

B.Sc. MATHEMATICS
SYLLABUS - 2017

SCHOOLS OF EXCELLENCE
with
CHOICE BASED CREDIT SYSTEM (CBCS)

SCHOOL OF COMPUTING SCIENCES
St. JOSEPH'S COLLEGE (Autonomous)

Special Heritage Status Awarded by UGC
Accredited at "A" Grade (3rd cycle) by NAAC
College with Potential for Excellence Conferred by UGC
DBT-STAR & DST-FIST Sponsored College
TIRUCHIRAPPALLI - 620 002, INDIA

B.Sc. MATHEMATICS

COURSE PATTERN - 2017 SET

Sem	Part	CODE	Title of the paper	Hrs	Cr	
I	I	Language	17UGT110001	Language-I	4	3
	II	English	17UGE120101	General English-I	5	3
	III	Core	17UMA130201	Basic Mathematics	7	4
			17UMA130202	Integral Calculus	6	4
	IV	Allied	17UMA130401	Allied :Statistics-I	6	4
			NMC	17UCE140801	Communicative English	-
	V. Edn	17UFC141001	Essentials of humanity	2	2	
Total for Semester I				30	25	
II	I	Language	17UGT210002	Language-II	4	3
	II	English	17UGE220102	General English-II	5	3
	III	Core	17UMA230203	Analytical Geometry	6	4
			17UMA230204	Differential Equations	5	4
	IV	Allied	17UMA230402	Allied: Statistics-II	6	4
			NMC	17UCE240802	Computer Literacy	2
	V. Edn	17UFC241002	Fundamentals of human rights	2	2	
Total for Semester II				30	22	
III	I	Language	17UGT310003	Language-III	4	3
	II	English	17UGE320103	General English-III	5	3
	III	Core	17UMA330205	Statics	6	4
			17UMA330206	Sequence and Series	5	4
	IV	Allied	17UMA330403A	Allied: Physics-I/or	6	(4) 5
			17UMA33 0403B	Allied: Accounts I		
	IV	NMC/EVS	17UCE340901	Environmental Studies (Partial online course)	2	2
			V. Edn	17UFC341003A	Formation of youth- I (OR)	2
				17UFC341003B	Religious Doctrine-I	
Total for Semester III				30	22/23	
IV	I	Language	17UGT410004	Language-IV	4	3
	II	English	17UGE420104	General English-IV	5	3
	III	Core	17UMA430207	Classical Algebra	4	3
			17UMA430208	Algebra I	5	3
	III	Core Elective I (WD)	17UMA430301A	Automata Theory/ Astronomy	4	4
			17UMA4303 01B			
	III	Allied	17UMA4304 04A	Allied: Physics –II	4	4
			17UMA430405	Allied: Physics Practicals	2	2
	IV	V. Edn	17UMA430404B	Allied: Accounts- II	6	(5)
			17UFC441004A	Formation of youth- II (OR)	2	2
		17UFC441004B	Religious Doctrine-II			
Total for Semester IV				30	24/23	

Sem	Part	CODE	Title of the paper	Hrs	Cr	
V	III	17UMA530209	Real Analysis	6	4	
		17UMA530210	Dynamics	6	4	
		17UMA530211	Algebra II	5	4	
		17UMA530212	Operations Research	5	4	
		Core Elective II (WS)	17UMA530302A	Number Theory	4	4
			17UMA530302B	Logic and Boolean Algebra		
		Additional core	17UMA530501A	1. Advanced Differential Equations	--	(2)
	17UMA530501B		2. Combinatorics (extra credit)			
	Self Paced Learning	17UMA530213	History of Mathematics- Online partial course		2	
	IV	SBE(BS)	17UMA540601A	Mathematics for Competitive Examinations (Ordinary)/	2	2
			17UMA540601B	MATLAB		
		IDC	17USS540701A	Soft Skills	2	2
			17USS540701B	National Cadet Corps (For NCC Cadets)		
Total for Semester V				30	26	
VI	III	17UMA630214	Complex Analysis	7	4	
		17UMA630215	Computer Oriented Numerical Methods in 'C' Programming	5	3	
		17UMA630216	Computer Lab ('C' Programming)	2	1	
		17UMA630217	Linear Algebra	6	4	
		17UMA630218	Graph Theory	4	4	
		17UMA630219	Comprehensive Exam	-	2	
		17UMA630220	Internship	-	2	
	Core Elective III (WS)	17UMA630303A	Fuzzy Theory	4	4	
		17UMA630303B	Optimization Techniques			
	Additional core	17UMA630502A	1. Advanced Calculus	--	(2)	
		17UMA630502B	2. Mathematical Economics (extra credit)			
	IV	SBE(WS)	17UMA640602A	Mathematics for Competitive Exams(Advanced)/	2	2
			17UMA640602B	LaTex		
Total for Semester VI				30	26	
V	Shepherd	17UCW651101	Community Service work (SHEPHERD) and Gender Studies		5	
Total Credit for all Semesters				180	150+4	

பொதுத்தமிழ் - 1

கற்றலின் உறுதிப்பாடு

1. சமூகமாற்றச் சிந்தனைகளை உள்ளடக்கிய தற்கால இலக்கியப் பரப்பை அறிதல்
2. புதுக்கவிதை, சிறுகதை உரைநடை ஆகியவற்றின் இலக்கியத்திறன் கண்டறிதல்.
3. சந்திப்பிழையின்றி எழுதும் திறன் பெறுதல்

அலகு-1 மகாகவி பாரதியார் கவிதைகள்
பாரதிதாசன் கவிதைகள்
நாமக்கல் கவிஞர் கவிதைகள்
உரைநடை- முதல் மூன்று கட்டுரைகள் (12 மணி நேரம்)

அலகு-2 பாவலரேறு பெருஞ்சித்திரனார் பாடல்கள்
கண்ணதாசன் கவிதைகள்
இலக்கிய வரலாறு (பக். 239-300)
இலக்கணம் - வலிமிகும் இடங்கள் (14 மணி நேரம்)

அலகு-3 சமூகக்கவிதைகள்
இலக்கிய வரலாறு (பக். 300-362)
சிறுகதை முதல் ஆறு சிறுகதைகள் (14 மணி நேரம்)

அலகு-4 அரசியல் கவிதைகள்
இலக்கணம் - வலி மிகா இடங்கள் (10 மணி நேரம்)

அலகு-5 மொழிபெயர்ப்புக்கவிதைகள்
சிறுகதை 7 முதல் 12 முடிய உள்ள சிறுகதைகள்
உரைநடை- 4 முதல் 6 முடிய உள்ள கட்டுரைகள் (10 மணி நேரம்)

பாடநூல்

1. பொதுத்தமிழ்- செய்யுள் திரட்டு- தமிழாய்வுத்துறை வெளியீடு-2017 -2020
2. சமூகவியல் நோக்கில் தமிழ் இலக்கிய வரலாறு, தமிழாய்வுத்துறை வெளியீடு, தூயவளனார் கல்லூரி திருச்சிராப்பள்ளி-2
3. உரைநடைநூல் - தமிழாய்வுத்துறை வெளியீடு.
4. சிறுகதைத் தொகுப்பு : (நாட்டுடைமையாக்கப்பட்ட படைப்பாளர்களின் சிறுகதைகள்) , தமிழாய்வுத்துறை வெளியீடு.

HINDI PAPER – I

Assurance of Learning

- To enable the students to develop their effective communicative skills in Hindi.
- To introduce the socially relevant subjects in Modern Hindi Literature
- To appreciate the features of Modern Hindi Prose.

UNIT – I

8 hours

Dr Abdul Kalam, Ling Badaliye, Vachan Badaliye, Baathcheeth-Aspathal Mein

UNIT – II

12 hours

Hamara Rajchinha, Noun Ling, Kaarak Chinha, Chaar Baayee, Baathcheeth, Dookan Mein

UNIT – III

12 hours

Moun hee mantra hai, Vachan, Kaarak, Vishwamitra Ka yagna, Baathcheeth, Hotel mein

UNIT – IV

14 hours

Veer Shivaji, Pronoun, Danush Yagna, Baathcheeth-Maidaan mein

UNIT – V

14 hours

Rajatilak Kee Thaiyaree, Adjectives, Baathcheeth-Pareeksha ke baare mein

Books Recommended

1. Dakshina Bharathi Hindi Prachar Sabha, Thiagaraya Nagar, Chennai – 600 017, Subhodh Hindi Patamala-2, Bharath Milap, Bharath-1, 2016.
2. Ramdev, Vyakaran Pradeep, Hindi Bhavan, 63, Tagore Nagar, Allahabad 2, 2016.

FRANÇAIS – I

Assurance of Learning

- Introduire la langue et la culture française aux étudiants
- Comparer la culture de l'Inde et de la France
- Familiariser l'étudiant avec le vocabulaire, la grammaire et les conversations

UNIT I : A l'aéroport Kamaraj domestic de Chennai (10 heures)

Saluer, demander et dire le nom, présenter quelqu'un, se présenter, souhaiter la bienvenue a quelqu'un, demander et dire l'identité de quelqu'un.

Grammaire : Etre, s'appeler, pronoms sujets, interrogation

UNIT II : A l'Université (10 heures)

Demander comment on se porte, présenter quel qu'un, prendre congé, exprimer, l'appréciation.

Grammaire : Articles définis et indéfinis, genre des noms, adjectifs, présent de l'indicatif : verbes réguliers en er, être avoir, apprendre, prépositions a, en, au, aux.

UNIT III : Au café (10 heures)

Dire ce qu'on aime, donner des informations, exprimer l'admiration, demander des informations sur quelqu'un.

Grammaire : Adjectifs interrogatifs, présent de l'indicatif : avoir, verbes en er , savoir, qu'est ce que c'est?, adjectifs possessifs, négation ,adjectifs irréguliers

UNIT IV : A la plage (15 heures)

Proposer une sortie, accepter, refuser la proposition

Grammaire : phrases au singulier et au pluriel, pronom indéfini- on, il y a, adjectifs démonstratifs, négation, interrogation, présent de l'indicatif : faire, voir, aller, sortir, connaître

UNIT V : Un concert et chez Nalli (15 heures)

Inviter, accepter, exprimer son incapacité d'accepter, complimenter, parlé au téléphone, demander le prix, protester contre le prix.

Grammaire : Présent de l'indicatif : verbes en er, venir, pouvoir, vouloir, articles contracte, avec, a chez, le futur, interrogation est ce que, adverbes interrogatifs, adjectifs possessifs, accord de l'adjectif, adjectifs exclamatifs, très/trop, présent de l'indicatif : acheter-regarder, l'impératif.

Manuel :

1. K.Madanagobalane, **Synchronie-1**, Samhitâ Publication, 2011.

Livre de référence :

1. Annie Berthet /B_atrix Sampsonis/ Catherine Hugot /V_ronnique M Kizirian / Monique Waendendries, **Alter Ego A1**, Hachette, 2006.
2. Yves Loiseau/R_gineM_rieux, Connexions 1, Didier, 2011.

SEM : I
17UGS110001

Hours/week: 4
Credits: 3

SANSKRIT PAPER – I

Assurance of Learning

- To introduce Sanskrit Aksharas.
- To improvise the writing skills.
- To introduce Present tense forms

UNIT – I

8 hours

Akharavivaranam – Svaras & Vyanjanaani – Samyukta Aksharani.

UNIT –II	12 hours
Shabdadayah – Aakaaraanta, ikaar aantah. ukaaraantah. Shabdadayah – Aakaaraanta, iikaar aantah. uukaaraantah.	
UNIT – III	12 hours
Anuvaada Prayogah.	
UNIT – IV	14 hours
Lat Lakarh – Parasmai – Pada Prayogah = Vakyarupah.	
UNIT – V	14 hours
Subhaashitaani	

Books Recommended

1. Kulapathy, K. M., Saral Sanskrit Balabodh, Bharathiya Vidya Bhavan, Munshimarg, Mumbai-400 007, 2014
2. R.S. Vadhyar & Sons, Book-Sellers and Publishers, Kalpathi, Palghat- 678003, Kerala, South India, Shabdha Manjari, 2014
3. Balasubramaniam R., Samskrita Akshara Siksha, Vangals Publication, 14th Main Road, JP Nagar, Bangalore -78, 2015.

Sem : I
17UGE120101

Hours/Week: 5
Credits: 3

GENERAL ENGLISH-I

Assurance of Learning

To help students

- use words and phrases related to self, home, friends and relatives in meaningful contexts
- develop positive self-esteem and thereby communicate confidently
- use language to perform basic functions like describing, clarifying, suggesting, and giving directions

Unit-I:

01. Personal Details
02. Positive Qualities
03. Listening to Positive Qualities
04. Relating and Grading Qualities
05. My Ambition
06. Abilities and Skills
07. Self-Improvement Word Grid
08. What am I doing?
09. What was I doing?
10. Unscramble the Past Actions
11. What did I do yesterday?

Unit-II:

12. Body Parts
13. Actions and Body Parts
14. Value of Life
15. Describing Self
16. Home Word Grid
17. Unscramble Building Types
18. Plural Form of Naming Words
19. Irregular Plural Forms
20. Plural Naming Words Practice
21. Whose Words?

Unit-III:

22. Plural Forms of Action Words
23. Present Positive Actions
24. Present Negative Actions
25. Un/Countable Naming Words
26. Recognition of Vowel Sounds
27. Indefinite Articles
28. Un/Countable Practice
29. Listen and Match the Visual
30. Letter Spell - Check
31. Drafting Letter

Unit-IV:

32. Friendship Word Grid
33. Friends' Details
34. Guess the Favourites
35. Guess Your Friend
36. Friends as Guests
37. Introducing Friends
38. What are We Doing?
39. What is (s)he / are they Doing?
40. Yes / No Question
41. What was s/he doing?
42. Names and Actions
43. True Friendship
44. Know your Friends
45. Giving Advice/Suggestions
46. Discussion on Friendship
47. My Best Friend

Unit-V:

48. Kinship Words
49. The Odd One Out
50. My Family Tree
51. Little Boy's Request
52. Occasions for Message
53. Words denoting Place
54. Words denoting Movement
55. Phrases for Giving Directions
56. Find the Destination
57. Giving Directions Practice
58. SMS Language
59. Converting SMS
60. Writing Short Messages
61. Sending SMS
62. The family debate
63. Family Today

Textbook

Joy, J.L. & Peter, F.M. *Let's Communicate 1*, New Delhi, Trinity Press, 2014. Print.

Extensive Reader

Dodd, E F. *Six Tales From Shakespeare*. London: Macmillan, 1987. Print. (First three tales)

Sem I

17UMA130202

Hrs/Week: 6

Credits : 4

INTEGRAL CALCULUS

Learning Assurances:

- Various techniques of integration.
- Applications of definite integrals.
- Applications of integration.
- Applications of improper integrals .
- Techniques of Beta, Gamma integrals.

UNIT I

Revision of all Integral models including Integration of Rational and Irrational Functions (Articles 1- 9 of Chapter 1)

UNIT II

Properties of Definite integrals – Integration by Parts – Bernoulli's Formula – Integration as Summation (Articles 10-11, 15 of Chapter 1)

UNIT III

Reduction Formulae for $x^n e^{ax}$, $\sin x$, $\cos x$, $\sin x \cos x$, $\tan x$, $\cot x$, $\sec x$, $\operatorname{cosec} x$, $x^m (\log x)^n$, $e^{ax} \cos bx$ (Articles 13-14 of Chapter 1)

UNIT IV

Area Under Plane Curves – Area of a Closed Curves – Length of a Curve – Area of Surface of revolution – Multiple Integrals – Evaluation

of Double and Triple Integrals (Cartesian Co-Ordinates only; Articles 1,4,5 of Chapter 2; Articles 1-4 of Chapter 5)

UNIT V

Improper Integrals– Beta and Gamma Functions– Recurrence formula of Gamma Functions – Properties of Beta Functions – Relation between Beta and Gamma Functions – Evaluation of Definite Integrals Using Gamma Functions (Articles 2-5 of Chapter 7)

TEXTBOOK:

1. S. Narayanan and T.K.Manicavachagam Pillay, Calculus (Major), Volume – II, S.Viswanathan Printers & Publishers, 2007.

REFERENCES

1. Dr. M.K Venkataraman, Engineering Mathematics, Volume -2, The National Publishing Company, Madras, 1988.
2. Calculus, Thomas and Finney, Pearson Education, 9th Edition, 2006.

Sem - I
17UMA130401

Hrs/Week: 6
Credit : 4

ALLIED STATISTICS - I

Learning Assurances:

- History and Introduction of Probability.
- Concepts of Random Variables and Distributions
- Properties of Mathematical Expectations
- Standard Distributions
- Applications to real life problems.

Unit-I

Short History –Basic Terminology - Axiomatic approach to probability – Some Theorems on Probability - Mathematical Notion - Conditional

probability- Multiplication Theorem of Probability –Independent Events-
Pairwise Independent Events - Baye's theorem.

Ch. 3: Sec 3.2-3.5, 3.8 (Omit 3.8.3, 3.8.4), 3.9 (Omit 3.9.2), 3.10-3.12,
3.15 Ch 4: Sec 4.2 (Omit 4.2.1)

Unit-II

Random variable - Distribution function - Discrete random variable -
Continuous random variable – Two-dimensional random variable. Ch
5 Sec 5.1-5.5 (Omit 5.5.6-5.5.7)

Unit-III

Mathematical expectation – Expected value of function of a random
variable – Properties of expectation – Properties of variance - Covariance
-Moment generating function – Cumulants - Chebychev's inequality.

Ch 6: Sec 6.1 - 6.6. Ch 7: Sec 7.1 – 7.2.

Unit-IV

Binomial distribution- Poisson distribution – Geometric distribution

Ch 8: Sec 8.4(Omit 8.4.3, 8.4.10-8.4.12), 8.5 and 8.7

Unit-V

Normal distribution - Gamma distribution – Beta distributions of first and
second kind - Exponential distribution (Ch 9: Sec 9.2 (Omit 9.2.11-9.2.15),
9.5 -9.8.

Textbook:

1. S.C. Gupta and V.K. Kapoor, Fundamentals of Mathematical
Statistics, 11th edition, Sultan Chand and Sons, 1982.

References:

1. P.R. Vittal, Mathematical Statistics, Margham Publications,
Chennai, 2004.
2. J.N. Kapur and H.C. Saxena. Mathematical Statistics 20th
Edition, S.Chand & Co Ltd. New Delhi, 2010.

ESSENTIALS OF HUMANITY

Assurance of Learning

- * To educate the students in the basic principles of value education and to inculcate the same values in them
- * To teach the students various dimensions of human personality and the ways to develop them.
- * To empower the students in gender sensitization, gender differences and gender roles.
- * To prepare the students for the smooth transfer from the stage of teenage to earlier adulthood.

Unit-I

Principles of Value Education - Introduction - Value Education- Characteristics of Values – Kinds of Values

Unit-II

Development of Human Personality - Personality traits - Theories of Personality - Discovering self- Defense mechanism - Power of positive thinking

Unit-III

Dimensions of Human Development - Physical development – Intellectual development - Emotional development - Social Development – Moral development - Spiritual development

Unit-IV

Responsible Parenthood - Human sexuality - Sex and love - Becoming a spouse - Responsible Parenthood

Unit-V

Gender Equality and Empowerment - Historical perspective - Education & economic development -Crimes against Women-Women's rights

Text Book:

Essentials of Humanity, Department of Foundation course, St.Joseph's College, Tiruchirappalli-2, 2016.
