activities including techniques & Organizational interfaces and the time frame for completion of various activities. the plans are updated, as the instructional design evolves.

are the design and development process generally begins with the need analysis report which comprises of (i) stated customer needs (ii) implied needs (iii) Overall goals of instructions (iv) Relevant standards that is AICTE and UGC guidelines and curricular of entrance test like National eligibility test and graduate aptitude test for engineers etc and (v) general characteristics of target population.

Organizational and Technical interfaces between different faculty and external expert groups providing input to the instructional design are defined, committees are constituted and their reports are documented. Faculty members from different disciplines connected with the design and development activity are associated with the process. The updation/restructuring is carried out as the design process progresses. Clear responsibilities are assigned and effective communication is ensured.

The requirements of instructional design are determined and recorded. For instructional design, the input is taken from various sources. Input requirements are clearly understood and reconciled. The design input may come from:

- Need analysis and Reviews
- Recommendation from alumni, senior management, industry etc.
- Success/failure reports of similar courses & programs
- Published Literature relevant to programs
- Boundary conditions w.r.t. GATE, NET curricula etc.

The process of determining solutions to satisfy the identified needs is laid down and documented. Instructions are designed by incorporating these solutions. The analysis and mappings are recorded. The design output at this stage is taken as the initial design for subsequent reviews. The output of instructional design and development is documented in the form of a report named "Curriculum and scheme of courses". Through various reviews and verifications, it is ensured that the design output meets the design input requirements.

The design output report includes:

- The types and levels of skills and knowledge to be imparted
- Details of need analysis and mappings at various stages
- Scheme of courses and the detailed syllabi
- Instructional strategies
- Selection of instructional aids for delivery
- Assessment and evaluation

The output documents like curriculum and instructional strategies are reviewed and approved by various institutional bodies before release at various levels and stages. Reviews are conducted at defined stages of the curriculum design, in which faculty members from the concerned area, as well as experts from amongst the peer group from within and/or outside the university, are associated. Records of the reviews are maintained. Based on the reviews, the design is updated and brought into document control for revision the design reviews are carried out at the end of each of the following stages using prescribed check lists:

- Need analysis
- Design and review by Board of Studies (BOS)
- Review by Senate Postgraduate Committee (SPGC)
- Review by Senate

Verification of design is conducted by comparison of the design with similar courses run by prestigious universities. Evolved designs are also verified by taking independent opinions of the experts from amongst the peer group from within or outside the university. The new curriculum is introduced only after adequate verification

Revision of the courses in AY 2022-23:

Step 1. PG Coordinator sent an email to all the faculty of the Department of Mathematics and CSED department

Step 2: Received Inputs from the faculty members. For examples the inputs of the some of the courses are mentioned in the Annexture I

Step 3: A BoS meeting is called and conducted by Head of the Department BoS Minutes.

Step 4. The university level committee approved the BoS minutes in SPGC Meeting.

The minutes of SPGC shall be approved from the Senate of the Institute.

Annexture I

THAPAR INSTITUTE
OF ENGINEERING & TECHNOLOGY
(Deemed to be University)

PRAMOD KUMAR VAISHNAV <pramod.kumar@thapar.edu>

Regarding revision in MSc syllabus

2 messages

Paramjeet Singh <paramjeet.singh@thapar.edu> Mon, Jan 3, 2022 at 11:55 AM
To: SOM Faculty <som_faculty@thapar.edu>
Cc: Head SoM <hsom@thapar.edu>

Dear All

We are in the process of revising the syllabus of MSc courses. In this regard, the faculty members have been assigned some courses to revise.

In each course, two faculty members have been assigned. The first faculty member will be responsible for sending the changes. Other faculty members (not listed in a particular course) can also give their inputs to the assigned faculty members.

While sending the changes, please mention on a separate page: contents added/deleted, specify CLO changes and also provide the latest version of reference books.

Attached is the MSc (Mathematics) scheme. Common courses of MSc (Math and Computing) will be changed from MSc (Math). Computing courses are to be sent to Head, CSED for inputs.

You are requested to provide the changes asap but **no later than January 20, 2022** as BOS will be conducted in this month. Please feel free to contact me for any clarifications.

Best regards,
Paramjeet
--
Assistant Professor
School of Mathematics
Thapar Institute of Engineering and Technology
(Deemed University)
Patiala 147004
India

Proposed Changes: **Mechanics PMA110**

Sr. No.	Proposed changes	Remarks
1	Removed the content : Disturbed orbit, Moving origins, Momental ellipsoid, Centre of percussion, Lagendre transformation, Contact transformation, Hamilton-Jacobi Poisson equations.	To reduce the content in the syllabus , it has been observed that some other important topics are not covered that are important for the national level examinations such as GATE, NET etc.
2	pendulum and projectile motion in a restricted medium, Central forces, Apses and apsidal distances, Stability of orbits, Kepler's laws of planetary motion.	Restructuring the lines
3	Changes proposed in CLO5 CLO5: obtain canonical equations using different combinations of generating functions and subsequently developing Hamilton Jacobi method to solve equations of motion. **CLO5 Modified:** obtain canonical equations using different combinations of generating functions	CLOs rewritten to be discussed in BOS meeting
3	Mann P., Lagrangian and Hamiltonian Dynamics, 2018	This book is introduced into the recommended books section. It contains the many applications of the Lagrangian and Hamiltonian mechanics.

SCHOOL OF MATHEMATICS

MINUTES OF THE MEETING OF THE BOARD OF STUDIES (BOS) OF SCHOOL OF MATHEMATICS HELD ON MAY 13, 2022 AT 3:30 P.M. IN THE ROOM NUMBER G-303, SCHOOL OF MATHEMATICS.

The following members attended the meeting:

1.	Dr. Mahesh Kumar Sharma	Chairman	Present
2.	Dr. S. S. Bhatia	Member	Present
3.	Dr. S. S. Dhaliwal	Member	Present
4.	Dr. Kapil Sharma	Member	Present
5.	Dr. Rajesh Kumar	Member	Present
6.	Dr. A. K. Lal	Member	Present
7.	Dr. Deepak Gumber	Member	Present
8.	Dr. Sapna Sharma	Member	Present
9.	Dr. Jatinderdeep Kaur	Member	Present
10.	Dr. Sanjeev Kumar	Member	Present
11.	Dr. Kavita	Member	Present
12.	Dr. Paramjeet Singh	Member	PG-Co-ordinator
13.	Dr. Pramod Kr. Vaishnav	Member	PG-Co-coordinator

PROCEEDINGS

Chairman, BOS welcomed the members of Board of Studies, School of Mathematics. The syllabi of M.Sc (Mathematics), M.Sc (Mathematics & Computing) and PG courses (M.Tech and Ph.D) the following courses were put forward for minor revisons:

1. PMA107 – Real Analysis
2. PMA108 – Algebra I

3. PMA109- Ordinary Differential Equations
4. PMA110-Mechanics
5. PMA111-Computer Programming
6. PMA205-Algebra II
7. PMA206-Partial Differential Equations
8. PMA207-Complex Analysis
9. PMA208-Numerical Analysis
10. PMA301-Functional Analysis
11. PMA302-Topology
12. PMA303-Probability and Statistics
13. PMA401-Number Theory
14. PMA325-Operator Theory
15. PMA326-Enumerative Combinatorics
16. PMC105-Discrete Mathematical Structures
17. PMC327-Machine Learning and Applications
18. PCL-108-Statiscal Methods and Algorithms
19. DMC-007- Research Methodology
20. DMC-013-Research Methodology

The members discussed the proposed syllabi. As per the advice of BOS members the syllabus have been modified. The revised syllabus is attached herewith.

Dr. Mahesh Sharma	Dr. S. S. Bhatia 13.5.22	Dr. S. S. Dhaliwal	Dr. Kapil Sharma
(Chairman)	(Member)	(Member)	(Member)
13/05/2022	13.5.22		
Dr. Rajesh Kumar	Dr. A. K. Lal	Dr. Deepak Gumber	Dr. Sapna Sharma
(Member)	(Member)	(Member)	(Member)

Dr. Jatinderdeep Kaur
(Member)

Dr. Sanjeev Kumar
(Member)

Dr. Kavita
(Member)

Dr. Parashjeet Singh
(PG-Coordinator)

Dr. Pramod Kumar Vaishnav
(PG-Co-coordinator)

THAPAR INSTITUTE OF ENGINEERING AND TECHNOLOGY: PATIALA

(Deemed to be University)

MINUTES OF THE 86TH MEETING OF SENATE POST GRADUATE COMMITTEE (SPGC) HELD ON 17 MAY, 2022 IN C-HALL.

PRESENT

The attendance sheet is placed at Annexure-A.

OPENING REMARKS BY THE CHAIRMAN

The Chairman welcomed the members to the 86th meeting of the SPGC.

PG 86.1 CONFIRMATION OF THE MINUTES:

The minutes of the 85th meeting of the SPGC held on October 14, 2021 were confirmed.

PG.86.2 ACTION TAKEN REPORT

The SPGC noted the action taken report.

PG 86.3 REVISION IN SCHEME AND SYLLABI OF ME-CAD/CAM ENGG

The SPGC discussed the minor revisions suggested by the BoS of MED in the schemes of ME-CCE and recommended the same to the Senate. Further the SPGC suggested that in the new course 'Machine condition monitoring and fault diagnosis' being offered in the Elective basket, L-T-P should be 2-1-2 instead of 3-1-0.

PG 86.4 REVISION IN SYLLABI OF COURSES OF ME-THERMAL ENGG

The SPGC discussed the minor revisions in the syllabi of Applied Solar Energy (PTH206) and Advanced Heat Transfer (PTH102) offered to ME-THE students and recommended the same to Senate for approval.

PG 86.5 REVISION IN SCHEME OF MCA W.E.F. 2022 BATCH

The SPGC discussed the minor revisions in the scheme of MCA – 2022 batch and recommended the same to Senate for approval.

PG 86.6 REVISION IN SYLLABI OF COURSES OFFERED BY SCHOOL OF MATHEMATICS (SOM)

The SPGC discussed the minor revisions in the syllabi of courses offered by SOM to the PG programmes and recommended the same to Senate for approval.

PG 86.7 PROPOSAL TO IMPROVE ADMISSION IN ME-POWER SYSTEM

The item was dropped as the same is under discussion by the committee under the chairmanship of Deputy Director.

PG 86.8 TO DISCUSS PHD SUPERVISION CONTINUATION AFTER FACULTY MEMBER HAS RESIGNED FROM THE INSTITUTE

The SPGC discussed the scenario when a supervisor, guiding a PhD student individually leaves the Institute and recommended that Doctoral committee should be empowered to take the call on the PhD guide on the request of the student.

PG 86.9 REVISION IN ADMISSION CRITERIA OF MSc – PHYSICS

The SPGC discussed the revised eligibility criteria for admission to MSc – Physics programme and recommended the following to Senate for approval.

Existing Criteria	**Proposed Criteria**
Recognised Bachelor's degree in Science of minimum 3-years duration with 60% (55% for SC/ST) marks in aggregate and Physics as one of the subject at the graduation level.	Recognised Bachelor's degree in Science/Engineering/Technology of minimum 3-years duration with 60% (55% for SC/ST) marks in aggregate and Physics as one of the subjects at the graduation level.

PG 86.10 REVISION IN SCHEME OF MSc - BIOTECHNOLOGY

The SPGC discussed the minor revisions in the scheme of MSc – Biotechnology and recommended the same to Senate for approval.

PG 86.11 REVISION IN SCHEME OF MTech - BIOTECHNOLOGY

The SPGC discussed the minor revisions in the scheme of MTech – Biotechnology and recommended the same to Senate for approval. Further the SPGC advised the HBTD to finalize the evaluation scheme of a course offered through MOOC platform in the scheme of MTech – Biotechnology and place the same in the next Senate meeting.

PG 86.12 TO SHIFT MA-PSYCHOLOGY PROGRAMME FROM SCHOOL OF HUMANITIES AND SOCIAL SCIENCES (SHSS) TO THAPAR SCHOOL OF LIBERAL ARTS AND SCIENCES (TSLAS)

The SPGC recommended the proposal of SPPC of SHSS to shift the MA-Psychology programme from SHSS to TSLAS and and recommended the same to Senate for approval.

The meeting ended with a vote of thanks to the Chair.

(Maninder Singh)
Chairman

(Hunish Bansal)
Asstt. Registrar (Academics)