MANONMANIAM SUNDARANAR UNIVERISTY,
TIRUNELVELI-12
SYLLABUS
UG - COURSES – AFFILIATED COLLEGES
Course Structure for B. Sc. Mathematics
(Choice Based Credit System)

(with effect from the academic year 2023-2024 onwards)

		Semester-I		
Part	**Subject Status**	**Subject Title**	**Subject Code**	**Credit**
I	Language	LANGUAGE		3
II	Language	ENGLISH		3
III	Core	ALGEBRA &TRIGONOMETRY		4
III	Core	DIFFERENTIAL CALCULUS		4
III		NUMERICAL METHODS WITH APPLICATIONS / ALLIED CHEMISTRY FOR PHYSICAL SCIENCE (MATHEMATICS AND PHYSICS)GE1		3
		ALLIED CHEMISTRY PRACTICAL I – VOLUMETRIC ANALYSIS GE II		
IV		SKILL ENHANCEMENT COURSE (NON MAJOR ELECTIVE)		2
IV		FOUNDATION COURSE FC BRIDGE MATHEMATICS		2

Total Marks: 100   Internal Exam: 25 marks + External Exam: 75 marks

1. **Scheme for internal Assessment**:
   Maximum marks for written test: **20 marks**
   3 internal tests, each of **I hour** duration shall be conducted every semester.
   To the average of the **best two** written examinations must be added the marks scored in. The **assignment** for 5 marks.

   The break up for internal assessment shall be:
   Written test- 20 marks; Assignment -5 marks   Total - 25 marks

2. **Scheme of External Examination**
   3 hrs. examination at the end of the semester
   A – Part : 1 mark question two - from each unit
   B – Part : 5 marks question one - from each unit
   C – Part : 8 marks question one - from each unit

➢ **Conversion of Marks into Grade Points and Letter Grades**

S.No	Marks	Letter Grade	Grade point (GP)	Performance
1	90-100	O	10	Outstanding
2	80-89	A+	9	Excellent
3	70-79	A	8	Very Good
4	60-69	B+	7	Good
5	50-59	B	6	Above Average
6	40-49	C	5	Pass
7	0-39	RA	-	Reappear
8	0	AA	-	Absent

➢ **Cumulative Grade Point Average (CGPA)**

$$CGPA = \frac{\Sigma\,(GP \times C)}{\Sigma C}$$

- **GP** = Grade point, **C** = Credit
- CGPA is calculated only for Part-III courses
- CGPA for a semester is awarded on cumulative basis

➢ **Classification**
   a) First Class with Distinction   : CGPA $\geq$ 7.5**
   b) First Class   : CGPA $\geq$ 6.0
   c) Second Class   : CGPA $\geq$ 5.0 and $<$ 6.0
   d) Third Class   :   CGPA $<$ 5.0

Nesamony Memorial Christian College, Marthandam

பொதுத்தமிழ் – 1

Unit 1 - மரபுக் கவிதை

1. பெ. சுந்தரனார் - தமிழ்த் தெய்வ வணக்கம்
2. பாரதிதாசன் - சிறுத்தையே வெளியில் வா
3. கவிமணி - புத்தரும் சிறுவனும்
4. முடியரசன்-மொழி உணர்ச்சி
5. கண்ணதாசன் - ஆட்டனத்தி ஆதிமந்தி - ஆதிமந்தி புலம்பல்
6. சுரதா - துறைமுகம் தொகுப்புலிருந்து ஏதேனும் ஒரு கவிதை
7. தமிழ் ஒளி – கடல்

Unit II – புதுக்கவிதை

1. அப்துல் ரகுமான் - வீட்டுக்கொரு மரம் வளர்ப்போம்
2. ஈரோடு தமிழன்பன் - சென்றியூ கவிதைகள் (ஏதேனும் ஐந்து கவிதைகள்)
3. வைரமுத்து – பிற்சேர்க்கை
4. மு.மேத்தா – வாழைமரம்
5. அறிவுமதி - வள்ளுவம் பத்து
6. நா. முத்துக்குமார் - ஆனந்த யாழை மீட்டுகிறாய்
7. சுகிர்தராணி - சபிக்கப்பட்ட முத்தம்
8. இளம்பிறை - நீ எழுத மறுக்கும் எனது அழகு

Unit III – சிறுகதைகள்

1. வாய் சொற்கள் - ஜெயகாந்தன் (மாலை மயக்கம் தொகுப்பு)
2. கடிதம் - புதுமைப்பித்தன்
3. கரு - உமாமகேஸ்வரி
4. முன்முடி - தி ஜானகிராமன்
5. சிதறல்கள் - விழி.பா.இதயவேந்தன்
6. காகித உறவு - சு. சமுத்திரம்
7. வீட்டின் மூலையில் சமையல் அறை - அம்பை
8. (மொழிபெயர்ப்புக் கதை) ஆண்டவன் செக்காவ் - நாய்க்காரய்ச் சீமாட்டி, சந்தியா பதிப்பகம்

Unit IV - பாடம் சார்ந்த இலக்கிய வரலாறு

Unit V - மொழித்திறன் போட்டி தேர்வு

1. பொருள் பொதிந்த சொற்றொடர் அமைத்தல்
2. ஒர் எழுத்து ஒரு மொழி
3. வேற்றுமை உருபுகள்
4. திணை, பால், எண், இடம்
5. கலைச்சொல்லாக்கம், மொழிபெயர்ப்பு

(குறிப்பு: அலகு 4,5 ஆகியன போட்டித் தேர்வு நோக்கில் நடத்தப்பட வேண்டும்)

MALAYALAM – I
PROSE, COMPOSITION AND TRANSLATION

Unit I
This unit focuses on Translation: Word level and syntactic level and also discuss the writing style of Essay. It introduces the proverbs, paraphrasing in Malayalam

Unit II
This units briefs the importance of Nalukettu in the history of Malayalam literature. The following unit examines thecharacteristics of the novel chapter ways. Chapter First to 10

Unit III
Remaining Chapters are introduced and discussed.

Unit IV This unit focuses on Marappavakalum Mattu Kadhakalum by Karur. It also introduces the story
        Story 1 Marappavakal- Discussion
        Story II Uthuppante Kirnar
        Story III Kalchakaram
        Story IV Poovamabhazham
        Story V Vallakkaran
        Story VI Chekuthan
        Story VII Mothiram
        Unit V Story VIII Safety Pin
        Story IX Aranhaanam
        Story X Kuta nannakkaanuntoo
        Story XI Chudala thengu
        Story XII Ampala parmbil
        Story XIII Ezhunnallathu Duty
        Story XIV Pisachinte Kuppayam

Reading List (Print and Online)
1. Malayala Sahithya Charithram – Dr. K.M.George (Ed.)
2. Cherukadha Innale Innu - M.Achuthan
3. Kadha Thedunna Kadha - N.Prabhakaran
4. M.T. Vakkinte Vismayam – V.R.Sudheesh
5. Kadhayum Kalavum –K.S.Ravikumar
6. Malayala Novalilee Desakaalangal- E. Ramkrishnan
7. Maranunna Malayala Noval- K.P. Appan
8. Andhanaya Daivam- P.K.Rajasekharan
9. Shyalee shilppam- Dr.K.M. Prabhakra Varir
10. Bhasha gadhyam- C.V. Vasudeva Bhattathiri
11. Karur Kadha patanam- M.M.Basheer

Recommended Texts
1. NALUKKETTU (NOVEL) : M.T. VASUDEVAN NAIR
2. MARAPPAVAKALUM MATTU KADHAKALUM (SHORT STORIES): KAROOR

HINDI I

Unit I
Buniyadi Hindi
- ➢ Swar
- ➢ Vyanjan
- ➢ Barah Khadi
- ➢ Shabd aur
- ➢ Vakya Rachna

Unit II
Hindi Shabdavali
- ➢ Rishto ke Naam
- ➢ Gharelu padartho ke Naam

Unit III
Vyakaran
- ➢ Sadharan Vakya aur Sangya
- ➢ Sarvanam
- ➢ Visheshan
- ➢ Kriya aadi shabdo ka prayog

Unit IV
Chote Gadyansh ka Pathan
- ➢ Bacho ki Kahaniya
- ➢ Patra-Patrikao mein prakashit Gadyansho ka Pathan

Unit V
Nibandh
- ➢ Sant Tiruvalluvar
- ➢ E.V.R Thandai Periyar
- ➢ Naari Sashaktikaran
- ➢ Paryavaran Sanrakshan
- ➢ Vibhinna pratiyogi parikshao ke bare mein jaankari dena

Pratiyogi priksha par adharit nibandho dwara bhasha ki kshamta badhane vale prashikshan kary.

Reference Books
1. Hindi ke Avyay Vakyansh – Chaturbhuj Sahay
2. Subodh Hindi Vyakaran – Phoolchand Jain
3. Sankshipt Hindi Vyakaran – Kamta Prasad
4. Vyavaharik Hindi – Nagappa
5. Abhinav Hindi Vyakran – Nagappa
6. Saral Hindi Vyakaran – Shyamchandra Kapur
7. Vyakaran Pradeep – Ramdev
8. Laghu Bal Kathaye – Ramashankar
9. Manoranjak Kahaniya – Premchand
10. CONCISE GRAMMAR OF THE HINDI LANGUAGE - H.C Scholberg
11. Hindi Grammar – Edwin Greaves

Related Online Contents (MOOCs, SWAYAM, NPTEL, YouTube, Websites, etc.)

1. fr#oYyqoj%

https://bharatdiscovery.org/india/%E0%A4%A4%E0%A4%BF%E0%A4%B0%E0%A5%81%E0%A4%B5%E0%A4%B2%E0%A5%8D%E0%A4%B2%E0%A5%81%E0%A4%B5%E0%A4%B0#:~:text=%E0%A4%A4%E0%A4%BF%E0%A4%B0%E0%A5%81%E0%A4%B5%E0%A4%B2%E0%A5%8D%E0%A4%B2%E0%A5%81%E0%A4%B5%E0%A4%B0%20(%E0%A4%85%E0%A4%82%E0%A4%97%E0%A5%8D%E0%A4%B0%E0%A5%87%E0%A4%9C%E0%A4%BC%E0%A5%80%3A%20Thiruvalluvar)%20%E0%A4%A6%E0%A4%95%E0%A5%8D%E0%A4%B7%E0%A4%BF%E0%A4%A3,%E0%A4%AA%E0%A4%A4%E0%A4%BE%20%E0%A4%AE%E0%A5%87%E0%A4%82%20%E0%A4%B5%E0%A4%BF%E0%A4%B6%E0%A5%8D%E0%A4%B5%E0%A4%BE%E0%A4%B8%20%E0%A4%B0%E0%A4%96%E0%A4%A4%E0%A5%87%20%E0%A4%A5%E0%A5%87%E0%A5%A4

2. bZ-os-jkelkeh

https://hi.wikipedia.org/wiki/%E0%A4%AA%E0%A5%87%E0%A4%B0%E0%A4%BF%E0%A4%AF%E0%A4%BE%E0%A4%B0#:~:text=%E0%A4%87%E0%A4%B0%E0%A5%8B%E0%A4%A1%20%E0%A4%B5%E0%A5%87%E0%A4%82%E0%A4%95%E0%A4%9F%20%E0%A4%A8%E0%A4%BE%E0%A4%AF%E0%A4%95%E0%A4%B0%20%E0%A4%B0%E0%A4%BE%E0%A4%AE%E0%A4%BE%E0%A4%B8%E0%A4%BE%E0%A4%AE%E0%A5%80%20(17,%E0%A4%B5%E0%A4%BE%E0%A4%B2%E0%A5%87%20%E0%A4%B9%E0%A4%BF%E0%A4%A8%E0%A5%8D%E0%A4%A6%E0%A5%81%E0%A4%A4%E0%A5%8D%E0%A4%B5%20%E0%A4%95%E0%A4%BE%20%E0%A4%B5%E0%A4%BF%E0%A4%B0%E0%A5%8B%E0%A4%A7%20%E0%A4%A5%E0%A4%BE%E0%A5%A4

3. ukjh l"kfDrdj.k%

https://www.hindikiduniya.com/essay/women-empowermentessayinhindi/#:~:text=%E0%A4%AE%E0%A4%B9%E0%A4%BF%E0%A4%B2%E0%A4%BE%20%E0%A4%B8%E0%A4%B6%E0%A4%95%E0%A5%8D%E0%A4%A4%E0%A4%BF%E0%A4%95%E0%A4%B0%E0%A4%A3%20%E0%A4%95%E0%A5%8D%E0%A4%AF%E0%A4%BE%20%E0%A4%B9%E0%A5%88%20%3F&text=%E0%A4%AE%E0%A4%B9%E0%A4%BF%E0%A4%B2%E0%A4%BE%20%E0%A4%B8%E0%A4%B6%E0%A4%95%E0%A5%8D%E0%A4%A4%E0%A4%BF%E0%A4%95%E0%A4%B0%E0%A4%A3%20%E0%A4%95%E0%A5%8B%20%E0%A4%AC%E0%A5%87%E0%A4%B9%E0%A4%A6%20%E0%A4%86%E0%A4%B8%E0%A4%BE%E0%A4%A8,%E0%A4%B8%E0%A4%95%E0%A5%8D%E0%A4%B7%E0%A4%AE%20%E0%A4%AC%E0%A4%A8%E0%A4%BE%E0%A4%A8%E0%A4%BE%20%E0%A4%AE%E0%A4%B9%E0%A4%BF%E0%A4%B2%E0%A4%BE%20%E0%A4%B8%E0%A4%B6%E0%A4%95%E0%A5%8D%E0%A4%A4%E0%A4%BF%E0%A4%95%E0%A4%B0%E0%A4%A3%20%E0%A4%B9%E0%A5%88%E0%A5%A4

4. i;kZoj.k laj{k.k%

a. https://hi.wikipedia.org/wiki/%E0%A4%AA%E0%A4%B0%E0%A5%8D%E0%A4%AF%E0%A4%BE%E0%A4%B5%E0%A4%B0%E0%A4%A3_%E0%A4%B8%E0%A4%88%E0%A4%B0%E0%A4%95%E0%A5%8D%E0%A4%B7%E0%A4%A3#:~:text=%E0%A4%AA%E0%A4%B0%E0%A5%8D%E0%A4%AF%E0%A4%BE%E0%A4%B5%E0%A4%B0%E0%A4%A3%20%E0%A4%B8%E0%A4%82%E0%A4%B0%E0%A4%95%E0%A5%8D%E0%A4%B7%E0%A4%A3%20%E0%A4%95%E0%A4%BE%20%E0%A4%B8%E0%A4%AE%E0%A4%B8%E0%A5%8D%E0%A4%A4%20%E0%A4%AA%E0%A5%8D%E0%A4%B0%E0%A4%BE%E0%A4%A3%E0%A4%BF%E0%A4%AF%E0%A5%8B%E0%A4%82,%E0%A4%AA%E0%A5%83%E0%A4%A5%E0%A5%8D%E0%A4%B5%E0%A5%80%20%E0%A4%B8%E0%A4%AE%E0%A5%8D%E0%A4%AE%E0%A5%87%E0%A4%B2%E0%A4%A8'%20%E0%A4%86%E0%A4%AF%E0%A5%8B%E0%A4%9C%E0%A4%BF%E0%A4%A4%20%E0%A4%95%E0%A4%BF%E0%A4%AF%E0%A4%BE%20%E0%A4%97%E0%A4%AF%E0%A4%BE%E0%A5%A4

b. http://gadyakosh.org/gk/%E0%A4%86%E0%A4%88%E0%A4%AF%E0%A5%87!_%E0%A4%AA%E0%A4%B0%E0%A5%8D%E0%A4%AF%E0%A4%BE%E0%A4%B5%E0%A4%B0%E0%A4%A3_%E0%A4%AC%E0%A4%9A%E0%A4%BE%E0%A4%8F%E0%A4%81_/_%E0%A4%85%E0%A4%A8%E0%A5%8D%E0%A4%A4%E0%A4%B0%E0%A4%BE_%E0%

PART II ENGLISH

Unit 1- Poetry
1. A Patch of Land - Subramania Bharati
2. The Sparrow - Paul Laurence Dunbar
3. A Nation's Strength – Ralph Waldo Emerson
4. Love Cycle - Chinua Achebe

Unit II - Prose
1. JRD - Harish Bhat
2. Us and Them - David Sedaris From Dress Your Family in Corduroy and Denim
3. Uncle Podger Hangs a Picture - Jerome K Jerome

Unit III- Short Stories
1. The Faltering Pendulum- Bhabani Bhattacharya
2. How I Taught my Grandmother to Read- Sudha Murthy
3. The Gold Frame- R.K. Laxman

Unit IV - Language Competency
1. Vocabulary : Synonyms, Antonyms, Word Formation
2. Appropriate use of Articles and Parts of Speech
3. Error correction

Unit V English for Workplace
1. Self - introduction, Greetings
2. Introducing others
3. Listening for General and Specific Information
4. Listening to and Giving Instructions /Directions

Text books (Latest Editions)
1. Steel Hawk and other stories by Bhattacharya, Bhabani, New Delhi: Sahitya Akademi, 1967
2. How I taught my Grandmother to Read and other Stories, Murthy, Sudha,Penguin Books, India, 2004

Web Resources
1. A patch of land by Subramania Bharati translated by Usha Rajagoplan : https://books.google.co.in/books?id=iSHvOmXuvLMC&printsec=frontcover&dq=subramania+bharati +poems&hl=en&newbks=1&newbks_redir=0&source=gb_mobile_search&sa=X&redir_esc=y#v=one page&q=subramania%20bharati%20poems&f=false
2. The Sparrow by Paul Laurence Dunbar https://poets.org/poem/sparrow-0
3. A Nation's Strength by Emerson https://poets.org/poem/nations-strength
4. Love cycle by Chinua Achebe : https://www.best-poems.net/chinuaachebe/ love-cycle.html
5. JRD by Harish Bhat https://www.tata.com/newsroom/heritage/coffee-tea-jrd-tata-stories
6. Us and Them by David Sedaris From Dress Your Family in Corduroy and Denimhttps://legacy.npr.org/programs/morning/features/2004/jun/sedaris/usandthem.html
7. Uncle Podger Hangs a Picture: http://rosyhunt.blogspot.com/2013/01/unclepodger-hangs-picture.html
8. The Gold Frame: https://fybaenglish.blogspot.com/2018/12/the-gold-frame-r-klaxman.html

Reference Books

(Latest Editions, and the style given must be strictly adhered to)
1. English in use - A textbook for College Students (English ,Paper back, - T.Vijay Kumar, KDurga Bhavani, YL Srinivas
2. Practical English Usage - 4th Edition By Michael Swan
3. The Art of Civilized Conversation: A Guide to Expressing Yourself with Style and
4. Grace -Margaret Shepherd, Penny Carter, (Illustrator), Sharon Hogan, 2005.

ALGEBRA & TRIGONOMETRY

Objectives of the Course
- Basic ideas on the Theory of Equations, Matrices and Number Theory.
- Knowledge to find expansions of trigonometry functions, solve theoretical and applied problems.

Course Outline

Unit I: Reciprocal Equations-Standard form–Increasing or decreasing the roots of a given equation- Approximate solutions of roots of polynomials by Horner''s method – related problems.

Unit II: Summation of Series: Binomial– Exponential –Logarithmic series (Theorems without proof) – Approximations - related problems.

Unit III: Characteristic equation – Eigen values and Eigen Vectors- Similar matrices - Cayley – Hamilton Theorem (Statement only) - Finding powers of square matrix, Inverse of a square matrix up to order 3 - related problems.

Unit IV: Expansions of $\sin n\theta$, $\cos n\theta$ in powers of $\sin\theta$, $\cos\theta$ - Expansion of $\tan n\theta$ in terms of $\tan\theta$, Expansions of $\cos n\theta$, $\sin n\theta$, $\cos m\theta \sin n\theta$ –Expansions of $\tan(\theta_1+\theta_2+\ldots,+\theta_n)$ - related problems.

Unit V: Hyperbolic functions – Relation between circular and hyperbolic functions Inverse hyperbolic functions, Logarithm of complex quantities – related problems.

Recommended Text
1. T.K. Manicavachagom Pillar. I. Natarajan and K S. Ganapathy, Algebra, Vol 1, S. Viswanathan (Printers & Publication) PVT. LID 2015
2. S. Arumugam and A. Thangapandi Issac, Theory of Equations and Trigonometry, New Gamma Publishing House, Palayamkottai. 2006

Reference Books
1. W.S. Burnstine and A.W. Panton, Theory of equations
2. David C. Lay, Linear Algebra and its Applications, 3rd Ed., Pearson Education Asia, Indian Reprint, 2007
3. G.B. Thomas and R.L. Finney, Calculus, 9th Ed., Pearson Education, Delhi, 2005
4. V. Durell and A. Robson, Advanced Trigonometry, Courier Corporation, 2003
5. J. Stewart, L. Redlin, and S. Watson, Algebra and Trigonometry, Cengage Learning, 2012.
6. Calculus and Analytical Geometry, G.B. Thomas and R. L. Finny, Pearson Publication, 9th Edition, 2010.

Website and e-Learning Source
1. https://nptel.ac.in

Nesamony Memorial Christian College, Marthandam

DIFFERENTIAL CALCULUS

Objectives
- The basic skills of differentiation, successive differentiation, and their applications.
- Basic knowledge on the notions of curvature, evolutes, involutes and polar co-ordinates and in solving related problems.

UNIT-I:

Successive Differentiation: Introduction (Review of basic concepts) – The nth derivative – Standard results – Trigonometrical transformation – Formation of equations involving derivatives – Leibnitz formula for the nth derivative of a Product.

UNIT-II:

Partial Differentiation: Partial derivatives – Successive partial derivatives – Function of a function rule – Total differential coefficient .

UNIT-III:

Partial Differentiation (Continued): Homogeneous functions – Partial derivatives of a function of two variables - Lagrange‟s method of undetermined multipliers.

UNIT-IV:

Envelope: Method of finding the envelope – Another definition of envelope – Envelope of family of curves which are quadratic in the parameter.

UNIT-V:

Curvature: Definition of Curvature – Circle, Radius and Centre of Curvature – Evolutes and Involutes – Radius of Curvature in Polar Co-ordinates.

Recommended Text
1. S. Narayanan and T K. Manicavachagom Pillax, Calculus, Vol 1, S. Viswanathan (Printers & Publication) PVT. LID. 2015.
2. S. Armugam and A. Thangapandi Issac, Calculus, New Gamma Publishing House, Palayamkottai 2011

Reference Books
1. R. Courant and F. John, Introduction to Calculus and Analysis (Volumes I & II), Springer- Verlag, New York, Inc., 1989.
2. T. Apostol, Calculus, Volumes I and II.
3. S. Goldberg, Calculus and mathematical analysis.
4. H. Anton, I. Birens and S. Davis, Calculus, John Wiley and Sons, Inc., 2002.
5. G.B. Thomas and R.L. Finney, Calculus, Pearson Education, 2010.
6. M.J. Strauss, G.L. Bradley and K. J. Smith, Calculus, 3rd Ed., Dorling Kindersley (India) P. Ltd. (Pearson Education), Delhi, 2007.

Website and e-Learning Source
1. https://nptel.ac.in

ALLIED PHYSICS – I

OBJECTIVES

To impart basic principles of Physics that which would be helpful for students who have taken programmes other than Physics.

UNIT-I

WAVES, OSCILLATIONS AND ULTRASONICS: simple harmonic motion (SHM) – composition of two SHMs at right angles (periods in the ratio 1:1) – Lissajous figures – uses – laws of transverse vibrations of strings – determination of AC frequency using sonometer (steel and brass wires) – ultrasound – production – piezoelectric method – application of ultrasonics: medical field – lithotripsy, ultrasonography –ultrasono imaging- ultrasonics in dentistry – physiotheraphy, opthalmology – advantages of noninvasive surgery – ultrasonics in green chemistry.

UNIT-II

PROPERTIES OF MATTER: Elasticity: elastic constants – bending of beam – theory of non- uniform bending – determination of Young's modulus by non-uniform bending – energy stored in a stretched wire – torsion of a wire – determination of rigidity modulus by torsional pendulum

Viscosity: streamline and turbulent motion – critical velocity – coefficient of viscosity – Poiseuille's formula – comparison of viscosities – burette method,

Surface tension: definition – molecular theory – droplets formation– shape, size and lifetime – COVID transmission through droplets, saliva – drop weight method – interfacial surface tension.

UNIT-III

HEAT AND THERMODYNAMICS: Joule-Kelvin effect – Joule- Thomson porous plug experiment – theory – temperature of inversion – liquefaction of Oxygen– Linde's process of liquefaction of air– liquid Oxygen for medical purpose– importance of cryocoolers– thermodynamic system – thermodynamic equilibrium – laws of thermodynamics – heat engine – Carnot's cycle – efficiency – entropy – change of entropy in reversible and irreversible process.

UNIT-IV

ELECTRICITY AND MAGNETISM: potentiometer – principle – measurement of thermo emf using potentiometer –magnetic field due to a current carrying conductor – Biot-Savart's law – field along the axis of the coil carrying current – peak, average and RMS values of accurrent and voltage – power factor and current values in an AC circuit – types of switches in household and factories– Smart wifi switchesfuses and circuit breakers in houses

UNIT-V

DIGITAL ELECTRONICS AND DIGITAL INDIA: logic gates, OR, AND, NOT, NAND, NOR , EXOR logic gates – universal building blocks – Boolean algebra – De Morgan's theorem – verification – overview of Government initiatives: software technological parks under MeitY, NIELIT- semiconductor laboratories under Dept. of Space – an introduction to Digital India

UNIT-VI

PROFESSIONAL COMPONENTS: expert lectures –seminars —webinars – industry inputs – social accountability – patriotism

TEXT BOOKS
1. R.Murugesan (2001), Allied Physics, S. Chand and Co, New Delhi.
2. Brijlal and N.Subramanyam (1994), Waves and Oscillations, Vikas Publishing House, New Delhi.
3. Brijlal and N.Subramaniam (1994), Properties of Matter, S.Chand and Co., New Delhi.
4. J.B.Rajam and C.L.Arora (1976). Heat and Thermodynamics (8th edition), S.Chand and Co., New Delhi.
5. R. Murugesan (2005), Optics and Spectroscopy, S.Chand and Co, New Delhi.
6. A. Subramaniyam, Applied Electronics 2nd Edn., National Publishing Co., Chennai.

REFERENCE BOOKS
1. Resnick Halliday and Walker (2018). Fundamentals of Physics b (11th edition), John Willey and Sons, Asia Pvt. Ltd., Singapore.
2. V.R.Khanna and R.S.Bedi (1998), Text book of Sound 1st Edn. Kedharnaath Publish and Co, Meerut.
3. N.S.Khare and S.S.Srivastava (1983), Electricity and Magnetism10th Edn., Atma Ram and Sons, New Delhi.
4. D.R.Khanna and H.R. Gulati (1979). Optics,S. Chand and Co. Ltd., New Delhi.
5. V.K.Metha (2004). Principles of electronics 6th Edn. S.Chand and company.

WEB RESOURCES
1. https://youtu.be/M_5KYncYNyc
2. https://youtu.be/ljJLJgIvaHY
3. https://youtu.be/7mGqd9HQ_AU
4. https://youtu.be/h5jOAw57OXM
5. https://learningtechnologyofficial.com/category/fluidmechanics-lab/
6. http://hyperphysics.phyastr

gsu.edu/hbase/permot2.htmlhttps://www.youtube.com/watc
h?v=gT8Nth9NWPMhttps://www.youtube.com/watch?v=9mX
OMzUruMQandt=1shttps://www.youtube.com/watch?v=m4u-
SuaSu1sandt=3shttps://www.biolinscientific.com/blog/what-aresurfactants-
and-how-do-they-work

ALLIED PRACTICAL– I

COURSE OBJECTIVES

Apply various physics concepts to understand Properties of Matter and waves, set up experimentation to verify theories, quantify and analyse, able to do error analysis and correlate results

Minimum of Eight Experiments from the list:

1. Young's modulus by non-uniform bending using pin and microscope
2. Young's modulus by non-uniform bending using optic lever, scale and telescope
3. Rigidity modulus by static torsion method.
4. Rigidity modulus by torsional oscillations without mass
5. Surface tension and interfacial Surface tension – drop weight method
6. Comparison of viscosities of two liquids – burette method
7. Specific heat capacity of a liquid – half time correction
8. Verification of laws of transverse vibrations using sonometer
9. Calibration of low range voltmeter using potentiometer
10. Determination of thermo emf using potentiometer
11. Verification of truth tables of basic logic gates using ICs
12. Verification of De Morgan's theorems using logic gate ICs.
13. Use of NAND as universal building block.

Note : Use of digital balance permitted

MATHEMATICS FOR COMPETETIVE EXAMINATION-I

Objectives
- To learn the techniques for solving aptitude problems and to enable the students prepare themselves for various competitive examinations.

UNIT-I: Simplification, averages.

UNIT-II: Ratio and proportion.

UNIT-III: Partnership-percentages.

UNIT-IV: Profit and Loss

UNIT-V: Problems on numbers.

Reference Books
1. R.S.Agarwal -Objective arithmetic,Published by S.Chand& Co Ltd.Edition 2018

Recommended Text
1. R.S.Agarwal - Arithmetic subjective and Objective, Published by S.Chand& Co Ltd. Revised Edition 1st April 2017
2. Rajesh Verma, Fast track Objective arithmetic, Arihant Publications India Limited Fourth Edition,1 st January 2018.

Website and e-Learning Source
1. https://nptel.ac.in

FC - Bridge Mathematics

Objectives
- To bridge the gap and facilitate transition from higher secondary to tertiary education;
- To instill confidence among stakeholders and inculcate interest for Mathematics;

UNIT-I:
Algebra: Binomial theorem, General term, middle term, problems based on these concepts

Unit II:
Sequences and series (Progressions). Fundamental principle of counting. Factorial n.

Unit III:
Permutations and combinations, Derivation of formulae and their connections, simple applications, combinations with repetitions, arrangements within groups, formation of groups.

Unit IV:
Trigonometry: Introduction to trigonometric ratios, proof of sin(A+B), cos(A+B), tan(A+B) formulae, multiple and sub multiple angles, sin(2A), cos(2A), tan(2A) etc., transformations sum into product and product into sum formulae, inverse trigonometric functions, sine rule and cosine rule

Unit V:
Calculus: Limits, standard formulae and problems, differentiation, first principle, uv rule, u/v rule, methods of differentiation, application of derivatives, integration - product rule and substitution method.

Recommended Text
1. NCERT class XI and XII text books.
2. Any State Board Mathematics text books of class XI and XII

Website and e-Learning Source
1. https://nptel.ac.in