MANIPUR UNIVERSITY
FOUR YEAR UNDERGRADUATE PROGRAMME (FYUP)
IN MATHEMATICS, 2025

INTRODUCTION

The Undergraduate (UG) syllabus of Mathematics in light of New Education Policy (NEP), 2020 consists of Major (Core) disciplines, Minor disciplines, Multi-Disciplinary Courses (MDC), Ability Enhancement Courses (AEC), Value Added Courses (VAC), Skill Enhancement Courses (SEC), Research Methodology, Dissertation (Collection of Data, Analysis and Preparation of Report) and Discipline Specific Electives (DSE).

The UG degree programme offers certificates, diplomas and degrees as follows:

UG Certificate: Certificate course consists of two Major disciplines, two Minor disciplines, two MDC, two AEC, two VAC and two SEC and one internship.

UG Diploma: Diploma course consists of eight Major disciplines, four Minor disciplines, three MDC, two AEC, three VAC, three SEC and one internship.

3-year UG Degree: 3-year UG degree course consists of fifteen Major disciplines, six Minor disciplines, three MDC, two AEC, three VAC, three SEC, Community engagement (NCC/NSS/Adult Education/Student mentoring/ NGO/ Govt. Institutions, etc.) and Internship.

4-year Honours/Honours with Research Degree: 4-year honours degree course consists of twenty Major disciplines, eight Minor disciplines, three MDC, two AEC, three VAC, three SEC, Community engagement (NCC/NSS/Adult Education/Student mentoring/ NGO/ Govt. Institutions, etc.), Internship, Research Methodology, three DSE/Dissertation.

AIMS FOR UG DEGREE IN MATHEMATICS

The UG Programme in mathematics is designed to teach students how to think critically, logically, and analytically, which enables them to employ mathematical reasoning in real-world situations. A UG degree in mathematics will expose students to a variety of intriguing and practical concepts that will help them in their preparation for a variety of mathematics-oriented jobs in industry, government, business, commerce, finance and research.

The programme covers broad range of topics on pure and applied mathematics. Also covers hands-on sessions in Computer Lab using various software, LaTaX, Python, MATLAB etc. which enables students to corelate and compare with recent developments in various branches of mathematics in a variety of organisations worldwide.

The programme aims to increase students' skill in mathematics as well as other cross-disciplinary subjects like commerce, physics, computer sciences, economics, and statistics etc. They have the option to undertake these courses through MOOCs/SWAYAM. They have flexibility to move from one discipline to another, to move one institution to another, to switch alternative modes of learning.

ATTRIBUTES OF A GRADUATE IN MATHEMATICS

Core Competency: Graduates will be well-versed in mathematical theories, concepts, and techniques, enabling them to solve challenging problems and pursue advanced study in mathematics or related fields.

Critical Thinking : Graduates will acquire the analytical and critical thinking abilities needed to formulate, evaluate, and resolve real-world issues using logical reasoning and mathematical modelling.

Problem-solving: Graduates will be adept at using computational tools and mathematical concepts to solve problems in a variety of sectors, including science, engineering, technology, and economics.

Communication Skills: Graduates will be able to effectively convey mathematical concepts, both orally and in writing, as well as collaborate in multidisciplinary teams to solve challenging problems.

Moral and Ethical Awareness: Graduates will exhibit a dedication to moral behaviour and professional obligations, which include comprehending how mathematical solutions affect society and maintaining a high standard of professional development.

Research Skills: Graduates will be equipped with the capacity to carry out autonomous research, enhancing their understanding of mathematics and stimulating their imagination in addressing abstract and practical issues.

Qualification Descriptors

The qualification descriptor suggests the generic outcomes and attributes to be obtained while obtaining the degree of B.A./B.Sc. (Major) Mathematics or B.A./B.Sc. with Mathematics as a minor subject. The qualification descriptors indicate the academic standards on the basis of following factors:

i. Level of knowledge
ii. Understanding
iii. Skills
iv. Competencies and attitudes
v. Values

PROGRAMME LEARNING OUTCOME

PLO1 **Disciplinary knowledge**: Bachelor degree in Mathematics is the culmination of in-depth knowledge of Algebra, Calculus, geometry, Real analysis, Differential equations and several other branches of pure and applied mathematics, this also leads to study of relevant areas such as computer science and other disciplines.

PLO2 **Communication Skills**: Ability to communicate the various mathematical concepts effectively using variety of examples mostly having real life applications and their geometric visualization. The skills and knowledge gained in this programme will lead to the proficiency in analytical reasoning which can be used to express thoughts and views in mathematically or logically correct statements.

PLO3 **Critical thinking and analytical reasoning**: The students undergoing this programme acquire the ability of critical thinking and logical reasoning and will apply in formulating or generalizing specific hypothesis, conclusion. The learner will be able to recognize and distinguish the various aspects of real-life problems.

PLO4 **Problem solving**: The Mathematical knowledge gained by the student through this programme develops an ability to solve the problems, identify and define appropriate computing requirements for its solutions. This programme will enhance the overall development.

PLO5 **Research related skills**: After the completion of this programme, the student will develop the capability of inquiring about appropriate questions relating to the Mathematical concepts, arguments. He/she will be able to define problems, formulate hypothesis, proofs, write the results obtained clearly.

PLO6 **Information/ digital literacy**: The completion of this programme will enable the learner to use appropriate softwares to solve the system of algebraic and differential equations.

PLO7 **Self-directed learning**: The student after the completion of the programme will be able to work independently, make an in-depth search of various areas of Mathematics and resources for self learning in order to enhance knowledge in mathematics.

PLO8 **Moral and ethical awareness / reasoning**: The student after the completion of the course will develop an ability to identify unethical behaviour such as fabrication, falsification or misinterpretation of data and adopting objectives, unbiased and truthful actions in all aspects of life in general and Mathematical studies in particular.

PLO9 **Lifelong learning**: This programme provides self directed learning and lifelong learning skills. With these skills, the learner will be able to think independently, improve personal development.

Programme Specific Outcomes

PSO1: Demonstrate the acquisition of comprehensive knowledge and coherent understanding in chosen elective and core subjects in mathematics.

PSO2: Apply mathematical techniques and tools, such as mathematical modeling, computational methods, and statistical analysis, to solve real-world problems in various fields.

PSO3: Possess strong analytical and critical thinking skills, enabling them to construct rigorous logical arguments, develop proofs, and solve complex mathematical problems.

PSO4: Proficient in using modern mathematical software and computational tools such as LaTeX, Python, MATLAB, and other relevant technologies to analyze data and solve mathematical problems.

PSO5: Communicate mathematical ideas and solutions to a variety of audiences, including mathematicians, scientists, engineers, and non-specialists, both orally and in writing.

PSO6: Formulate research questions, literature review, methodology, presentation of findings, and demonstrate dedication to lifelong learning and professional development.

PSO7: Utilize the skills that necessary for success in national level competitive exams, pursuing doctoral research degree, teaching and others.

Course Structure of the
FOUR YEAR UNDERGRADUATE PROGRAMME (FYUP)
IN MATHEMATICS, 2025 BASED ON NEP-2020

Semester	Course		Title of the paper	Credit
	Category	Code		
I (FIRST)	Major	**MJC45MAT101(T)25**	Algebra	4
	Minor	**MNC45MAT101(T)25**	Algebra	4
	MDC	**MDC45MSC101(T)25**	Quantitative Aptitude	3
	AEC			4
	SEC	**SEC45MAT101(T)25** **SEC45MAT101(P)25**	LaTeX	3
	VAC			2
	Total Credit			20

MJC45MAT101(T)25 : Algebra

Nature of Course	**Major**			
Course Code	**MJC45MAT101(T)25**			
Course Title	**Algebra**			
Course Level	**100**			
Credit Details	**Total Credit**	**Lecture/Week**	**Tutorial/Week**	**Total Hour/Week**
	4	**3**	**1**	**4**
Course Audience	**BA/BSc First Semester**			
Proposed by	**Board of Under-Graduate Studies of Department of Mathematics, Manipur University**			
Pre Requisites	**Set, function, matrix, determinant, polynomial, equation, inequation, means.**			
Pre Requisite Course Required	**10+2 Mathematics**			
Faculty Eligibility and Specialization	**Not required**			

Course Objectives: The primary objective of this course is to introduce the basic tools of theory of equations, complex numbers, number theory and matrices to understand their linkage to the real-world problems.

Course Learning Outcomes: After completion of the course, a student will be able to

1.	Employ De Moivre's theorem in a number of applications to solve numerical problems.
2.	Solve polynomial equations of degree three and four.
3.	Solve problems based on standard inequalities.
4.	Recognize consistent and inconsistent systems of linear equations by using rank.

Detailed Syllabus Content

Unit	Unit Name	Detailed Syllabus	L	T	P	Total
I	De Moivre's theorem	De Moivre's theorem for integer and rational indices, applications of De Moivre's theorem, summation of series	9	3	-	12
II	Polynomial equations	Polynomial functions, polynomial equations, fundamental theorem of algebra (statement only), Descarte's rule of signs, relation between roots and coefficients of a polynomial equation, symmetric function of the roots of an equation, sum of powers of the roots, Cardan's method of cubic and Ferrari's method for biquadratic equations.	9	3	-	12
III	Inequalities	Arithmetic mean, geometric mean, mean of m^{th} power, Cauchy-Schwartz inequality, inequalities of Holder, Minkowski and Chebyshev.	9	3	-	12
IV	Matrices	Rank of a matrix, linear independence, rank and elementary operations, row reduction and echelon forms, system of linear equations, solution of the matrix equation AX=B, solution sets of linear systems.	9	3	-	12
V	Matrices	Characteristic equation, eigenvectors and eigen values, Cayley- Hamilton theorem, inverse of matrix, orthogonal matrix.	9	3	-	12

Suggested Readings

1. **MK Singal, Asha Rani Singal,** (2020); *Algebra* (31st Ed) R Chand & Co, New Delhi.
2. **Chandrika Prasad,** (2014). *Text Book on Algebra and Theory of Equations* Pothishala Pvt. Ltd, Allahabad.

Additional Readings:

1. **Kolman, Bernard, & Hill, David R.** (2001). *Introductory Linear Algebra with Applications* (7th ed.). Pearson Education, Delhi. First Indian Reprint 2003.
2. **Lay, David C., Lay, Steven R., & McDonald, Judi J.** (2016). *Linear Algebra and its Applications* (5th ed.). Pearson Education.
3. **Andrilli, Stephen, & Hecker, David** (2016). *Elementary Linear Algebr*a (5th ed.). Academic Press, Elsevier India Private Limited.

Teaching plan (MJC45MAT101(T)25: Algebra):

Week 1: De Moivre's theorem for integer and rational indices [1] Chapter 5 (Section 2, 4).
Week 2: Applications of De Moivre's theorem to various problems. [1] Chapter-5 (Section-3.1 to 3.4)
Week 3: Summation of series. [1] Chapter-5 (Section-3.5)
Week 4: Polynomial functions, polynomial equation, fundamental theorem of algebra (statement only), and related problems**.** [1] Chapter-4 (Section-5, 6, 7)
Week 5: Descarte's rule of signs, relation between roots and coefficients of a polynomial equation and related problems. [1] Chapter-4(section-7, 8, 9)
Week 6: Symmetric function of the roots of an equation, sum of powers of the roots and related problems. [1] Chapter-4(section-10, 11)
Week 7: Arithmatic mean, geometric mean, mean of m^{th} power and related problems. [2] Chapter-3 (Section-3.3, 3.4, 3.41, 3.42, 3.43, 3.5, 3.51)
Week 8: Cauchy-Schwartz inequality. [2] Chapter-3 (Section-3.7)
Weak 9: Inequalities of Holder, Minkowski and Chebyshev and related problems. [2] Chapter-3 (Section-3.7)
Week 10: Row reduction and Echelon forms, rank of a matrix, linear independence, rank and elementary operations.
[2] Chapter-6(Section-6.4, 6.41 to 6.46, 6.67, 6.7),
Week 11: System of linear equations, solution of the matrix equation AX=B;
[1] Chapter-6(Section-13, 15)
Week 12: Solution sets of linear systems; [1] Chapter 7 (Section-7.2 &7.3)
Week 13: Characteristic equation, eigenvectors and eigen values; [2] Chapter 6 (Section 6.6, 6.61).
Week 14: Cayley-Hamilton theorem; [2] Chapter 6 (Section 6.63).
Week 15: Inverse of matrix, orthogonal matrix. [2] Chapter-6 (Section-6.7, 6.8)

Assessment Methods

- Oral and written examinations,
- Closed-book and open-book tests,
- Problem-solving exercises,
- Individual and group project reports,
- Seminar and presentations,
- Interactive sessions,

MNC45MAT101(T)25 : Algebra

Nature of Course	**Minor**			
Course Code	**MNC45MAT101(T)25**			
Course Title	**Algebra**			
Course Level	**100**			
Credit Details	**Total Credit**	**Lecture/Week**	**Tutorial/Week**	**Total Hour/Week**
	4	**3**	**1**	**4**
Course Audience	**BA/BSc First Semester**			
Proposed by	**Board of Under-Graduate Studies of Department of Mathematics, Manipur University**			
Pre Requisites	**Set, function, matrix, determinant, polynomial, equation, inequation, means.**			
Pre Requisite Course Required	**10+2 Mathematics**			
Faculty Eligibility and Specialization	**Not required**			

Course Objectives: The primary objective of this course is to introduce the basic tools of theory of equations, complex numbers, number theory and matrices to understand their linkage to the real-world problems.

Course Learning Outcomes: After completion of the course, a student will be able to

1.	Employ De Moivre's theorem in a number of applications to solve numerical problems.
2.	Solve polynomial equations of degree three and four.
3.	Solve problems based on standard inequalities.
4.	Recognize consistent and inconsistent systems of linear equations by using rank.

Detailed Syllabus Content

Unit	Unit Name	Detailed Syllabus	L	T	P	Total
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III	Inequalities	Arithmetic mean, geometric mean, mean of m^{th} power, Cauchy-Schwartz inequality, inequalities of Holder, Minkowski and Chebyshev.	9	3	-	12
IV	Matrices	Rank of a matrix, linear independence, rank and elementary operations, row reduction and echelon forms, system of linear equations, solution of the matrix equation AX=B, solution sets of linear systems.	9	3	-	12
V	Matrices	Characteristic equation, eigenvectors and eigen values, Cayley- Hamilton theorem, inverse of matrix, orthogonal matrix.	9	3	-	12

Suggested Readings

1. **MK Singal, Asha Rani Singal,** (2020); *Algebra* (31st Ed) R Chand & Co, New Delhi.
2. **Chandrika Prasad,** (2014). *Text Book on Algebra and Theory of Equations* Pothishala Pvt. Ltd. Allahabad.

Additional Readings:

1. **Kolman, Bernard, & Hill, David R.** (2001). *Introductory Linear Algebra with Applications* (7th ed.). Pearson Education, Delhi. First Indian Reprint 2003.
2. **Lay, David C., Lay, Steven R., & McDonald, Judi J.** (2016). *Linear Algebra and its Applications* (5th ed.). Pearson Education.
3. **Andrilli, Stephen, & Hecker, David** (2016). *Elementary Linear Algebr*a (5th ed.). Academic Press, Elsevier India Private Limited.

Teaching plan (MNC45MAT101(T)25: Algebra):

Week 1: De Moivre's theorem for integer and rational indices [1] Chapter 5 (Section 2, 4).
Week 2: Applications of De Moivre's theorem to various problems. [1] Chapter-5 (Section-3.1 to 3.4)
Week 3: Summation of series. [1] Chapter-5 (Section-3.5)
Week 4: Polynomial functions, polynomial equation, fundamental theorem of algebra (statement only), and related problems**.** [1] Chapter-4 (Section-5, 6, 7)
Week 5: Descarte's rule of signs, relation between roots and coefficients of a polynomial equation and related problems. [1] Chapter-4(section-7, 8, 9)
Week 6: Symmetric function of the roots of an equation, sum of powers of the roots and related problems. [1] Chapter-4(section-10, 11)
Week 7: Arithmatic mean, geometric mean, mean of m^{th} power and related problems. [2] Chapter-3 (Section-3.3, 3.4, 3.41, 3.42, 3.43, 3.5, 3.51)
Week 8: Cauchy-Schwartz inequality. [2] Chapter-3 (Section-3.7)
Weak 9: Inequalities of Holder, Minkowski and Chebyshev and related problems. [2] Chapter-3 (Section-3.7)
Week 10: Row reduction and Echelon forms, rank of a matrix, linear independence, rank and elementary operations.
[2] Chapter-6(Section-6.4, 6.41 to 6.46, 6.67, 6.7),
Week 11: System of linear equations, solution of the matrix equation AX=B;
[1] Chapter-6(Section-13, 15)
Week 12: Solution sets of linear systems; [1] Chapter 7 (Section-7.2 &7.3)
Week 13: Characteristic equation, eigenvectors and eigen values; [2] Chapter 6 (Section 6.6, 6.61).
Week 14: Cayley-Hamilton theorem; [2] Chapter 6 (Section 6.63).
Week 15: Inverse of matrix, orthogonal matrix. [2] Chapter-6 (Section-6.7, 6.8)

Assessment Methods

- Oral and written examinations,
- Closed-book and open-book tests,
- Problem-solving exercises,
- Individual and group project reports,
- Seminar and presentations,
- Interactive sessions,

MDC45MSC101(T)25 : Quantitative Aptitude

Nature of Course	**MDC**			
Course Code	**MDC45MSC101(T)25**			
Course Title	**Quantitative Aptitude**			
Course Level	**100**			
Credit Details	**Total Credit**	**Lecture/Week**	**Tutorial/Week**	**Total Hour/Week**
	3	**3**	**0**	**3**
Course Audience	**BA/BSc First Semester**			
Proposed by	**Board of Under-Graduate Studies of Department of Mathematics, Manipur University**			
Pre Requisites	**Concept of unitary methods, ratio and proportion, mensuration, arrangements**			
Pre Requisite Course Required	**10 Mathematics**			
Faculty Eligibility and Specialization	**Not required**			

Course Objectives: The main aim of this course is to gain knowledge of elementary ideas about arithmetic abilities which one finds in daily life. It will help the students from any background to get acquainted with this knowledge and get prepared for any competitive examinations.

Course Learning Outcomes: This course will enable the students to:

1.	gain sufficient ideas of mental and arithmetic abilities.
2.	handle mental/quantitative aptitude test questions with great ease.
3.	acquire the skill of solving problems of daily life quickly.
4.	formulate real-life problems mathematically and solve using quantitative techniques.

Detailed Syllabus Content

Unit	Unit Name	Detailed Syllabus	L	T	P	Total
I	Arithmetic Ability I	Chain Rule –Time and Work – Pipes and Cisterns Time and Distance – Problems on Trains – Boats and Streams	12	-	-	12
II	Arithmetic Ability II	Simple Interest – Compound Interest – Stocks and Shares.	9	-	-	9
III	Arithmetic Ability III	Clocks – Area	6	-	-	6
IV	Arithmetic Ability IV	Volume and Surface Area	9	-	-	9
V	Arithmetic Ability V	Permutations and Combinations.	9	-	-	9

Suggested Readings

1. Scope and treatment as in "*Quantitative Aptitude*", S. Chand and Company Ltd. Ram Nagar, New Delhi (2007).

Additional Readings:

1. NCERT Mathematics text books for standard VIII, IX, X, XI.

Teaching plan (MDC45MSC101(T)25: Quantitative Aptitude):

1. **Week 1&2:** Chain Rule –Time and Work – Pipes and Cisterns,[1] Chapters 14, 15 & 16.
2. **Week 3&4: Time** and Distance-Problems on Trains-Boats and Streams [1] Chapters 21, 22 & 29.
3. **Week 5-7:** Simple Interest-Compound Interest-Stocks and Shares. [1] Chapters 17, 18 & 19.
4. **Week 8 & 9:** Clocks – Area [1] Chapters 24, 25.
5. **Week 10-12:** Volume and Surface Area. [1] Chapter 28.
6. **Week 13-15:** Permutations and Combinations. [1] Chapters 30 & 31.

Assessment Methods

- Oral and written examinations,
- Problem-solving exercises,
- Individual and group project reports,
- Interactive sessions,

SEC45MAT101(T)25 : La*TeX* (Theory)

Nature of Course	**SEC**			
Course Code	**SEC45MAT101(T)25**			
Course Title	**LaTeX (Theory)**			
Course Level	**100**			
Credit Details	**Total Credit**	**Lecture/Week**	**Tutorial/Week**	**Total Hour/Week**
	2	**2**	**0**	**2**
Course Audience	**BA/BSc First Semester**			
Proposed by	**Board of Under-Graduate Studies of Department of Mathematics, Manipur University**			
Pre Requisites	**Basic Computer Literacy**			
Pre Requisite Course Required	**10+2 Mathematics**			
Faculty Eligibility and Specialization	**Master in Mathematics with Computer Programming knowledge**			

Course Objectives: The purpose of this course is to acquaint students with the latest typesetting skills, which shall enable them to prepare high quality typesetting, beamer presentation and webpages.

Course Learning Outcomes: After studying this course the student will be able to:

1.	typeset mathematical formulas, use nested list, tabular & array environments.
2.	create or import graphics.
3.	use beamer to create presentation.

Detailed Syllabus Content

Unit	Unit Name	Detailed Syllabus	L	T	P	Total
I	Getting Started with La*TeX*	Introduction to *TeX* and La*TeX*, Typesetting a simple document, Adding basic information to a document, Environments, Footnotes, Sectioning and displayed material.	6	-	-	6
II	Mathematical Typesetting with La*TeX*-I	Accents and symbols, Mathematical Typesetting (Elementary and Advanced)**:** Subscript/ Superscript, Fractions, Roots, Ellipsis, Mathematical Symbols.	6	-	-	6
III	Mathematical Typesetting with La*TeX*-II	Arrays, Tables, Delimiters, Multiline formulas, Spacing and changing style in math mode.	6	-	-	6
IV	Graphics in La*TeX*	Graphics in LaTeX, Simple pictures using PS Tricks, Plotting of functions.	6	-	-	6
V	Beamer Presentation in La*TeX*	Beamer presentation.	6	-	-	6

SEC45MAT101(P)25 : La*TeX* (Practical)

Nature of Course	**SEC**			
Course Code	**SEC45MAT101(P)25**			
Course Title	**La*TeX* (Practical)**			
Course Level	**100**			
Credit Details	**Total Credit**	**Lecture/Week**	**Tutorial/Week**	**Total Hour/Week**
	1	**1**	**0**	**2**
Course Audience	**BA/BSc First Semester**			
Proposed by	**Board of Under-Graduate Studies of Department of Mathematics, Manipur University**			
Pre Requisites	**Basic Computer Literacy**			
Pre Requisite Course Required	**10+2 Mathematics**			
Faculty Eligibility and Specialization	**Master in Mathematics with Computer Programming knowledge**			

Course Objectives: The purpose of this course is to acquaint students with the latest typesetting skills, which shall enable them to prepare high quality typesetting, beamer presentation and webpages.

Course Learning Outcomes: After studying this course the student will be able to:

1.	typeset mathematical formulas, use nested list, tabular & array environments.
2.	create or import graphics.
3.	use beamer to create presentation.

Detailed Syllabus Content

Unit	Unit Name	List of Practicals	L	T	P	Total
I	LaTeX Practical-1	[1] Chapter 9 (Exercises 4 to 10)	-	-	4	4
II	LaTeX Practical-2	[1] Chapter 10 (Exercises 1 to 4 and 6 to 9)	-	-	4	4
III	LaTeX Practical-3	[1] Chapter 11 (Exercises 1, 3, 4, and 5)	-	-	3	3
IV	LaTeX Practical-4	[1] Chapter 15 (Exercises 5, 6 and 8 to 11).	-	-	4	4

Suggested Readings

1. **Bindner, Donald & Erickson, Martin.** (2011). *A Student's Guide to the Study, Practice, and Tools of Modern Mathematics*.CRC Press, Taylor & Francis Group, LLC.
2. **Lamport, Leslie** (1994). *LaTeX*: *A Document Preparation System*, User's Guide and Reference Manual (2nd ed.). Pearson Education.Indian Reprint.

Teaching Plan {SEC45MAT101(T)25 : La*TeX* (Theory)}:

Weeks 1 to 3: Introduction to TeX and LaTeX, Typesetting a simple document, Adding basic information to a document, Environments, Footnotes, Sectioning and displayed material.
[1] Chapter 9 (9.1 to 9.5)[2] Chapter 2 (2.1 to 2.5)

Weeks 4 to 6: Accents of symbols, Mathematical typesetting (elementary and advanced): subscript/superscript, Fractions, Roots, Ellipsis, Mathematical symbols..[1] Chapter 9 (9.6 and 9.7)

Weeks 7 to 9: Arrays, Delimiters, Multiline formulas, Spacing and changing style in math mode [2] Chapter 3 (3.1 to 3.3)

Weeks 10 to 12: Graphics in LaTeX, Simple pictures using PS Tricks, Plotting of functions.
[1] Chapter 9 (Section 9.8)[1] Chapter 10 (10.1 to 10.3)[2] Chapter 7 (7.1 and 7.2)

Weeks 13 to 15: Beamer presentation.
[1] Chapter 11 (Sections 11.1 to 11.4)

List of Essential Major Equipments

- **Computer Laboratory**

Essential Software (Open-source)

- **La*TeX***

Student Activities

- Practical assignments and laboratory reports,
- Interactive sessions,