

# Minutes of the board of studies of the Department of Mathematics

held on 9 Feb. 2019, Saturday at 10.00.a.m. in the Department of Mathematics, St. Xavier's College (Autonomous), Palayamkottai.

## **Members Present:**

1. Dr. S. Arulraj (Chairman)
2. Dr. A. Lourdasamy
3. Mrs. C. Caroline Selvaraj
4. Dr. Y. Therese Sunitha Mary
5. Dr. S. Nithya
6. Dr. S. Sujith
7. Dr. S. Balamurugan
8. Mr. A. Vinoth
9. Mr. J. Amal Rayan
10. Rev. Fr. A. Antony samy S.J.
11. Dr. A. Anto Kinsely
12. Mr. J. M. Prabhakar
13. Dr. S. Sethuramalingam
14. Ms. D. Saranya
15. Mrs. S. Philo
16. Mrs. D. Kirupa Packiya Rani
17. Dr. P. Srinivasan (AC Nominee)
18. Dr. Rajaram (AC Nominee)
19. Dr. R. Kala (University Nominee)

- 1. Arulraj
- Arulraj
- C. Caroline Selvaraj
- Y. Therese Sunitha
- S. Nithya
- S. Sujith
- S. Balamurugan
- A. Vinoth
- J. Amal Rayan
- A. Antony samy S.J.
- A. Anto Kinsely
- J. M. Prabhakar
- S. Sethuramalingam
- D. Saranya
- S. Philo
- D. Kirupa Packiya Rani
- P. Srinivasan
- Rajaram
- R. Kala

## **Members Absent:**

1. Dr. P. Xavier Raj
2. Rev. Fr. S. Arul Ravi S.J.
3. Prof. Selvakumar (Alumni)

The meeting was started at 10.00 a.m. with a silent prayer. The chairman of the board introduced the external members (University Nominee and External Experts) and Dr. A. Lourdasamy introduced the members of the board.

Dr. S. Sujith presented the minutes of the previous board held on 10-02-2018 and the board approved the same.

**The board discussed and recommended the following with immediate effect from the even semester of the academic year 2018-19.**

1. In the B.Sc. program, for the course "Application of Calculus (18 USB 22)", the question pattern for the semester examination is as follows.

Part A -  $5 \times 3 = 15$

Part B -  $5 \times 8 = 40$  ER

Part C -  $3 \times 15 = 45$  3/5 cat changed

2. For the M.Phil. program, the students are recommended to present a paper in a conference/to publish a paper in a journal.

**The board discussed and recommended the following from the academic year 2019-20.**

Under Graduate Program

1. For the course "Differential and Integral Calculus (18UMT11)", the books Calculus I and Calculus II by T.K. Manicavachagom Pillai and T. Natarajan can be considered as reference books.
2. In the course "Differential and Integral Calculus (18 UMT 11)", the course outcome no. 3 may be rewritten as "Evaluate integration using  $\beta$  and  $\gamma$  functions" instead of the statement "Evaluate integrals using  $\beta$  and  $\gamma$  functions"
3. For the course "Set theory, Theory of equations and Trigonometry (18 UMT 21)", the book "A Foundation course in Mathematics" by Ajith Kumar, Kumaresan and Baba Kumar sarma may be considered as a reference book.
4. For the course "Mathematical Logic ( 18 USB 22)", the book "A Foundation course in Mathematics" by Ajith Kumar, Kumaresan and Baba Kumar sarma may be considered as a reference book.
5. For the course "Abstract Algebra (18 UMT 51)", the book Contemporary Abstract Algebra by Joseph A. Gallian may be considered as a reference book.

### Post Graduate Program

1. For the course "Partial Differential Equations (18 PMT 34)", the book Introduction to Partial Differential Equations by K. Sankara Rao may be considered as a reference book.
2. For the course "Complex Analysis (18 PMT 33)" the page numbers of the text book for each chapters may be specified and also the book Complex Analysis by Joseph Bak, Donald J. Newman may be considered as a reference book.
3. For the course "Differential Geometry (18 PMT 42)", the book Differential Geometry of Curves and Surfaces by Manfredo P. Do Carmo may be considered as a reference book.

**The board discussed and recommended the following in the next revision of syllabus.**

### Under Graduate Program

1. For the course "Set theory, Theory of equations and Trigonometry (18 UMT 21)", the book by "Summation of Series and Trigonometry" by Dr. S.Arumugam and A.Thangapandi Isaac may be considered for unit I and the book "Trigonometry by S.Narayanan" by T.K.ManicavachagomPillay may be considered for units II to IV.
2. For the course "Application of Calculus (18 USB 22)", instead of the existing text book, the book "Engineering Mathematics" by Venkataraman may be considered.
3. For the course, Statistics I ( 18 UMTA 31), instead of the existing text book, the book titled "Fundamentals of Mathematical Statistics" by S.C. Gupta and V.K. Kapoor may be considered.
4. The course SBE 5 and SBE 6 may be interchanged.
5. For the course "Number theory (18 UMTE 41)", the book Elementary Number theory by Gareth A. Jones and J. Mary Jones may be considered as the text book.

### Post Graduate Program

1. For the course "Algebra I (18 PMT 11)", the book A First course in Abstract Algebra by John B. Fraleigh may be considered as the text book.
2. The course "Java (18 PMT 14)" may be replaced by R programming.
3. The course "Mathematica (18 PMTE 21)" may be replaced by SAGE programming language.
4. The algebra courses in the existing syllabus is as follows.

18 PMT 11 – Algebra – I

18 PMT 21 – Linear Algebra

18 PMT 31 - Algebra – II

The above order of the courses may be reorganized as given below.

18 PMT 11 – Linear Algebra

18 PMT 21 – Algebra – I

18 PMT 31 - Algebra – II

5. For the course "Fuzzy Sets (18 PMTE 31)", the book Intuitionistic Fuzzy Sets: Theory and Applications by Krassimir T. Atanassov may be considered as the texts book and also for the V unit, the topic operators in Fuzzy sets may be considered.
6. For the course "Differential Geometry (18 PMT 42)", the book Elementary Topics in Differential Geometry by Thorpe, J. A. may be considered as the text book.
7. The computer languages Latex, SAGE, Scilab and Octane may be considered for value added courses.

M.Phil. Program

1. "Fuzzy Graphs" may be considered as a paper for the project oriented elective.

Dr., S. Balamurugan who recorded the minutes of the meeting presented the resolutions and the board approved the same. Finally, Rev. Dr. A. Antony Samy S.J. proposed the vote of thanks and then the meeting came to an end.

*A. A. S. J.*

## Minutes of the board of studies of the Department of Mathematics

Minutes of the board of studies in Mathematics was held on 6.09.2019 at 12 pm in the Department of mathematics

Members present:

1. Dr. S. Arulraj (Chairman) *S. Arulraj*
2. Dr. A. Lourdudamy *A. Lourdudamy*
3. Mrs. C. Caroline Selvaraj *C. Caroline*
4. Dr. Y. Therese Sunitha Mary *Y. Therese Sunitha Mary*
5. Dr. S. Nithya *S. Nithya*
6. Dr. S. Sujith *S. Sujith*
7. Mr. A. Vinoth *A. Vinoth*
8. Rev. Dr. S. Arul Ravi SJ *S. Arul Ravi SJ*
9. Mr. J. Amal Rayan *J. Amal Rayan*
10. Dr. A. Anto Kinsley *A. Anto Kinsley*
11. Dr. J. M. Prabhakar *J. M. Prabhakar*
12. Dr. S. Sethu Ramalingam *S. Sethu Ramalingam*
13. Ms. D. Saranya *D. Saranya*
14. Mrs. S. Philo *S. Philo*
15. Mrs. D. Kirupa Packiya Rani *D. Kirupa Packiya Rani*
16. Mr. S. Sahayarajjoseph Nirmalkumar *S. Sahayarajjoseph Nirmalkumar*

Members Absent

1. Dr. P. Xavier Raj
2. Dr. S. Balamurugan

The board suggested to start "B.Sc- Mathematics" as an additional section(Batch III) in the self financing stream based on the increasing demand for B.Sc Mathematics during the past several years. The Current UG syllabus can be followed for the proposed programme.

*S. Arulraj*  
(Dr. S. ARULRAJ)

# Minutes of the board of studies of the Department of Mathematics

held on 8 Feb. 2020, Saturday at 10.00.a.m. in the Department of Mathematics, St. Xavier's College (Autonomous), Palayamkottai.

## Members Present:

1. Dr. S. Arulraj (Chairman)
2. Dr. A. Lourdasamy
3. Dr. P. Xavier Raj
4. Dr. C. Caroline Selvaraj
5. Dr. Y. Therese Sunitha Mary
6. Dr. S. Nithya
7. Dr. S. Sujith
8. Dr. S. Balamurugan
9. Mr. A. Vinoth
10. Rev. Fr. S. Arul Ravi S.J.
11. Mr. J. Amal Rayan
12. Dr. A. Anto Kinsley
13. Dr. J. M. Prabhakar
14. Dr. S. Sethuramalingam
15. Ms. D. Saranya
16. Mrs. S. Philo
17. Mrs. D. Kirupa Packiya Rani
18. Mr. S. Sahayaraj Joseph Nirmalkumar

- P. Arulraj
- A. Lourdasamy
- P. Xavier Raj
- C. Caroline Selvaraj
- Y. Therese Sunitha Mary
- S. Nithya
- S. Sujith
- S. Balamurugan
- A. Vinoth
- Rev. Fr. S. Arul Ravi S.J.
- J. Amal Rayan
- Dr. A. Anto Kinsley
- Dr. J. M. Prabhakar
- Dr. S. Sethuramalingam
- Ms. D. Saranya
- Mrs. S. Philo
- Mrs. D. Kirupa Packiya Rani
- Mr. S. Sahayaraj Joseph Nirmalkumar

19. Dr. Rajaram (AC Nominee)

- Rajaram

20. Dr. R. Kala (University Nominee)

- R. Kala  
8-2-2020

21. Prof. Selvakumar (Alumni)

22. B. JOESY (I.M.Sc) B. J. f

23. M. VIMAL (U.B.Sc) M.V. f

Members Absent:

2/2/20

Dr. P. Srinivasan (AC Nominee)

The meeting was started at 10.00.a.m. with a prayer by Rev. Fr. S. Arul Ravi S.J. Dr. A. Lourdasamy welcomed the members and introduced the experts.

Dr. S. Sujith presented the minutes of the previous board held on 9- 02- 2019 and the board approved the same.

**The board discussed and recommended the following from the academic year 2020-21.**

In the M.Sc. (Mathematics) syllabus, the board suggested to make changes in the following subjects based on the

In Algebra I (18 PMT 11), the board feel the content is very heavy and therefore the board suggested to remove some sections and the remaining sections may be rearranged accordingly.

For Complex Analysis ( 18 PMT 33 ), Unit V is removed and Unit IV is separated in to Unit IV and Unit V.

For Graph Theory ( 18 PMT 43 ), in Unit II for section 7.1 only definitions and examples can be considered and section 7.2 may be removed.

In the B.Sc. (Mathematics) syllabus, the board suggested to make changes in the following subjects.

In the paper Set theory, Theory of equations and Trigonometry ( 18 UMT 21 ), Chapter I may be removed from Unit I as it is a typing error.

**The board discussed and recommended the following in the next revision of syllabus.**

**In M.Sc. (Mathematics) syllabus, the board suggested the following.**

Numerical Analysis by Sastri and Ayyangar may be considered for PG syllabus instead of Computer Oriented Numerical Methods.

Algebra may be separated in to three papers.

The paper Fuzzy Theory may be considered instead of the existing paper Fuzzy sets. Also the concept of Intuitionistic Fuzzy by Xu may be considered as a section in Fuzzy Theory.

In the B.Sc. (Mathematics) syllabus, the board suggested the following.

CONM may be considered as a paper instead of Numerical methods.

For the papers Statistics I and II, the book Fundamentals of Mathematical Statistics by S.C. Gupta and V.K. Kapoor can be considered as the text book

For Analytic Geometry, the book prescribed by UGC may be considered as a text book. Also, the book Analytical Geometry by Anton may also be considered.

For Differential Equations and Fourier series, the book by Manickavasakam pillai may be considered as a text book instead of the book Differential Equation and Applications by Arumugam Issac.

For Linear Algebra, the book by Kumaresan may be considered instead of the existing book by Santiago.

For Complex Analysis, the book by Alphors may be considered as the text book instead of the existing book by Karunakaran.

**For PG admission, entrance examination may be considered.** For admitting the students in M.Sc. (Mathematics) 50% weightage may be given to the entrance marks the remaining 50% weightage may be given to B.Sc. mark.

Dr. S. Balamurugan who recorded the minutes of the meeting presented the resolutions and the board approved the same. Finally, Dr. S. Arul Raj proposed the vote of thanks and then the meeting came to an end.

S. Arul Raj  
(Dr. S. ARULRAJ)



# SET THEORY, THEORY OF EQUATIONS AND TRIGONOMETRY

(Course Code: 18 UMT 21)

Semester - II

Core - 2

Hours - 6

Credits - 5

- Course Outcomes:** The students will acquire the knowledge of
1. learning the fundamentals of sets, relations and mappings
  2. the relation between the roots and the coefficients of equation
  3. solving problems using transformation of equations
  4. applications of De Moivre's theorem
  5. trigonometric functions and related problems
  6. hyperbolic functions

**Unit- I:**  
Relations - Equivalence relations - Functions.

(Text book 1: Chapter 2)

**Unit-II:**  
Formation of equations - Relation between roots and coefficients - Sum of powers of roots - Reciprocal equations

(Text book 1: Sections 5.1- 5.4)

**Unit- III:**  
Transformation of equations - Multiple roots - Nature and position of roots - Horner's and Newton's method to find a root of the equation correct to two places of decimals.

(Text book 1: Sections 5.5- 5.7 and 5.10)

**Unit - IV:**  
Complex Numbers - Demoivre's theorem - Problems - Expansions of  $\cos n\theta$ ,  $\sin n\theta$ ,  $\tan n\theta$ ,  $\tan(A+B+C+\dots)$  - Examples on formation of equation- Powers of sines and cosines of  $\theta$  in terms of functions of multiples of  $\theta$

(Text book 2: Chapter 2 sections 1- 4)

**Unit- V:**  
Expansions of  $\sin\theta$  and  $\cos\theta$ , in series of ascending powers of  $\theta$  - limits of expressions of sines and cosines - Hyperbolic functions - Inverse hyperbolic functions - Examples - Logarithms of complex quantities

(Text book 2: Chapters 3 - 5)

## Text books:

1. S. Arumugam and A. Thangapandi Isaac, Set Theory, Number System and Theory of Equations, New Gamma Publishing House, 1997.
2. S. Narayanan and T.K Manicavachagom Pillay, Trigonometry (for B.Sc., Mathematics Major classes), S. Viswanathan Publishers Pvt. Ltd., 2012.

## Reference books:

1. M. D Raisinghania and R.S Aggarwal, A Text book on Trigonometry , S.Chand and Company Ltd., 1985
2. M.L. Khanna, Trigonometry, Jai Prakash Nath and company, Educational publishers, 1988
3. R.S Aggarwal, A Text book on Modern Algebra, S. Chand and Company Pvt. Ltd., 1988

  
H.O.D.

Controller of Examinations

Principal

# ALGEBRA – I

(Course Code 18 PMT 11)

Semester - I

Core - 1

Hours - 6

Credits – 5

**Course Outcomes:** The students will learn

1. Cayley's theorem and permutation groups
2. Sylow's theorems in finite groups
3. direct products and finite abelian groups
4. about rings, ideals and homomorphism
5. Euclidean, Unique Principal Ideal and Unique factorization domains

**Unit- I:**

Group actions and permutation representations – Caylay's theorem – the class equations – automorphisms

(Chapter 4: Sections 4.1 – 4.4)

**Unit- II:**

The Sylow's theorem- Direct products – the fundamental theorem of finitely generated Abelian groups – Basic definitions and examples - polynomial rings

(Chapter 4: Section 4.5 & Chapter 5: Section 5.1 ,5.2, Chapter7: Section 7.1, 7.2)

**Unit- III:**

Ring homomorphisms and quotient rings – properties of ideals – rings of fractions- Euclidean domains

(Chapter 7: Sections 7.3 – 7.6, Chapter 8: Section 8.1)

**Unit- IV:**

Principal ideal domains – unique factorization domains- Definitions and basic properties – polynomial rings over fields I

(Chapter 8: Sections 8.2 – 8.3, Chapter 9: Section 9.1,9.2)

**Unit- V:**

Polynomial rings that are unique factorization domains – irreducibility criteria – polynomial rings over fields II

(Chapter 9: Sections 9.3-9.5)

**Text book:**

David S.Dummit and Richard M. Foote, Abstract Algebra, Third Edition, Wiley India Pvt. Ltd., 2014

**Reference books:**

- 1) Vijay K. Khanna and S.K. Bhambri, A Course in Abstract Algebra, Third edition, Vikas Publishing House Pvt. Ltd , 2009.
- 2) Joseph A. Gallian, Contemporary Abstract Algebra, Narosa publication, Eighth edition, 2009.

H.O.D.

Controller of Examination

Principal

# COMPLEX ANALYSIS

(Course Code : 18 PMT 33)

Semester - III

Core - 11

Hours - 6

Credits -5

**Course Outcomes :** The learner will acquire the knowledge of

1. evaluating integrals along a path in the complex plane
2. linear fractional transformations
3. computing Taylor and Laurent's expansions of simple functions
4. using Cauchy's integral formula
5. using Cauchy's Residue theorem to evaluate integrals.

## Unit - I:

Introduction to the Concept of an Analytic function - Power Series - Linear Fractional Transformation – Solved exercises (problems related to above concepts only.)

(Chapter 2: Sections 2.1 to 2.3)

## Unit - II:

Definitions and Properties of Conformal Mappings-Elementary Conformal Mappings-Solved exercises (problems related to above concepts only.)

(Chapter 3: Sections 3.1 and 3.2)

## Unit - III:

Basic definition and properties of complex integration - Cauchy's theorem- General form of Cauchy's theorem – Solved exercises (problems related to above concepts only.)

(Chapter 4: Sections 4.1 to 4.3)

## Unit- IV:

Cauchy's integral formula and its application – Singularities - Solved exercises (problems related to above concepts only.)

(Chapter 4: Sections 4.4 to 4.5)

## Unit- V:

Calculus of Residues-Computation of Integrals - Solved exercises (problems related to above concepts only.)

(Chapter 4: Sections 4.6 to 4.7)

## Text book:

V. Karunakaran, Complex Analysis, 2<sup>nd</sup> edition, Narosa Publishing House, New Delhi, 2002.

## Reference books:

1. S. Ponnusamy, Foundations of Complex analysis, 2<sup>nd</sup> edition, Narosa Publishing House, 2005.
2. Lars V. Ahlfors, Complex analysis, Third edition, McGraw Hill international, 1979.

H.O.D

Controller of Examinations

Principal

# GRAPH THEORY

(Course Code : 18 PMT 43)

Semester - IV

Core - 15

Hours - 5

Credits - 4

**Course Outcomes:** The learner will be able to

1. know the basics of graph theory
2. acquire the knowledge of Eulerian and Hamiltonian graphs
3. get the idea of graph embedding on surfaces
4. understand the concept of colourings and their implications
5. apply graph theory in different fields
6. pursue research in discrete mathematics

## UNIT - I:

Graphs and graph models- connected graphs – common classes of graphs – the degree of a vertex – regular graphs – degree sequence

(Chapter 1: Sections 1.1 to 1.3; Chapter 2: Sections 2.1 to 2.3)

## UNIT - II:

The definition of isomorphism – isomorphism as a relation - bridges – trees

(Chapter 3: Sections 3.1 and 3.2; Chapter 4: Sections 4.1 - 4.2.)

## UNIT - III:

Cut vertices - blocks – connectivity- Eulerian graphs - Hamiltonian graphs – strong digraphs (Definition and examples only)

(Chapter 5: Sections 5.1 and 5.3; Chapter 6: Sections 6.1 and 6.2;  
Chapter 7: Sections 7.1(definition and example only)

## UNIT - IV:

Matchings – factorization - planar graphs - embedding graphs on surfaces

(Chapter 8: Sections 8.1 and 8.2; Chapter 9: Sections 9.1 and 9.2)

## UNIT - V:

The four color problem - vertex coloring - edge coloring -The Ramsey Number of graphs

(Chapter 10: Sections 10.1 - 10.3; Chapter 11: Section 11.1)

## Text book:

Gary Chartrand and Ping Zhang, Introduction to Graph Theory, Tata McGraw-Hill Publishing Company Limited, New Delhi, 2006.

## Reference books:

1. J. A. Bondy and U. S. R. Murty, Graph theory with applications, The MacMillan Press Ltd., 1976.
2. Choudum, A First Course in Graph Theory, Laxmi Publications, 2000.

H.O.D.

Controller of examinations

Principal

2020-21

## Minutes of the board of studies of the Department of Mathematics

held on 5th Feb. 2021, Saturday at 10.00.a.m. in the room number S12, St. Xavier's College (Autonomous), Palayamkottai.

### Members Present:

- |   |               |
|---|---------------|
| 1. Dr. S. Arulraj (Chairman)                | - [Signature] |
| 2. Dr. A. Lourdasamy                        | - [Signature] |
| 3. Dr. P. Xavier Raj                        | - [Signature] |
| 4. Dr. C. Caroline Selvaraj                 | - [Signature] |
| 5. Dr. Y. Therese Sunitha Mary              | - [Signature] |
| 6. Dr. S. Nithya                            | - [Signature] |
| 7. Dr. S. Sujith                            | - [Signature] |
| 8. Dr. S. Balamurugan                       | - [Signature] |
| 9. Dr. A. Vinoth                            | - [Signature] |
| 10. Rev.Fr. S. Arul Ravi S.J.               | - [Signature] |
| 11. Mr. J. Amal Rayan                       | - [Signature] |
| 12. Dr. A. Anto Kinsley                     | - [Signature] |
| 13. Dr. S. Sethu Ramalingam                 | - [Signature] |
| 14. Ms. D. Saranya                          | - [Signature] |
| 15. Dr. S. Philo                            | - [Signature] |
| 16. Mrs. D. Kirupa Packiya Rani             | - [Signature] |
| 17. Mr. S. Shayarajjoseph Nirmalkumar       | - [Signature] |
| 18. Mr. J. John Stephan                     | - [Signature] |
| 19. Dr. R. Kala (Subject Expert)            | - [Signature] |
| 20. Dr. A. Punitha Tharani (Subject Expert) | - [Signature] |
| 21. Dr. P.J.A. Alphonse (Alumnus)           | - [Signature] |
| 22. Mr. S. Marimuthu (Industrial Expert)    | - [Signature] |

### Students' Representatives

- |  |               |
|--|---------------|
| 23. Mr. P. Vignesh Raja, II M.Sc. (Maths)  | - [Signature] |
| 24. Mr. G. Reginal Bosco III B.Sc. (Maths) | - [Signature] |

The meeting was started at 10.00.a.m. with a prayer by Rev. Fr. S. Arul Ravi S.J. and Dr. A. Lourdasamy welcomed the members of the board.

Dr. S. Sujith presented the minutes of the previous board held on 8-02-2020 and the board approved the same.

[Signature]

The board suggested the following:

1. In UG program, the subject C & C++ may be considered instead of the course Python. The subject C & C++ may consist of three units from C and two units from C++.
2. In UG program, the subjects Python, R and Data Analytics may be introduced as ECC courses.
3. For UG program, the board discussed the inclusion of the subject Professional English in SBE-3. Seventeen members of the board including the subject experts and the student representatives accepted the above proposal and five members of the board suggested to include the subject Professional English in ECC courses.
4. In PG program, the subject Data Analytics may be introduced as an optional subject in Elective I in the first semester.
5. In PG program, the subjects Pebbling in Graphs, Algebraic Graph Theory, LaTeX and Queuing and Inventory models may be introduced as ECC courses.
6. In PG program the board suggested to frame a new syllabus for the subjects Graph Theory, Analysis I, Analysis II and Complex Analysis.
7. For PG admission, Entrance examination may be considered.
8. The program outlines for UG, PG, M.Phil and Ph.D. courses were fixed as follows. This is placed for the approval of academic council.

*[Handwritten signature]*

## B.Sc. Programme Outline:

Sem	Part	Status	Course Code	Title of the Paper	Hrs	Credits
I	I	I Lang.	21 UGT 11	General Tamil – I	6	3
			21 UGH 11	Hindi – I		
			21 UGF 11	French – I		
	II	II Lang.	21 UGE 11	General English – I	6	3
	III	Core-1	21 UMT 11	Differential and Integral Calculus	6	5
	III	Allied-1 T	21 UPHA 11	Physics – I	4	4
	III	Allied-1 P	21 UPHA 12	Physics Practical – I	2	1
	IV	NME-1	21 UNM 11	Choose a course offered by other dept. /Numerical ability I (for other major students)	2	2
	IV	SBE-1	21 USB 11	Personality Development	2	2
IV	VE	21 UVE 11	Religion/Ethics	2	2	
<b>Sub Total</b>					<b>30</b>	<b>22</b>
II	I	I Lang.	21 UGT 21	General Tamil – II	6	3
			21 UGH 21	Hindi – II		
			21 UGF 21	French – II		
	II	II Lang.	21 UGE 21	General English – II	6	3
	III	Core-2	21 UMT 21	Set Theory, Theory of Equations and Trigonometry	6	5
	III	Allied-2 T	21 UPHA 21	Physics – II	4	4
	III	Allied-2 P	21 UPHA 22	Physics Practical– II	2	1
	IV	NME-2	21 UNM 21	Choose a course offered by other dept./Numerical ability II (for other major students)	2	2
	IV	SBE-2	21 USB 21	Religion/Ethics	2	2
IV	SBE-3	21 USB 22	Application of Calculus/ Mathematical Logic/ Professional English (to Mathematics major only)	2	2	
<b>Sub Total</b>					<b>30</b>	<b>22</b>
III	I	I Lang.	21 UGT 31	General Tamil – III	6	3
			21 UGH 31	Hindi – III		
			21 UGF 31	French – III		
	II	II Lang.	21 UGE 31	General English – III	6	3
	III	Core-3	21 UMT 31	Sequences and Series	6	5
	III	Allied-3	21 UMTA 31	Statistics-I	6	5
	IV	SBE-4	21 USB 31	Human Rights and Social Analysis	2	2
IV	SBE-5	21 USB 32	Techniques in Reasoning / Bio-Statistics (to Mathematics major only)	2	2	
IV	ES	21 UES 31	Environmental Studies	2	2	
<b>Sub Total</b>					<b>30</b>	<b>22</b>

*T. A. M.*

Sem	Part	Status	Sub. Code	Title of the Paper	Hrs	Cdts
IV	I	I Lang.	21 UGT 41	General Tamil – IV	6	3
			21 UGH 41	Hindi – IV		
			21 UGF 41	French – IV		
	II	II Lang.	21 UGE 41	General English – IV	6	3
	III	Core-4 T	21 UMT 41	C and C++	2	1
		Core-4 P	21 UMT 42	C and C++	5	5
	III	Allied-4	21 UMTA 41	Statistics-II	5	4
	III	Elect-1	21 UMTE 41	Analytical Geometry and Vector Calculus/ Number Theory		
	IV	SBE-6	21 USB 41	Mathematics for competitive exams (to other Major)	2	2
	<b>Sub Total</b>					<b>30</b>
V	III	Core-5	21 UMT 51	Abstract Algebra	6	5
	III	Core-6	21 UMT 52	Real Analysis	6	5
	III	Core-7	21 UMT 53	Differential Equations and Fourier Series	6	5
	III	Core-8	21 UMT 54	Mechanics	6	5
	III	Elect-2	21 UMTE 51	Linear Programming and Game Theory / Operations Research	6	5
	<b>Sub Total</b>					<b>30</b>
VI	III	Core-9	21 UMT 61	Linear Algebra and Lattices	6	5
	III	Core-10	21 UMT 62	Modern Analysis	6	5
	III	Core-11	21 UMT 63	Complex Analysis	6	5
	III	Core-12	21 UMT 64	Graph Theory	6	5
	III	Elect-3	21 UMTE 61	Astronomy/ Numerical Methods / Discrete Mathematics	6	5
<b>Sub Total</b>					<b>30</b>	<b>26</b>
III & IV	Extension Activities		STAND			1
<b>Grand Total</b>					<b>180</b>	<b>140</b>

**Extra Credit Courses ;**

Sem.	Part	Sub. Code	Title of the Paper	Cdts
I	V	21 UME 11	Set Theory	4
II	V	21 UME 12	Analytical Geometry of Two Dimensions	4
III	V	21 UME 31	Python	4
III	V	21 UME 32	R Programming	4
III	V	21 UME 33	Classical Algebra	4
IV	V	21 UME 41	Data Analytics	4
IV	V	21 UME 42	Statistical Methods	4
V	V	21 UME 51	Quantitative Aptitude	4
VI	V	21 UME 61	Differentiation and Integration	4

*P. A. M.*



## M.Sc. Programme Outline :

Sem.	Status	Course Code	Title of the Paper	Hrs.	Lib.	Cdts.
I	Core-1	21 PMT 11	Linear Algebra	6	-	5
	Core-2	21 PMT 12	Analysis-I	6	-	5
	Core-3	21 PMT 13	Mechanics	5	1	4
	Core-4 T	21 PMT 14	Java	4	-	4
	Core-4 P	21 PMT 15	Java Practical	2	-	1
	Elect-1	21 PMTE 11	Number Theory/Algorithms and Complexity/ MATLAB/ Data Analytics	5	1	4
<b>Sub Total</b>				<b>28</b>	<b>2</b>	<b>23</b>
II	Core-5	21 PMT 21	Algebra - I	6	-	5
	Core-6	21 PMT 22	Analysis-II	6	-	5
	Core-7	21 PMT 23	Ordinary Differential Equations	5	1	4
	Core-8 T	21 PMT 24	Computer Oriented Numerical Methods	4	-	4
	Core-8 P	21 PMT 25	Practical -Computer Oriented Numerical Methods	2	-	1
	Elect-2	21 PMTE 21	Combinatorics / Calculus of Variations and Integral Equations / Advanced Java / Mathematica	5	1	4
<b>Sub Total</b>				<b>28</b>	<b>2</b>	<b>23</b>
III	Core-9	21 PMT 31	Algebra - II	6	-	5
	Core-10	21 PMT 32	Topology	6	-	5
	Core-11	21 PMT 33	Complex Analysis	6	-	5
	Core-12	21 PMT 34	Partial Differential Equations	5	1	5
	Elect-3	21 PMTE 31	Statistics/ Fuzzy Sets	5	1	4
<b>Sub Total</b>				<b>28</b>	<b>2</b>	<b>24</b>
IV	Core-13	21 PMT 41	Functional Analysis	5	-	5
	Core-14	21 PMT 42	Differential Geometry	5	-	5
	Core-15	21 PMT 43	Graph Theory	5	-	4
	Core-16	21 PMT 44	Project	10	-	3
	Elect-4	21 PMTE 41	Operations Research / Stochastic Process	5	-	3
<b>Sub Total</b>				<b>30</b>	<b>-</b>	<b>20</b>
I & II	Ext. Act.		STAND	-	-	1
<b>Grand Total</b>				<b>120</b>		<b>91</b>

### Extra Credit Courses :

Sem.	Status	Sub. Code	Title of the Paper	Cdts
I	ECC	21 PME 11	Analysis I for competitive examinations	3
I	ECC	21 PME 12	Pebbling in Graphs	3
II	ECC	21 PME 21	Analysis II for competitive examinations	3
II	ECC	21 PME 22	Algebraic Graph Theory	3
II	ECC	21 PME 23	History of Mathematics	3
III	ECC	21 PME 31	Algebra for competitive examinations	3
III	ECC	21 PME 32	LaTex	3
IV	ECC	21 PME 41	Differential equations for competitive examinations	3
IV	ECC	18 PME 42	Queuing and Inventory models	3

*P. A. M.*

## M.Phil. Programme Outline:

Sem.	Status	Course Code	Title of the Paper	Hrs	Lib. Hrs	Cdts
I	Core - 1	21 MMT 11	Commutative Algebra	4	6	4
	Core - 2	21 MMT 12	Banach Algebra and Spectral Theory	4	6	4
	Core - 3	21 MMT 13	Research Methodology (Internal)	4	6	4
<b>Sub Total</b>				<b>12</b>	<b>18</b>	<b>12</b>
II	Core - 4	21 MMT 21	Dissertation	7	12	4
	Elective	21 MMTE 21	Project Oriented Elective Courses – 1. Harmonic Analysis 2. Algebraic Topology 3. Differential Manifolds 4. Advanced Analysis	5	6	4
<b>Sub Total</b>				<b>12</b>	<b>18</b>	<b>8</b>
<b>Grand Total</b>				<b>60</b>		<b>20</b>

## Ph.D. Program Outline (course work) :

No.	Subject code	Title of the paper	Hours	Credits
1	21 PHM 1	Advanced Operations Research and Fuzzy sets	4	4
2	21 PHM 2	Algebraic Graph Theory	4	4
3	21 PHM 3	Centrality and Convexity in Graphs	4	4
4	21 PHM 4	Extensions in Pebbling in Graphs	4	4
5	21 PHM 5	Fundamentals of Domination in Graphs	4	4
6	21 PHM 6	Labeling techniques in Graphs	4	4
7	21 PHM 7	Pebbling in graphs	4	4
8	21 PHM 8	Queuing and Inventory models	4	4

Dr. S. Nithya proposed the vote of thanks and the meeting came to an end.

Dr. S. Balamurugan recorded the minutes of the meeting.

  
Chairman.

Department of Mathematics

St. Xavier's College (Autonomous), Palayamkottai

Minutes of the Board of Studies meeting

held on 23<sup>th</sup> April, 2022 Saturday at 10.00 a.m. in the department of Mathematics' staff room, St. Xavier's College (Autonomous), Palayamkottai.

**Members Present:**

- Dr. S. Arul Raj (Chairman)
- Dr. A. Lourdasamy
- Dr. P. Xavier Raj
- Dr. C. Caroline Selvaraj
- Dr. S. Nithya
- Dr. S. Sujith
- Dr. S. Balamurugan
- Dr. A. Vinoth
- Rev. Fr. S. Arul Ravi S.J.
- Mr. J. Amal Rayan
- Dr. A. Anto Kinsley
- Dr. S. Sethuramalingam
- Ms. D. Saranya
- Mrs. S. Philo
- Mrs. D. Kiruba Packia Rani
- Mr. S. Sazayaraj Joseph Nirmalkumar
- Dr. A. Delman
- Dr. R. Kala (Subject Expert)
- Dr. A. Punitha Tharani (Subject Expert)
- Dr. P.J.A. Alphonse (Alumnus)
- Mr. S. Marimuthu (Industrial Expert)

- T. A. M.  
- A. Lourdasamy  
- P. Xavier Raj  
- C. Caroline Selvaraj  
- S. Nithya  
- S. Sujith  
- S. Balamurugan  
- A. Vinoth  
- S.A.R.  
- J. Amal Rayan  
- A. Anto Kinsley  
- S. Sethuramalingam  
- D. Saranya  
- S. Philo  
- D. Kiruba Packia Rani  
- S. Sazayaraj Joseph Nirmalkumar  
- A. Delman  
- R. Kala  
- A. Punitha Tharani  
- P.J.A. Alphonse  
- S. Marimuthu

**Students' Representatives**

- Rev. Fr. Y. Baskar, S.J.
- Ms. Gifty Ferin

Y. Baskar  
Gifty Ferin

**Members Absent:**

- Dr. Y. Therese Sunitha Mary

The meeting was started at 10.00 am with a prayer by Rev. Fr. S. Arul Ravi S. J and Dr.A Lourdasamy welcomed the members of the board.

Mr. J. Amal Rayan presented the minutes of the previous board held on 05.02.2021 and the board approved the same.

The board suggested the following:

1. In the course Set Theory, Theory of Equations and Trigonometry, the typographical error can be rectified.
2. One of the student representatives suggested that the course "Data Science" may be included
3. One of the student representatives suggested that LaTeX may be introduced as a unit in practical paper, but board replied that library hours may be used for conducting seminars or talks related to LaTeX introduction.
4. Ms. Saranya presented the revised syllabus of Professional English for Mathematics.
5. The board suggested the topic Zorn's lemma, axioms and paradoxes may be included in the course Professional English for Mathematics.
6. The board accepted that the scheme of evaluation of Professional English for Mathematics read by Head of the Department.
7. The board suggested that the following components may be included in the scheme of evaluation for practical examination.

Record Note - 20 Marks

Writing the Program - 30 Marks

Demo - 40 Marks

Viva - 10 Marks

8. The agenda – introducing the Internship program for UG students was discussed. Some of the board members suggested to introduce the Internship program as optional. After the discussion, the board decided to introduce the Internship program as mandatory and also the board suggested the following points regarding internship program.
  - (i) Duration - minimum 15 days
  - (ii) The Internship program is to be completed within the first five semesters.
9. The board resolved that Calculator is not allowed to use for the papers related to competitive examinations and the same is to be mentioned on the corresponding question papers.

The chairman proposed the vote of thanks and the meeting came to an end.

Dr. S. Nithya recorded the minutes of the meeting.



Chairman

# PROFESSIONAL ENGLISH

(Course code: 21 USB 22)

Semester - II

SBE - 3

Hours - 2

Credits - 2

## Unit 1:

History of Mathematics: History of  $e$  - History of Zero – History of  $\pi$  - Infinity  
History of Mathematicians: Srinivasa Ramanujan – Gauss – Euclid of Alexandria –  
Leonhard Euler – Pythagoras – Poisson – Hausdorff – Fibonacci.

## Unit 2:

The axiom of Choice – Zorn's Lemma – Countable Sets – Cardinal Arithmetic –  
Cardinal Numbers.

## Unit 3:

Greek Alphabets – Number System – Symbols for Comparing – Fractions –  
Divisibility – Prime Numbers – Common multiples – Powers, Roots and Logarithm –  
Trigonometry – Plane Geometry – Logic and Set – Limits, Derivatives and Integrals.

## Unit 4:

Career Planning – Art of Writing – Art of Writing E-mail – Preparing CV and Resume.

## Unit 5:

Combinatorics – Puzzles – Numbers

## Course Material and web links:

Unit 1: <https://mathshistory.st-andrews.ac.uk/>

Unit 2: Paul R. Halmos, Naïve Set theory, Springer-Verlag New York Inc, 1974.

Unit 3: English for Mathematics Course Material.

Unit 4: Dr. K. Alex, Soft Skills Know yourself and Know the World, S. Chand and Company  
Pvt. Ltd, 2014

Unit 5: Paul R. Halmos, Problems of Mathematicians, Young and old, The Mathematical  
Association of America, 1991.