
ST. TERESA'S COLLEGE, ERNAKULAM
(AUTONOMOUS)

Affiliated to Mahatma Gandhi University, Kottayam



CURRICULUM FOR
BACHELOR'S PROGRAMME
IN MATHEMATICS

Under Choice Based Credit & Semester System
& Outcome Based Education

(2018 Admissions)

BMAT- BACHELOR'S PROGRAMME IN MATHEMATICS**PROGRAM SPECIFIC OUTCOMES**

- PSO1:** Explain underlying structures of mathematics (i.e., logical structure, sets, relations and functions) and the relationships among them.
- PSO2:** Construct basic manipulative skills in number theory, graph theory, calculus, analysis, algebra and geometry.
- PSO3:** Develop expertise in constructing mathematical proofs and employ mathematical ideas to design models for solving real world problems in pace with technological advancements.
- PSO4:** Integrate logical reasoning, critical thinking, intellectual curiosity and scientific temper to extrapolate the acquired knowledge into different branches of science
- PSO5:** Develop analytical, creative and cognitive skills and foster social responsibility along with environmental consciousness.

SEMESTER I

Course Code	Course Title	Credits	Course Type
EN1A01B18	Fine-tune Your English	4	Common Course I
EN1A02B18	Pearls from the Deep	3	
FR1A01B18	French Language and Communicative Skills-I	4	Common Course II
HN1A01B18	Kahaani Aur Upanyas		
MA1A01B18	Kathasahityam		
ST1C01B18	Descriptive statistics	3	Complementary course I
PH1C01B18	Properties of matter & error analysis	2	Complementary course II
MT1B01B18	Discrete mathematics and trigonometry	3	Core course-1

SEMESTER I

COMMON COURSE I

EN1A01B18–FINE-TUNE YOUR ENGLISH

Credits: 4

Total Lecture Hours: 90

Course Outcomes:

CO1: Recognize the basics of English grammar

CO2: Choose the appropriate word classes

CO3: Identify common errors in the use of English language in various contexts.

CO4: Apply the rules of grammar to comprehend, speak, and write grammatically correct English

CO5: Compose materials for business communication

Mapping of Course Outcomes with Program Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	1	2	2	2
CO2	2	1	2	2	2
CO3	1	1	2	2	2
CO4	2	1	2	2	3
CO5	1	1	1	3	2

Syllabus Content

Module 1 (18 Hours)

The Sentence and its Structure : How to Write Effective Sentences – Phrases:What are They? – The Noun Clauses – The Adverb Clause – “If All the Trees Were Bread and Cheese” – The Relative Clause – How Clauses are Conjoined

Module II (18 Hours)

Word-Classes and Related Topics: Understanding the Verb – Understanding Auxiliary Verbs – Understanding Adverbs – Understanding Pronouns – The Reflexive Pronoun – The Articles I – The Articles II – The Adjective – Phrasal Verbs – Mind your Prepositions

Module III (18 Hours)

To Err is Human: Concord – Errors – Common and Uncommon
Spelling and Pronunciation : Pronunciation: Some Tips – More Tips on Pronunciation – An awesome Mess? – Spelling Part II

Module IV (18 Hours)

Tense and Related Topics: ‘Presentness’ and Present Tenses – The ‘Presentness’ of a Past Action – Futurity in English – Passivisation, Interrogatives and Negatives : Negatives – How to Frame Questions – What’s What? – The Question Tag

Module V (18 Hours)

Conversational English : Some time expressions – Is John There Please?, Miscellaneous and General Topics -: Reading - Letter Writing . In addition there will be an essay question on a general topic.

SEMESTER I

COMMON COURSE I

EN1A02B18–PEARLS FROM THE DEEP

Credits: 3

Total Lecture Hours: 72

Course Outcomes:

CO1: Name prominent literary figures and recognize various literary devices

CO2: Analyze inherent themes and motives

CO3: Identify the nuances of the age in which the literary work was written

CO4: Examine the different aspects of theatre

Mapping of Course Outcomes with Program Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	1	1	2	2
CO2	1	1	2	3	3
CO3	1	1	1	1	2
CO4	1	1	1	2	2

Syllabus Content

Module 1 (18hours)

Fiction : Ernest Hemingway: The Old Man and the Sea

Module II (18hours)

One Act Plays : Susan Glaspell: Trifles, Asif Currimbhoy: The Refugee, A.A Milne: The Boy Comes Home

Module III (18hours)

Short Stories : Guy De Maupassant: Two Friends - O. Henry: The Gift of Magi- K.A Abbas: Sparrows - Flora Annie Steel: Valiant Vicky, the Brave Weaver

Module IV (18hours)

Poems : Rumi: The Chance of Humming -Walter Scott: Lochinvar- John Keats: La Belle Dame Sans Mercy- Robert Frost: After Apple Picking- Chinua Achebe: Refugee Mother and Child- Kamala Das: My Grandmother's House- Ted Hughes: Jaguar- Pablo Neruda: Tonight I can Write the Saddest Lines- P.P Ramachandran: How Simple It Is!

SEMESTER I

COMMON COURSE II

MA1A01B18–KATHASAHITHYAM

Credits: 4

Total Lecture Hours: 72

Course Outcomes:

കോഴ്സൗട്ട്കം(Course outcome)

CO1: ചെറുകഥ, നോവൽ പഠനത്തിലൂടെ വായനാശേഷിയും ആസ്വാദന പ്രാപ്തിയും കൈവരിക്കൽ.

CO2: ചെറുകഥയുടെയും നോവലിന്റെയും കാലാനുസൃതമായ ഭാവുകത്വപരിണാമം തിരിച്ചറിയൽ.

CO3: നിലവിലുള്ള സാമൂഹ്യജീവിതയാഥാർത്ഥ്യങ്ങളെ അഭിമുഖീകരിക്കാൻ പ്രാപ്തരാക്കൽ.

CO4: ആശയവിനിമയം, ഭാഷാവിഷ്കരണം എന്നീ ശേഷികൾ കൈവരിക്കുന്നു

CO5: കഥ, നോവൽ എന്നിവയുടെ വ്യതിരിക്ത സവിശേഷതകൾ തിരിച്ചറിയുന്നു.

CO6: പുതുകാലജീവിതാനുഭവങ്ങൾ വിലയിരുത്താൻ പര്യാപ്തരാകുന്നു.

Mapping of Course Outcomes with Program Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	2	3	3
CO2	1	1	1	2	1
CO3	1	1	3	2	2
CO4	3	2	3	2	3
CO5	1	2	1	2	2
CO6	2	1	3	2	2

Syllabus content

ഖണ്ഡംഒന്ന് (10 മണിക്കൂർ)

- 1.പുവമ്പഴം -കാരുർ
- 2.ഭൂമിയുടെഅവകാശികൾ -വൈക്കംമുഹമ്മദ്ബഷീർ

ഖണ്ഡംരണ്ട് (15മണിക്കൂർ)

- 1.കടൽ -ടി .പദ്മനാഭൻ
- 2.പെരുമഴയുടെപിറ്റേന്ന് -എം. ടി. വാസുദേവൻനായർ
- 3.മാനാഞ്ചിറടെസ്സ് -വി .കെ.എൻ
- 4.തരിശുനിലം -മാധവിക്കുട്ടി

ഖണ്ഡംമൂന്ന് (15മണിക്കൂർ)

- 1.ആർക്കറിയാം -സക്കറിയ
- 2.ഓരോഎഴുത്തുകാരിയുടെഉള്ളിലും -സാനാജോസഫ്
- 3.തിരുത്ത് -എൻ .എസ് .മാധവൻ
- 4.മോഹമത്തെ -കെ .ആർ .മീര

ഖണ്ഡംനാല് (10 മണിക്കൂർ)

- 1.അഗ്നി -സിതാര.എസ്
- 2.ബിരിയാണി -സന്തോഷ്എച്ചിക്കാനം
- 3.മോദസ്ഥിരനായിഅങ്ങാടിപ്പുമലപോലെ -എസ്. ഹരീഷ്
- 4.സ്നേഹബഹുമാനപ്പെട്ടഅന്നാമ്മയ്ക്ക്ഗീതാലക്ഷ്മിഎഴുതുന്നകത്ത് -(പ്രിയഎ .എസ്
- 5.ചിലസ്വപ്നങ്ങളിൽസീതാലക്ഷ്മിയുടെകറുത്തമുടിയിഴ -ഇന്ദുമേനോൻ

ഖണ്ഡംഅഞ്ച് (22മണിക്കൂർ)

ആടുജീവിതം -ബന്യാമിൻ

SEMESTER I

COMMON COURSE II

HN1A01B18–KAHAANI AUR UPANYAS

Credits: 4

Total Lecture Hours: 72

Course Outcomes:

CO1: Discuss story content and structure in depth.

CO2: Analyse characterization and comment on the development of the characters as the story/ novel unfolds.

CO3: Analyse short stories and novels on the basis of literary elements like plot, theme, metaphor, and image.

CO4: Compare treatments of theme, character and subject matter of different short stories.

CO5: Illustrate greater reading fluency and improved vocabulary in Hindi.

Mapping of Course Outcomes with Program Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	1	1	2	2
CO2	2	1	2	1	2
CO3	1	2	1	2	1
CO4	2	2	2	2	2
CO5	1	1	2	2	3

Syllabus content

Module I (16 Hours)

Anthim Saakshya –Chandrakaanta Chapters 1 ,2 -Eidgaah- Premchand

Module II (20 Hours)

Anthim Saakshya –Chandrakaanta Chapters 3, 4, 5 Jangal Ka Daah- Swayam Prakash Chchutti
Ka Din- Usha Priyamvada

Module III (20 Hours)

Anthim Saakshya –Chandrakaanta Chapters 6,7,8 Maa Rasoi Mei Rehti Hai – Kumar Ambuj
Kheer – Madhavi Kutty

Module IV (16 Hours)

Anthim Saakshya –Chandrakaanta Chapters 9, 10 Heelibon Ki Baththakhe- Agyey

SEMESTER I

COMMON COURSE II

FR1A01B18– FRENCH LANGUAGE AND COMMUNICATIVE SKILLS - I

Credits: 4

Total Lecture Hours: 72

Course Outcomes:

CO1: Describe topics such as family, professions, time, place, likes and dislikes, daily life situations.

CO2: Develop language, vocabulary and grammar skills.

CO3: Articulate various speech sounds and their determined combinations.

CO4: Prepare conversations based on scenarios which helps while traveling

CO5: Articulate the concepts to express one's opinion in a specific situation.

Mapping of Course Outcomes with Program Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	1	1	1	2
CO2	1	1	1	1	3
CO3	1	1	1	1	2
CO4	1	1	2	2	2
CO5	1	1	1	1	3

Syllabus Content:

Module I

(25 hours)

La population L'alphabet – Les chiffres – Identité – Se présenter – Poser des questions – Les professions – Les nationalités

Module II

(23 hours)

La banlieue Demander une information, un prix – l'heure – la ville

Module III

(24 hours)

Quartier de Paris Décrire un lieu – Indiquer un prix, un itinéraire.

SEMESTER I

COMPLEMENTARY COURSE I

ST1C01B18 – DESCRIPTIVE STATISTICS

Credits: 3

Total Lecture Hours: 72

Course Outcomes:

CO1: Describe the basic concepts of Statistics

CO2: Manage raw data by constructing tables and express them by diagrams and graphs.

CO3: Illustrate the fundamental characteristics of data

CO4: Evaluate the different types of Index numbers

Mapping of Course Outcomes with Program Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	2	2	1	2
CO2	1	2	3	2	3
CO3	1	1	2	2	2
CO4	1	1	3	2	1

Syllabus content

Module I

(20 hours)

Introduction to Statistics, Population and Sample, Collection of Data, Various methods of data collection, Census and Sampling. Methods of Sampling – Simple Random Sampling– stratified sampling – systematic sampling (Method only), Types of data – quantitative, qualitative, Classification and Tabulation, Frequency Table, Diagrammatic representation – Bar diagram, pie diagram; pictogram and cartogram.

Module II

(20 hours)

Measures of Central Tendency – Mean; Median; Mode; Geometric Mean; Harmonic Mean and Properties, Partition values- Quartiles, Deciles, Percentiles, Absolute and Relative measures of Dispersion – Range, Quartile Deviation, Box Plot, Mean Deviation, Standard Deviation, Coefficient of Variation. Graphical representation – histogram, frequency polygon, frequency curve, ogives and stem and leaf chart.

Module III

(16 hours)

Raw Moments, Central Moments, Inter Relationships (First Four Moments), Skewness – Measures – Pearson's, Bowley's and Moment Measure; Kurtosis- Measures of Kurtosis – Moment Measure, Measure based on partition values.

Module IV

(16 hours)

Index Numbers – definition, limitations, uses, Simple Index Numbers; Weighted Index Numbers – Laspeyer's, Paasche's and Fisher's Index Numbers, Test of Index Numbers, Construction of Index Numbers, Cost of Living Index Numbers – Family Budget Method, Aggregate Expenditure Method.

SEMESTER I

COMPLEMENTARY COURSE II

PH1C01B18 – PROPERTIES OF MATTER & ERROR ANALYSIS

Credits: 2

Total Lecture Hours: 36

Course Outcomes:

CO1: Apply static and dynamic methods to determine rigidity modulus and bending of beams to Young's modulus

CO2: Analyze the factors affecting surface tension and viscosity

CO3: Discuss the theory for the dynamics of fluid systems

CO4: Estimate the errors occurring in a mathematical calculation

Mapping of Course Outcomes with Program Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	1	2	2	1
CO2	1	2	2	2	2
CO3	1	1	2	2	1
CO4	1	3	3	2	2

Syllabus Content:

Module I

(13 hours)

Elasticity : Stress- strain- Hooke's law- Elastic moduli- Poisson's ratio- twisting couple determination of rigidity modulus- static and dynamic methods- static torsion- torsion pendulum, bending of beams- cantilever, uniform and non-uniform bending, I section girder.

Module II

(10 hours)

Surface tension: Molecular theory of surface tension - surface energy - excess pressure in a liquid drop, factors affecting surface tension – applications. Hydrodynamics -Streamline and turbulent flow - critical velocity - Coefficient of viscosity - Derivation of Poiseuille's equation, Stokes equation-Determination of viscosity by Poiseuille's method - Brownian motion – Viscosity of gases – Bernoulli's theorem.

Module III

(13 hours)

Error Analysis - Basic ideas – uncertainties of measurement – importance of estimating errors – dominant errors – random errors – systematic errors - rejection of spurious measurements. Estimating and reporting errors – errors with reading scales, errors of digital instruments – number of significant digits –absolute and relative errors – standard deviation. Propagation of errors – sum and differences – products and quotients – multiplying by constants – powers.

SEMESTER I**CORE COURSE-1****MT1B01B18 – DISCRETE MATHEMATICS AND TRIGONOMETRY****Credits: 3****Total Lecture Hours: 72****Course Outcomes:**

CO1: Explain the Propositional Calculus in Mathematical Logic and apply various methods for proving theorems.

CO2: Discuss Set theory, Relations, Functions, Ordered sets & Lattices.

CO3: Analyze circular and hyperbolic functions

CO4: Compute the factors of expressions like $x^n - 1$, $x^n + 1$ and $x^{2n} -$

$$2x^n a^n \cos n\theta + a^{2n}$$

Mapping of Course Outcomes with Program Specific Outcomes

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	2	2	2
CO2	3	2	1	1	1
CO3	3	2	2	1	2
CO4	2	2	1	1	2

Syllabus Content:

Module 1 (20 Hrs)

Mathematical Logic: Propositional logic, Propositional equivalences, Predicates and quantifiers, Rules of inference, Introduction to proofs

Module 2 (12Hrs)

Set theory: Sets, set operations, functions

Module 3 (20 Hrs)

Ordered sets & Lattices: Poset, Product set & order, Hasse diagrams of partially ordered sets, Minimal & Maximal, and First & Last point, Lattices, Lattices as partially ordered sets.

Module 4 (20hrs)

Trigonometry : Circular and hyperbolic functions of a complex variable
Separation into real and imaginary parts. Factorisation of x^n-1 , x^n+1 , $x^{2n} - 2x^na^n \cos n t + a^{2n}$. Summation of infinite series by C+iS method.