# C. ABDUL HAKEEM COLLEGE [AUTONOMOUS]

**[Affiliated to Thiruvalluvar University, Vellore]**

## MELVISHARAM – 632509


## Syllabus under CBCS Pattern

## Learning Outcome Based Curriculum Frame work [LOCF]

## with effect from 2018 onwards

## B.Sc. Physics

## Prepared By

## Department of Physics

**Programme Outcomes (PO) for Bachelor of Science (B.Sc.):**

**PO1: Critical Thinking and Scientific Reasoning**

Capable of critical thought after attaining basic disciplinary knowledge and understanding of major concepts, theoretical principles and experimental findings for scientific reasoning in the field of basic sciences.

**PO2: Problem Solving**

Ability to have effective problem solving skills in relevance to the society based on the knowledge and skills acquired from sciences.

**PO3: Skill Development**

Capable of demonstrating research, including wider interdisciplinary areas, as well as the ability to use current instruments/information technology in science-related fields. Improving the standard of science with a strong scientific temperament, leadership, and governing abilities.

**PO4: Computational/Digital Literacy**

Capable of locating, retrieving, and evaluating various science-related needs using computer/mobile-based digital literacy and search resources.

**PO5: Effective Communication**

Ability to communicate deep technical science information in writing and orally.

**PO6: Moral and Ethical Awareness**

Capable of carrying out their work with integrity and accuracy, avoiding unethical behaviours such as exaggeration, falsification, misrepresentation or plagiarism. Environmental and sustainability problems in the local area are being brought to the attention of the public.

**PO7: Social Responsibility**

Demonstrate numerous social issues, empathy and equity-based personal growth, as well as the opportunity to volunteer in real life and function as a true citizen.

**PO8: Life-long Learning**

Capable of self-paced and self-directed learning for personal growth, as well as imparting knowledge/skills for society re-skilling.

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**PSO for B. Sc Physics**

**PSO1:** Comprehend the basic laws and explore the fundamental concepts of Physics.

**PSO2:** Procure analytical and logical skills for higher education.

**PSO3:** Providing a hands-on learning experience such as in measuring the basic quantities in properties of matter, heat, optics, electricity and electronics.

**(For Candidates admitted from June 2018 onwards)**

# C. ABDUL HAKEEM COLLEGE (AUTONOMOUS), MELVISHARAM-632509

## DEPARTMENT OF PHYSICS

## B.Sc. PHYSICS

## CBCS PATTERN (REGULATIONS – 2018 - 2019)

## The Course of Study, Credits and Scheme of Examinations

## I YEAR

| S.No | Part | Course Title | Subject Codes | Hrs/ week | Credits | Title of the Paper | Maximum Marks | | |
|---|---|---|---|---|---|---|---|---|---|
| **I YEAR** | | | **SEMESTER I** | | | | **CIA Marks** | **EXT Marks** | **TOTAL Marks** |
| 1 | I | Language | U18FTA101/ U18FUR101 | 6 | 4 | Tamil/Urdu/Others-I | 25 | 75 | 100 |
| 2 | II | English | U18FEN101 | 6 | 4 | English-I | 25 | 75 | 100 |
| 3 | III | Main-Theory | U18MPH101 | 6 | 6 | Properties of Matter and Acoustics | 25 | 75 | 100 |
| --- | III | Main-Practical | U18MPHP21 | 3 | 0 | Core Practical-I | 0 | 0 | 0 |
| 4 | III | Allied-I Theory | U18AMA101/ | 7 | 4 | Mathematics I/ | 25 | 75 | 100 |
| | | | U18AZL101 | 4 | 4 | Zoology-I | | | |
| --- | III | Allied-I Practical | U18AZLP21 | 3 | 0 | Allied Practical-Zoology | 0 | 0 | 0 |
| 5 | IV | Environmental Studies | U18CES101 | 2 | 2 | Environmental Studies | 25 | 75 | 100 |
| | | | | **30** | **20** | | **125** | **375** | **500** |
| | | | | | | | | | |
| **S.No** | **Part** | **Course Title** | **Subject Codes** | **Hrs/ week** | **Credits** | **Title of the Paper** | **Maximum Marks** | | |
| **I YEAR** | | | **SEMESTER II** | | | | **CIA Marks** | **EXT Marks** | **TOTAL Marks** |
| 6 | I | Language | U18FTA201/ U18FUR201 | 6 | 4 | Tamil/Urdu/Others-II | 25 | 75 | 100 |
| 7 | II | English | U18FEN201 | 4 | 4 | English-II | 25 | 75 | 100 |
| 8 | III | Main-Theory | U18MPH201 | 6 | 5 | Thermal Physics and Statistical Methods | 25 | 75 | 100 |
| 9 | III | Main-Practical | U18MPHP21 | 3 | 3 | Core Practical-I | 25 | 75 | 100 |
| 10 | III | Allied-I Theory | U18AMA201/ | 7 | 6 | Mathematics- II/ | 25 | 75 | 100 |
| | | | U18AZL201 | 4 | 4 | Zoology-II | | | |
| 11 | III | Allied-I Practical | U18AZLP21 | 3 | 2 | Allied Practical-I Zoology | 25 | 75 | 100 |
| 12 | IV | Value Education | U18CVE201 | 2 | 2 | Value Education | 25 | 75 | 100 |
| 13 | IV | Soft Skills | U18CSS201 | 2 | 1 | Soft Skills | 25 | 75 | 100 |
| | | | | **30** | **25** | | **200** | **600** | **800** |

# II YEAR

| S.No | Part | Course Title | Subject Codes | Hrs/ week | Credits | Title of the Paper | Maximum Marks | | |
|---|---|---|---|---|---|---|---|---|---|
| **II YEAR** | | | **SEMESTER III** | | | | **CIA Marks** | **EXT Marks** | **TOTAL Marks** |
| 14 | I | Language | U18FTA301/ U18FUR301 | 6 | 4 | Tamil/Urdu/Others-III | 25 | 75 | 100 |
| 15 | II | English | U18FEN301 | 6 | 4 | English-III | 25 | 75 | 100 |
| 16 | III | Main-Theory | U18MPH301 | 3 | 3 | Optics | 25 | 75 | 100 |
| --- | III | Main-Practical | U18MPHP41 | 3 | 0 | Core Practical-II | 0 | 0 | 0 |
| 17 | III | Allied-II Theory | U18ACH301/ U18ACH302 | 4 | 4 | Chemistry I/ Biochemistry-I | 25 | 75 | 100 |
| --- | III | Allied-II Practical | U18ACHP41/ U18ACHP42 | 3 | 0 | Allied Practical-Chemistry/ Biochemistry | 0 | 0 | 0 |
| 18 | IV | Skill Based Subject | U18SPH301 | 3 | 3 | Basic Electronics **(SBS-I)** | 25 | 75 | 100 |
| 19 | IV | Non Major Elective | U18NPH301 | 2 | 2 | Basic Physics -I **(NME-I)** | 25 | 75 | 100 |
| | | | | **30** | **20** | | **150** | **450** | **600** |

| S.No | Part | Course Title | Subject Codes | Hrs/ week | Credits | Title of the Paper | Maximum Marks | | |
|---|---|---|---|---|---|---|---|---|---|
| **II YEAR** | | | **SEMESTER IV** | | | | **CIA Marks** | **EXT Marks** | **TOTAL Marks** |
| 20 | I | Language | U18FTA401/ U18FUR401 | 6/4* | 4/3* | Tamil/Urdu/Others-IV | 25 | 75 | 100 |
| 21 | I | Urdu Lab | U18FURP41 | 2* | 1* | Practical Urdu | 25 | 75 | 100 |
| 22 | II | English | U18FEN401 | 6 | 4 | English-IV | 25 | 75 | 100 |
| 23 | III | Main-Theory | U18MPH401 | 3 | 3 | Analog and Digital Electronics | 25 | 75 | 100 |
| 24 | III | Main-Practical | U18MPHP41 | 3 | 3 | Core Practical-II | 25 | 75 | 100 |
| 25 | III | Allied-II Theory | U18ACH401/ U18ACH402 | 4 | 4 | Chemistry –II/ Biochemistry-II | 25 | 75 | 100 |
| 26 | III | Allied-II Practical | U18ACHP41/ U18ACHP42 | 3 | 2 | Allied Practical-Chemistry/ Biochemistry | 25 | 75 | 100 |
| 27 | IV | Skill Based Subject | U18SPHP41 | 3 | 3 | Skill based practical **(SBS-II)** | 25 | 75 | 100 |
| 28 | IV | Non Major Elective | U18NPH401 | 2 | 2 | Basic Physics -II **(NME-II)** | 25 | 75 | 100 |
| | | | | **30** | **25** | | **225** | **675** | **900** |

*** Urdu**

# III YEAR

| S.No | Part | Course Title | Subject Codes | Hrs/ week | Credits | Title of the Paper | Maximum Marks | | |
|---|---|---|---|---|---|---|---|---|---|
| **III YEAR** | | | **SEMESTER V** | | | | **CIA Marks** | **EXT Marks** | **TOTAL Marks** |
| 29 | III | Main- Theory | U18MPH501 | 6 | 6 | Electricity and Magnetism | 25 | 75 | 100 |
| 30 | III | Main-Theory | U18MPH502 | 6 | 5 | Atomic physics and Spectroscopy | 25 | 75 | 100 |
| 31 | III | Main-Theory | U18MPH503 | 6 | 5 | Mechanics and Mathematical physics | 25 | 75 | 100 |
| --- | III | Main-Practical | U18MPHP61 | 3 | 0 | Core Practical-III (General) | 0 | 0 | 0 |
| --- | III | Main-Practical | U18MPHP62 | 3 | 0 | Core Practical-IV (Electronics) | 0 | 0 | 0 |
| 32 | III | Elective-I | U18EPH501/ U18EPH502/ U18EPH503 | 3 | 3 | **(Choose any one)** Applied Physics/ Geophysics/ Numerical Methods | 25 | 75 | 100 |
| 33 | III | Main | U18EINP51 | 0 | 2 | Internship Training | 25 | 75 | 100 |
| 34 | IV | Skill Based Subject | U18SPH501 | 3 | 2 | Embedded Systems-I **(SBS-III)** | 25 | 75 | 100 |
| | | | | **30** | **23** | | **150** | **450** | **600** |

| S.No | Part | Course Title | Subject Codes | Hrs/ week | Credits | Title of the Paper | Maximum Marks | | |
|---|---|---|---|---|---|---|---|---|---|
| **III YEAR** | | | **SEMESTER VI** | | | | **CIA Marks** | **EXT Marks** | **TOTAL Marks** |
| 35 | III | Main- Theory | U18MPH601 | 5 | 4 | Nuclear and Particle Physics | 25 | 75 | 100 |
| 36 | III | Main-Theory | U18MPH602 | 5 | 4 | Relativity and Quantum Mechanics | 25 | 75 | 100 |
| 37 | III | Main-Theory | U18MPH603 | 5 | 4 | Solid state physics | 25 | 75 | 100 |
| 38 | III | Main-Practical | U18MPHP61 | 3 | 3 | Core Practical-III (General ) | 25 | 75 | 100 |
| 39 | III | Main-Practical | U18MPHP62 | 3 | 3 | Core Practical-IV (Electronics) | 25 | 75 | 100 |
| 40 | III | Elective-II | U18EPH601/ U18EPH603/ U18EPH604 | 3 | 3 | **(Choose any one)** Material Science/ Radio Communication and Television/ Introduction to C Programming | 25 | 75 | 100 |
| 41 | III | Elective-III | U18EPH602/ U18EPH605/ U18EPH606 | 3 | 3 | **(Choose any one)** Instrumentation/ Non-Destructive Testing/ Medical Physics | 25 | 75 | 100 |
| 42 | IV | Skill Based Subject | U18SPH601 | 3 | 2 | Embedded Systems-II **(SBS-IV)** | 25 | 75 | 100 |
| 43 | V | Extension Activities | U18CEA601 | 0 | 1 | Extension Activities | 100 | - | 100 |
| | | | | **30** | **27** | | **300** | **600** | **900** |

# C. ABDUL HAKEEM COLLEGE (Autonomous), Melvisharam

Syllabus for First year B.A.,B.Sc.,&B.Com (C.S) effective from the year 2018-2019

| | | | |
|---|---|---|---|
| Class | : UG First year B.A.,B.Sc.,&B.Com (C.S) | Semester | : I |
| Subject Code | : U18FTA101 | Title | : Part-I Tamil |
| Credits | : 4 | Max Marks | : 75 |

| | |
|---|---|
| **OBJECTIVES** | தமிழ் மொழியின் இலக்கிய, இலக்கணச் செழுமைகளைப் பயிற்சிகளின் வழி வெளிக்கொணர்தல். |
| **COURSE OUTCOME(S)** | |
| **CO1** | பக்தி இயக்க காலத்தில் சமூகப் பண்பாட்டு வரலாற்றை இனம் காணல். கவிதை வழி சமூகச் சிந்தனைகளையும் இயற்கையின் முக்கியத்துவத்தையும் கவிதை வழி இயம்பல். |
| **CO2** | தமிழ் உரைநடை இலக்கியங்களில் உள்ள நேர மேலாண்மை மற்றும் அறிவியல் தமிழ் குறித்த பதிவுகளை விளக்குதல். தமிழ்ச் சிறுகதைகளில் தனி மனித மன உணர்வுகளை வெளிக் கொணரல். |
| **CO3** | செவ்வியல் இலக்கிய நெடிய வரலாறு, இலக்கணப் பயிற்சி வழி போட்டித் தேர்வுகளை எதிர்கொள்ளல். |

## பாடத்திட்டம்

### அலகு - 1 பக்தி

1. திருமூலர் - திருமந்திரம் (7 பாடல்கள்)
2. மு. மேத்தா - நாயகம் ஒரு காவியம்
   அ. தலைக்கு விலை
   ஆ. சிலந்தி செய்த செயல்
3. சேவியர் - இயேசுவின் கதை
   அ. சிலுவை, ஆ. உன்னதரின் உயிர்ப்பு

### அலகு - 2 கவிதை

1. பாரதியார் - கண்ணம்மா என் குழந்தை (முழுவதும்)
2. பாரதிதாசன் - குடும்ப விளக்கு - முதியோர் காதல் (தேர்ந்தெடுத்த 10 பாடல்கள்)
3. கவிமணி - ஆறு தன் வரலாறு கூறுதல்
4. நா.காமராசன் - கறுப்பு மலர்கள்
   அ. வானவில், ஆ. கடல்
5. அப்துல் காதர் - மின்னல் திரிகள் -
   மெழுகுவர்த்தியும் ஊதுவத்தியும்

### அலகு - 3 உரைநடை

1. அப்துல் ரகுமான் - எம்மொழி செம்மொழி
2. வா.செ. குழந்தைசாமி - அறிவியலும் வறுமையொழிப்பும்
3. வெ. இறையன்பு - நேரம் கடிகாரத்தில் இல்லை

### அலகு - 4 சிறுகதை

1. மேலாண்மை பொன்னுசாமி - அன்பூவாசம்
2. வைரமுத்து - இப்படியும் ஒருவன் இறந்தான்
3. வண்ணதாசன் - ஓர் உல்லாசப் பயணம்

**அலகு - 5**

**அ. இலக்கிய வரலாறு**

1. பக்தி & சமய இலக்கியங்கள் - அறிமுகம்
   (சைவம், இசுலாம், கிறித்தவம் )
2. இக்கால இலக்கியங்கள் - தோற்றமும் வளர்ச்சியும்
   (கவிதை, உரைநடை, சிறுகதை)

**ஆ. திறனறிப் பயிற்சி**

1. அகரவரிசைப்படுத்துதல்
2. வல்லினம் மிகும் இடங்கள்
3. வல்லினம் மிகா இடங்கள்
4. சந்திப்பிழை நீக்குதல்
5. பொதுக் கட்டுரை

**பார்வை நூல்கள்**


| | | | |
|---|---|---|---|
| 1 | இலக்கியச் சோலை | - | சி.அப்துல் ஹக்கீம் கல்லூரி வெளியீடு.<br>2018 சூன் வெளியீடு |
| 2 | மினனல் திரிகள் | - | அப்துல் காதர்<br>சல்மா பதிப்பகம்,வாணியம்பாடி,<br>முதல் பதிப்பு,2004 |
| 3 | இயேசுவின் கதை | - | சேவியர்<br>யாளி பதிவு வெளியீடு, கோடம்பாக்கம் சென்னை- 24<br>முதல் பதிப்பு -2005 |
| 4 | எம்மொழி செம்மொழி | - | கவிக்கோ அப்துல் ரகுமான்<br>நேஷனல் பப்ளிஸர்ஸ்,தி.நகர்,<br>சென்னை -17 முதல் பதிப்பு -2010 |
| 5 | தமிழ் இலக்கிய வரலாறு | - | பேரா.மது.ச.விமலானந்தம்<br>அபிராமி பதிப்பகம், இராயபுரம், சென்னை -13<br>மறு பதிப்பு -2002 |
| 6 | நற்றமிழ் இலக்கணம் | - | டாக்டர்.சொ.பரமசிவம்,<br>பட்டுப் பதிப்பகம், 1269, 32-ஆம் தெரு<br>அண்ணாநகர் மேற்கு, கம்பர் குடியிருப்பு,<br>சென்னை -40<br>பன்னிரண்டாம் பதிப்பு -2012 |

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **I Year** Subject Code: **U18FUR101** Semester: **I**

Language - 1 Title: **URDU – I (Prose, Grammar & Letter Writing)**

Credits: **4** Max. Marks: **75**

| | |
|---|---|
| **OBJECTIVES**: | ✓ To promote students' proficiency in the basics of Urdu.<br>✓ To accelerate their zeal to cultivate Writing Skills.<br>✓ To strengthen their reading and receptive skills. |
| **COURSE OUTCOMES** | ➢ Students will acquire the required academic efficiency.<br>➢ They will be learning the techniques of exemplary writing.<br>➢ They will develop ability to foster fast reading of Texts. |

**Unit – I**

1.SAIR PAHLAY DARWESH KI – Meer Amman Dehalvi
2.UMEED KI KHUSHI – Sir Syed
3.Letter to the Principal Seeking Leave

**Unit – II**

1.MIRZA GHALIB KE AKHLAQ WA ADAT – Moulana hali
2.ZUBAIDA KHATOON – Abdul Haleem Sharar
3.Zameer Aur Uski Khismien
4.Letter to the Manager of a Firm Seeking Employment

**Unit – III**

1.NOOR JHAN – Mohamed Hussain Azad
2.SAWERE JO KAL ANKH MERI KHULI – Patras Bukhari
3.Sifat Aur Uski Khimein
4.Letter to a Publisher of Book Seller Placing Order for Books

**Unit – IV**

1.KHUD GHARAZ DOST – Duputi Nazeer Ahmed
2.SIR SYED MARHOOM AUR URDU LITERATURE – Allama Shibli
3.Letter to the Father / Guardian Asking Money for Payment of College Fees

**Unit – V**

1.Letter to a Friend Inviting Him to Your Sister's Marriage
2.Sifat Aur Uski Khimein
3.Fe'l Aur Uski Khimein
4.Lawazim-E-Ism
5.Alamat-E-Fael "Nay" Aur Alamat-E-Mafo'ol "Ko" Ke Quaide

**BOOK PRESCRIBED**: "ADAB-E-JAMEEL", Published by Dept. of Urdu, C. Abdul Hakeem College, Melvisharam.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

| | | | | | |
|---|---|---|---|---|---|
| Year: | **I Year** | Subject Code: | **U18FEN101** | Semester: | **I** |
| English - 1 | | Title: | **ENGLISH – I** | | |
| Credits: | **4** | | | Max. Marks: | **75** |

**Course Outcome(s):**

- **CO1:** Understand various forms of literature like Prose, Poetry, Biography, Short Story and Drama.
- **CO2:** Acquire the knowledge of grammatical system of English Language and also develop four Language Skills (LSRW).

**UNIT - I** **PROSE**

1. The Curse of Untouchability — M.K. Gandhi
2. India and Democracy — Dr. B.R. Ambedkar
3. The Ant and the Grasshopper — W.S. Maugham
4. My Lost Dollar — Stephan Leacock

**UNIT – II** **POETRY**

1. All the World is a Stage — William Shakespeare
2. La Belle Dame Sans Merci — John Keats
3. Ozymandias — P.B. Shelley
4. River — A.K. Ramanujan

**UNIT - III** **SHORT STORIES**

1. The Doctor's Word — R. K. Narayan
2. The Model Millionaire — Oscar Wilde

**UNIT - IV** **ONE-ACT PLAY & BIOGRAPHY**

1. The Refund — Fritz Karinthy
2. Biography of Socrates

**UNIT - V** **WARM UP**

1. **Lexical Skills:**
    1. Words
    2. Synonyms and Antonyms
    3. Homonyms, Homophones
    4. Words often confused

2. **Descriptive Grammar:**
    1. Describing the Parts of Speech
    2. The Phrase and The Clause
    3. The Sentence and its types
    4. Nouns

3. **Traditional Grammar:**
    1. The Tenses- Introduction
       Present Tense
        - Simple Present Tense
        - Present Continuous Tense
        - Present Perfect Tense
        - Present Perfect Continuous Tense
    2. Voice of the Verb

4. **Communication Skills (LSRW):**
    1. Greeting
    2. Introducing
    3. Inviting someone
    4. Seeking Permission

    English for Communication - I

5. **Composition:**
    1. Letter Writing
    2. Dialogue Writing
    3. Report Writing
    4. Précis Writing
    5. Reading for Comprehension

    English for Communication - I

**Prescribed Book:** HALL OF FAME – I Board of Editors, Published by Emerald publishers, Egmore, Chennai – 600 008: www.emeraldpublishers.com, Mail: info@emeraldpubliser.com.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **I Year** Subject Code: **U18MPH101** Semester: **I**

Major - 1 Title: **PROPERTIES OF MATTER AND ACOUSTICS**

Credits: **6** Max. Marks: **75**

| **OBJECTIVES** | To study the basic properties of matter, fluids, acoustics and its applications |
|---|---|
| **COURSE OUTCOME(S)** | |
| **CO1** | To study the basics of elasticity, types of stress and amount of strain |
| **CO2** | To determine the elasticity of materials using Young's modulus |
| **CO3** | To understand the physical properties of fluids |
| **CO4** | To study the concepts and properties of waves and SHM |
| **CO5** | To learn the production of ultrasonic waves, the concepts of acoustics and their applications. |

**UNIT – I : ELASTICITY I**

Hooke's law – stress-strain diagram – Elastic moduli – Poisson's ratio – Relation between elastic constants – Work done in stretching and twisting a wire – Twisting couple on a cylinder – Determination of Rigidity modulus by static torsion (Scale and telescope) – Rigidity modulus by torsional pendulum (with and without masses).

**UNIT – II : ELASTICITY II**

Bending of beams – Expression for bending moment – Cantilever – Expression for depression at the loaded end – Young's modulus by cantilever depression – Theory of non-uniform bending – Determination of Young's modulus by non-uniform bending (pin and microscope) – Determination of young's modulus by Koenig's method – Uniform bending-Expression for elevation – Determination of Young's modulus by uniform bending (pin and microscope).

**UNIT – III: FLUIDS**

Surface Tension: Molecular forces– Shape of liquid meniscus in capillary tube -surface energy– pressure difference across liquid surfaces - Excess of pressure –– variation of surface tension with temperature – Jaegar's method.

Viscosity : Viscosity – Rate flow of liquid in a capillary tube – Poiseuille's formula – Determination of coefficient of viscosity of a liquid – Variations of a viscosity with temperature and pressure.

Physics of low pressure – production and measurement of low pressure – Rotary pump – Diffusion pump – Molecular pump – Detection of leakage.

**UNIT – IV: WAVES AND OSCILLATIONS**

Longitudinal and Transverse Waves -– Superposition of wave – Interference of sound wave - Stationary waves – properties – Velocity of transverse waves along a stretched string - Simple harmonic motion (SHM).

Differential equation of SHM- Average kinetic energy of vibrating particle – Total energy of vibrating particle- SHM: Theory of Free damped and forced vibrations –Resonance.

**UNIT – V: ACOUSTICS AND ULTRASONICS**

Intensity and loudness of sound – Decibels – Intensity levels – Reverberation time and its measurement - Sabine's formula – Derivation –Absorption coefficient and its determination – Factor affecting the acoustics of buildings.

Ultrasonic waves – Production – Piezo electric crystal method – Magnetostriction Method – Properties – Detection – Attenuation – Diffraction – Acoustic Grating – Velocity of ultrosonics in liquids –Application of ultrasonics : Medical, Industrial and scientific.

**Books for Study:**


1. Properties of Matter, Murugeshan R, S Chand & Co. Pvt. Ltd., New Delhi, 2013.
2. Properties of Matter, Brij Lal & Subramaniam N, Eurasia Publishing Co., New Delhi, 1989.
3. Text book of Sound, Brij Lal & Subramaniam N, Vikas Publishing House, New Delhi, 1982.
4. Text book of Sound, M N Srinivasan, Himalaya Publications, 1991.
5. Waves and Oscillations - Subrahmanyam N. & Brij Lal, Vikas Publishing House Pvt. Ltd., New Delhi, 1994.


**Books for Reference:**


1. Fundamental of General Properties Of Matter, H.R Gulat, R.Chand And Co, 1977.
2. The Physics of Waves and Oscillations, N.K Bajaj, Tata Mcgraw-Hill, 1988.
3. Oscillations and Waves, Satya Prakash and Akash Saluja, Pragati Prakashan, 2002.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **I Year** Subject Code: **U18AMA101** Semester: **I**

Allied - 1 Title: **ALLIED MATHEMATICS - I**

Credits: **4** Max. Marks: **75**

| **OBJECTIVES:** | This course covers basic ideas of theory of equations, matrices & calculus. |
|---|---|
| **COURSE OUTCOME(S):** At the end of the course, the students will able to: | |
| **CO1** | Evaluate the sum of the series by using Binomial, Logarithm, and Exponential series. |
| **CO2** | Examine the nature of the roots of the polynomial equation, reciprocal equations and Application of Newton's method to find approximate solution of the polynomial equations. |
| **CO3** | Identify the different types of a matrix and calculate eigen values and corresponding eigen vectors of a square matrix. |
| **CO4** | Compute nth derivative, Jacobians, Evaluate Curvature, Radius of Curvature ,Construct the PDE by eliminating arbitrary constants, arbitrary functions and solve different types of nonlinear PDE's. |

**UNIT - I: ALGEBRA**

Partial Fractions – Binomial - Exponential and logarithmic Series (without Proof) - Simple problems.

**UNIT - II: THEORY OF EQUATIONS**

Polynomial Equations with real Coefficients - Irrational roots - Complex roots - Transformation of equation by increasing or decreasing roots by a constant - Reciprocal equations - Newton's method to find a root approximately - Simple problems.

**UNIT - III: MATRICES**

Symmetric - Skew-Symmetric - Orthogonal and Unitary matrices - Rank of a matrix - Consistency of equations - Eigen roots and eigen vectors - Cayley Hamilton theorem (without proof) - Verification and computation of inverse matrix.

**UNIT - IV: DIFFERENTIAL CALCULUS**

$n^{th}$ derivatives - Leibnitz theorem (without proof) and applications - Jacobians -Concepts of polar co-ordinates - Curvature and radius of curvature in Cartesian co-ordinates.

**UNIT - V: PARTIAL DIFFERENTIAL EQUATIONS**

Formation - complete integrals and general integrals - Four standard types - Lagrange's equation and simple problems.

**Recommended Text:**

P.Duraipandian and S.Udayabaskaran, (1997) Allied Mathematics, Vol. I & II. Muhil Publishers, Chennai.

**Reference Books:**

1. P.Balasubramanian and K.G.Subramanian,(1997) Ancillary Mathematics. Vol. I & II. Tata McGraw Hill, New Delhi.
2. S.P.Rajagopalan and R.Sattanathan,(2005) Allied Mathematics .Vol. I & II. Vikas Publications, New Delhi.
3. P.R.Vittal (2003) Allied Mathematics . Marghan Publications, Chennai
4. P.Kandasamy, K.Thilagavathy (2003) Allied Mathematics Vol-I, II S.Chand & company Ltd., New Delhi-55.
5. Isaac, Allied Mathematics. New Gamma Publishing House, Palayamkottai**.**

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

| | | | | | |
|---|---|---|---|---|---|
| Year: | **I Year** | Subject Code: **U18AZL101** | | Semester: | **I** |
| Allied - 1 | | Title: **ALLIED ZOOLOGY - I** | | | |
| Credits: | **4** | | | Max. Marks: | **75** |

**OBJECTIVES:**

To study the systems and functional morphology of Invertebrates and Chordates.

**Unit-I**

Morphology and life history of Plasmodium vivax, Obeliageniculata and Taeniasolium.

**Unit-II**

Leech: Morphology, Digestive system & parasitic adaptations of Leech.
Cockroach: Morphology, Mouth parts-Digestive system and Nervous system.
Freshwater Mussel: Morphology, Digestive system, Respiratory System, Glochidium Larva.

**Unit-III**

Sea Star: Morphology, Digestive system, Water vascular system and Bipinnaria larva.
Amphioxus: Morphology, Digestive system, circulatory system.
Shark: Morphology, Respiratory System, Circulatory system, Yolksac placenta.

**Unit-IV**

Frog: Morphology, Digestive System, Respiratory System, circulatory system, Brain.
Calotes: Morphology, circulatory system, Urinogenital system.

**Unit-V**

Pigeon: Morphology & Respiratory system, Flight adaptations.
Rabbit: Morphology, Dentition, Digestive system, structure & function of heart.

**REFERENCE BOOKS:**


1. EkambranathaAyyar, M and Anantha Krishnan, T.N. “Manual of Zoology, Volume I & II Viswanathan Printers and Publishers, Chennai
2. Jordon, E.L, and Verma, P.S. “Invertebrate Zoology”. Chand & Co, Ltd, New Delhi.
3. Yung, J.Z., “Life of Vertebrates”, Cambridge Uni. Press.
4. Arumugham. N., “Invertebrate Zoology” Vol. I Saras publication.
5. P.S.Dhami and J.K.Dhami-Invertebrate Zoology, “S.Chand& Co, New Delhli.
6. Dr.(Tmt)BernesAnandharaj “tpy’;fpay; Jizg;ghlk;” Vol. I Cresolite Publications.
7. Arumugam, N., “Chordate Zoology” Vol.2. Saras Publication.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

| | | | | | |
|---|---|---|---|---|---|
| Year: | **I Year** | Subject Code: **U18CES101** | | Semester: | **I** |
| Part-IV | | Title: **ENVIRONMENTAL STUDIES** | | | |
| Credits: | **2** | | | Max. Marks: | **75** |

| **OBJECTIVES** | To understand the environment around us and to conserve our nature. |
|---|---|

| **Course Outcomes:** At the end of the Course, the Students will able to | |
|---|---|
| **CO1** | Describe the available food and natural resources. |
| **CO2** | Explain the structure and functions of ecosystem |
| **CO3** | Elaborate the control of environmental pollution. |
| **CO4** | Analyze the social issues of human beings. |

**UNIT-I: INTRODUCTION TO ENVIRONMENTAL SCIENCES NATURAL RESOURCES**

Environmental Sciences - Relevance - Significance - Public awareness - Forest resources - Water resources - Mineral resources - Food resources - conflicts over resource sharing - Exploitation - Land use pattern - Environmental impact - fertilizer - Pesticide Problems - case studies.

**UNIT-II: ECOSYSTEM, BIODIVERSITY AND ITS CONSERVATION**

Ecosystem - concept - structure and function - producers, consumers and decomposers - Food chain - Food web - Ecological pyramids - Energy flow - Forest, Grassland, desert and aquatic ecosystem. Biodiversity - Definition - genetic, species and ecosystem diversity - Values and uses of biodiversity - biodiversity at global, national (India) and local levels - Hotspots, threats to biodiversity - conservation of biodiversity - Insitu & Exsitu.

**UNIT-III: ENVIRONMENTAL POLLUTION AND MANAGEMENT**

Environmental Pollution - Causes - Effects and control measures of Air, Water, Marine, soil, solid waste, Thermal, Nuclear pollution and Disaster Management - Floods, Earth quake, Cyclone and Landslides. Role of individuals in prevention of pollution - pollution case studies.

**UNIT-IV: SOCIAL ISSUES - HUMAN POPULATION**

Urban issues - Energy - water conservation - Environmental Ethics - Global warming - Resettlement and Rehabilitation issues - Environmental legislations - Environmental production Act. 1986 - Air, Water, Wildlife and forest conservation Act - Population growth and Explosion - Human rights and Value Education - Environmental Health - HIV/AIDS - Role of IT in Environment and Human Health - Women and child welfare - Public awareness - Case studies.

**UNIT-V: FIELD WORK**

Visit to a local area / local polluted site / local simple ecosystem - Report submission.

**Suggested Readings:**

1. KUMARASAMY, K., A. ALAGAPPA MOSES AND M. VASANTHY, 2004. ENVIRONMENTAL STUDIES, BHARATHIDSAN UNIVERSITY PUB, 1, TRICHY
2. RAJAMANNAR, 2004, ENVIRONEMNTAL STUDIES, EVR COLLEGE PUB, TRICHY
3. KALAVATHY, S. (ED.) 2004, ENVIRONMENTAL STUDIES, BISHOP HEBER COLLEGE PUB., TRICHY

# C.ABDUL HAKEEM COLLEGE (Autonomous), Melvisharam

Syllabus for First year B.A.,B.Sc.,&B.Com (C.S) effective from the year 2018-2019

| | | | |
|---|---|---|---|
| Class | : UG First year B.A.,B.Sc.,&B.Com (C.S) | Semester | : II |
| Subject Code | : U18FTA201 | Title | : Part-I Tamil |
| Credits | : 4 | Max Marks | : 75 |

| | |
|---|---|
| OBJECTIVES | தமிழ் மொழியின் இலக்கிய, இலக்கணச் செழுமைகளைப் படைப்புகளின் வழி வெளிக்கொணர்தல். |
| COURSE OUTCOME(S) | |
| CO1 | காலம்தோறும் நிலவி வந்த அறம் சார் விழுமியங்களை அடையாளம் காணல். ஆளுமைகளின் அறிமுகத்தால் தன்னம்பிக்கை, விடாமுயற்சி, ஆளுமைத்திறன்களை விளக்கி எடுத்துரைத்தல். |
| CO2 | சமூகச் சீர்கேடு,பண்டைய அரச வரலாறு போன்றவற்றை விளக்கி,வாசிப்பையும் உச்சரிப்பையும் மேம்படுத்தல். திரைப் பாடல்கள் வழி நாட்டின் நிலைப்பாட்டை எடுத்துரைத்து தனி மனித சுயப் பண்புகளைப் பரிசோதித்தல். |
| CO3 | காலந்தோறும் தமிழ் இலக்கியங்களில் மாறுபடும் பாடுபொருள். வடிவம் முதலியவற்றை வரலாற்றின் வழி எடுத்துரைத்தல். |

## பாடத்திட்டம்

### அலகு - 1 நீதி இலக்கியங்கள்

1. திருக்குறள் - செய்ந்நன்றி அறிதல், நட்பு பிரிவாற்றாமை
2. நாலடியார் - தேர்ந்தெடுத்த 10 செய்யுள்
3. விவேக சிந்தாமணி - தேர்ந்தெடுத்த 7 செய்யுள்

### அலகு - 2 வாழ்க்கை வரலாறு

1. நவாப். சி. அப்துல் ஹக்கீம்
2. டாக்டர். ஐடா ஸ்கடர்
3. டாக்டர் மு. வரதராசனார்

### அலகு - 3 நாடகம்

1. பேரறிஞர் அண்ணா - வழக்கு வாபஸ்
2. ப. சங்கரலிங்கனார் - மானம் பெரிதே!
3. இன்குலாப் - மணிமேகலை (சிறை விடு கதை)

### அலகு - 4 திரைத்தமிழ்

1. கண்ணதாசன்
   1. ஆறு மனம் - ஆறு மனமே ஆறு
   2. வாழ்க்கை - வாழ நினைத்தால் வாழலாம்
2. பட்டுக்கோட்டை கல்யாணசுந்தரம்
   3. விவசாயி - கடவுள் எனும் முதலாளி
   4. ஏழை ஏக்கம் - கையிலே வாங்கினேன்
3. வாலி
   5. பரிவு - புத்தன் காந்தி ஏசு
   6. பிரிவு - தரைமேல் பிறக்கவிட்டார்

**அலகு - 5**

**(அ) இலக்கிய வரலாறு**

1. நீதி இலக்கியங்கள்
2. நாடகம் தோற்றமும் வளர்ச்சியும்

**(ஆ) திறனறிப் பயிற்சி**

1. மரபுப் பெயர்கள் - அறிமுகம்
2. வழூஉச் சொற்கள் - அறிமுகம்
3. பிற மொழிச் சொற்களை நீக்குதல்
4. வடமொழிச் சொற்களை நீக்குதல்
5. விண்ணப்பம் எழுதுதல்

**பார்வை நூல்கள்**

| | | | |
|---|---|---|---|
| 1 | இலக்கியச் சோலை | - | சி.அப்துல் ஹக்கீம் கல்லூரி வெளியீடு.<br>2018 சூன் வெளியீடு |
| 2 | கொடை வள்ளல் நவாப்<br>சி.அப்துல் ஹக்கீம் | - | அப்துல் காதர்<br>உலகத் தமிழாராய்ச்சி நிறுவனம்,சென்னை<br>முதல் பதிப்பு,2015 |
| 3 | வெற்றித்தூண் | - | ப.சங்கரலிங்கனார்<br>என்.சி.பி.எச். அம்பத்தூர் சென்னை- 98<br>முதல் பதிப்பு -2013 |
| 4 | மணிமேகலை நாடகம் | - | இன்குலாப்<br>குமரன் பப்ளிஸர்ஸ், வடபழனி , சென்னை -26<br>முதல் பதிப்பு -2005 |
| 5 | விவேக சிந்தாமணி | - | ஞா.மாணிக்கவாசகன் (உ.ஆ)<br>உமா பதிப்பகம், சென்னை-001<br>ஆறாம் பதிப்பு – 2010 |
| 6 | பட்டுக்கோட்டை<br>கல்யாணசுந்தரம்<br>பாடல்கள் | - | என்.சி.பி.எச். அம்பத்தூர் சென்னை- 98<br>பதினாறாவது பதிப்பு -2009 |
| 7 | கண்ணதாசன் திரை<br>இசைப் பாடல்கள் | - | கண்ணதாசன், வானதி பதிப்பகம்,தீனதயாளு தெரு,<br>தி.நகர்,சென்னை -17<br>பன்னிரண்டாம் பதிப்பு – டிசம்பர் 2007 |
| 8 | தமிழ் இலக்கிய வரலாறு | - | பேரா.மது.ச.விமலானந்தம்<br>அபிராமி பதிப்பகம், இராயபுரம், சென்னை -13<br>மறு பதிப்பு -2002 |
| 9 | நற்றமிழ் இலக்கணம் | - | டாக்டர்.சொ.பரமசிவம்,<br>பட்டுப் பதிப்பகம், 1269, 32-ஆம் தெரு<br>அண்ணாநகர் மேற்கு, கம்பர் குடியிருப்பு,<br>சென்னை -40<br>பன்னிரண்டாம் பதிப்பு -2012 |

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **I Year** Subject Code: **U18FUR201** Semester: **II**

Language - 2 Title: **URDU – II (Manzoomath, Ghazaliath & Translation)**

Credits: **4** Max. Marks: **75**

| | |
|---|---|
| **OBJECTIVES:** | ✓ To enhance students' creative thinking.<br>✓ To trigger the literary skills dormant in them.<br>✓ To train them to advance their Translation Skills. |
| **COURSE OUTCOMES:** | ➢ Students will be able to expand the frontiers of their creative intellect.<br>➢ Their fascination for Literature will get doubled or tripled.<br>➢ The translation skills will help them professionally. |

**Unit – I**

1.NAGHMA-E-HASRATH – Akbar Allahbadi
2.MEER TAQI MEER – Hasthi Apni Habbab Ki Si Hai
3.KHAJA MEER DARD – Tohmaten Chand Apne Zimmz Dhar Chale

**Unit – II**

1.QAUMI GEETH – Allama Iqbal
2.SHAIK IBRAHIM ZAUQ – Layi Hayath Aaye Qaza Le Chali
3.MIRZA GHALIB – Dil Hi To Hai Na Sang Wa Khisht

**Unit – III**

1.NISAR MAIN TERI GALIYON KE – Faiz Ahmed Faiz
2.MOMIN KHAN MOMIN – Adam Mein Rehthe
3.JIGAR MURADABADE – Dil Gaya Ronaq Hayath Gayi

**Unit – IV**

1.WO NABION MEIN RAHMATH LAQAB PANE WALA – Masaddas Hali
2.FIRAQ – Sar Mein Souda Bhi Nahin
3.KAWISH BADRI – Az Sare Nav Fikr Ka Aaghaaz Karna Chahiye
4.A General Passage Translation from English to Urdu

**Unit – V**

1.TAJ MAHAL – Sahir Ludhyanwi
2.SHAKIR NAITHI – Shahid Maqsood Ek Din Rubaroo Ho Jayega
3.PARVEEN – Chalna Ka Hosala Naye
4.A General Passage Translation from English to Urdu

**BOOK PRESCRIBED**: "ADAB-E-JAMEEL", Published by Dept. of Urdu, C. Abdul Hakeem College, Melvisharam.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

| | | | | | |
|---|---|---|---|---|---|
| Year: | **I Year** | Subject Code: | **U18FEN201** | Semester: | **II** |
| English - 2 | | Title: | **ENGLISH – II** | | |
| Credits: | **4** | | | Max. Marks: | **75** |

**Course Outcome(s):**

- **CO1:** Comprehend various forms of literature like Prose, Poetry, Biography, Short Story and Drama.
- **CO2:** Develop the knowledge of grammatical system of English Language and also develop four Language Skills (LSRW).

**UNIT - I** **PROSE**

1. The Eternal Silence of These Infinite Crowds — N.C. Chaudhari
2. Comfort — Aldous Huxley
3. The Challenge of Our Time — E.M. Foster
4. Words of Wisdom — Chetan Bhagat

**UNIT – II** **POETRY**

1. Kubla Khan — S.T. Coleridge
2. I Know Why the Caged Bird Sings — Maya Angelo
3. Punishment in Kindergarten — Kamala Das
4. The Unknown Citizen — W.H. Auden

**UNIT - III** **SHORT STORIES**

1. A Devoted Son — Anita Desai
2. A Cup of Tea — Katherine Mansfield

**UNIT - IV** **ONE-ACT PLAY & BIOGRAPHY**

1. Funeral Oration from Julius Caesar — William Shakespeare
2. Biography of Sir Syed Ahmed Khan

**UNIT - V** **WARM UP**

1. **Lexical Skills:**
    1. One Word Substitutes
    2. Correct Usage of words
    3. Commonly misspelt words
    4. Formation of plurals

2. **Descriptive Grammar:**
    1. Articles and its kinds
    2. Prepositions and its kinds
    3. Pronouns
    4. Kind of Pronouns
    5. Verbs – Transitive and Intransitive Verbs

3. **Traditional Grammar:**
    1. The Tenses- Introduction
       Past Tense
        (a) Simple Past Tense
        (b) Past Continuous Tense
        (c) Past Perfect Tense
        (d) Past Perfect Continuous Tense
    2. Direct and Indirect Speech

4. **Communication Skills (LSRW):**
    1. Offering a Suggestion
    2. Asking for Advice
    3. Persuading
    4. Complimenting

    } English for Communication - I

5. **Composition:**
    1. Electronic Mail
    2. Body Language
    3. Facing and Interview
    4. Negotiating
    5. Group Discussion

    } English for Communication - I

**Prescribed Book:** HALL OF FAME – II Board of Editors, Published by Emerald publishers, Egmore, Chennai – 600 008: www.emeraldpublishers.com, Mail: info@emeraldpubliser.com.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **I Year** Subject Code: **U18MPH201** Semester: **II**

Major - 2 Title: **THERMAL PHYSICS AND STATISTICAL METHODS**

Credits: **5** Max. Marks: **75**

| | |
|---|---|
| **OBJECTIVES** | Be familiar with the basics of Thermodynamics (laws, heat engines, Maxwell relations, deriving identities), and how it links to Statistical Physics. |
| **COURSE OUTCOME(S)** | |
| **CO1** | To study the nature and transmission of heat and black body radiation |
| **CO2** | To understand the liquefaction of gases and different types of thermometry |
| **CO3** | Remember the first law of thermodynamics and its applications |
| **CO4** | Application of Second Law of Thermodynamics towards Internal combustion engines |
| **CO5** | To understand the concepts of statistical thermodynamics and its applications. |

**UNIT I: TRANSMISSION OF HEAT**

Thermal conduction - Thermal conductivity of a good conductor - Theory – Determination by Forbes method - Thermal conductivity of a poor conductor - Theory -Determination by Lees disc method.

Wiedmann-Franz's law - Practical applications of conduction of heat - Black body radiation – Stefan- Boltzmann's law - Determination of Stefan's constant - Laboratory method distribution of energy in the spectrum of a black body – Planck's quantum theory of radiation.

**UNIT II: LIQUEFACTION OF GASES AND THERMOMETRY**

Cooling by adiabatic expansion – Joule-Thomson expansion – Principle of regenerative cooling – Liquefaction of air by Lind's process – Liquefaction of hydrogen - Liquefaction of Helium by Onne's methods –Helium I & II – Properties of He II – Adiabatic demagnetization.

Thermometry – Types of thermometers - Platinum resistance thermometer - Callendar and Griffith's bridge – standardization and temperature scale - Low and high temperature measurement.

**UNIT III: FIRST LAW OF THERMODYNAMICS**

Thermodynamic system - Zeroth law and the concept of temperature – concept of heat - Internal energy - External work - Quasistatic process - First law of thermodynamics – First law of thermodynamics for closed system.

Application: Specific heats of a gas - Isothermal and adiabatic process - Gas equation during an adiabatic process – work done during Isothermal and adiabatic process.

**UNIT IV: SECOND LAW OF THERMODYNAMICS**

Reversible and irreversible processes - Second law of thermodynamics - Indicator diagram - Carnot's reversible engine - Carnot's cycles - Efficiency - Carnot's engine and refrigerator - Carnot's theorem.

Internal combustion engines - Otto engine and Diesel engine - Working and efficiency - Clausius inequality – Entropy - Change of entropy of a closed irreversible system - Change in entropy in reversible and irreversible processes – Temperature - Entropy diagram.

**UNIT V: CLASSICAL STATISTICAL METHODS**

Phase space - Micro and Macro canonical ensembles - Different types of ensembles - Definition of Probability - Relation between entropy and probability - Degrees of Freedom - Classical Statistics - Maxwell-Boltzmann distribution law - Distribution of velocity - Derivation of Maxwell Boltzmann, Fermi Dirac and Bose Einstein statistics as the most probable distributions.

**Books for study:**


1. Heat Thermodynamics and Statistical Physics, Brijlal and N. Subramaniyam, S Chand & Co.
2. Thermal Physics R Murugeshan and Kiruthiga Sivaprasad, S Chand & Co., New Delhi.
3. Heat and thermodynamics, J B Rajam, S Chand & Co., New Delhi.


**Books for Reference:**


1. Heat and thermodynamics, D S Mathur, S Chand & Co., New Delhi.
2. Statistical Mechanics, Sathya Prakash and J P Agarwal, Kedar Nath & Ram Nath & Co., Meerut.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **I Year** Subject Code: **U18MPHP21** Semester: **II**

Major Practical - 1 Title: **CORE PRACTICAL – I**

Credits: **3** Max. Marks: **75**

| | |
|---|---|
| **OBJECTIVES** | To apply the basic principles of properties of matter, Electricity, Electronics and Optics by doing the relevant experiments. |
| **COURSE OUTCOME(S)** | |
| **CO1** | understand and evaluate the Young's modulus and Rigidity modulus of the given material |
| **CO2** | analyze the electrical parameters like resistance using potentiometer |
| **CO3** | understand the ways to calibrate an ammeter using potentiometer |
| **CO4** | apply the basic principles of optics to determine the focal length of the given lens and refractive index of the material of prism |
| **CO5** | understand the comparison of cell and capacitance |
| **CO6** | skill development-practical exposure |

**(Any 16 Experiments)**

1. Young's modulus – Non-uniform bending – pin and microscope.
2. Young's modulus – Non-uniform bending – optic lever.
3. Rigidity modulus – Torsional pendulum – without masses.
4. Surface tension and interfacial surface tension – drop weight method.
5. Comparison of viscosities of two different liquids – Burette method.
6. Compound Pendulum – Determination of 'g' and 'k'
7. Specific heat capacity of a liquid by method of cooling.
8. Sonometer – Frequency of tuning fork.
9. Sonometer – AC frequency using steel wire.
10. Focal length – R and μ of a long focus concave lens, Combination Method and Auxiliary Lens Method.
11. Spectrometer – Hollow prism – Refractive Index of a liquid.
12. Spectrometer – Grating – Minimum deviation method.
13. Potentiometer – Calibration of low range voltmeter.
14. Potentiometer – Internal resistance of a cell.
15. Post Office box – Temperature coefficient of resistance of a coil.
16. Figure of merit – Table Galvanometer.
17. Comparison of E.M.F of cells using Ballistic Galvanometer (B.G.).
18. Comparison of capacitances using Ballistic Galvanometer (B.G.).
19. Construction of low range power pack – Bridge rectifier.
20. Characteristics of Zener diode.

**Books for study:**


1. A Text book of Practical Physics, M. N. Srinivasan, S. Balasubramanian and R. Renganathan, Sultan Chand & Sons, New Delhi, 2005.
2. C.C Ouseph, G.Rangarajan- A Text Book of Practical Physics- S. Viswanathan Publishers - Part I (1990) & II (1996).


**Book for reference:**


1. S.L Gupta and V.Kumar- Practical Physics- Pragati Prakashan – 25th Edition (2002)

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **I Year** Subject Code: **U18AMA201** Semester: **II**

Allied - 2 Title: **ALLIED MATHEMATICS – II**

Credits: **6** Max. Marks: **75**

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|---|---|
| **OBJECTIVES:** | This course covers basic ideas of integrals, trigonometry functions, Laplace transform & Vector analysis. |
| **COURSE OUTCOME(S):** At the end of the course, the students will able: | |
| **CO1** | Use Bernoulli and Reduction formulae to evaluate the single integrals and Define Beta and Gamma functions and to solve the double & triple integrals & to expand Fourier series for several functions. |
| **CO2** | Express multiples of $\theta$ interms of powers of $\theta$ of trigonometry function and vice versa.. |
| **CO3** | Define Laplace Transforms, Inverse Laplace Transforms and is application to solve ordinary differential equations. |
| **CO4** | To know the concepts and simple applications of Vector differentiation and Vector integration. |

**UNIT-I : INTEGRAL CALCULUS**

Bernoulli's formula for integration by parts - Reduction formula for: $\int x^n e^{ax}\,dx$, $\int \sin^n x dx$, $\int \cos^n x dx$ (with proof & problems), $\int_0^{\pi/2} \sin^m x \cos^n x dx$ (no proof, problems only) - properties of definite integrals and simple problems.

**UNIT-II: APPLICATION OF INTEGRATION**

Evaluation of double, triple integrals - Fourier series for functions in (0, 2π) and (-π, π).

**UNIT-III: TRIGONOMETRY**

Expansions of $\sin^n \theta$, $\cos^n \theta$, $\sin n\theta$, $\cos n\theta$, $\tan n\theta$ - Expansions of $\sin \theta$, $\cos \theta$, $\tan \theta$ in terms of θ - Hyperbolic and inverse hyperbolic functions - Logarithms of complex numbers.

**UNIT-IV : LAPLACE TRANSFORMS**

Laplace Transformations of standard functions and simple properties - Inverse Laplace transforms - Applications to solutions of linear differential equations of order 1 and 2 - simple problems.

**UNIT-V: VECTOR ANALYSIS**

Scalar point functions - Vector point functions - Gradient - divergence - curl - Directional derivatives - Unit to normal to a surface - Line and surface integrals - Guass, Stoke's and Green's theorems(without proofs) - Simple problem based on these Theorems.

**Recommended Text:**

P.Duraipandian and S.Udayabaskaran,(1997) Allied Mathematics, Vol. I & II. Muhil Publishers,Chennai.

**Reference Books:**

1. P.Balasubramanian and K.G.Subramanian,(1997)Ancillary Mathematics. Vol. I & II. Tata McGraw Hill, New Delhi.
2. S.P.Rajagopalan and R.Sattanathan,(2005) Allied Mathematics .Vol. I & II. Vikas Publications, New Delhi.
3. P.R.Vittal(2003). Allied Mathematics . Marghan Publications, Chennai.
4. P.Kandasamy, K.Thilagavathy (2003) Allied Mathematics Vol-I, II S.Chand & company Ltd., New Delhi-55.
5. Isaac, Allied Mathematics. New Gamma Publishing House, Palayamkottai.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

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|---|---|---|---|---|---|
| Year: | **I Year** | Subject Code: | **U18AZL201** | Semester: | **II** |
| Allied - 2 | | Title: | **ALLIED ZOOLOGY - II** | | |
| Credits: | **4** | | | Max. Marks: | **75** |

**OBJECTIVES:**

To study the principles of Cell Biology, Genetics, Human Physiology, Developmental Biology, Biotechnology and Medical Microbiology.

**Unit-I CELL BIOLOGY AND GENETICS**

Cell Biology: Ultra-structure of a typical animal cell – Structure and function of mitochondria, lysosome and nucleus.

Genetics: Structure of DNA, the genetic material – Human genetic disorders (Phenylketonuria, Alkaptonuria and Albinism) – Sex determination in man – X and Y-linked inheritance in man.

**Unit-II HUMAN PHYSIOLOGY**

Respiration – Respiratory pigments – Role of respiratory pigments in transport of gases.

Excretion – Types of excretory products – Omithine cycle, Kidney failure and transplantation.

Diseases of circulatory system: Blood pressure, Coronary heart disease, Rheumatic heart disease, Cerebral thrombosis.

**Unit-III DEVELOPMENTAL BIOLOGY**

Human: Spermatogenesis, Ogenesis, Fertilization – Twin-types.

Cleavage and gastrulation in frog.

**Unit-IV BIO-TECHNOLOGY**

Scope and Application of Biotechnology in human health/medicine – Application of Biotechnology in Agriculture – Biological waste treatment.

**Unit-V MEDICAL MICROBIOLOGY**

Introduction to medical microbiology – Study of some common bacterial diseases (Diptheria, Tuberculosis), viral diseases (AIDS and Rabies) and protozoan diseases (amoebiosis and malaria) – Their control measures.

**REFERENCE BOOK:**

1. Verma P.S. and Agarwal – Cell and Molecular Biology, S.Chand & Co., New Delhi.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

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|---|---|---|---|---|---|
| Year: | **I Year** | Subject Code: | **U18AZLP21** | Semester: | **II** |
| Allied Practical | | Title: | **ALLIED ZOOLOGY PRACTICAL** | | |
| Credits: | **2** | | | Max. Marks: | **75** |

**INVERTEBRATA AND CHORDATA**

**SPOTTERS**

**I: Study of the following specimens to bring out and their adaptations to their respective modes of life.**

Entamoeba, Plasmodium, Obelia Polyp, Obelia Medusa, *Taenia solium*, Taenia Scolex, Taenia proglattids, *Hirudinaria granulosa* (Leech), T.S. of Leech, fresh water muscle, glochidium larva, Starfish, Pedicellaria of Star fish, Bipinnaria Larva, Amphioxus, Shark, Placoid Scale of Shark, Pigeon, Quill Feather of Pigeon, Rabbit, Frog two cell stage, Frog four cell stage, Frog eight cell stage, blastopore of frog, Sperm of man, Ovum of woman, Stethoscope, Sphygmomanometer.

**MINOR PARCTICAL**

**II: MOUNTING**

Earthworm - Body seta, Mouth Parts: Cockroach, Honey bee, and Mosquito, Brain of frog.

**MAJOR PARCTICAL**

**III: DISSECTIONS**

Morphology of Cockroach

Cockroach - Digestive and Nervous system

Morphology of Frog

Frog - Digestive system, Urino-genital system (male and female) (Chart/Model)

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **I Year** Subject Code: **U18CVE201** Semester: **II**

Part - IV Title: **VALUE EDUCATION**

Credits: **2** Max. Marks: **75**

| **OBJECTIVES** | To understand human values and ethical issues |
|---|---|
| **COURSE OUTCOME(S):** At the end of course the students shall able to | |
| **CO1** | Describe the basic concept of human values. |
| **CO2** | Explain the structure and responsibility of families |
| **CO3** | Elaborate the human ethical relationships. |
| **CO4** | Analyze the modern welfare and globalization. |

**UNIT-I :** Value Education - Definition - relevance to present day - Concept of Human Values - self introspection - Self-esteem.

**UNIT-II:** Family values - Components, structure and responsibilities of family - Neutralization of anger - Adjustability - Threats of family life - Status of women in family and society - Caring for needy and elderly - Time allotment for sharing ideas and concerns.

**UNIT-III:** Ethical values - Professional ethics - Mass media ethics - Advertising ethics - Influence of ethics on family life - psychology of children and youth - Leadership qualities - Personality development.

**UNIT-IV:** Social values - Faith, service and secularism - Social sense and commitment - Students and Politics - Social awareness, Consumer awareness, Consumer rights and responsibilities - Redressal mechanisms.

**UNIT-V:** Effect of international affairs on values of life / Issue of Globalization - Modern warfare - Terrorism. Environmental issues - mutual respect of different cultures, religions and their beliefs.

**Suggested Readings:**

1. T. Anchukandam and J. Kuttainimathathil (Ed) Grow Free Live Free, Krisitu Jyoti Publications, Bangalore (1995)
2. Mani Jacob (Ed) Resource Book for Value Education, Institute for Value Education, New Delhi 2002.
3. DBNI, NCERT, SCERT, Dharma Bharti National Institute of Peace and Value Education, Secunderabad, 2002.
4. Daniel and Selvamony - Value Education Today, (Madras Christian College, Tambaram and ALACHE, New Delhi, 1990)
5. S. Ignacimuthu - Values for Life - Better Yourself Books, Mumbai, 1991.
6. M.M.M.Mascaronhas Centre for Research Education Science and Training for Family Life Promotion - Family Life Education, Bangalore, 1993.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

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|---|---|---|---|---|---|
| Year: | **I Year** | Subject Code: | **U18CSS201** | Semester: | **II** |
| Part - IV | | Title: | **SOFT SKILLS** | | |
| Credits: | **1** | | | Max. Marks: | **75** |

**Course Outcome(s)**

- **CO1:** Effectively communicate through verbal / written communication and also improve the listening skills.

- **CO2:** Actively participate in Group Discussion / Meetings / Interviews and prepare and deliver presentations.

**UNIT I**

1. Ability to listen and document what you have heard
2. Reading and comprehension

**UNIT II**

3. Ability to read and follow instructions
4. Ability to interpret and transcode information

**UNIT III**

5. Asking for and responding to information
6. Communication skills with public, fellow employees, supervisors and customers

**UNIT IV**

7. Spelling and Grammar
8. Ability to fill out a job application

**UNIT V**

9. Expressing courtesy
10. General and Individual Traits:
    (a) Honesty
    (b) Reliability
    (c) Good Attitude
    (d) Common Sense

**Prescribed Book: Basic Soft skills for Under Graduate,** Board of Editors, Published by Emerald publishers, Egmore, Chennai – 600 008: www.emeraldpublishers.com.
Mail: info@emeraldpubliser.com.

# C. ABDUL HAKEEM COLLEGE (Autonomous), Melvisharam

Syllabus for Second year B.A.,B.Sc.,&B.Com (C.S) effective from the year 2018-2019

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|---|---|---|---|
| Class | : UG Second year B.A.,B.Sc.,&B.Com (C.S) | Semester | : III |
| Subject Code | : U18FTA301 | Title | : Part-I Tamil |
| Credits | : 4 | Max Marks | : 75 |

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|---|---|
| **OBJECTIVES** | தமிழ்மொழியிலுள்ள பண்பு, பழமை, சிறப்பு, வடிவம், இலக்கண முறைமை போன்றவற்றை வெளிக்கொணர்தல். |
| **COURSE OUTCOME(S)** | |
| **CO1** | தமிழில் உள்ள காப்பிய இலக்கியங்களையும் கதை வழி வாழ்வியலையும் அறிய வைத்தல். நெடுங்கவிதைகளைப் பயிற்றுவிப்பதன் மூலம் நவீன திறனாய்வு முறைகளில் ஈடுபட துணை நிற்றல். |
| **CO2** | உரைநடையின் அடிப்படைத் திறனையும் பிழையின்றி எழுதும் முறையையும் சமூக உண்மைகளையும் நிலைநாட்டல். இலக்கணத்தைப் பயிற்றுவிப்பதன் மூலம் சிறந்த மொழியாக்க முயற்சிக்கு ஆயத்தப்படுத்தல். |
| **CO3** | காலந்தோறும் தமிழ் இலக்கியங்களில் மாறுபடும் பாடுபொருள். வடிவம் முதலியவற்றை இலக்கிய வரலாற்றின் வழி பயிற்றுவித்தல். |

## பாடத்திட்டம்

**அலகு–I காப்பியம்**

1. சிலப்பதிகாரம் - கனாத்திறம் உரைத்த காதை (முழுவதும்)
2. மணிமேகலை - ஆபுத்திரன் திறம் அறிவித்த காதை (முழுவதும்)
3. சீவக சிந்தாமணி - விமலையார் இலம்பகம் (தேர்ந்தெடுத்த 20 பாடல்கள்)

**அலகு–II புதுக்காவியம்**

1. பாரதிதாசன் - சஞ்சீவி பர்வதத்தின் சாரல் (முழுவதும்)
2. துறவி - நளவெண்பா - கலி நீங்கு காண்டம் - 'நீங்கினான் கலி'

**அலகு–III உரைநடை**

1. கலைஞர் மு.கருணாநிதி - சிந்தனையும் செயலும் - அழுக்காறு, ஒழுக்கம்
2. தொ.பரமசிவம் - விடுபூக்கள் - 'சமூக வரலாற்றுப் பார்வையில் திருவிழாக்கள்'
3. சுகி.சிவம் - வாழப் பழகுவோம் - 'மனம் போல வாழ்வு'

**அலகு–IV இலக்கணம்**

1. **எழுத்து** - முதல், சார்பெழுத்துக்கள் **சொல்** - பகுபத உறுப்புகள், ஆகுபெயர் , வழக்கு **அணி** – உவமை, உருவகம், சொற்பொருள், தற்குறிப்பேற்றம், எடுத்துக்காட்டு உவமை.

**அலகு–V (அ) இலக்கிய வரலாறு**

1. ஐம்பெருங்காப்பியங்கள், ஐஞ்சிறுகாப்பியங்கள்
2. உரைநடை தோற்றமும் வளர்ச்சியும்

**(ஆ) திறனறிப் பயிற்சி**

1. அலுவலகக் கடிதங்கள்,
2. அறிக்கை மற்றும் செய்தி எழுதுதல்

**பார்வை நூல்கள்**


1 இலக்கியச் சாரல் - சி.அப்துல் ஹக்கீம் கல்லூரி வெளியீடு.
2019 சூன் வெளியீடு

2 சிந்தனையும் செயலும் - கலைஞர் மு.கருணாநிதி
பூம்புகார் பதிப்பகம்,127,பிராகசம் சாலை,சென்னை -18
நான்காம் பதிப்பு -2017

3 விடுபூக்கள் - தொ.பரமசிவம்
மணி பதிப்பகம், 29ஏ, யாதவர் கீழத் தெரு,
பாளையங்கோட்டை. மூன்றாம் பதிப்பு -2016

4 வாழப் பழகுவோம் வாருங்கள் - சுகி.சிவம்
வானதி பதிப்பகம், 13, தீனதயாளு தெரு,
தி.நகர், சென்னை. மூன்றாம் பதிப்பு -2003

5 வகைமை நோக்கில் தமிழ் இலக்கிய வரலாறு - முனைவர் பாக்யமேரி
என்.சி.பி.எச்., அம்பத்தூர், சென்னை -98
முதல் பதிப்பு -2008

6 நற்றமிழ் இலக்கணம் - டாக்டர்.சொ.பரமசிவம்,
பட்டுப் பதிப்பகம், 1269, 32-ஆம் தெரு
அண்ணாநகர் மேற்கு, கம்பர் குடியிருப்பு,
சென்னை -40
பன்னிரண்டாம் பதிப்பு -2012

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **II Year** Subject Code: **U18FUR301** Semester: **III**

Language - 3 Title: **URDU – III (AFSANA, MAZMOON NAWESI & MUKALAMA NIGARI)**

Credits: **4** Max. Marks: **75**

| | |
|---|---|
| **OBJECTIVES:** | To arouse interest for Non-Detailed Texts.<br>To equip them with ample knowledge to pen their own articles.<br>To instill in them a flair for translation. |
| **COURSE OUTCOMES** | Students will care more for Non-Detailed Texts on par with Detailed Texts.<br>They will sharpen necessary skills to draft essays on varied themes.<br>They will succeed in their official routine with their ability to translate. |

**Unit – I**

1.KAFAN – Prem Chand
2.JAMUN KA PED – Krishan Chander

**Unit – II**

1.KHUSH NASEEB – Ali Akbar Amburi
2.DARD KA EHSAS – Ameerunnisa

**Unit – III**

1.BHOLA – Rajender Singh Bedi
2.NAYA QANOON – Saadath Husain Manto

**Unit – IV**

1.NOOR-O-NAR – Ali Abbas Hussani
2.AAKHR PAISA BACH HI GAYA – B.S.Ramaiya

**Unit – V**

1. GULDASTA-E-MAZAMEEN-O-INSHA PARDAZI - Mohammed Arif Khan
2. A General Passage for Translation from Urdu To English

**BOOK PRESCRIBED**: "ADAB-E-JAMEEL", Published by Dept. of Urdu, C. Abdul Hakeem College, Melvisharam.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

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|---|---|---|---|---|---|
| Year: | **II Year** | Subject Code: | **U18FEN301** | Semester: | **III** |
| English - 3 | | Title: | **ENGLISH – III** | | |
| Credits: | **4** | | | Max. Marks: | **75** |

**Course Outcome(s)**

- **CO1:** Recognize the various forms of literature like Prose, Poetry, Biography, Short Story and Drama.
- **CO2:** Describe the knowledge of grammatical system of English Language and also develop four Language Skills.(LSRW)

**UNIT - I** **PROSE**

1. Futurology — Aldous Huxley
2. Engine Trouble — R. K. Narayan
3. I have a Dream — Martin Luther King
4. Function of Education — J Krishnamurthi

**UNIT – II** **POETRY**

1. Poor Girl — Maya Angelou
2. Solitary Reaper — William Wordsworth
3. The Tyger — William Blake
4. My Grand Mother's House — Kamala Das

**UNIT - III** **SHORT STORIES**

1. The Last Leaf — O' Henry
2. Sparrows — K Ahmed Abbas

**UNIT - IV** **ONE-ACT PLAY& BIOGRAPHY**

1. The Proposal — Anton Chekov
2. Father Damien — G. F. Lamb

**UNIT - V** **WARM UP**

1. Lexical Skills
2. Descriptive Grammar
3. Traditional Grammar
4. Communication Skills (LSRW)
5. Composition

**WARM UP**

**1. Lexical Skills**

- Foreign Words and Special Terminology
- Building Vocabulary (Affixes)
- Phrasal Verbs
- Idioms and Phrases

2. **Descriptive Grammar**
   - Adjectives
   - Kinds of Adjectives
   - Adverb
   - Kinds of Adverbs
   - Participles, Gerund & Infinitive

3. **Traditional Grammar**
   - The Tenses – Introduction
   - Future Tense – Simple Future Tense, Future Continuous Tense, Future Perfect Tense & Future Perfect Continuous Tense.
   - Degrees of Comparison

4. **Communication Skills (LSRW)**
   - Expressing Sympathy
   - Expressing Gratitude
   - Complaining
   - Apologizing

5. **Composition**
   - Public speaking
   - Seminar
   - Writing a Memorandum
   - Expansion of Proverbs

**Book Prescribed:**

HALL OF FAME – III Board of Editors, Published by Emerald publishers, Egmore, Chennai – 600 008: www.emeraldpublishers.com, Mail: info@emeraldpubliser.com.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **II Year** Subject Code: **U18MPH301** Semester: **III**

Major - 3 Title: **OPTICS**

Credits: **3** Max. Marks: **75**

| | |
|---|---|
| **OBJECTIVES** | ➢ To learn the principles which govern optics<br>➢ To learn and understand the various optical instruments and their usage |
| **COURSE OUTCOME(S)** | |
| **CO1** | To understand the various aberrations in lenses and methods to minimize them |
| **CO2** | To understand the concept of interference and its applications |
| **CO3** | To understand the phenomenon of diffraction and its applications with grating |
| **CO4** | To learn the theory of polarization and its production, detection with its applications |
| **CO5** | To understand the working of different optical instruments |

**UNIT – I : GEOMETRICAL OPTICS**

Aberration in lenses – types of aberrations - Spherical aberration in lenses – Methods of minimizing spherical aberration – Condition for minimum spherical aberration in the case of two lenses separated by a distance – Chromatic aberration in lenses – Condition for achromtism of two thin lenses (in contact and out of contact)coma – astigmatism – Cardinal points and planes.

**UNIT – II : INTERFERENCE**

Theory of thin films – Interference by reflection - Air wedge – Determination of diameter of a thin wire – Michelson's Interferometer – construction and working – Applications – determination of wavelength of light and thickness of a film.

**UNIT – III : DIFFRACTION**

Fresnel's diffraction – Diffraction at circular aperture - Fraunhofer's diffraction –– Plane diffraction grating – Theory and experiment to determine wavelength - Dispersive power of grating –Missing orders – Overlapping spectra.

**UNIT – IV : POLARIZATION**

Introduction to polarisation – Double refraction – Huygen's explanation of double refraction in uniaxial crystal –Plane, elliptically and circularly polarized light – theory - Quarter wave plate – half wave plate - Production and detection – optical activity - Specific Rotatory Power - Kerr effect and Faraday effect.

**UNIT – V : OPTICAL INSTRUMENTS**

Ramsden's and Huygen's eyepieces – Cardinal points determination - Constant deviation spectrometer – Jamin's & Rayleigh's Interferometers – determination of refractive indices of gases – Rayleigh's criteria Resolving power of telescope, Prism and grating

**Books for study:**


1. Optics by Subramaniam N & Brij Lal, S Chand & Co. Pvt. Ltd., New Delhi, 1990.
2. Optics by Khanna D R & Gulati H R, R Chand & Co. Pvt. Ltd., New Delhi, 1979.
3. Optics and Spectroscopy by Murugeshan, S Chand & Co. Pvt. Ltd., New Delhi.


**Books for Reference**:


1. Fundamentals of Optics by Jenkins Francis and White E Harvey, McGraw Hill Inc., New Delhi, 1976.
2. Optical Physics by Lipson. S G, Lipson H and Tannhauser D S, Cambridge University Press (1995).
3. Fundamental of Optics by Raj M G, Anmol Publications Pvt. Ltd., (1996), New Delhi.
4. Fundamentals of Physics, 6th Edition, by D Halliday, R Resnick and J Walker. Wiley NY 2001.
5. Physics, 4th Edition Vols I, II & II Extended by D Halliday, R Resnick and K S Krane, Wiley, Ny, 1994.
6. CRC Handbook of Physics & Chemistry, 80th Ed., CRS Press, Ny, 1999.
7. The Feynman Lectures on Physics, Vols. I, II and III by R P Feynman, R B Leighton and M Sands,Narosa, New Delhi 1998.
8. Fibre Optic Communication System, Govind P. Agarwal, John –Willey & Sons.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **II Year** Subject Code: **U18ACH301** Semester: **III**

Allied - 3 Title: **ALLIED CHEMISTRY - I**

Credits: **4** Max. Marks: **75**

| | |
|---|---|
| **Objectives** | To study the various techniques of extraction of metals, basic concepts of polarization effects, fundamentals of kinetics, catalysis, photochemistry and importance of industrial chemistry. |
| **Course Outcome(s)** | |
| **CO1** | Explain the basic principles of extraction of metals |
| **CO2** | Discuss the various concepts of Cycloalkanes, Polarization effects and Stereo isomerism. |
| **CO3** | Describe the fundamentals of Kinetics, Catalysis and Photochemistry |
| **CO4** | Distinguish the conventional and non-conventional energy resources |
| **CO5** | Identify the uses of naphthalene, osmosis and nuclear chemistry |

**UNIT - I: INORGANIC CHEMISTRY - I**

1.1 Extraction of Metals - Minerals and Ore - Minerals of Iron and Copper - Ore dressing - Froth floatation and Magnetic separation.

1.2 Refining of metals - Electrolytic, Van Arkel and Zone Refining.

1.3 Extraction of Uranium and Thorium.

**UNIT - II: ORGANIC CHEMISTRY - I**

2.1 Cycloalkanes - Preparation and properties of Cyclohexane - Bayer's angle strain theory.

2.2 Polarization - Inductive effect, mesomeric effect and steric effect.

2.3 Stereo isomerism - Types, causes of optical activity of lactic acid and tartaric acid - Racemisation - Resolution – Geometrical Isomerism – maleic and fumaric acid.

**UNIT - III: PHYSICAL CHEMISTRY - I**

3.1 Chemical kinetics – Distinction between Order and Molecularity – derivation of first order rate equation – half life period of first order reaction.

3.2 Catalysis – Catalyst - Types - promoters – catalytic poisoning – Active center – Distinction between homogeneous and heterogeneous catalysts – Industrial application of catalysts.

3.3 Photochemistry - Grothus Draper's law, Stark Einstein's law – quantum yield. Phosphorescence, fluorescence, chemiluminescence and photosensitization.

**UNIT - IV: INDUSTRIAL CHEMISTRY**

4.1 Conventional Energy Resources - Fuels – Classifications - Calorific value – Coal – Classification (Peat, Lignite, Bituminous and Anthracite).

4.2 Crude oil – Petroleum Refining – Cracking – thermal and catalytic cracking - Applications of Cracking – Knocking – Octane Number and Cetane Number.

4.3 Non- Conventional Energy Resources –Solar Energy - Need – Thermal Conversion (Solar Heater) and Electrical Conversion (Solar Cell) – Wind Energy – Tidal Energy – Bio-fuels.

**UNIT - V: INDUSTRIAL CHEMISTRY AND NUCLEAR CHEMISTRY**

5.1 Naphthalene – Preparation properties and uses of naphthalene – Structure of Naphthalene.

5.2 Osmosis – Osmotic pressure – reverse osmosis – desalination of sea water.

5.3 Nuclear chemistry – definition of half life period – Group displacement law – Radioactive series – Nuclear fission and fusion – Nuclear Reactor – Application of nuclear chemistry in medicine, agriculture and industries – C14 dating.

**Books for Study:**


1. B. R. Puri, L. R Sharma and K.C Kalia, **Principles of Inorganic Chemistry**, 33rd Edition, Vishal Publishing Co. Jalandhar- Dehli.
2. B.S Bahl and Arun Bahl, **Advanced Organic Chemistry**, Sultan Chand and Co., Ltd, Reprint 2010.
3. B. R. Puri, L. R Sharma and M.S Pathania, **Principles of Physical Chemistry**, Edition, Vishal Publishing Co., 2018.
4. B.K. Sharma, **Industrial Chemistry – Including Chemical Engineering,** Goel Publishing House, Meerut. 2008.


**Books for Reference:**


1. P.L Soni and Mohan Katyal, **Textbook of Inorganic Chemistry,** 20th Edition, Sultan Chand & Sons, Reprint 2001.
2. P.L Soni and H.M Chawla, **Textbook of Organic Chemistry,** 25th Revised Edition, Sultan Chand & Sons, 1992.
3. K.S Tewari and M.K Vishnoi, **A Textbook of Organic Chemistry,** 3rd Edition, Vikas Publishing House Pvt. Ltd, 2006.
4. M.K Jain and S.C Sharma, **Modern Organic Chemistry,** Vishal Publishing Co, 2004.
5. P.L Soni, O.P Dharmarha and U.N Dash, **Textbook of Physical Chemistry,** 21st Revised Edition, S. Chand & Co, Reprint 2000.
6. P.K Mani and A.O Thomas, **A Textbook of Practical Chemistry,** Scientific Publication, 1973.
7. O.P. Pandey, D. N. Bajpai and S.Giri, **Practical Chemistry,** 8th Edition, S. Chand & Co, 2001.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **II Year** Subject Code: **U18ACH302** Semester: **III**

Allied - 3 Title: **ALLIED BIOCHEMISTRY – I**

Credits: **4** Max. Marks: **75**

| | |
|---|---|
| **Objective(s)** | The main objectives of this course is intended to provide a basic foundation and understanding of the principles of modern biochemistry necessary for further work in the biochemical/biomedical areas.<br><br>Knowledge and understanding of the basic principles in biochemistry including the molecular composition of living cells, the organization of biological molecules within the cell, and the structure and function of these biological molecules with some practical connections to everyday life. |
| **Course Outcome(s)** | |
| **CO1** | Acquire fundamental knowledge of delineate structure, function and inter-relationships of carbohydrates. |
| **CO2** | Gain the knowledge of structure and biological functions of amino acids and proteins. |
| **CO3** | Understand the concepts of structure and biological functions of various lipids and the difference between simple and complex lipids. |
| **CO4** | Understand the basic concepts of Structures, functions, difference and formation and their significance DNA and RNA. |
| **CO5** | Know the concept of body regulators - Vitamins and minerals. |

**UNIT-I: Chemistry of carbohydrates**

General Functions, Classification and Structure of Glucose - features and Haworth Projection. Stereoisomers, chemical reactions of monosaccharide, oxidation, reduction, action of alkali, strong acid, osazones formation. Disaccharides - Occurrence and structure of maltose, lactose, sucrose. Polysaccharides- structure and functions of starch.

**UNIT-II: Chemistry of Amino acids and Proteins**

Amino acid structure- D & L forms of amino acids. Classification based on polarity, essential and non essential amino acid. Physical properties: Zwitter ions, pI, ampholytes of amino acids, UV absorption and chemical properties. Protein classification, functions, structural organization - Primary structure, Secondary structure-alpha helix and beta sheet. Denaturation of protein.

**UNIT-III: Chemistry of Lipids**

Classification and general functions of lipids Fatty acids saturated and unsaturated, clinical significance of PUFA. Simple lipids, Triglycerides. Definition and significance - Acid Number, Saponification Number, Iodine Number and Reichert- Meissel Number. Compound lipids - Structure and function of Glycerophospholipids (Cephalin, Lecithin and Phosphotidyl inositol), Phosphosphingolipids (ceramide, Sphingomyeline), Glycolipids or Cerebrosides (Galacto and Glucocerebrocides). Steroids - Cholesterol structure and biochemical significance.

**UNIT-IV: Chemistry of Nucleic acids**

Definition, nucleoside, nucleotide and polynucleotide. Double helical model of DNA and its biological functions. Structure and biological functions of RNA Differences between DNA and RNA. DNA replication, transcription and translation process.

**UNIT-V: Vitamins and Minerals:**

A brief outline of occurrence and biological function of Vitamins and minerals (Na, K, Cl, Ca, P, I, Fe, Mg & S).

**REFERENCES:**


1. Lehninger Principles of Biochemistry-David L. Nelson, Michael M. Cox, Macmillan Worth Publishers.
2. Biochemistry - Garrett Grishmam. 3rd edition. International student's edition.
3. Biochemistry by L . Veerakumari , MJP publishers,Chennai-5.
4. Harper's Biochemistry-Rober K. Murray, Daryl K. Grammer, McGraw Hill, Lange Medical Books. 25th edition.
5. Fundamentals of Biochemistry-J.L. Jain, Sunjay Jain, Nitin Jain, S. Chand & Company.
6. Biochemistry-Dr. Amit Krishna De, S. Chand & Co., Ltd.
7. Biochemistry-Dr. Ambika Shanmugam, Published by Author.
8. Biomolecules-C.Kannan , MJP Publishers,Chennai-5.
9. Biophysical Chemistry - Upadhyay and Upadhyay Nath, Himalayan Publication.
10. Analytical Biochemistry - R.B. Turner, Elsevier, N.Y.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **II Year** Subject Code: **U18SPH301** Semester: **III**

Skill Based - 1 Title: **BASIC ELECTRONICS (SBS-I)**

Credits: **3** Max. Marks: **75**

| | |
|---|---|
| **OBJECTIVES** | To learn the characteristics of semiconductor devices and IC's. To learn the applications of analog and digital circuits |
| **COURSE OUTCOME(S)** | |
| **CO1** | To understand the fundamental of semiconductor physics relevant to diodes. |
| **CO2** | To understand the properties and characteristics of different semiconductor devices |
| **CO3** | To gain knowledge about different form of power supplies needed for operating semiconductor devices |
| **CO4** | To acquire knowledge on the operating of different forms of amplifiers and their applications |
| **CO5** | To acquire understanding on the operating of different forms of Oscillators and their applications |

**UNIT I – SEMICONDUCTORS**

Introduction – Intrinsic Semiconductor – Mechanism of Hole contributing to conductivity – Extrinsic Semiconductor – N-Type and P-Type – Majority and Minority Charge Carriers – Mobile Charge carrier and immobile Ions – Conduction in intrinsic Semiconductor – Mass Action Law – Charge densities in N and P-Type Semiconductors – Band gap – PN Junction diode – Diode current equation – Bridge rectifier and its efficiency.

**UNIT II – SEMICONDUCTOR DEVICES**

Bipolar Junction Transistor: Common Emitter connection and its characteristics. Field Effect Transistor: Working – Drain and Transfer Characteristics – FET Parameters. MOSFET: Construction and working of Depletion and Enhancement MOSFETs. SCR: Construction and working of SCR – Characteristics of SCR – SCR Switching. UJT: Construction and working of UJT – Characteristics of UJT.

**UNIT III – POWER SUPPLY**

Introduction – Ordinary D.C Power Supply – Filters – Inductor Filter – Capacitor Filter – π-Filter – Voltage regulation – Minimum load resistance – Regulated Power supply – Low and high voltage regulator – Zener Diode voltage regulator – Transistor voltage regulator (series and Shunt type) – Series Feedback Voltage regulator – IC Regulators ( Fixed and Adjustable).

**UNIT IV –AMPLIFIERS**

Transistor as an Amplifier – Common Emitter Transistor amplifier (NPN) – RC-coupled amplifier –Transformer-coupled amplifier – Direct-coupled amplifier. Power Amplifiers: Class A – Class B – Class C – Push-pull amplifier. h-parameters: Equivalent circuit for CE transistor – Amplifier expressions for current gain, input resistance, voltage gain, output resistance and power gain using h-parameters.

**UNIT V – OSCILLATORS**

Introduction – classification of Oscillators – Oscillatory circuit – Frequency of oscillatory circuit – Essentials of Transistor Oscillator – Barkhausen criterion – Working of Hartley and Colpitt oscillators – Basic principle of RC Oscillator –Working of phase shift and Wien bridge oscillators – Crystal oscillator.

**Books for study:**


1. Principles of Electronics by V.K.Mehta and Rohit Mehta, S.Chand & Co., New Delhi.
2. A Text Book of Applied Electronics by R.S.Sedha, S.Chand & Co., New Delhi.
3. Electronic Principles by A.P.Malvino, McGraw Hill Book Company.


**Books for reference:**


1. Electronic devices and circuits by Jacob Millman and Christos C. Halkias, Tata MeGrew – Hill Edition 1991.
2. Electronic devices and circuits by B. Sasikala and S. Poornachandra, Scitech Publication (India)Pvt. Ltd., Chennai
3. Electronic devices and circuits by Allen Mottershead, Prentice Hall of India Pvt. Ltd., New Delhi.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **II Year** Subject Code: **U18NHS301** Semester: **III**

Non Major - 1 Title: **INDIAN NATIONAL MOVEMENT (NME-I)**

Credits: **2** Max. Marks: **75**

**Objectives:**

To enable the students to perceive how traders of the west became the rulers of the east.
To understand the policies and strategies of the East Indian Company and the British empire.
To evaluate the contribution of the freedom fighters.

| **COURSE OUTCOME(S)** Students are able to | |
|---|---|
| **CO1** | Understand the Early Nationalists, socio – Religion Reformers in 19th Century and demonstrate the Political Associations. |
| **CO2** | Think Critically about nationalism and its Impact on our Freedom History. Integrate these regarding analyzes the Salient Features of Moderates. |
| **CO3** | Understand the Phase of Extremist and their role and Contributions. |
| **CO4** | State the role of Gandhiji in the Freedom Movement. |
| **CO5** | Evaluate the sacrifices of our freedom fighters and understand the nation hood. |

**UNIT - I**

Early Nationalist Response : Vellore Mutiny of 1806 - Causes, Course, Causes for Failure, Nature and Impact of the Revolt of 1857 – Socio-Religious Reform Movements in 19 th Century - Brahmo Samaj, Raja Ram Mohan Roy - Devendrnath Tagore – Kesav Chandira Sen - Arya Samaj, Dayanada Saraswathi - Prarthana Samaj -Ramakrishna Mission , Swami Vivekananda-Theosophical Society, Annie Besant - Aligarh Movement, Sir Sayed Ahamad Khan - Political Associations In Bengal, Bombay and Madras upto 1885.

**UNIT - II**

Institutionalization of the National Movement: Factors responsible for the formation of the Indian National Congress – Objectives, Origin of the Congress – A.O. Hume - Moderate Phase (1885-1905) – Early Congressman – Gopala Krishna Gokhale - their nature, ideology, politics and leaders.

**UNIT – III**

Extremist Phase (1905-1916): Partition of Bengal – Swadeshi Movement – Bala Gangadhara Tilak - Formation of Muslim Leaque - Surat Split – Swadeshi and Boycott Movement – Bengal Reunion and Transfer of Capital – India in First World War –Home Rule Movement - Lucknow Pact – August Declaration.

**UNIT – IV**

Emergence of Gandhiji: Rowlatt Act – Jalianwala Bagh Massacre – Khilafat Movement and Non-Cooperation Movement – Boycott of council , Court , School and colleges - Swarajya Party – Simon Commission – Nehru Report – Civil Disobedience Movement – Round Table Conferences – Gandhi Irwin Pact – Poona Pact - Government of India Act 1935.

**UNIT - V**

Final Phase: Provincial Governments – Lahore Resolution – Concept of Pakistan - Subas Chandra Bose and Azad Hind Fauj - INA - Individual Satyagraha - The Cripps Mission – Quit India Movement – Cabinet Mission – Transfer of Power - Mountbatten Plan – Partition – Indian Independence Act - Independence

**Books for Reference:**


1. Tara Chand: History of Freedom Movement Vol. I-IV, Publications Division, Govt. of India, 1983.
2. SumitSarkar: Modern India, 1885 - 1947, MacMillan India Ltd, Madras, 1986.
3. Bipin Chandra and Others: India's Struggle for Independence, Penguin Books, 1990.
4. Majumdar, R.C., & Chopra, P.N., Main Currents of Indian History, Sterling Publishers Pvt Ltd, New Delhi, 1979
5. Desai, A.R., Social Background of Indian Nationalism
6. Grover, B.L., A New Look at Modern Indian History, S.Chand & Company Ltd, New Delhi, 2009.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **II Year** Subject Code: **U18NKS301** Semester: **III**

Non Major - 1 Title: **FUNDAMENTALS OF MARKETING (NME-I)**

Credits: **2** Max. Marks: **75**

**OBJECTIVES:**

To acquaint the students with the basics of marketing to make them understand the consumer behaviour and buying motives.

**COURSE OUTCOME(S):**

**CO1** - Provide an idea about marketing and its functions.
**CO2** - Enhance the knowledge of students on marketing of service.
**CO3** - Students will familiar with the products and its classifications
**CO4** - Learn basic concept of sales forecast and distribution channel.
**CO5** - Understand the effective pricing policies and strategy.

**UNIT: I INTRODUCTION TO MARKETING**

Market – Meaning, Definition - Classifications of Market – Marketing - Meaning, Definition Importance of marketing – Functions of Marketing – Marketing Concept - Marketing Mix.

**UNIT: II PRODUCTS**

Products – Classifications of products – Product characteristics – Product life cycle – Product mix - Product mix Strategy.

**UNIT: III PRICING**

Pricing – Objectives, pricing policies and procedures, Factors influencing pricing decision – Kinds of Pricing – Pricing Strategy.

**UNIT: IV SALES FORECASTING**

Sales Forecasting – Various methods of Sales Forecasting – Limitation of Sales Forecasting – Distribution Channel – Meaning – Importance – Merits and Demerits – Types of Intermediaries.

**UNIT: V MARKETING OF SERVICE**

Service Marketing - Concept of Service - Characteristics of Services Marketing - Future of the Service Sector - The mix elements in Service Product - Pricing for Services - Promoting Services - Physical Evidence.

**Text books:**

1. Slanton , W.J. “Fundamentals of Marketing”.

**Reference books:**

1. Rajan Nair, “Marketing Management”, Sultan Chand & Sons, 01-Jan-1995
2. RamaswanyNamakumari, “Marketing Management”, Macmillan India Limited, 2002.
3. Philp Kotler, “Marketing Management”, Pearson Education, 06-Jan-2015.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **II Year** Subject Code: **U18NMA301** Semester: **III**

Non Major - 1 Title: **BASIC MATHEMATICS (NME-I)**

Credits: **2** Max. Marks: **75**

**Objectives:** This Course aims to study about the basic elementary concepts of Mathematics for Non-Major Students.

| **Course Outcomes:** At the end of the course, the students will able to | |
|---|---|
| **CO1** | Understand the concepts of Set theory. |
| **CO2** | Understand the number system. |
| **CO3** | Understand the logic concepts. |
| **CO4** | Understand the elementary concepts of Matrices. |
| **CO5** | Find the determinant of Matrices. |

**UNIT-I: Sets**

Definition - Subsets - Power sets - Equality of sets - Finite and Infinite sets - Set operations - De-Morgan's laws - Distributive tables - Cartesian products.

**UNIT-II: Number system**

Binary, Octal, Hexadecimal numbers - conversion from one system to another system - addition and subtraction - one's complement.

**UNIT-III: Symbolic logics**

Logical statements - connectives - truth tables - tautologies operations - groups – (problems and simple properties only).

**UNIT-IV: Matrices**

Definition - types of matrices - operations on matrices - adjoint and inverse - applications - solving non-homogeneous equations.

**UNIT-V: Determinants**

Definition - properties (without proof) - application of determinants - Cramer's rule for the solution of a system of equations.

**Reference Books**


1. Dr.M.K.Venkataraman & others, "Discrete mathematics and structures", The National Publishing Company, Madras.
2. Trembly J.P and Manohar.R "Discrete Mathematical Structures with applications to computer science" Tata McGraw - Hill Pub., Co., Ltd. New Delhi 2003.
3. Richard Johnsonbaugh, "Discrete Mathematics" fifth Edn., Pearson Education Asia, New Delhi 2002.
4. V.Vijayendran "Digital Fundamentals" S.Viswanathan Printers & Publishers Pvt. Ltd.
5. T.K.Manicavachagom Pillay & Others, "Algebra", Volume II, S.Viswanathan Printers & Publishers Pvt. Ltd.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **II Year** Subject Code: **U18NCH301** Semester: **III**

Non Major - 1 Title: **CHEMISTRY IN DAILY LIFE (NME-I)**

Credits: **2** Max. Marks: **75**

| | |
|---|---|
| **Objective(s)** | To introduce students to a breadth of ways in which chemistry impacts every aspect of modern life, from the food we eat to the clothes we wear, the way we communicate and work, the way we keep ourselves healthy and how we diagnose and treat those who aren't. Chemistry's role in our everyday life and how chemistry will impact on people's lives in the future. |
| **Course Outcome(s)** | |
| **CO1** | Understand the basic concepts in chemistry. |
| **CO2** | Explore the knowledge of cosmetics and their hazardous in our daily life. |
| **CO3** | Gain the knowledge of water analysis and their treatment methods. |
| **CO4** | Understand the concepts of pH and buffer action in our daily life. |
| **CO5** | Learn about the nature of food, food sources, balanced diet, various adulterants and their governing laws. |

**UNIT: I Basic Concepts in Chemistry**

Elementary ideas of Atoms, elements, Atomic mass and Molecular mass. Isotopes, isobars and isotones. Methods of expressing concentration: Weight percentage, molality, molarity, normality and ppm.

**UNIT: II Cosmetics**

General formulation, preparation and toxicology of different types of cosmetics - Tooth paste, Shampoos, Hair dyes, lipstick, nail polish, perfumes, deodorants, Shaving cream Talcum powder, soaps and detergents.

**UNIT-II Water Analysis**

Sampling of Water for analysis - Chemical Substances affecting Potability - Colour, Turbidity, Odour, Taste, Temperature, pH and Electrical Conductivity. Purification of water Hard and soft water. Analysis of pollutant water by COD and BOD.

**UNIT-IV Acid - Base balance**

Definition classification, preparation properties and uses of acids and bases of Neutralisation reactions in everyday life. Indicators pH and their biological significance of pH; Buffer solutions – Importance of buffer in living system.

**UNIT-V Food and Nutrition**

Carbohydrates, Proteins, Fats, Minerals and Vitamins, definitions, sources and their physiological importance - balanced diet.

Adulterants in milk, ghee, oil, coffee powder, tea, asafoetida, chilli powder, pulses and turmeric powder - identification. Food laws, Safety and Standards.

**REFERENCES:**


1. Chemical Process Industries (4th Edition) R. Norris Shreve Joseph A.Brink,Jr.
2. Perfumes, Cosmetics and Soaps W.A.Poucher (Vol.3) Environmental Chemistry A.K.De.
3. B. Sreelakshmi, Food Science, New Age International, New Delhi, 2015.
4. Shashi Chowla; Engineering Chemistry, Danpat Rai Publication.
5. B.K. Sharma; Industrial Chemistry. Goel Publishing House, Meerut, 2003.
6. C.N.R. Rao; Understanding Chemistry, Universities Press.
7. M.K. Jain and S.C. Sharma; Modern Organic Chemistry, Vishal Pub. Co., Jalandhar, 2009.
8. V.R.Gowariker; N.V. Viswanathan and J. Sreedhar; Polymer Science, 2nd edn., New Age, New Delhi, 2015.
9. P.C. Pall; K. Goel and R.K. Gupta; Insecticides, Pesticides and Argobased Industries.
10. Singh, K., Chemistry in Daily Life; Prentice Hall of India, New Delhi, 2008.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

| | | | | | |
|---|---|---|---|---|---|
| Year: | **II Year** | Subject Code: | **U18NZL301** | Semester: | **III** |
| Non Major - 1 | | Title: | **POULTRY FARMING (NME-I)** | | |
| Credits: | **2** | | | Max. Marks: | **75** |

**Objectives:**

To impart training on Modern Poultry Farming Technology

To create knowledge on self employment opportunity.

**Course Outcomes**

**CO1**: To learn the importance and current need of Poultry

**CO2**: Promote and encourage the students to study the types of fowls.

**CO3**: To study the morphology of breeds

**CO4**: Learn the proper and scientific methodology of feed

**CO5**: To learn the diseases and management.

**UNIT – I**

Poultry-definition-types of poultry-fowls-ducks-Quails. Scope and importance of poultry-Status of Poultry in India and World. Classification of fowls based on colour, comb and meat.

**UNIT – II**

External structure of a male and female fowl-identification of sex-External morphology of variety of fowls: American Class (Rhode Island Red and Plymouth Rock), Asiatic class (Brahma), English Class (Sussex, Australop and Orpington), Mediterranean class (Leghorn and Minorca)

**UNIT – III**

Feeding poultry –Feed Preparation- Feeing equipments-Management of Egg Layers – Management of Broilers in large scale farms.

**UNIT – IV**

Poultry diseases: Causative agent and prevention of Viral, Bacterial, Fungal, protozoan and Parasitic diseases. Vaccination chart for fowls.

**UNIT – V**

Construction and Management of modern poultry farms – Management of egg layers-care during winter and summer-Progressive plans to promote poultry as a self-employment venture.

**Reference Books:**


1. Jull Morley, A. 1971: Poultry Husbanry, Tata –McGraw Hill Publ. Co New Delhi – India.
2. Sastry, Thomas and Singh, 1982: Farm Animals Management and Poultry production – Vikas Publ. co. New Delhi – India.
3. Harbans Singh and Earl.N. Moore, 1982: Live stock and poultry production – prentice hall India Publ. Co., New Delhi – India.
4. Banarjee, G.C. 1986: poultry, Oxford – IBH publ. co., New Delhi – India.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **II Year** Subject Code: **U18NCM301** Semester: **III**

Non Major - 1 Title: **BUSINESS MANAGEMENT AND COMMUNICATION (NME-I)**

Credits: **2** Max. Marks: **75**

| | |
|---|---|
| **OBJECTIVES:** | To enable the students to know management and impart skill in communication to draft business letters. |
| **COURSE OUTCOME(S)** | |
| **CO1** | To understand the management principles and functions |
| **CO2** | To perceive the knowledge in planning and organising |
| **CO3** | To understand the knowledge of leaders and their qualities. |
| **CO4** | To impart skills in communication and provide guideline for effective communication. |
| **CO5** | To seek knowledge about letters and became aware of drafting letters to various organization. |

**UNIT-I – INTRODUCTION TO MANAGEMENT**

Management – Meaning – Nature – Levels of Management -Functions of Management -Henry fayol's principles of Management.

**UNIT-II - PLANNING**

Planning – Meaning – Merits & Demerits of Planning - Steps in Planning - Organizing – Meaning – characteristics –– Principles of organization.

**UNIT-III – LEADERSHIP**

Meaning**–** Importance-Leadership styles – Qualities of a Leader.

**UNIT-IV - INTRODUCTION TO COMMUNICATION**

Business Communication – Meaning - Importance – Media of Communication (Written, oral, face to face and visual communication) – Principles of an Effective Communication – Types of communication.

**UNIT- V – BUSINESS LETTERS**

Layout of a letter –Application for Situation - Letter of enquiry and complaint.

**TEXT BOOK:**

1.Dr. C.B. Gupta, Business Management –Sultan Chand & Sons.

**Reference Books:**

1. Rajendra Pal & J S Korlahali, Essentials of Business Communication.
2. Ramesh and Pattanchetti, Business Communication, R Chand & Co.
3. Jayashankar, Business Management –Margham Publications, Chennai.
4. Dr.N.Premavathy, Principles of Management, Sri Vishnu Publications, Chennai.

# C.ABDUL HAKEEM COLLEGE (Autonomous), Melvisharam

Syllabus for Second year UG Programmes effective from the year 2018-2019

| | | | |
|---|---|---|---|
| **Class** | : Second year UG Programmes | **Semester** | : III |
| **Subject Code** | : U18NTA301 | **Title** | : Basic Tamil (Non Major-1) |
| **Credits** | : 2 | **Max Marks** | : 75 |

| | |
|---|---|
| **OBJECTIVES** | தமிழ்மொழியின் அடிப்படை இலக்கண, இலக்கியப் பண்புகளை எழுத மற்றும் வாசிக்க ஆயத்தப்படுத்தல். |
| **COURSE OUTCOME(S)** | |
| **CO1** | தமிழ் எழுத்துக்களை ஒலி வடிவம், வரி வடிவம் என பிரித்து வகைப்படுத்தல். தமிழின் அடிப்படை இலக்கிண வடிவ மாறுதல்களை எடுத்துரைத்தல். |
| **CO2** | எளிமையான தமிழ்ச் சொற்களை அறிமுகப்படுத்தி பொருளை விளக்குதல். அதிகம் பயன்படும் பெயர், வினை, மற்றும் தொகுப்புச் சொற்களை அமைக்க பயிற்சி வழங்கல் |
| **CO3** | எளிமையான சிறுகதைகளின் வழி வாசிப்புத் திறனை மேம்படுத்தல். |

## பாடத்திட்டம்

**அலகு–I எழுத்து**

1. உயிர் எழுத்துக்கள். மெய்யெழுத்துக்கள் - வகை, எண்ணிக்கை அறிதல்
2. உயிர் மெய் எழுத்துக்கள், வல்லினம், மெல்லினம், இடையினம்

**அலகு–II எழுத்து**

திணை, பால், எண், இடம், காலம், ஒருமை - பன்மை வேறுபாடு, குறில் நெடில் வேறுபாடு

**அலகு–III சொல்**

1. ஒரெழுத்து ஒரு மொழி பெயர் ( பூ,ஆ,கா...) வினை ( வா,போ...)
2. ஈரெழுத்து ஒரு மொழி பெயர் ( கனி, பனி...) வினை (நில், படி...)
3. தொடர் மொழி : முக்கனி ,முத்தமிழ், மூவேந்தர் ,நாற்றிசை, ஐம்பொறி , அறு சுவைகள் - இவற்றை விளக்குக.

**அலகு–IV சொல்**

1. பெயர்ச்சொல் , வினைச்சொல் வகைகள்
2. பறவைப் பெயர்கள், விலங்குகளின் பெயர்கள், மலர்கள், வானவில்லின் வண்ணங்கள், இந்திய மொழிகள், எண்கள் (ஒன்று முதல் பத்து வரை எழுத்தால் எழுதுதல்)

**அலகு–V சிறுகதை**

1. நேர்மை தந்த பரிசு

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **II Year** Subject Code: **U18NUR301** Semester: **III**

Non Major - 1 Title: **FUNCTIONAL URDU - I (NME-I)**

Credits: **2** Max. Marks: **75**

| | |
|---|---|
| **OBJECTIVES:** | ✓ To popularize Urdu among Non-Urdu Knowing students.<br>✓ To introduce them to the basic infrastructure of Urdu.<br>✓ To train them in exact pronunciation of Urdu words. |
| **COURSE OUTCOMES** | ➢ Students will learn the primary lessons in Urdu.<br>➢ They will develop the ability to form simple sentences.<br>➢ They will gain proficiency in Urdu Calendar. |

**Unit I**

Urdu alphabets

Reading & Writing practice in Urdu

**Unit II**

Word completion,

Pronunciation, Connecting words.

**Unit III**

Vowels,

Prepositions & Urdu Numerals.

**Unit IV**

Formation of Simple Sentences.

**Unit V**

Conversation &

Urdu Calendar (Week days and Months).

# C.ABDUL HAKEEM COLLEGE (Autonomous), Melvisharam

Syllabus for Second year B.A.,B.Sc.,&B.Com (C.S) effective from the year 2018-2019

| | | | |
|---|---|---|---|
| **Class** | : UG Second year B.A.,B.Sc.,&B.Com (C.S) | **Semester** | : IV |
| **Subject Code** | : U18FTA401 | **Title** | : Part-I Tamil |
| **Credits** | : 4 | **Max Marks** | : 75 |

| | |
|---|---|
| **OBJECTIVES** | செவ்வியல் தமிழ் இலக்கிய வடிவங்கள், விழுமியங்கள், இலக்கண அமைப்பியல் போன்றவற்றை அறியச் செய்தல். |
| **COURSE OUTCOME(S)** | |
| **CO1** | சங்க கால சமூகவியலையும் வாழ்வியல் அறங்களையும் அறிய வைத்தல். இடைக்காலத்தில் சமூக அமைப்பினையும் இலக்கிய வடிவ மாறுதல்களையும் விளக்கி எடுத்துரைத்தல். |
| **CO2** | கவிதைகள் வெளிக்காட்டும் சம கால பதிவுகளை எளிமையாக வெளிக்கொணர்தல். இலக்கணத்தைப் பயிற்றுவிப்பதன் மூலம் சிறந்த மொழியாக்க முயற்சிக்கு ஆயத்தப்படுத்தல் |
| **CO3** | படைப்பிலக்கியப் பயிற்சி வழி படைப்புத்திறனை மேம்படுத்தல். |

## பாடத்திட்டம்

**அலகு–I சங்க இலக்கியம்**

1. குறுந்தொகை - பாடல் எண்கள் : 32, 40, 58, 69, 79, 176 (6 பாடல்கள்)
2. ஐங்குறுநூறு - குறிஞ்சி – கபிலர் - கிள்ளைப்பத்து (முதல் 6 பாடல்கள்)
3. புறநானூறு - பாடல் எண்கள் : 86, 182, 188, 196, 277, 279 (6 பாடல்கள்)

**அலகு–II சிற்றிலக்கியம்**

1. குற்றாலக் குறவஞ்சி - குற்றால மலை வளம் ( 6 பாடல்கள்)
2. முக்கூடற் பள்ளு - பள்ளியர் ஏசல் ( 8 பாடல்கள்)
3. முத்தொள்ளாயிரம் - சேரன் -3 சோழன் -3 பாண்டியன் - 3 ( 9 பாடல்கள்)

**அலகு–III கவிதை**

1. கவிஞர் மீரா - ‘ஏற்றம் காண்போம்’
2. கவிஞர் முடியரசன் - ‘துயில்’
3. கவிஞர் தாராபாரதி - ‘காற்றுக்குப் புதிய திசை காட்டு’

**அலகு–IV இலக்கணம்**

**யாப்பு-** எழுத்து – அசை – சீர் - தளை – அடி – தொடை

**அலகு–V(அ) இலக்கியவரலாறு**

1. சங்க இலக்கியங்கள்
2. சிற்றிலக்கியங்கள்

**(ஆ) திறனறிப் பயிற்சி**

1. படைப்பிலக்கியம் - கட்டுரை , கதை ,– பயிற்சி வழங்கல்

**பார்வை நூல்கள்**


| | | | |
|---|---|---|---|
| 1 | இலக்கியச் சாரல் | - | சி.அப்துல் ஹக்கீம் கல்லூரி வெளியீடு.<br>2019 சூன் வெளியீடு |
| 2 | மீரா கவிதைகள் | - | கவிஞர் மீரா<br>அகரம் பதிப்பகம்,1,நிர்மலா நகர்,தஞ்சாவூர் -7<br>முதல் பதிப்பு -2002 |
| 3 | முடியரசன் கவிதைகள் | - | கவிஞர் முடியரசன்<br>பாரி நிலையம், 29ஏ, பிராட்வே, சென்னை -1<br>முதல் பதிப்பு -1954 |
| 4 | கவிஞாயிறு தாராபாரதி கவிதைகள் | - | மலர் மகன் (தொ.ஆ)<br>இலக்கிய வீதி, 149- பூங்கா சாலை அண்ணா நகர் மேற்கு - விரிவு<br>சென்னை. -01 முதல் பதிப்பு -2007 |
| 5 | வகைமை நோக்கில் தமிழ் இலக்கிய வரலாறு | - | முனைவர் பாக்யமேரி<br>என்.சி.பி.எச்., அம்பத்தூர், சென்னை -98<br>முதல் பதிப்பு -2008 |
| 6 | நற்றமிழ் இலக்கணம் | - | டாக்டர்.சொ.பரமசிவம்,<br>பட்டுப் பதிப்பகம், 1269, 32-ஆம் தெரு<br>அண்ணாநகர் மேற்கு, கம்பர் குடியிருப்பு,<br>சென்னை -40<br>பன்னிரண்டாம் பதிப்பு -2012 |

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **II Year** Subject Code: **U18FUR401** Semester: **IV**

Language - 4 Title: **URDU – IV (DRAMA, RUBAYIATH & HISTORY OF URDU LITERATURE)**

Credits: **3** Max. Marks: **75**

| | |
|---|---|
| **OBJECTIVES**: | ✓ To promote students' knowledge of various literary genres like Drama.<br>✓ To effectuate their caliber to pen poems of their own.<br>✓ To motivate them to build lively conversations. |
| **COURSE OUTCOMES** | ➢ Students will learn to excel in the art of reading Plays.<br>➢ They will hoan their faculty of imagination.<br>➢ They will emerge as exponents of good conversation. |

**Unit – I**

1. Darwaza kholdo-Krishan Chander [First Quarter]
2. Agoosh-E- Lihad Mein Jab Ke Sona Hoga - Anees
3. Gulshan Mein Phiroou – Anees
4. Meer Taqi Meer

**Unit – II**

1. Darwaza kholdo-Krishan Chander [Second Quarter]
2. Ghaflat Kihansihse Aah Bharna Acha –Akber Allahbadi
3. Har Ek Se Sun Naye Fasana Ham Ne – Aker Allahbadi
4. Mirza Ghalib

**Unit – III**

1. Darwaza kholdo-Krishan Chander [Third Quarter]
2. Gunche Teri Zindagi Pe Dil Halth Hai -- Josh
3. Gunche Teri Zindagi Pe Dil Halth Hai – Josh
4. Sir Syed Ahmed Khan

**Unit – IV**

1.Darwaza kholdo-Krishan Chander [Last Quarter]
2.Muflis Hun Na Dowlath Hai Na Sermaya Hai --Amjad
3.Is Naam Ki Zindagi Mein Kuch Jaan To Ho – Amjad
4.Moulana Hali
5. Prem Chand

**Unit – V**

1. Roshan Nahi Karta Jala Dethe Hain –Asghar Vellori
2. Dhoonda Tho Kithabon Mein Sadaqath Na Mili –Asghar Vellori
3. Akber Ilahbadi
4. Allama Iqbal
5. Krishan Chandar

**BOOK PRESCRIBED**: "ADAB-E-JAMEEL", Published by Dept. of Urdu, C. Abdul Hakeem College, Melvisharam.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **II Year** Subject Code: **U18FURP41** Semester: **IV**

Urdu Lab Title: **PRACTICAL URDU (URDU SOFTWARE)**

Credits: **1** Max. Marks: **75**

**Unit I**

Introduction to Urdu Software
Practical

**Unit II**

Key Board and its kinds
Practical

**Unit III**

Types of Fonts
Practical

**Unit IV**

Text Alignment
Practical

**Unit V**

Inpage & Unicode Tools
Practical

**Prescribed Text Book**: "URDU SOFTWARE" Published by NCPUL, New Delhi, LINGUSTIC WITH PRACTICAL (Job Oriented Urdu Software Programme).

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

| | | | | | |
|---|---|---|---|---|---|
| Year: | **II Year** | Subject Code: | **U18FEN401** | Semester: | **IV** |
| English - 4 | | Title: | **ENGLISH – IV** | | |
| Credits: | **4** | | | Max. Marks: | **75** |

**Course Outcome(s)**

- **CO1:** Perceive the various forms of literature like Prose, Poetry, Biography, Short Story and Drama.
- **CO2:** Assimilate the knowledge of grammatical system of English Language and also develop four Language Skills.(LSRW)

**UNIT - I** **PROSE**

1. The Rule of the Road — A. G. Gardiner
2. Forgetting — Robert Lynd
3. Mobile and Mixed Up — Anil Dharker
4. Water: The Elixir of Life — Sir C. V. Raman

**UNIT - II** **POETRY**

1. The Lotus — Toru Dutt
2. The Highway Man — Alfred Noyes
3. Character of a Happy Life — Henry Wotton
4. Refugee Mother and Child — Chinua Achebe

**UNIT - III** **SHORT STORIES**

1. Two Gentlemen of Verona — A. J. Cronin
2. The World Renowned Nose — V. M. Basheer

**UNIT - IV** **ONE-ACT PLAY& BIOGRAPHY**

1. Love at First Sight – The Tempest — William Shakespeare
2. My Friend, Albert Einstein — Holfman

**UNIT - V** **WARM UP**

1. Lexical Skills
2. Descriptive Grammar
3. Traditional Grammar
4. Communication Skills (LSRW)
5. Composition

**WARM UP:**

**1. Lexical Skills**

- Common Errors in English
- Formation of Words
- Spelling and Sound: Introduction to Phonetics
- Vowels and Consonants

2. **Descriptive Grammar**
   - Conjunction and its Kinds
   - Interjection
   - Regular and Irregular Verbs
   - Modals and Auxiliaries Verbs

3. **Traditional Grammar**
   - Question Tags
   - Simple, Compound & Complex Sentences
   - Figures of Speech (a) Metaphor (b) Irony (c) Oxymoron (d) Personification (e) Simile

4. **Communication Skills (LSRW)**
   - Phoning
   - Offering Help
   - Asking for Information
   - Making Appointment

5. **Composition**
   - Designing a Resume
   - Writing Covering Letters for Resume
   - Preparing Agenda for Meetings
   - Writing Minutes of Meetings

**Book Prescribed:**

HALL OF FAME – IV Board of Editors, Published by Emerald publishers, Egmore, Chennai – 600 008: www.emeraldpublishers.com, Mail: info@emeraldpubliser.com

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **II Year** Subject Code: **U18MPH401** Semester: **IV**

Major - 4 Title: **ANALOG AND DIGITAL ELECTRONICS**

Credits: **3** Max. Marks: **75**

| | |
|---|---|
| **OBJECTIVES** | To understand the basic concepts of linear integrated circuits,, special function ICs and Digital logic circuits |
| **COURSE OUTCOME(S)** | |
| **CO1** | To introduce the basics of linear integrated circuits |
| **CO2** | To learn the linear and non-linear applications of Op–Amps |
| **CO3** | To introduce some special function ICs |
| **CO4** | To present the digital fundamentals, Boolean algebra and applications of combinational circuits |
| **CO5** | To introduce the analysis and design procedures for synchronous and asynchronous sequential circuits |

**UNIT – I : Operational Amplifier I**

Ideal operational amplifier – Inverting Amplifier – Non-inverting Amplifier – Voltage follower – Difference amplifier – Difference mode and common mode gains – CMRR – Slew rate – Scale changer – Inverting summing amplifier – Subtractor – Instrumentation amplifier – V-to-I converter – I-to-V converter – Precision diode – Precision full wave rectifier – S/H circuit.

**UNIT – II : Operational Amplifier II**

Logarithmic and Antilogarithmic amplifiers – Analog multiplier and divider – Differentiator – Integrator – Comparator – Zero crossing detector – Window detector – RC active filters – First order low pass filter – Second order active filter – High pass active filter.

**UNIT – III : Special Function ICs**

IC 555 Timer: Functional block diagram – Monostable operation – Missing pulse detector – Pulse width modulation – Astable operation – FSK generator – Pulse position modulator – Schmitt trigger.

Phase Locked Loop: Basic principles – Digital phase detector – Voltage controlled oscillator IC 566 – PLL IC 565 – Frequency multiplication/division – Frequency translation – AM detection.

**UNIT – IV : Combinational Logic Circuits**

Binary and hexadecimal number systems – Conversions between binary, decimal and hexadecimal – 1's and 2's complements – 2's complement subtraction – 8421 BCD code – Boolean theorems – Sum of products – K-map reduction – Don't care conditions – 4-input multiplexer – 1-to-4 demultiplexer – 3-to-8 decoder – BCD to 7-segment decoder – Encoder – 4-input priority encoder – Half and full adders – Controlled inverter – Adder-subtractor.

**UNIT – V : Sequential Logic Circuits**

RS flip flop – Clocked RS flip flop – D flip flop – 4-bit register – Edge triggered D flip flop – Preset and clear inputs – JK flip flop – JK master slave flip flop – 4-bit shift left shift register – 4-bit asynchronous counter – Down counter – Synchronous mod-5 counter – Synchronous BCD counter – ALU – Arithmetic unit – Logic unit – Status register and flags.

**Books for study:**


1. Linear Integrated Circuits – D. Roy Choudhury & Shail B. Jain – New Age International Publishers, Fourth Edition, 2012.
2. Digital Principles and Applications – A. P. Malvino & D.P. Leach – Tata McGraw-Hill Publishing Company Limited, New Delhi, Fourth Edition, 1991.
3. Digital Fundamentals – V. Vijayendran – S. Viswanathan Publishers Pvt. Ltd., Chennai, First Edition, 2003.


**Books for Reference:**


1. Op-Amps and Linear Integrated Circuits – Ramakant A. Gayakwad – Prentice Hall of India Pvt. Ltd., New Delhi, Fourth Edition, 2002.
2. Linear Integrated Circuits – S. Salivahanan & V.S. Kanchana Bhaaskaran – Tata McGraw Hill Education Private Limited, New Delhi, 2010.
3. Operational Amplifiers and Their Applications – Dr. Subir Kumar Sarkar – S. Chand & Co. Ltd., New Delhi, Revised Edition, 2010.
4. Digital Design – M. Morris Mano – Prentice Hall of India Pvt. Ltd., New Delhi, Second Edition, 1998.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **II Year** Subject Code: **U18MPHP41** Semester: **IV**

Major Practical - 2 Title: **CORE PRACTICAL – II**

Credits: **3** Max. Marks: **75**

| **OBJECTIVES** | To apply the basic principles of properties of matter, Electricity, Electronics and Optics by doing the relevant experiments. |
|---|---|
| **COURSE OUTCOME(S)** | |
| **CO1** | Understand and evaluate the Young's modulus and Rigidity modulus of the given material |
| **CO2** | Analyze the electrical parameters like resistance using potentiometer |
| **CO3** | apply the basic principles of optics to determine the refractive index of the material of prism |
| **CO4** | Understand and analyze the characteristics of electronic devices such as diodes and transistors |
| **CO5** | Skill Development-Practical exposure |

**(Any 16 Experiments)**

1. Young's modulus uniform bending Pin and microscope.
2. Young's modulus uniform bending Scale and Telescope.
3. Bifilar pendulum – Determination of M I of a rectangular body.
4. Surface Tension of a liquid - capillary rise method.
5. Viscosity by stoke's method
6. Sonometer – AC frequency – brass wire.
7. Sonometer – Specific gravity of solid and liquid
8. Spectrometer – Refractive index of a prism – i-d curve.
9. Spectrometer – grating – Determination of wavelength - normal incidence method.
10. Air wedge – thickness of a thin wire.
11. Thermal conductivity of a bad conductor-Lee's Disc method
12. Carey Fosters bridge – Temperature coefficient of resistance.
13. Potentiometer – Calibration of high range ammeter.
14. Potentiometer – resistance and specific resistance of a wire.
15. Field along the axis of a coil – Deflection Magnetometer
16. m and $B_H$ – Tan C – deflection magnetometer and vibration magnetometer.
17. BG – Figure of merit – Charge sensitiveness.
18. BG – Absolute capacitance of a capacitor
19. Regulated Power supply using Zener diode
20. Characteristic of a Transistor – CE mode

**Books for study:**

1. A Text book of Practical Physics, M.N.Srinivasan, S.Balasubramanian and R.Renganathan, Sultan Chand & Sons, New Delhi, 2005.
2. C.C Ouseph, G.Rangarajan- A Text Book of Practical Physics- S. Viswanathan Publisher-Part I 1990
3. C.C Ouseph, C.Rangarajan, R.Balakrishnan- A Text Book of Practical Physics- S.Viswanathan Publisher-Part II ( 1996)

**Book for reference:**

1. S.L Gupta and V.Kumar- Practical Physics- Pragati Prakashan – 25th Edition (2002)

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **II Year** Subject Code: **U18ACH401** Semester: **IV**

Allied - 4 Title: **ALLIED CHEMISTRY - II**

Credits: **4** Max. Marks: **75**

| | |
|---|---|
| **Objectives** | To study the basic concepts of coordination compounds, structure and properties of carbohydrates, proteins and amino acids.<br>To learn the fundamental concepts in Electrochemistry, Industrial and medicinal chemistry. |
| **Course Outcomes** | |
| **CO1** | Know the basic chemistry of Coordination and Interhalogen Compounds |
| **CO2** | Learn the occurrence and properties of bioorganic compounds |
| **CO3** | Understand the basics of electrochemistry and buffer solutions |
| **CO4** | Recognize the applications of Paints, Fertilizers, Pesticides, etc. |
| **CO5** | Learn the fundamentals and applications of medicinal chemistry |

**UNIT - I: INORGANIC CHEMISTRY - II**

1.1 Coordination chemistry: Werner Theory of coordination compounds – Chelation – Function and structure of Haemoglobin and Chlorophyll.

1.2 VSEPR Theory: Shapes of simple molecules $BF_3$, $PCl_5$, $SF_6$ and $XeF_6$.

1.3 Interhalogen compounds: Definition, Types (AX, $AX_3$, $AX_5$ and $AX_7$), Preparation Properties and Structure.

**UNIT - II: ORGANIC CHEMISTRY - II**

2.1 Carbohydrates: Classification –Properties, Structure and uses of Glucose, Starch, Cellulose Nitrate and Cellulose acetate.

2.2 Amino acid and protein: preparation and properties of Glycine – Classification of Protein based on physical properties and biological functions.

2.3 Primary and secondary structures of protein (Elementary treatment only) Composition of DNA and RNA and their biological role.

**UNIT - III: PHYSICAL CHEMISTRY - II**

3.1 Electrochemistry: Conductance – Specific and Equivalent conductance – their determination – effect of dilution on conductance.

3.2 Kohlrasch's law – Determination of dissociation constant of weak electrolyte using conductance measurement – Conductometric Titrations – Strong Acid Vs Strong Base, Strong Acid Vs Weak Base and Weak Acid Vs Strong Base.

3.3 pH definition - Buffer solutions – Importance of buffer in living system.

**UNIT - IV: INDUSTRIAL CHEMISTRY**

4.1 Paints – Requisites of a good Paint, Constituents and functions of paint. Colour and Dye – Classification based on constitution and application.

4.2 Fertilizers – Bio-fertilizers – Organic manures and their importance – Role of NPK in plants – preparation and uses of Urea, Ammonium Nitrate, Potassium Nitrate and Super phosphate of lime.

4.3 Contents in match sticks and match box – Industrial making of safety matches. Preparation and uses of chloroform, DDT, gamhexane and freon.

**UNIT - V: MEDICINAL CHEMISTRY**

5.1 Drugs – Sulpha drugs – Uses and mode of action of Sulpha Drugs – Antibiotics – Uses of Penicillin, chloramphenicol, and streptomycin. Drug abuse and their implications – alcohol – LSD.

5.2 Anaesthetics – General and local anaesthetics – Definition and examples for antiseptics analgesics, antipyretics, tranquilizers and sedatives

5.3 Causes, prevention and controlling measures of Diabetes, Cancer and AIDS.

**Books for Study:**


1. R.D. Madan, Modern Inorganic Chemistry, 2nd Edition, S. Chand & Co, Reprint 2004.
2. B.S Bahl and Arun Bahl, Advanced Organic Chemistry, Sultan Chand and Co., Ltd, Reprint 2010.
3. B. R. Puri, L. R Sharma and M.S Pathania, Principles of Physical Chemistry, 47th Edition, Vishal Publishing Co., 2018.


**Books for Reference:**


1. P.L Soni and Mohan Katyal, Textbook of Inorganic Chemistry, 20th Edition, Sultan Chand & Sons, Reprint 2001.
2. P.L Soni and H.M Chawla, Textbook of Organic Chemistry, 25th Revised Edition, Sultan Chand & Sons, 1992.
3. K.S Tewari and M.K Vishnoi, A Textbook of Organic Chemistry, 3rd Edition, Vikas Publishing House Pvt. Ltd, 2006.
4. M.K Jain and S.C Sharma, Modern Organic Chemistry, Vishal Publishing Co, 2004.
5. P.L Soni, O.P Dharmarha and U.N Dash, Textbook of Physical Chemistry, 21st Revised Edition, S. Chand & Co, Reprint 2000.
6. P.K Mani and A.O Thomas, A Textbook of Practical Chemistry, Scientific Publication, 1973.
7. O.P. Pandey, D. N. Bajpai and S.Giri, Practical Chemistry, 8th Edition, S. Chand & Co, 2001.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

| | | | | | |
|---|---|---|---|---|---|
| Year: | **II Year** | Subject Code: | **U18ACH402** | Semester: | **IV** |
| Allied - 4 | | Title: | **ALLIED BIOCHEMISTRY – II** | | |
| Credits: | **4** | | | Max. Marks: | **75** |

| | |
|---|---|
| **Objective(s)** | The main objectives of this course is intended to provide a basic foundation and understanding of the principles of modern biochemistry necessary for further work in the biochemical/biomedical areas.<br>Knowledge and understanding of the basic principles in biochemistry including the molecular composition of living cells, the organization of biological molecules within the cell, and the structure and function of these biological molecules with some practical connections to everyday life. |
| **Course Outcome(s)** | |
| **CO1** | Acquire fundamental knowledge of mechanisms involved in maintenance of body fluid pH homeostasis and electrolytes. |
| **CO2** | Gain the knowledge of the fundamental aspects of enzymology- Action, mechanism, kinetics and inhibition. |
| **CO3** | To excel in integrate the various aspects of metabolism and their regulatory pathways. |
| **CO4** | Understand the basic concepts of biochemical basis of inborn error metabolism. |
| **CO5** | Familiarize with the principles of various conventional and specialized laboratory investigations and instrumentation analysis and interpretation of a given data. |

**UNIT - I: Acid - Base balance:**

Concept of pH, pOH, buffer and its application, buffer capacity. Henderson - Hasselbalch equation and its importance. Buffer in body fluids of extracellular and intracellular fluids and their function. Fluid and Electrolytes balance, Disorders.

**UNIT - II: Enzyme Chemistry:**

Definition - enzyme, apoenzyme, holoenzyme, prosthetic group, active site, enzyme specificity, turnover number, specific activity, Katal, IU, coenzyme, co-factor, allosteric enzymes. IUB/EC Classification (up to one digit). Factors affecting enzyme reaction - substrate, pH and temperature. Enzyme kinetics-Derivation of Michaelis-Menten equation and Lineweaver-Burk plot for mono-substrate reaction. Enzyme inhibition - Competitive and Non-competitive.

**UNIT - III: Metabolism**

Carbohydrate metabolism-Glycolysis, TCA cycle, HMP shunt and its energy yield. amino acids metabolism-Deamination, Transamination reactions, SGOT and SGPT. Urea cycle, beta oxidation of fatty acids.

**UNIT - IV: Inborn Errors of Metabolism**

Disease definition, causes and symptoms-Galactosemia, Von - Gierke's Disease, Hemophilia, Albinism, Alkaptonuria, Taysach's.

**UNIT - V: Biochemical Techniques:**

Principles and application of: (a)chromatography (paper, and thin layer) , (b) electrophoresis (SDS PAGE), (c) absorption photometry (colorimetry and spectrophotometry), (d) centrifugation (Differential centrifugation), (e) radio immunoassay.

**REFERENCES:**


1. Lehninger Principles of Biochemistry-David L. Nelson, Michael M. Cox, Macmillan Worth Publishers.
2. Biochemistry - Garrett Grishmam. 3rd edition. International student's edition.
3. Biochemistry by L . Veerakumari , MJP publishers,Chennai-5.
4. Harper's Biochemistry-Rober K. Murray, Daryl K. Grammer, McGraw Hill, Lange Medical Books. 25th edition.
5. Fundamentals of Biochemistry-J.L. Jain, Sunjay Jain, Nitin Jain, S. Chand & Company.
6. Biochemistry-Dr. Amit Krishna De, S. Chand & Co., Ltd.
7. Biochemistry-Dr. Ambika Shanmugam, Published by Author.
8. Biomolecules-C.Kannan , MJP Publishers,Chennai-5.
9. Biophysical Chemistry - Upadhyay and Upadhyay Nath, Himalayan Publication.
10. Analytical Biochemistry - R.B. Turner, Elsevier, N.Y.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **II Year** Subject Code: **U18ACHP41** Semester: **IV**

Allied Practical Title: **PRACTICAL - ALLIED CHEMISTRY**

Credits: **2** Max. Marks: **75**

| **Objectives** | To Analyse various volumetric estimations. |
|---|---|
| **Course Outcome(s):** On Completion of the course, students will be able to | |
| **CO1** | Develop the skill required for the quantitative analysis of acidimetry, permanganometry, Complexometry and iodometry titrations. |
| **CO2** | Develop skills to determine the functional groups in an organic sample. |

### PART I: Volumetric Analysis

Students must write the short procedure and calculations for the given estimation in the examination.

**Acidimetry and Alkalimetry**

1. Estimation of Hydrochloric acid using standard Sulphuric acid solution.
2. Estimation of Sodium Hydroxide using standard Hydrochloric acid solution.
3. Estimation of Borax using standard Sodium Carbonate solution.
4. Estimation of Oxalic acid using standard Sulphuric acid solution.

**Permanganometry**

1. Estimation of $FeSO_4$ using standard Mohr salt solution.
2. Estimation of Oxalic acid using standard ferrous sulphate solution.

**Dichrometry**

1. Estimation of $K_2Cr_2O_7$ using standard Potassium Dichromate solution.
2. Estimation of $Fe^{2+}$ using diphenylamine / N-phenyl anthranilic acid as an indicator.

**Complexometry**

1. Estimation of Copper using standard Copper Sulphate solution.
2. Estimation of Total Hardness of water using Ethylene diammine tetra acetic acid.

### PART II: Organic Qualitative Analysis

Systematic analysis of the following Organic compounds containing one functional group and their characterization using confirmatory tests.

- ✓ Aromatic aldehyde - Benzaldehyde
- ✓ Carbohydrate
- ✓ Carboxylic acid (mono and dicarboxylic acid)
- ✓ Phenol
- ✓ Aromatic primary amine
- ✓ Amide
- ✓ Diamide

**Reference Book for Practical**:

i) Vogel's Quantitative Chemical Analysis – J. Mendham, Pearson Publisher, 2009 Edition.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **II Year** Subject Code: **U18ACHP42** Semester: **IV**

Allied Practical Title: **PRACTICAL - ALLIED BIOCHEMISTRY**

Credits: **2** Max. Marks: **75**

| | |
|---|---|
| **Objective(s):** | The main objectives of these experiments to support theoretical concepts and clinical diagnosis. |
| **Course outcomes** | |
| **Volumetric Analysis** | To develop skills for quantitative estimation using the different branches of volumetric Analysis. |
| **Qualitative Organic Analysis** | To develop skills required for the qualitative analysis of organic compounds, determination of physical constants. |
| **Preparations** | To make use of conventional techniques/instruments to perform biochemical analysis. |

**Volumetric Estimation:**

1. Estimation of Iron in Ferrous Ammonium Sulphate using potassium permanganate as link solution and oxalic acid as primary standard.
2. Estimation of Glucose by Benedict's quantitative method.
3. Estimation of Glycine by formal titration.
4. Estimation of ascorbic acid by titrimetric method using 2, 6-dichlorophenol indophenol.
5. Determination of saponification value of edible oil.

**Qualitative analysis:**

1. Identification of biomolecules - Amino acids, proteins, carbohydrates, lipids and nucleic acids.
2. Qualitative tests for Amino acids and proteins (Million's , Ninhydrin, Xanthoproteic and Biuret test)
3. Qualitative tests for lipids a) Miscibility test b) Saponification test c) Unsaturation test d) Sudan black dye test e) Salkowski test for cholesterol
4. Qualitative tests for DNA (DPA) & RNA (Orcinol) (Neumann's test for presence of phosphorus)

**Preparation:**

1. Casein from milk
2. Starch from potato.
3. Albumins and globulins from egg white.

**Reference Books for Practical**:

i) An Introduction to Practical Biochemistry - David T Plummer
ii) Introductory Practical Biochemistry - Sawhney & Singh
iii) Biochemical Methods - S.Sadasivam and A.Manickam
iv) Experimental Biochemistry-Rao & Deshpande

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **II Year** Subject Code: **U18SPHP41** Semester: **IV**

Skill Based - 2 Title: **SKILL BASED PRACTICAL (SBS-II)**

Credits: **3** Max. Marks: **75**

| | |
|---|---|
| **OBJECTIVES** | To understand the basic role of various components in electronic circuits, to build the circuits such as amplifiers, multivibrator. |
| **COURSE OUTCOME(S)** | |
| **CO1** | apply the basic principles of optics to determine the refractive index of the material of prism |
| **CO2** | understand and analyze the working of Op-amp, differentiator and integrator |
| **CO3** | understand and analyze the working of basic digital circuits using digital kits |
| **CO4** | Analyze the electrical parameters resistance and potential divider |
| **CO5** | Skill Development-Practical exposure |

**(Any 08 Experiments)**

1. Refractive index of Liquid and Solid using the travelling microscope
2. Newton's Ring – Measurement of thickness of paper sheet
3. The effect of temperature on a thermistor
4. Ohm's Law – Study of resistance of a given wire
5. Passive Differentiator and Integrator – Using R and C
6. Determination of Time constants – RC and RL series circuits
7. Potential divider construction (12 volts to 2, 3, 5 volts)
8. Principle of Dynamo- Using magnet and coil
9. AND, OR, NOT gates using transistors (by soldering)
10. Solid state relay – Controlling the external circuit
11. Light detection using LDR
12. Op-amp – Inverting and Non-inverting amplifiers
13. 555 Timer – Astable multivibrator
14. Half Adder and Half Subtractor using logic gates
15. R-S Flip-Flop using logic gates

**Books for study and reference:**


1. A Laboratory course in Electronics, T. Ramalingom and P. Raghupalan, Oxford & IBH Publishing co. New Delhi
2. A text book of practical Physics, M.N. Srinivasan, Sultan Chand & Sons, New Delhi
3. Practicals Physics,- St. Joseph's college, Trichy
4. http://practicalphysics.org/

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **II Year** Subject Code: **U18NHS401** Semester: **IV**

Non Major - 2 Title: **CIVIL SERVICES AND OTHER COMPETITIVE EXAMINATIONS (NME-II)**

Credits: **2** Max. Marks: **75**

**Objectives:**

To enable the students to perceive how Competitive Examinations in India.

To understand the policies and strategies of the Central Services Union Public Service Commission, Railway Recruitment Board.

To evaluate the contribution of the Subjects of Study for TNPSC Examinations Group I and Competitive Examination Preparation Tips

| **COURSE OUTCOME(S)** Students are able to | |
|---|---|
| **CO1** | Understand the Union Public Service Commission and its Competitive Examinations in India. |
| **CO2** | Study the jobs, in central Government Organizations and how to apply Competitive Examinations. |
| **CO3** | Narrate the Kind of Tamil Nadu Public Service Examination Group Wise. |
| **CO4** | Understand and Recognize the Subject of Study for the TNPSC Examinations |
| **CO5** | Visualize the future Plans and describe the Competitive Examination Preparation Tips |

**UNIT – I**

Competitive Examinations in India: Introduction – Civil Services – Preliminary and Main Examinations – Government Employment in Other Services – Examination Patterns

**UNIT - II**

Central Services: Union Public Service Commission – Railway Recruitment Board – Defence Examinations – LIC/GIC Examinations – Staff Selection Commission Examinations – UGC / NET Examinations – Bank Examinations

**UNIT – III**

TNPSC: Tamil Nadu Public Services Commissions – Combined Civil Services Examinations, Group I – Combined Civil Services Examinations, Group II (Interview Posts) – Madras High Court Service Examinations – District Educational Officers Examinations – Village Administrative Officers Examinations – Other Technical Examinations

**UNIT – IV**

Subjects of Study for TNPSC Examinations Group I: – Mathematics – Physics – Chemistry – Biology – Zoology – History – Sociology – Computer Science – TNPSC Group II, III and IV: General Knowledge – Politics – History – Current Affairs – National Movement – Science – Geography – Economics and Business – Intelligent Quotient –General Tamil – Perusing Previous Years Question Papers

**UNIT – V**

Competitive Examination Preparation Tips: Motivation – Active Learner – Organizing Studies – Time Management – Reading Newspapers, Magazines, Subject and Reference Books – Writing Examinations at Home – Good Handwriting Practice – Avoiding Stress – Perusing Previous Years Question Papers

**Books for Reference:**


1. Dr. Divya S Iyer, Path Finder: Civil Services Main Examination, DC Books Pvt Ltd, New Delhi
2. Edgar Thorpe, The Pearson CSAT Manual 2013: Civil Services Aptitude Test for the UPSC Civil Services Preliminary Examination, New Delhi
3. S.A. Majid, Special Current Affairs for Civil Services Examination, Kalinjar Publications, New Delhi
4. SanjivVerma, The Indian Economy : For UPSC and State Civil Services Preliminary and Main Examinations, Unique Publications, New Delhi
5. Veerasekaran, TNPSC Group II, Kizhakku Publishers, Chennai
6. Veerasekaran, TNPSC Group III, Kizhakku Publishers, Chennai

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

| | | | | | |
|---|---|---|---|---|---|
| Year: | **II Year** | Subject Code: | **U18NKS401** | Semester: | **IV** |
| Non Major - 2 | | Title: | **PROJECT MANAGEMENT (NME-II)** | | |
| Credits: | **2** | | | Max. Marks: | **75** |

**OBJECTIVES:**

To initiate students into the starting of a project and to help them execute the project successfully. To give theoretical knowledge for planning and management in the review of the projects undertaken.

**COURSE OUTCOME(S):**

**CO1** - Understand the basics about project and its types.
**CO2** - Learn about project survey and idea generation.
**CO3** - Have in depth knowledge about project selection and choice of technology
**CO4** - Understand project finance and its sources.
**CO5** - Understand the project formulation and preparation of project report.

**UNIT-I INTRODUCTION**

Meaning – Definition – Characteristics of Project – Classification of Projects - Project life cycle.

**UNIT-II PROJECT SURVEY**

Project Ideas and Innovation **-** Sources of Project Idea **-** Need Analysis - Market Research - Market Planning.

**UNIT-III PROJECT SELECTION**

Selection of project: Criteria for Selection of Project - Site selection - Factors Influencing Location of Project – Locational Advantages and Disadvantages - Choice of technology and appropriate Technology.

**UNIT-IV PROJECT FINANCE**

Sources of Finance – Shares and Debentures-types and features - Public Deposits - Bank Credit – Institutional Supports: ICICI, IDBI, IFCI.

**UNIT-V PROJECT FORMULATION AND INCENTIVES**

Project Formulation: Meaning – Importance of Project formulation - Feasibility Analysis – Project Report - Incentives – Subsidy, Bounty and Concession – Need for Incentives – State and Central incentives – Taxation benefit.

**Text book:**

1. C.B. Gupta, “Project management”, A.P.H Publishing Corporation, New Delhi, 2000.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **II Year** Subject Code: **U18NMA401** Semester: **IV**

Non Major - 2 Title: **FOUNDATION MATHEMATICS FOR COMPETITIVE EXAMINATIONS (NME-II)**

Credits: **2** Max. Marks: **75**

| **Objectives:** This Course aims to prepare the students for various competitive examinations. |
|---|

| **Course Outcomes:** At the end of the course, the students will able to | |
|---|---|
| **CO1** | Understand the concepts of Ratio and Proportion**.** |
| **CO2** | Understand the concepts of Percentages. |
| **CO3** | Solve the problems on profit and loss. |
| **CO4** | Understand simple interest and compound interest**.** |
| **CO5** | Solve the problems on time & work and time & distance. |

**UNIT-I**

Ratio and proportions.

**UNIT-II**

Percentages.

**UNIT-III**

Profit and loss, discounts.

**UNIT-IV**

Simple and compound interest**.**

**UNIT-V**

Time, Distance and Work.

**Reference Books:**


1. Quantitative Aptitude - R.S. Aggarwal (S.Chand & Co. - New Delhi 2008).
2. Course in Mental Abilities and Quantitative Aptitude for Competitive Examinations - Edgar Thorpe (Tata McGraw - Hill Pub., Co., Ltd. New Delhi – II Edn.,).

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **II Year** Subject Code: **U18NCH401** Semester: **IV**

Non Major - 2 Title: **CHEMISTRY IN DAILY LIFE – II (NME-II)**

Credits: **2** Max. Marks: **75**

| | |
|---|---|
| **Objective(s)** | To introduce students to a breadth of ways in which chemistry impacts every aspect of modern life, from the food we eat to the clothes we wear, the way we communicate and work, the way we keep ourselves healthy and how we diagnose and treat those who aren't. Chemistry's role in our everyday life and how chemistry will impact on people's lives in the future. |
| **Course Outcome(s)** | |
| **CO1** | Acquire fundamental knowledge in preparations of cosmetics and their toxicology. |
| **CO2** | Gain the knowledge of using the chemicals as food in day to day life. |
| **CO3** | Understand the usage of chemicals as food production agents and their hazardous. |
| **CO4** | Understand the importance of plastics and their pollution. |
| **CO5** | Learn about the man made materials and their importance. |

**UNIT-I Common Drugs**

Antibiotics, Antipyretics, Analgesics, Anti-inflammatory agents, Sedatives, Antiseptics, disinfectants, Antihistamines, Tranquilizers, Hypnotics and Antidepressant drugs - Definition, Examples, uses and side effects.

**UNIT-II Colour chemicals and Food additives**

Definition- Preservatives, Food colours - permitted and non-permitted. Artificial sweeteners, Emulsifying agents, Antioxidants. Artificial Sweetening agents – Saccharin – Cyclamate – Advantages and Disadvantages.

**UNIT-III Chemicals in food production**

Fertilizers used in natural sources - Fertilizers urea, NPK and Super phosphates need - uses and hazards. Biofertilizers and Pesticides – definition and examples.

**UNIT-IV Plastic technology**

Plastics, Polythene, PVC, Bakelite, Polyesters, Resins and their Applications. Natural Rubber - Synthetic rubbers - Vulcanisation - Preparation and its Applications. Environmental hazards of plastics.

**UNIT – V Man made Materials**

Colour chemicals – pigments and dyes, classification, examples and applications.
Raw materials and manufacturing process of Cement, and glass.

**REFERENCES:**


1. Chemical Process Industries (4th Edition) R. Norris Shreve Joseph A.Brink,Jr.
2. Perfumes, Cosmetics and Soaps W.A.Poucher (Vol.3) Environmental Chemistry A.K.De.
3. B. Sreelakshmi, Food Science, New Age International, New Delhi, 2015.
4. Shashi Chowla; Engineering Chemistry, Danpat Rai Publication.
5. B.K. Sharma; Industrial Chemistry. Goel Publishing House, Meerut, 2003.
6. C.N.R. Rao; Understanding Chemistry, Universities Press.
7. M.K. Jain and S.C. Sharma; Modern Organic Chemistry, Vishal Pub. Co., Jalandhar, 2009.
8. V.R.Gowariker; N.V. Viswanathan and J. Sreedhar; Polymer Science, 2nd edn., New Age, New Delhi, 2015.
9. P.C. Pall; K. Goel and R.K. Gupta; Insecticides, Pesticides and Argobased Industries.
10. Singh, K., Chemistry in Daily Life; Prentice Hall of India, New Delhi, 2008.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

| | | | | | |
|---|---|---|---|---|---|
| Year: | **II Year** | Subject Code: **U18NZL401** | | Semester: | **IV** |
| Non Major - 2 | | Title: **SERICULTURE (NME-II)** | | | |
| Credits: | **2** | | | Max. Marks: | **75** |

**Objectives:**

To impart training on silk worm culture technology.
To create knowledge on self-employment opportunity.

**Course Outcomes:**

**CO1**: To describe about the Taxonomy, Morphological sex differences in larva and adult.
**CO2**: To understand the culture of mulberry plants.
**CO3**: To know about the culture methods of *B.mori and* mulberry silk.
**CO4**: To describe the diseases and pests of *B.mori.* and Mulberry.
**CO5**: To Study the quality of silk, silk gland and marketing strategies of silk.

**UNIT – I**

Classification of commercial varieties of mulberry. Biology of silk worm (*Bombyx mori*). Mulberry plantation establishment and cultivation practices.

**UNIT – II**

Diseases of mulberry – fungal, bacterial, viral and nematode diseases, deficiency diseases and their remedial measures.

**UNIT – III**

Silkworm rearing operations – Chawki rearing and late age rearing techniques.

**UNIT – IV**

Diseases of silk worm.Physical and commercial characters of cocoons. Reeling operations, importance of by – products of Sericulture.

**UNIT – V**

Economics of Sericulture – Sericulture prospects in India- Sericulture as Self Employment venture.

**Reference Books:**


1. Ganga, G. 2003: comprehensive sericulture Vol-l, Moriculture – Oxford –IBH Puubl. Co. India.
2. Ganga, G. 2003: comprehensive sericulture Vol –II Silkworm rearing – Oxford – IBH Publ. Co. India.
3. Ganga, G. and Sculochana Chetty, J. 1997: An Introduction to sericulture Oxford – IBH Publ. Co.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **II Year** Subject Code: **U18NCM401** Semester: **IV**

Non Major – 2 Title: **GENERAL COMMERCIAL KNOWLEDGE (NME-II)**

Credits: **2** Max. Marks: **75**

| | |
|---|---|
| **OBJECTIVES:** | To enable the students to gain basic knowledge of Trade, Commerce and Industry |
| **COURSE OUTCOME(S)** | |
| **CO1** | To understand basic concept of trade, commerce and industry |
| **CO2** | To glimpse the knowledge in different form of organization. |
| **CO3** | To learn about company and its workings |
| **CO4** | To impart knowledge in company management and administration. |
| **CO5** | To seek knowledge about Company Meetings, Minutes, Agenda, Quorum and Resolution. |

**UNIT-I - INTRODUCTION**

Commerce, Trade, Industry – Meaning – Scope and Importance of Commerce – Economic Basis of Commerce.

**UNIT-II – TYPES OF BUSINESS**

Sole Trade – characteristics- advantages and disadvantage – Partnership - Features – Merits and Demerits - Co-operatives – Features – Types of co-operatives.

**UNIT-III – JOINT STOCK COMPANY**

Joint Stock Company – Features – Memorandum and Articles – Contents – Prospectus and Contents.

**UNIT-IV – MANAGEMENT OF COMPANY**

Management of Joint Stock Company – Directors – Qualification, Appointment, Removal, Powers and Duties.

**UNIT-V – COMPANY MEETINGS**

Company Meetings – Types – Minutes – Agenda – Quorum – Resolution.

**REFERENCE BOOKS:**

1. Gosh and Bhutan, General Commercial Knowledge, Sultan Chand & Sons, New Delhi.
2. J.C. Bahl&E.R.Dhongde, Elements of Commerce & Business Methods, New Book & Co., Mumbai.
3. P.N. Reddy &S.S.Gulshan, Commerce – Principles & Practice, S. Chand & Co., New Delhi.
4. J.C. Sinha &V.N.Mughali, A text book of Commerce, R. Chand & Co., New Delhi.
5. K.L.Nagarajan, Vinayagam, Radhasamy and Vasudevan, Principles of Commerce and General Commercial Knowledge, S.Chand & Co., New Delhi.

# C.ABDUL HAKEEM COLLEGE (Autonomous), Melvisharam

Syllabus for Second year UG Programmes effective from the year 2018-2019

| | | | |
|---|---|---|---|
| Class | : Second year UG Programmes | Semester | : IV |
| Subject Code | : U18NTA401 | Title : Basic Tamil (Non Major-2) | |
| Credits | : 2 | Max Marks | : 75 |

| | |
|---|---|
| OBJECTIVES | தமிழ் மொழியின் அடிப்படை பண்புகளை அறிய வைத்து எளிய இலக்கண, இலக்கியப் பயிற்சிகளின் வழி மதிப்பீடு செய்தல். |
| COURSE OUTCOME(S) | |
| CO1 | தமிழ் அகராதிகளைப் பயன்படுத்தவும் எழுத்துக்களை நினைவில் கொள்ளவும் பயிற்சி வழங்கல். தமிழ்ச் சொற்களில் சந்திப்பிழை தவிர்க்க எளிய பயிற்சி வழங்கல் |
| CO2 | தமிழில் உள்ள எளிய மற்றும் இனிய இலக்கியங்களை அறிமுகப்படுத்தி பொருளை விளக்குதல். எளிமையான சிறுகதைகளின் வழி வாசிப்புத் திறனை மேம்படுத்தல். |
| CO3 | கலைச் சொற்களையும் ,மரபுத் தொடர்புகளையும் மொழிபெயர்த்தல் |

## பாடத்திட்டம்

**அலகு–I எழுத்து**

**1.அகர வரிசையில் அமைத்தல்** (ஒவ்வொன்றிற்கும் 10 பெயர்கள்)
தமிழ் மாதங்கள், தமிழ்ப் புலவர்கள், தமிழக ஊர்கள் , தலைவர்கள், தமிழ் நூல்கள்,

**2. பிழை நீக்கி எழுதுதல்**

1..ஆளும் வேளும் பல்லுக்கு உறுதி
2. ஆரம் செய விறும்பு
3.பனிவுடைமை நல்ல பன்பு
4. எண்ணை குலியல் நல்லது
5.இங்கு விரகு விற்க்கப்படும்
6. நூன் பள் மருத்துவரைப் பார்த்தேன்
7.பேரூந்து நிருத்தும் இடம்
8. உணக்கு உனவு தேவையா?
9.கம்பண் வீட்டுக் கட்டுத்தரியும் கவி பாடும்
10. ஐந்திள் வலையாதது ஐம்பதில் வளையுமா?

**அலகு–II**

**(அ) சேர்த்து எழுதுதல்** : சுட்டு, வினா, திசைப் பெயர் - அடிப்படையிலான சொற்கள்
எ.கா : அ + இடம் = அவ்விடம், எ + பையன் = எப்பையன், வடக்கு+ மேற்கு=வடமேற்கு

**(ஆ) பிரித்து எழுதுதல்** : கனி, மரம் - அடிப்படையிலான சொற்கள்
எ.கா : வாழை + பழம் = வாழைப்பழம் மரம் + வேர் = மரவேர்

**(இ) எதிர்ச்சொல் தருதல்** : பண்பு அடிப்படையிலான சொற்கள்
எ.கா : நன்மை X தீமை நல்ல X கெட்ட உயரம் X குட்டை .

**அலகு–III செய்யுள்**

**(அ) ஆத்திசூடி (முதல் 12 செய்யுள்)**
**(ஆ) திருக்குறள் (குறள் எண்கள் : 10, 15, 82, 398, 788)**
**(இ) கவிமணி - நூறு வயது தருவன**

**அலகு–IV சிறுகதை**

1. கொடிக்குக் காய் பாரமா ?
2. மூன்று பொற்காசுகள்

**அலகு–V(அ) தமிழில் மொழிபெயர்க்க**

Cell phone , Computer, Television, Demand Draft, E- Mail, Environment, Fax, Internet,

Post office , xerox. Encyclopedia, fond, Laptop, Soft copy, file , car, lorry,

**(ஆ) நேர் காணல்**

**கலைத் துறையினர், அரசியல் தலைவர், விளையாட்டு வீரர், அறிவியல் அறிஞர்**

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **II Year** Subject Code: **U18NUR401** Semester: **IV**

Non Major – 2 Title: **FUNCTIONAL URDU - II (NME-II)**

Credits: **2** Max. Marks: **75**

| | |
|---|---|
| **OBJECTIVES:** | ✓ To advance students' knowledge of Urdu.<br>✓ To impart training in Urdu Composition.<br>✓ To brief them about Urdu poetry. |
| **COURSE OUTCOMES** | ➢ Students will learn Urdu equivalents of important Nomenclature.<br>➢ They will develop interest in Urdu poetry.<br>➢ They will acquire the ability to translate technical terms. |

**Unit I**

Basics of Urdu Grammar.

**Unit II**

Names of flowers, fruits, birds, colours & vegetables.

**Unit III**

Composition (A short paragraph consisting of four or five simple sentences).

**Unit IV**

Two simple poems.

**Unit V**

Translation (Technical terms and a passage).

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **III Year** Subject Code: **U18MPH501** Semester: **V**

Major - 5 Title: **ELECTRICITY AND MAGNETISM**

Credits: **6** Max. Marks: **75**

| | |
|---|---|
| **OBJECTIVES** | To understand the basic principles of Electricity and the instruments and their applications and also about properties of magnetic materials and terrestrial magnetism. |
| **COURSE OUTCOME(S)** | |
| **CO1** | To study Static Electricity principles and their applications |
| **CO2** | To understand the theory of Carey Foster's bridge, potentiometer, B.G and their applications. |
| **CO3** | To understand the principles of electromagnetic induction and Maxwell's Equations. |
| **CO4** | To understand the principles of Transient currents and AC circuits and their applications. |
| **CO5** | To study the magnetism due to current carrying coils, the properties of magnetic materials. |

**UNIT – I: ELECTROSTATICS**

Coulomb's inverse square law – Continuous charge distribution – Electric field intensity – Intensity due to a point charge – Gauss Theorem and its proof – Applications of Gauss theorem – Intensity due to a uniformly charged sphere –Intensity due to a uniform infinite cylindrical charge– Poisson's and Laplace's equations – Electric Potential – Potential due to spherical charge – Electric potential as line integral of electric field – Relation between electric potential and electric field in vector form –Capacitance – Energy of a charged capacitor – Loss of energy due to sharing of charges –The quadrant electrometer – heterostatic and idiostatic uses.

**UNIT – II: ELECTRICAL MEASUREMENTS**

Carey Foster Bridge – Theory – Determination of temperature coefficient of resistance – Potentiometer –Calibration of voltmeter– Calibration of ammeter –Determination of resistance of a coil and comparison of resistances.

Magnetic field – force experienced by moving electrons in magnetic field – torque on current loop in uniform magnetic field –Moving Coil Ballistic Galvanometer – principle – construction – theory – damping correction – Voltage and current sensitivity of B.G – Measurement of charge sensitivity – Uses of BG –Absolute capacitance of a capacitor – comparison of two capacitances – comparison of emf's of two cells.

**UNIT – III: ELECTRO MAGNETIC INDUCTION**

Faraday's laws of electromagnetic induction in vector form – Lenz's law – Deduction of Faraday's laws from Lorentz force–Self inductance and mutual inductance –Determination of self-inductance by Anderson's bridge method – Determination of absolute mutual inductance by BG–Ruhmkorff's induction coil and it's working.

Maxwell's equations – Displacement current –Maxwell's equations in free space– Electromagntic waves in free space– energy density of electromagnetic wave – Poynting vector– energy per unit volume – Hertz experiment for production and detection of electromagnetic waves.

**UNIT – IV: Transient currents and AC circuits**

Growth of current in a circuit containing a resistance and inductance – Decay of current in a circuit containing L and R–Charge and discharge of capacitor through a resistance – Measurement of high resistance by leakage using B.G. –Growth of Charge in a LCR circuit – Discharge of capacitor through an inductor and a resistor in series –Condition for the discharge to be oscillatory.

Alternating current – A C circuit (LCR) – j operator method – LCR series resonance circuit – parallel resonance circuit – power in ac LCR circuit – Choke coil – Transmission of electric power over long distances –Skin effect – Tesla coil – Three phase AC generator – Distribution of three phase AC – AC dynamo – Two phase AC generator.

**UNIT – V: MAGNETISM**

Introduction – parameters of magnetism – properties of magnetic field using divergence and curl –types and properties of magnetism – Electron theory of dia, para and ferromagnetism – experiment to draw M-H curve (horizontal method) – Experiment to draw B-H curve (Ballistic method) – energy loss due to hysteresis – importance of hysteresis curve – determination of susceptibility: Curie balance method – magnetic circuit.

**Books for study :**


1. Electricity and Magnetism, Brijlal&Subrahmanyam, RatanPrakashanMandir Publishers - 1995.
2. Electricity and Magnetism, Murugeshan R, 8$^{Th}$ edition 2006, S.Chand& Co.
3. Electricity and Magnetism, Narayanamurti, The National Publishing Company Madras.
4. Fundamentals of Electricity and Magnetism, R.G.Mendiratta and B.K.Sawhney East - West Press(1976).


**Books for reference:**


1. Advanced level physics, Nelkon and Parker Annold Publishers (sixth edition).
2. Electricity and Magnetism, A.S. Mahajan and A.A. Rangwala, Tata McGraw-Hill (1989).
3. Feynman lectures on physics, volume 2 Narosa Publishing House (1992).
4. Fundamental University Physics, Alonso and Finn Addison – Wesley Publishing Company(1977).

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **III Year** Subject Code: **U18MPH502** Semester: **V**

Major - 6 Title: **ATOMIC PHYSICS AND SPECTROSCOPY**

Credits: **5** Max. Marks: **75**

| | |
|---|---|
| **OBJECTIVES** | To learn the principles of atomic physics and the instruments used to learn it.<br>To learn and understand the the fundamental principles regarding the various spectroscopic methods. |
| **COURSE OUTCOME(S)** | |
| **CO1** | To learn different atomic models, concepts of spin and its determination. |
| **CO2** | To learn the basic concepts of spectrum, types and splitting. The effect of magnetic field on atom is also studied. |
| **CO3** | To study the interaction of radiation with atoms using microwaves and IR rays for clear understanding of above spectra. |
| **CO4** | To learn raman spectra, the failure of classical theory and success of quantum theory and to understand the experimental arrangement. |
| **CO5** | To learn the behavior of diatomic molecules with electronic excitation and also to learn about concepts of laser its applications. |

**UNIT I : ATOMIC STRUCTURE**

Introduction – Rutherford's experiment scattering of α- particles – Theory - Bohr atom model – Correspondence principle – Critical Potential – Frank & Hertz experiment – Sommerfeld's relativistic atom model – Vector atom model – Associated quantum numbers - Pauli's Exclusion Principle – Total Magnetic dipole moment due to orbital and spin motion of the electron – Bohr magnetron - Stern and Gerlach experiment.

**UNIT II: OPTICAL SPECTRA AND SPLITTING OF ENERGY LEVELS**

Spectral terms – Spectral notations – Selection rules – Fine structure of sodium D line – Hyperfine structure - Zeeman effect – Lorentz classical theory of normal Zeeman effect – Larmor's theorem – Debye's explanation of normal Zeeman effect - Anamalous Zeeman effect - theoretical explanation – Lande's g factor – Paschen-Back effect – Stark Effect.

**UNIT III: MICROWAVE AND INFRARED SPECTROSCOPY**

Classification of Molecules - Interaction of Radiation with Rotating Molecules – Theory of Rotational Spectrum of Rigid Diatomic Molecule – Theory of vibration-rotation spectrum of Diatomic molecules – Energy of Diatomic molecule – Vibrating Diatomic molecule as a harmonic oscillator – anharmonic oscillator – Infrared Spectrometer.

**UNIT IV: RAMAN SPECTROSCOPY**

Classical theory of Raman effects and its failure - Difference between IR and Raman spectra – Raman Spectrometer – Quantum theory of Raman effect - Molecular Polarizability - Pure rotational Raman spectra of linear molecules - Vibrational Raman spectra - Stokes and anti-Stokes lines and their intensity difference - rule of mutual exclusion.

**UNIT V : ELECTRONIC SPECTROSCOPY OF MOLECULES AND LASER PHYSICS**

Electronic spectra of Diatomic molecules - The Franck Condon Principle - Disassociation energy and disassociation products - Lasers: Population inversion - Laser pumping - Resonators - Vibrational modes of resonators – Gain - Control resonators - Q Factor - Threshold condition - Quantum yield - Pumping power - Neodymium laser - Nd:YAG laser – Semiconductor laser – Dye laser – Lasers in industries.

**Books for study:**


1. Modern physics by R Murugeshan and Kiruthiga Sivaprasath, S Chand & Co., New Delhi - 2005.
2. Atomic and Nuclear physics by N Subramanian and Brij Lal, S Chand & Co. – 2000.
3. Modern Physics by G. Aruldhas and P Rajagopal, II Edition, PHI, 2006.
4. Modern Physics by A B Gupta, Books & Allied (Pvt) Publishers, II Edition, 2015.
5. Molecular Structures & Spectroscopy by G Aruldhas.
6. Atomic Physics by J B Rajam.


**Books for Reference:**


1. Atomic physics by A B Gupta and Dipak Ghosh Books and Allied Publishers.
2. Modern physics by J H Hamilton and Yang, McGraw Hill Publication 1996.
3. Concepts of Modern physics by A Beiser, Tata McGraw Hill, New Delhi 1997.
4. Physics of Atoms and Molecules, Bransden and Joachein 2nd Edition (Pearson 2011).
5. Introduction to Atomic Spectroscopy by H.E. White (McGraw Hill).
6. Spectroscopy by Gupta & Kumar.
7. Spectroscopy by Banwell.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **III Year** Subject Code: **U18MPH503** Semester: **V**

Major - 7 Title: **MECHANICS AND MATHEMATICAL PHYSICS**

Credits: **5** Max. Marks: **75**

| | |
|---|---|
| **OBJECTIVES** | To learn the principles of Mechanics and the experimental verification techniques.<br>To learn the basic principles of mathematics as a tool to understand the applications of it in understanding physics principles and theories. |
| **COURSE OUTCOME(S)** | |
| **CO1** | To learn the basic principles of Dynamics, Statics and Hydrostatics with the experimental verification techniques. |
| **CO2** | To learn the basic concepts of Rockets and Satellites under the action of gravity. |
| **CO3** | To understand the broad basics of classical mechanics and its application to simple problems. |
| **CO4** | To learn the basic principles of vectors and its relevance to their applications in Physics. |
| **CO5** | To learn the basics of special functions and their importance in Physics |

**UNIT – I : DYNAMICS, STATICS AND HYDROSTATICS**

Rigid body – moment of inertia – radius of gyration – moment of inertia of a solid cylinder, cylindrical shell, solid sphere, spherical shell - Compound pendulum – theory – equivalent simple pendulum – reversibility of centers of suspension and oscillation.

Center of gravity – C.G of a uniform rectangular lamina - C.G of a tetrahedron – Stability of equilibrium. Centre of pressure – centre of pressure of a vertical rectangular lamina – centre of pressure of a vertical triangular lamina. Laws of floatation – metacentre – Determination of metacentric height of a ship. Bernoulie's theorem – Applications – Pitot tube - Venturimeter.

**UNIT – II : GRAVITATION, ROCKETS AND SATELLITES**

Kepler's law – Newton's law of gravitation – Determination of G : Boys' Method – Gravity and Acceleration due to gravity – variation of acceleration due to gravity - Gravitation potential. Rockets- Basic Principles of rocket motion – Rocket Equation, thrust and acceleration - Multistage rockets – liquid, solid and cryogenic – propellant rockets – Escape velocity.

Satellites - Orbital velocity and period of revolution – Relation between Escape velocity and Orbital velocity - Launching of a satellite, types of satellite orbits - Space shuttle.

**UNIT – III : CLASSICAL MECHANICS**

Lagrangian formulation of classical mechanics – Mechanics for a system of particles – Generalised co-ordinates – transformation equations – configuration space – Principles of virtual work – D'Alembert's principle – Lagrange's equation – Applications of Lagrange's equation – Simple pendulum – Compound pendulum. Hamiltonian formulation of classical mechanics – phase space – Hamiltonian function – Hamilton's canonical equations of motion – Applications of Hamilton's equations of motion – Simple pendulum - Compound pendulum.

**UNIT – IV : MATHEMATICAL PHYSICS**

Gauss divergence theorem – Stokes theorem – Greens theorem – applications of vectors to hydrodynamics. Orthogonal curvilinear coordinates – spherical polar coordinates – differential operators in terms of orthogonal curvilinear coordinates – expressions for gradient, div, curl and $\nabla^2$ in Cartesian, spherical and cylindrical coordinates.

**UNIT – V : SPECIAL FUNCTIONS**

Beta and gamma functions – problems – relation between beta and gamma functions – Bessel's differential equations – Legendre's differential equations – Hermite's differential equations – Laguerre's differential equations – series solutions – Dirac delta functions - properties.

**Books for study:**


1. Mechanics and mathematical methods, R Murugeshan, S Chand & Co. Ltd. 1999.
2. Dynamics, M.Narayanamurti and Nagarajan, National Publishing Company, 2002.
3. Mechanics, D S Mathur, S.Chand and Co.
4. Mathematical Physics by Sathya Prakash
5. Mathematical Physics by B D Gupta.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **III Year** Subject Code: **U18EPH501** Semester: **V**

Elective - 1 Title: **APPLIED PHYSICS**

Credits: **3** Max. Marks: **75**

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|---|---|
| **OBJECTIVES** | To learn the applications of Physics in different domains and the instruments used. |
| **COURSE OUTCOME(S)** | |
| **CO1** | To learn different NDT methods and their applications. |
| **CO2** | To learn the origin and the behaviour of the universe and its constituents. |
| **CO3** | To study the principles of fiber optics and the application of it in communication. |
| **CO4** | To learn about the seismic waves and their properties and effects. |
| **CO5** | To learn the various forms of energies and the potential nature of solar energy and its utilization. |

**UNIT I – NON-DESTRUCTIVE TESTING (NDT)**

Introduction - Defects in materials - NDT Methods - Visual Inspection - Liquid Penetration Testing - Magnetic Particle Testing (MPT) – Ultrasonic Testing (UT) – Eddy Current Testing (ECT) - Radiographic Testing Methods – Thermal Testing – Applications, advantages and limitations.

**UNIT II – ASTROPHYSICS**

Origin of the universe - the big bang theory - the steady state theory - Hubble's law - major constituents of the universe - Solar System - Planets - laws of motion of planets - inner planets - outer planets - Stars - Birth of a star - Death of a star - Chandrasekhar limit - white dwarfs - Neutron stars.

**UNIT III – FIBER OPTICS**

Principles and propagation of light through optical fiber - basic characteristics of optical fiber - acceptance angle - numerical aperture - classification of fibers - step index and graded index fibers - single mode and multi mode fibers - losses in fibers – absorption, scattering and bending losses. Fiber optic communication system (Block diagram only) – Optical Detectors – PIN – APD.

**UNIT IV – GEOPHYSICS**

Introduction - Seismology: P waves, S waves, their velocities - Time distance curves and the location of epicentres - Effect of boundaries - Major discontinuities and resulting phase of seismic waves.

**UNIT V – ENERGY PHYSICS**

Conventional and Non-conventional energy sources- solar energy -The Characteristics of sun - Solar constant - Physical principles of the conversion of solar radiation into Heat - Flat-Plate collectors –Collector Energy losses- Solar air heaters – Concentrating collectors – focusing and non- focusing concentrators -Advantages and disadvantages of concentrating collectors over flat-plate collectors.

**Books for study:**


1. Mani P. Engineering Physics I, Dhanam Publications, 2011.
2. Optics and Spectroscopy by R Murugashan, Kiruthiga Sivaprasad, S. Chand 2014.
3. Introduction to Fiber optics by K. Thyagarajan and Ajoy Ghatak, Cambridge University Press, 1999.
4. Practical Non-Destructive Testing by Baldevraj, T. Jayakumar, M. Thanvasimuthu, Narosa Publishing House, Chennai, 2002.
5. Garland, G.D., Introduction to Geophysics 11 Ed., WB Saunder Company, London, 1979.
6. Solar Energy Utilisation, G .D. Rai, Khanna Publications, New Delhi, 1982.
7. Non – Conventional Energy sources, G.D. Rai, Khanna Publishers, New Delhi,1994.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

| | | | |
|---|---|---|---|
| Year: | **III Year** | Subject Code: **U18EPH502** | Semester: **V** |
| Elective - 1 | | Title: **GEOPHYSICS** | |
| Credits: | **3** | | Max. Marks: **75** |

| | |
|---|---|
| **OBJECTIVES** | Make students to motivate in understanding about the earth and their inside mechanism, Also to transfer knowledge about earthquakes and their measurements. |
| **COURSE OUTCOME(S)** | |
| **CO1** | To learn above different forms of earth waves and their importance in the field of earthquakes. |
| **CO2** | To understand the basic concepts of seismometer and their role of detecting earthquakes |
| **CO3** | To study the measurement of earthquakes and also to gain knowledge on earth gravity. |
| **CO4** | Acquiring information about our earth magnetism and their impacts. Also learn about our earth structure. |
| **CO5** | To learn the behaviour of thermal energy of earth and their importance. Also to gain idea on radioactive dating. |

**UNIT 1: INTRODUCTION AND SEISMOLOGY**

Introduction - Seismology: P waves, S waves, their velocities – Time distance curves and thelocation of epicentres – Effect of boundaries – Major discontinuities and resulting phase ofseismic waves.

**UNIT II: SURFACE WAVES AND SEISMOMETRY**

Surface waves: Rayleigh waves and Love waves – Study of earth by surface waves. Seismometry: Horizontal seismograph and seismography equation – Strain seismograph.

**UNIT III: EARTHQUAKES AND GRAVITY**

Earthquakes: Focus, magnitude, frequency – Detection and prediction – Gravity: The potential (Laplace's equation and Poisson's equation) – Earth gravity – Absolute and relative measurements of gravity – Hammond Faller method.

**UNIT IV: GEOMAGNETISM AND INTERNAL STRUCTURE OF THE EARTH**

Geomagnetism - Fundamental equations: Helmholtz's and Maxwell's equations – magnetometers - Flux gate (saturation) magnetometer – Induction magnetometer – proton precession magnetometer – alkali vapour magnetometers – Theories of earth's magnetism – Causes of the main field – Dynamo theories.

**UNIT V: GEOCHRONOLOGY AND GEOTHERMAL PHYSICS**

Geochronology: Radioactivity of the earth – Radioactive dating of rocks and minerals – Potassium Argon method – Geological time scale – The age of the earth – Geothermal physics: Flow of heat to the surface of the earth – Sources of heat within the earth.

**Books for study:**

1. Garland, G.D., Introduction to Geophysics 11 Ed., WB Saunder Company, London, 1979.
2. Cook, A. H., Physics of the Earth and Planets I Ed. , McMillan Press, London, 1973.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **III Year** Subject Code: **U18EPH503** Semester: **V**

Elective - 1 Title: **NUMERICAL METHODS**

Credits: **3** Max. Marks: **75**

| | |
|---|---|
| **OBJECTIVES** | To study the computational techniques involved in different mathematical manipulation. |
| **COURSE OUTCOMES(S)** | |
| **CO1** | To solve simultaneous equations using method of triangularisation |
| **CO2** | To find the inverse of a matrix using Gauss Jordan Method |
| **CO3** | To apply various interpolation methods and finite difference concepts |
| **CO4** | To understand the curve fitting for the given data using principles of least squares |
| **CO5** | Demonstrate how to integrate the functions using different rules like Simpsons 1/3 rule |

**UNIT I: SIMULTANEOUS LINEAR ALGEBRAIC EQUATIONS**

Method of Triangularisation - Gauss elimination method - Inverse of a matrix - Gauss-Jordan method.

**UNIT II: NUMERICAL SOLUTION OF ALGEBRAIC, TRANSCENDENTAL AND DIFFERENTIAL EQUATIONS**

Bisection method – Regula falsi method - Newton-Raphson method - Horner's method - Solution of ordinary differential equation - Euler's method.

**UNIT III: INTERPOLATION**

Finite differences – Operators Δ, ∇, D – Relation between operators –Linear interpolation – Interpolation with equal intervals – Newton forward interpolation formula –Newton backward interpolation formula.

**UNIT IV:CURVE FITTING**

Principles of least squares - fitting a straight line - linear regression - fitting an exponential curve.

**UNIT V:NUMERICAL INTEGRATION**

Trapezoidal Rule - Simpson's 1/3 rule and 3/8 rule - Applications - Weddle's rule.

**Books for Study:**


1. Numerical methods, M.K.Venkatraman, National Publishing Company,(1990).
2. Numerical methods, V. Rajaraman, Prentice - Hall India Pvt. Ltd.,(2003).
3. Numerical methods, P. Kandasamy, K. Thilagavathy and K. Gunavathy, S. Chand & Co.(2002).

**Books for References:**


1. Numerical methods for Scientific and Engineering computation , Jain Iyenger and Jain, New Age International (P)Ltd.,(2004).
2. Numerical methods,S.S.Sastry, Prentice Hall of India Pvt. Ltd.,NewDelhi(2003).


**Web Site:**

1. http://www.sst.ph.ic.ac.uk/angur/lectures/compphys/compphys.html.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **III Year** Subject Code: **U18EINP51** Semester: **V**

Elective Title: **INTERNSHIP TRAINING**

Credits: **2** Max. Marks: **75**

| | |
|---|---|
| **Objectives:** Internships are intent to develop self confidence in the field of his subject with focus on his career development and to gain higher research knowledge. | |
| **Course Outcomes :** At the end of the course, the student will be able to | |
| **CO1** | Utilise the obtained knowledge of theory and practical to do individual task. |
| **CO2** | Apply analytical thinking to solve the scientific problems in order to reach targeted output. |
| **CO3** | Transfer the obtained output for the development of product or resource. |
| **CO4** | Acquire knowledge of report preparations. |

**Instructions for Internships:**

1. **Internship –**
    a. Internship with Industry/ Govt. / NGO/ PSU/Any Micro/Small/Medium enterprise/ Online Internship
    b. Inter/Intra Institutional Activities **–** Inter/ Intra Institutional Workshop/ Training/ Working for consultancy/ research project
2. **Suggested Periods –** During summer vacation after 4$^{th}$ semester.
3. **Duration –** Min 2 Weeks
4. **Proposed document to be submitted as evidence –** Internship Report and Certificate.

**Internship Report:**

After completion of Internship, the student should prepare a comprehensive report to indicate what he has observed and learnt in the training period. The student may contact Industrial Supervisor/ Faculty Mentor for assigning special topics and problems and should prepare the final report on the assigned topics. Daily diary maintains will help in writing the industrial report since much of the information has already been incorporated by the student into the daily diary. The training report should be signed by the Internship Supervisor and Faculty Mentor.

5. **Evaluation Method –** Viva-voce Examination/presentations by the Faculty mentor and Faculty from other department.
    **Internal:** 25 marks (For attendance)
    **External:** 75 Marks (Internship report)

The Internship report will be evaluated on the basis of following criteria:

i. Originality **(15)**.
ii. Adequacy and purposeful write-up **(15)**.
iii. Organization, format, drawings, sketches, style, language, etc. **(15)**.
iv. Variety and relevance of learning experience **(15)**.
v. Practical applications, relationships with basic theory and concepts taught in the course **(15)**.

**Note:** Internships may be full-time or part-time; they are full-time in the summer vacation and part-time during the academic session.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **III Year** Subject Code: **U18SPH501** Semester: **V**

Skill Based - 3 Title: **EMBEDDED SYSTEMS I (SBS-III)**

Credits: **2** Max. Marks: **75**

| **OBJECTIVES** | To introduce the basic concepts of architecture, programming and features of embedded systems |
|---|---|
| **COURSE OUTCOME(S):** On completion of the course, students will be able to | |
| **CO1** | Understand the structure and components of embedded system |
| **CO2** | Understand the memory and I/O organization of a microcomputer |
| **CO3** | Understand the functional blocks and clock system of MSP430 microcontrollers |
| **CO4** | Understand the overall program design and the concepts of assembly language programming of MSP430 microcontroller |
| **CO5** | Understand the concepts of interrupts and low power modes functioning in a microcontroller |

**UNIT I**

**Embedded Systems:** Structure of an Embedded System – Hardware Components – Software Components – Classification of Embedded Systems – The Life Cycle of Embedded Designs – Base Microcomputer Structure – Microcontrollers Vs Microprocessors – RISC Vs CISC Architectures.

**MSP430:** Central Processing Unit – Program Counter – Stack Pointer – Status Register – Constant Generators – General Purpose Registers.

**UNIT II**

**Memory Organization**: Memory Types – Little and Big Endian Conventions – Von Neumann and Harvard Architectures – Memory and CPU Data Exchange – MSP430 Memory Map – Memory Mapped Input and Output.

**I/O Organization:** I/O Subsystem Organization – Anatomy of an I/O Interface.

**UNIT III**

Where does the MSP430 Fit? – MSP430 Microcontroller Families – General Features of MSP430 – Pin-Out – Functional Block Diagram –– Clock Generator – Clock System – Crystal Oscillators LFXT1, XT2 – Internal Low Power, Low Frequency Oscillator VLO – Digitally Controlled Oscillator DCO – Control of Clock Module through Status Register – Interrupts and Resets – Power-On Reset – Power-Up Clear – Conditions after Reset.

**UNIT IV**

**Programming:** An Overview of Programming Levels – High Level Code – Machine Language – Assembly Language Code – Addressing Modes – Register Mode – Indexed Mode – Indirect Register Mode – Indirect Autoincrement Register Mode – Constant Generator and Emulated Instructions – Instruction Set – Movement Instructions – Arithmetic and Logic Instructions – Shift and Rotate Instructions – Flow of Control – Instruction Timing – Illegal Operations – What happens when a subroutine is called? – Passing parameters to a subroutine and returning a result – Aspects of C for Embedded Systems – Intrinsic Functions.

**UNIT V**

**Interrupts:** What happens when an interrupt is requested? – Interrupt Service Routines in Assembly Language – Interrupt Service Routines in C – Non-Maskable Interrupts.

**Low Power Modes:** Low Power Modes of Operation – Waking from a Low Power Mode – Returning from a Low Power Mode to Main Function

**Books for Study:**


1. Introduction to Embedded Systems Using Microcontrollers & the MSP430 – Manuel Jiménez, Rogelio Palomera, Isidoro Couvertier, Springer, 2014 – ISBN-978-1-4614-3142-8.
2. MSP430 Microcontroller Basics – John Davies, Elsevier, 2008 – ISBN-978-0-7506-8276- 3.


**References:**


1. Programmable Microcontrollers with Applications – C. Unsalan, H.D. Gurhan – McGraw Hill Education Publishers, 2014.
2. Texas Instruments MSP430 reference page: http://www.ti.com/lsds/ti/microcontrollers_16-bit_32-bit/msp/overview.page

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **III Year** Subject Code: **U18MPH601** Semester: **VI**

Major - 8 Title: **NUCLEAR AND PARTICLE PHYSICS**

Credits: **4** Max. Marks: **75**

| | |
|---|---|
| **OBJECTIVES** | To understand the properties of nucleus and nuclear reactions and to acquire knowledge on particle detectors, accelerators, cosmic rays and elementary particles. |
| **COURSE OUTCOME(S)** | |
| **CO1** | To study the nuclei properties, compare a drop of liquid with that of a nucleus and understand Shell model. |
| **CO2** | To learn the basic radioactivity and to calculate half-lives and radiation hazards. |
| **CO3** | Distinguish between principles and working of different types of detectors, counters and accelerators. |
| **CO4** | Explain natural and artificial transmutations, calculate Q-value of a reaction, and recognize the applications of isotopes. |
| **CO5** | To learn about the concept of subatomic particle and quarks, conservation laws. |

**UNIT 1 : GENERAL PROPERTIES OF NUCLEI**

Nuclear size, charge, mass - determination of nuclear radius - mirror nucleus method - mass defect and binding energy - packing fraction - nuclear spin - magnetic dipole moment - electric quadrupole moment - nuclear models-liquid drop model - Weizacker semi empirical mass formula - shell model and magic numbers - collective model - nuclear forces - meson theory of nuclear force (qualitative).

**UNIT 2 : RADIOACTIVITY**

Natural radioactivity - law of disintegration - half life and mean life period - units of radioactivity - transient and secular equilibrium - radiocarbon dating - age of earth - alpha rays – characteristics - Geiger Nuttal law - α-ray spectra - Gamow's theory of α-decay (qualitative study) - beta rays – characteristics - beta ray spectra - neutrino hypothesis - violation of parity conservation - experimental verification with Co-60 - gamma rays and internal conversion - nuclear isomerism.

**UNIT 3 : RADIATION DETECTORS AND PARTICLE ACCELERATORS**

Ionisation chamber - G.M.Counter - quenching and resolving time - scintillation counter - photo multiplier tube – thermoluminescence - thermoluminescence dosimetry (TLD) - Linear accelerator – cyclotron – synchrocyclotron - betatron.

**UNIT 4 : NUCLEAR REACTIONS**

Conservation laws - nuclear reaction Kinematics - Q-value - threshold energy - artificial radioactivity - radioisotopes and its uses - classification of neutrons - nuclear fission - chain reaction - critical mass and size - nuclear reactor - breeder reactor - transuranic elements - nuclear fusion - thermonuclear reactions - sources of stellar energy.

**UNIT 5 : ELEMENTARY PARTICLES**

Introduction – Baryons – Hyperons – Leptons – Mesons – Particles and Anti-particles – Antimatter – The fundamental interactions – Elementary particles - Quantum numbers – conservation laws and symmetry – quark model.

**Books for study:**

1. Atomic and Nuclear Physics by N. Subrahmanyam and Brijlal, S Chand & Co., New Delhi(1996).
2. Nuclear Physics by Tayal D.C., Himalaya Publishing House, Mumbai(2006).
3. Nuclear Physics by R. C. Sharma, K.Nath & Co., Meerut (2000)
4. Nuclear Physics by Irving Kaplan, Narosa Publishing house, New Delhi.
5. Modern Physics by R Murugeshan, Kiruthiga Sivaprasath, S Chand and Company Ltd., New Delhi (2016).

**Books for Reference:**

1. Nuclear Physics by R.R.Roy and B.P.Nigam, New Age International (P) Ltd., New Delhi (1997).
2. Fundamentals of Elementary Particle Physics by Longo, Mc Graw-Hill.
3. Nuclei and Particles by Serge., W.A. Benjamin, USA.
4. Elements of Nuclear Physics by ML Pandya and RPS Yadav, Kedarnath Ram Nath, Meerut.

**Web Site:**

1. http://ocw.mit.edu/ocw Web/physics/8-701 spring 2004/Lectine notes.
2. http://faraday.physics.utoronto.ca/GeneralInterest/D.Bailey/SubAtomic/Lectures/Lect.html.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **III Year** Subject Code: **U18MPH602** Semester: **VI**

Major - 9 Title: **RELATIVITY AND QUANTUM MECHANICS**

Credits: **4** Max. Marks: **75**

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|---|---|
| **OBJECTIVES** | To learn the basics of relativity, mathematical physics.<br>To learn the basics of quantum mechanics & their applications. |
| **COURSE OUTCOME(S)** | |
| **CO1** | To learn the introduction, importance and significance of relativity with the experimental verification techniques. |
| **CO2** | To learn the behaviour of objects in space and time in detail |
| **CO3** | To understand failure of classical mechanics and birth of quantum mechanics along with its salient features. |
| **CO4** | To learn the derivation of Schrödinger wave equations and their operator formalism. |
| **CO5** | To learn applications of Schrödinger wave equations. |

**UNIT – I : RELATIVITY I**

Frames of reference – Michelson – Morley experiment – Significance of negative result – postulates of special theory of relativity – Lorentz transformation equations – Length contraction – Time dilation – Relativity of simultaneity – Law of addition of velocities – variation of mass with velocity – relativistic kinetic energy equations.

**UNIT – II : RELATIVITY II**

Postulates of general theory of relativity - Minkowski's Four Dimensional space-time continuum - The general theory of relativity – Gravitational red shift – Rest mass of Photon – Space-time diagram – Geometrical representation of simultaneity, contraction and dilation. Time order and space separation of events –Twin paradox – Space time diagram of twin paradox.

**UNIT – III: INTRODUCTION TO QUANTUM THEORY AND MATTER WAVES**

Failure of classical mechanics – wave particle duality – de Broglie wavelength – concept of wave velocity and group velocity – velocity of de Broglie wave - Heisenberg's Uncertainty principle – proof of Uncertainty principle for one dimensional wave packet – Physical significance of uncertainty principle – consequences of uncertainty relation -Postulates of wave mechanics – properties of wave functions - physical significance of wave function – limitations of wave functions.

**UNIT – IV: SCHRODINGER WAVE EQUATIONS**

Schrodinger time dependant wave equation - Schrodinger time independent wave equation -– operator in quantum mechanics – eigen functions – eigen values – expectation values - expectation value of momentum $P_x$ —– probability density – normalization of wave function.

**UNIT – V: APPLICATIONS**

Applications of Schrodinger wave equation: particle in one dimensional box – potential step - barrier penetration problem – rigid rotator – one dimensional simple harmonic oscillator – hydrogen atom.

**Books for study:**


1. Introduction to Special Theory of Relativity by Robert Resnick, Wiley India
2. Modern Physics by R Murugeshan, Kiruthiga, Sivaprasath S Chand & Co. (2007).
3. Elements of Quantum Mechanics by Kamal Singh and S.P. Singh
4. Quantum Mechanics by V K Thangappan, Wiley Eastern.
5. A Text Book of Quantum Mechanics by P M Mathews and Venkatesan, McGraw Hill.


**Books for reference:**


1. Quantum Mechanics by Ghatak and Loganathan, McMillan.
2. Basic Quantum Mechanics by A Ghatak, McMillan India (2002).
3. Quantum Mechanics by V. Devanathan, Narosa, Chennai, 2005.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

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|---|---|---|---|---|---|
| Year: | **III Year** | Subject Code: | **U18MPH603** | Semester: | **VI** |
| Major - 10 | | Title: | **SOLID STATE PHYSICS** | | |
| Credits: | **4** | | | Max. Marks: | **75** |

| | |
|---|---|
| **OBJECTIVES** | To learn the basic principles of Physics applied to study of solids, the relationship between the structure and property. |
| **COURSE OUTCOME(S)** | |
| **CO1** | To study the basics of crystal structures |
| **CO2** | To learn the theories of crystal diffraction, crystal imperfections and bonding in crystals and their properties. |
| **CO3** | To know about the theories of optical and thermal properties of solid materials |
| **CO4** | Gain knowledge about the theories of free electrons and dielectric properties of materials. |
| **CO5** | To study superconductivity and theories of magnetic of materials. |

**UNIT I: CRYSTALLOGRAPHY**

Distinction between crystalline and Amorphous – Different features of the crystal (Face, forms, Edges and Interfacial angles) – Space Lattice – Basis and crystal structure – Primitive unit cells –Unit Cell – Number of lattice point per unit cell – Symmetry element (Rotation, plane and centre of symmetry) – Point group – Space group and its characteristic – Seven classes of crystal – Bravais Lattices – Lattice planes and Miller indices – Atomic radius – Atomic Packing –Lattice constant and density – Crystal system (SC,BCC,FCC and HCP).

**UNIT II: CRYSTAL DIFFRACTION, IMPERFECTIONS AND BONDING**

Diffraction of X-Rays by Crystals – Bragg's Law in one Dimension – Experimental methods in X-Ray Diffraction by Laue Method and Rotating Crystal Method – Point Defects – Line Defects – Surface Defects – Volume Defects – Effects of crystal imperfections – Types of Bonding in Crystals – Ionic – Valence – Metallic – Van der Waal's and Hydrogen bonding.

**UNIT III: OPTICAL AND THERMAL PROPERTIES OF SOLIDS**

Lattice vibration – Elastic vibration of continuous media – Phonon – Some features of phonon – Classical theory of Specific heat capacity of solids – Dulong and Pettit's law – Einstein's theory of Specific heat – Debye's model of Specific heat – Lattice thermal conductivity of solid.

**UNIT IV: FREE ELECTRON THEORY AND DIELECTRICS**

Free electron gas – Drude Lorentz free electron theory – Ohm's Law –Electrical conductivity –Thermal conductivity – Electrical resistivity versus temperature – Dielectric Polarization – Dielectric constant – Clausius-Mosotti Relation – Types of Polarizibality – Dipole Polarizibality in details.

**UNIT V: SUPERCONDUCTIVITY AND THEORIES OF MAGNETISM**

Introduction – zero resistance – critical field – Meissner effect – Type I & II Superconductor – Classical Theory of Diamagnetism (Langevin's Theory) – Langevin's Theory of Paramagnetism – Weiss Theory of Paramagnetism – Classical and quantum theory of ferromagnetism.

**Books for Study:**


1. Solid State Physics by Gupta and Kumar.
2. Material Science and Engineering by V.Raghavan, PHI.
3. Solid State Physics by R.L. Singhal.
4. Material Science by M. Arumguarn, Anuradha Publishers.
5. Modern Physics by R Murugesan and Kiruthiga Sivaprasath, S. Chand &company Ltd Edition 2007.


**Books for Reference:**


1. Introduction to Solid State Physics by Kittel, Wiley and Sons.
2. Solid State Physics A J Dekker.
3. Solid State Physics, P.K. Palanisamy, Scitech publications.
4. Solid State Physics, P.K. Puri, V.K. Babber, S. Chand and company, Delhi.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **III Year** Subject Code: **U18MPHP61** Semester: **VI**

Major Practical - 3 Title: **PRACTICAL – III (GENERAL)**

Credits: **3** Max. Marks: **75**

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|---|---|
| **OBJECTIVES** | To give hand on experience on the subject with different experiment in the field of heat, light, magnetic, electronics etc. |
| **COURSE OUTCOME(S)** | |
| **CO1** | Acquire practical knowledge about the basic concepts of elasticity |
| **CO2** | Acquire practical knowledge about the basic concepts of surface tensions with experiments. |
| **CO3** | Acquire practical knowledge about the basic concepts of heat with experiments. |
| **CO4** | Utilise the knowledge about the basic concepts of electricity, Potentiometer, Galvanometer with experiments to gain hand on experience. |
| **CO5** | To learn the functioning of CRO, Transistors and rectifier circuits. |
| **CO6** | Skill Development-Practical exposure |

**(Any 20 Experiments)**

1. Young's Modulus of the beam by Non-uniform bending using Koenig's method.
2. Young's modulus – cantilever depression –Scale and Telescope method.
3. Young's modulus – cantilever – dynamic method.
4. Determination of coefficient of viscosity – Searle's Method.
5. Determination of viscosity – Poiseuille's method.
6. Melde's string – Frequency of the vibrator.
7. Forbe's method – Coefficient of thermal conductivity of a good conductor.
8. Determination of Stephan's constant.
9. Newton's rings – Radii of curvature and the refractive index of a lens.
10. Spectrometer – Refractive index of a prism – (i-i') curve.
11. Spectrometer – Refractive index of a narrow angled prism.
12. Spectrometer – Dispersive power of a prism.
13. Laser Beam – Diffraction at a straight wire – Thickness of the wire.
14. Field along the axis of a circular coil – Vibration magnetometer – m and $B_H$.
15. EMF of a thermocouple – Mirror Galvanometer – Direct deflection method.
16. Potentiometer – EMF of a thermocouple.
17. Conversion of Galvanometer into Voltmeter (0-3 V) and Ammeter (0-15 mA).
18. Potentiometer – Calibration of a high range voltmeter (0-10V).
19. LCR Series Resonance circuit – Frequency response curve and bandwidth.
20. Ballistic galvanometer – Comparison of Mutual inductances.
21. Ballistic galvanometer – High resistance by leakage method.
22. Ballistic galvanometer – Internal resistance of a dry cell.
23. Determination of self inductance of a coil – Anderson's Method.
24. Determination of self inductance of a coil – Rayleigh's bridge method.
25. Determination of band gap energy of a semiconductor material.

**Books for study:**

1. A Text book of Practical Physics, M.N.Srinivasan, S.Balasubramanian and R.Renganathan, Sultan Chand & Sons, New Delhi, 2005.
2. C.C Ouseph, G.Rangarajan- A Text Book of Practical Physics - S. Viswanathan Publisher-Part I 1990.
3. C.C Ouseph, C.Rangarajan, R.Balakrishnan- A Text Book of Practical Physics-S.Viswanathan Publisher-Part II ( 1996).

**Book for reference:**

1. S.L Gupta and V.Kumar- Practical Physics- Pragati Prakashan – $25^{th}$ Edition (2002).

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **III Year** Subject Code: **U18MPHP62** Semester: **VI**

Major Practical - 4 Title: **PRACTICAL – IV (ELECTRONICS)**

Credits: **3** Max. Marks: **75**

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|---|---|
| **OBJECTIVES** | To give hand on experience on the subject with different experiment in the field of electronics, Microcontroller (MSP430) etc. |
| **COURSE OUTCOME(S)** | |
| **CO1** | Acquire practical knowledge about the basic concepts of Timer, semiconductor devices with experiments. |
| **CO2** | Utilise the knowledge about the basic concepts of Analogy and digital ICs with experiments to gain hands on experience. |
| **CO3** | To acquire programming and interfacing knowledge of MSP430 microcontroller with applications. |
| **CO4** | To learn the functioning of CRO, Transistors and rectifier circuits. |
| **CO5** | Skill Development-Practical exposure |

**( Any 15 Experiments )**

1. Construction of dual power supply using ICs 7809 and 7909.
2. FET characteristics.
3. UJT characteristics.
4. SCR characteristics.
5. Single stage CE transistor amplifier.
6. Hartley oscillator using transistor.
7. Colpitts oscillator using transistor.
8. Op-amp – Differentiator and integrator.
9. Op-amp – Summing amplifier (inverting) and difference amplifier.
10. Op-amp – Schmitt trigger.
11. NAND, NOR as universal gates.
12. Verification of De Morgan's theorems.
13. Half adder/subtractor and full adder/subtractor using NAND/NOR gates only.
14. 555 timer – Monostable multivibrator.
15. R-S, Clocked R-S and D Flip-Flops using NAND/NOR gates only.
16. Modulus counters using IC 7490.
17. Programming in Assembly Language for MSP430G2553/MSP430F5529 – (i) Multiplication by repeated addition method (ii) Division by repeated subtraction method.
18. Programming in Assembly Language for MSP430G2553/MSP430F5529 – Finding the largest/smallest data in an array.
19. Programming in C Language for MSP430G2553/MSP430F5529 – To configure the Watchdog Timer / Timer_A for blinking LED at different timings using interrupts.
20. Programming in C Language for MSP430G2553/MSP430F5529 – To configure the Port Interrupts for turning ON/OFF LED.

21. Programming in C Language for MSP430G2553/MSP430F5529 – To configure the Timer_A for generation of PWM outputs for various digital data.
22. Programming in C Language for MSP430G2553/MSP430F5529 – To configure ADC10/ADC12 for conversion of analog voltage to digital data.

**Books for study and reference:**


1. B.E.S. Practicals - Sugraj Samvel and Soloman
2. Digital Fundamentals - V.Vijayendaran, S,Viswanadhan Publishers, Chennai
3. Programmable Microcontrollers with Applications – C. Unsalan, H.D. Gurhan – McGraw Hill Education Publishers, 2014.
4. Texas Instrument MSP430 reference Page: http://www.ti.com/lsds/ti/microcontrollers_16-bit_32-bit/msp/overview.page
5. IDE User Guide for MSP430:
   1) Code Composer Studio™ v8.x for MSP430™ User's Guide: http://www.ti.com/lit/ug/slau157ar/slau157ar.pdf
   2) Energia is an open-sourced, community-driven IDE http://energia.nu/guide/
6. Code Examples from Texas Instruments website: www.ti.com.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **III Year** Subject Code: **U18EPH601** Semester: **VI**

Elective - 2 Title: **MATERIALS SCIENCE**

Credits: **3** Max. Marks: **75**

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|---|---|
| **OBJECTIVES** | ❖ To learn and the various field which involves the concept of materials.<br>❖ To learn the basic application of material science and nano materials in different fields |
| **COURSE OUTCOMES(S)** | |
| **CO1** | To learn about the different form of materials and to understand about basis of nucleation. |
| **CO2** | To create awareness about the different growth technique for the growth of materials. |
| **CO3** | To study the fundamentals and properties of semiconducting materials. |
| **CO4** | To gain knowledge about the synthesis and applications of nanomaterials. |
| **CO5** | To study the structural, optical and electrical properties of materials using relevant instruments. |

**UNIT I: PHASE DIAGRAMS AND NUCLEATIONS**

Introduction to Phases – Phase Diagram – Types – Solid solution phase diagram – Eutectic and Eutectoid Phase diagram – Line Rule – Lever Rule – Gibb's Phase Rule – Fick's laws of diffusion – Nucleation – Homogeneous Nucleation – Heterogeneous Nucleation.

**UNIT II: GROWTH TECHNIQUES OF MATERIALS**

Solidification and crystallization – Melt growth – Czochralski Method – Bridgman Technique – Low temperature solution growth – Vapour Phase Deposition Method – Sol-gel Method – Surface heat treatment by diffusion and thermal method.

**UNIT III: SEMICONDUCTING MATERIALS**

Simple and Compound semiconductor – Effective mass of electron and its derivation – Carrier concentration in an intrinsic semiconductor – Fermi level and its variation with temperature – Band gap determination – Carrier concentration in n-Type – Fermi Level – Carrier concentration in p-Type semiconductor.

**Unit IV: NANOMATERIALS**

Nanomaterials – Different type – Top-down and Bottom-up process – Ball Milling – Plasma Arcing –Pulse Laser deposition – Chemical Vapour Deposition – Physical, Magnetic and Mechanical properties of nanomaterials –Application of nanomaterials (Materials and information technology).

**UNIT V: CHARACTERIZATION OF MATERIALS**

Principle, construction and working of Optical Microscope – Principle, construction and working of scanning electron microscope (SEM) – Principle, construction and working of U-V spectrometer – Principle, construction and working of Hall effect – determination of charge carrier.

**Books for study:**


1. A text book of Physics of Materials by Dr. P. Mani, 2nd Edition January 2017, Dhanam Publication, Chennai.
2. Materials science and engineering- V Edn- V Raghavan (PHI).
3. A text book of Solid State Physics by Dr. P. Mani, 1st Edition January 2017, Dhanam Publication, Chennai.


**Books for Reference:**


1. Introduction to Materials science and engineering – Ralls Cartney and Wolf ( Wiley).
2. Introduction to Nanoscience & Nanotechnology by K. K. Chattopadhyay and A. N. Banerjee, Publisher: PHI Learning and Private Limited.
3. Encyclopaedia of Materials Characterization, Surfaces, Interfaces, Thin Films, Eds. Brundle, Evans and Wilson, Butterworth – Heinmann, 1992.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **III Year** Subject Code: **U18EPH603** Semester: **VI**

Elective - 2 Title: **RADIO COMMUNICATION AND TELEVISION**

Credits: **3** Max. Marks: **75**

| **OBJECTIVES** | To study the basic principles of analog and digital communication systems |
|---|---|
| **COURSE OUTCOMES(S)** | |
| **CO1** | To apply mathematical skills in core topics like signal analysis |
| **CO2** | To familiarize the student with modulation techniques like amplitude modulation and demodulation |
| **CO3** | To recognize and understand modulation schemes for continuous wave modulation including frequency modulation |
| **CO4** | To recognize and understand common digital pulse modulation schemes including delta modulation and pulse-code modulation. |
| **CO5** | To study the analysis and synthesis of TV Pictures, Composite Video Signal, Receiver Picture tubes and Television Camera Tubes. |

**UNIT I: INTRODUCTION TO FOURIER TRANSFORM**

Properties of Fourier Transform - Sampling theorem – Natural Sampling & Flat-top Sampling (Qualitative analysis).

**UNIT II: AMPLITUDE MODULATION & DEMODULATION**

Block diagram of Communication System – Types of Communication Systems – Need for Modulation – Amplitude Modulation – Definition & Representation – Generation of Amplitude Modulation (Balanced modulator) –Detector – AM demodulator –Block diagram of AM Transmitter – definition of low level & high level modulation – Superheterodyne receiver.

**UNIT III: FREQUENCY MODULATION**

Representation of FM – Generation of FM – Direct method (Varactor diode modulator) – indirect method (Armstrong method) – FM detection – slope detector –FM Transmitter – Direct method & Armstrong method – FM superheterodyne receiver – Pre-emphasis & De-emphasis – Comparison of AM & FM.

**UNIT IV: ANALOG PULSE CODE MODULATION**

Generation & Detection of PAM, PWM & PPM – Digital Pulse Modulation & Demodulation – PCM – Quantizing & Coding – Generation & Demodulation of PCM – Companding & encoding – Applications of PCM.

**UNIT V: TELEVISION ENGINEERING**

Picture transmission and reception – Sound transmission and reception –Synchronization – Receiver Controls – Colour television – Transmission & Reception – Image continuity – Number of Scanning lines – Sequential Scanning – Interlaced Scanning – Picture tubes – Monochrome and colour picture tubes – Image orthicon – Plumbicon – Fundamental concepts of three colour system.

**Books for Study:**

1. Kennedy, Electronic Communication System, 6th Edition, McGraw-Hill Inter Student Edition (2017).
2. Shanmugam, Sam K., 1st Edition, Digital and Analog Communication System, John Willey (1979).
3. Srinivasan. K.S., Digital Communication, Tata McGraw-Hill Education.
4. Arokh Singh and Chhabra A.K., Principles of Communication Engineering – S. Chand.
5. Gulati R. R., Monochrome and Colour Television (Wiley Eastern, New Delhi, 1995).

**Books for Reference:**

1. Venkatraman SK., Digital Communication, S. Chand.
2. Roddy and Coolen, Communication Electronics, PHI.
3. Lathi B.P., Communication Systems, Wiley Eastern.
4. Taub and Shilling, Communication Systems, McGraw Hill.
5. Grob B., Basic Television and Video Systems, McGraw Hill.
6. Veera Lakshmi A., Srivel R., (2010) Television And Video Engineering (Ane Books India).

**Web Site:**

1. NPTEL
2. http://www.electronicsteacher.com
3. http://www.abcofelectronics.com
4. www.ocw.mit.edu
5. www.academic.earth

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Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **III Year** Subject Code: **U18EPH604** Semester: **VI**

Elective - 2 Title: **INTRODUCTION TO C PROGRAMMING**

Credits: **3** Max. Marks: **75**

| **OBJECTIVES** | To enable the students to develop and implement simple applications using C language |
|---|---|
| **COURSE OUTCOME(S)** | |
| **CO1** | To understand the overall structure of a C program using its basic constructs |
| **CO2** | To develop simple applications in C using decision making and looping control structures |
| **CO3** | To design and implement applications using arrays and strings |
| **CO4** | To develop and implement applications in C using user-defined functions |
| **CO5** | To develop applications in C using structures, pointers and files |

**UNIT I BASICS OF C PROGRAMMING**

Structure of a C program – C character set – Data Types – Storage classes – Constants – Keywords – Variables – Arithmetic and Logical Operators – Bitwise Operators – Precedence and Associativity – Expressions – Input/Output statements (printf and scanf) – Assignment statements.

**UNIT II CONTROL STRUCTURES IN C**

Decision making statements (if, if-else and nested if-else) – Looping statements (while, do-while, for) – break and continue statements – nesting of loops – switch-case statement – goto statement.

**UNIT III ARRAYS AND STRINGS**

Introduction to Arrays – Declaration – Initialization – One dimensional array – Example Programs: Computing Mean, Median and Mode – Two dimensional arrays – Example Programs: Matrix Operations (Addition, Scalingand Transpose) – String operations: length, compare, concatenate, copy – Selection sort, linear and binary search.

**UNIT IV FUNCTIONS**

Introduction to functions – Function prototype, function definition, function call, Built-in functions (string functions, math functions) – Recursion – Example Programs: Computation of Sine series, Scientific calculator using built-in functions – The C Preprocessor.

**UNIT V POINTERS,STRUCTURES AND SIMPLE PROGRAMS**

Pointers – Pointer operators – Pointer arithmetic – Arrays and pointers – Parameter passing to functions (Pass by value, Pass by reference) –Structure - Nested structures – Array of structures – Unions – Simple Programs: Temperature conversion (Fahrenheit to Centigrade and vice-versa, Radioactive decay, Electric field due to a point charge, temperature gradient.

**Books for study:**


1. Balagurusamy, E. – Programming in ANSI C, 6th Edition, Tata McGraw Hill Education Pvt. Ltd., 2012.
2. Kanetkar, Y.P. – Let us C, 15th Edition, BPB Publications, 2016.
3. Kernighan, B.W and Ritchie,D.M, —The C Programming language, 2nd Edition, Pearson Education, 2006.


**Books for Reference:**


1. Byron S. Gottfried, "Schaum's Outline of Theory and Problems of Programming with C",McGraw-Hill Education, 1996.
2. Reema Thareja, —Programming in C, Oxford University Press, 2nd Edition, 2016.
3. Paul Deitel and Harvey Deitel, —C How to Program, Seventh edition, Pearson Publications
4. Juneja, B. L and Anita Seth, —Programming in C, CENGAGE Learning India Pvt. Ltd., 2011.
5. Pradip Dey, Manas Ghosh, —Fundamentals of Computing and Programming in C, First Edition, Oxford University Press, 2009.
6. Anita Goel and Ajay Mittal, —Computer Fundamentals and Programming in C, Dorling Kindersley (India) Pvt. Ltd., Pearson Education in South Asia, 2011.
7. Palaniswamy, S. – Physics Through C Programming, First Edition, Pragati Prakashan Publications, Meerut, 2004.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **III Year** Subject Code: **U18EPH602** Semester: **VI**

Elective - 3 Title: **INSTRUMENTATION**

Credits: **3** Max. Marks: **75**

| **OBJECTIVES** | To learn the basic principles of Physics applied to study the function of basic instruments. |
|---|---|
| **COURSE OUTCOME(S)** | |
| **CO1** | To study the basics of Electromechanical instruments. |
| **CO2** | To learn the constructions of different forms of bridges used for practical measurement purpose. |
| **CO3** | To understand the principles and working of oscilloscope |
| **CO4** | To study the basics of Instrumentation Amplifiers. |
| **CO5** | To learn the basic functioning of transducers and display devices. |

**UNIT I: ELECTROMECHANICAL INSTRUMENTS**

Accuracy and precision - Type of errors – PMMC galvanometer, sensitivity, loading effects – Conversion of Galvanometer into ammeter, voltmeter and shunt type ohmmeter – Multimeter – watt-hour meter.

**UNIT II: DC & AC BRIDGES**

Wheat stone bridge – Kelvin's bridge – Balancing condition for AC Bridge – Maxwell's bridge –Schering's bridge – Wien's bridge – Determination of frequency.

**UNIT III: OSCILLOSCOPES**

Oscilloscope – Block diagram – Deflection sensitivity – Electrostatic deflection – electrostatic focusing – CRT Screen – Measurement of wave form frequency, Phase difference and time intervals – Sampling Oscilloscope.

**UNIT IV: INSTRUMENTATION AMPLIFIERS**

Instrumentation amplifier – electronic voltmeter and multimeter – Digital voltmeter – Function Generator – Wave analyzer – Fundamentals of spectrum analyzer.

**UNIT V: TRANSDUCER & DISPLAY DEVICES**

Strain gauge – Unbonded strain gauge – Displacement transducer – LVDT – Resistance thermometer – Photoconductive cells – Seven segment displays – LCDs.

**Books for Study:**


1. Modern Electronic instrumentation and measurement techniques, Albert D. Helfrick and William D. Cooper, Prentice Hall of India Pvt. Ltd.
2. A course in Electrical and Electronic measurement and instrumentation, A.K. Sawhney, Dhanpat Rai and Sons.
3. Electronic instrumentation and measurements, P.B. Zbar, Mc Grew Hill International.

## C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **III Year** Subject Code: **U18EPH605** Semester: **VI**

Elective - 3 Title: **NON-DESTRUCTIVE TESTING**

Credits: **3** Max. Marks: **75**

| | |
|---|---|
| **OBJECTIVES** | ❖ To learn different non-destructive techniques involved in the defects of materials.<br>❖ To apply the techniques learnt to various Industries. |
| **COURSE OUTCOMES(S)** | |
| **CO1** | To obtain sufficient knowledge on visual testing, codes and standard. |
| **CO2** | To gain the knowledge on liquid penetrate testing and applications |
| **CO3** | Inspections of materials using MPT method |
| **CO4** | To understand and apply the eddy current and radiographic testing methods to inspect the material quality |
| **CO5** | Ability to work with instruments related to Ultrasonics |

**Unit 1: Visual Testing**

Fundamentals of Visual Testing – vision, lighting, material attributes, environmental factors, visual perception, direct and indirect methods – mirrors, magnifiers, boroscopes and fibroscopes– light sources and special lighting– calibration – Inspection objectives, inspection checkpoints, sampling plan, inspection pattern etc– classification of indications for acceptance criteria – Codes, Standards and Specifications (ASME,ASTM,AWS etc.).

**Unit 2: Liquid Penetrant Testing**

Principles – types and properties of liquid penetrants – developers – advantages and limitations of various methods - Preparation of test materials – Application of penetrants to parts, removal of excess penetrants, post cleaning – Control and measurement of penetrant process variables –selection of penetrant method – solvent removable, water washable, post emulsifiable – Units and lighting for penetrant testing –dye penetrant process – applicable codes and standards.

**Unit 3: Magnetic Particle Testing**

Selecting the method of magnetization, inspection materials, wet and dry particles – calibration- capabilities of equipment– magnetic particle inspection of castings and welding – Dry continuous method, wet residual method – Principles and methods of demagnetization – Residual magnetism – applicable codes and standards.

**Unit 4: Eddy Current and Radiographic Testing**

Eddy current testing: Generation of eddy currents – Properties of eddy currents – Eddy current sensing elements – Probes – Instrumentation – Types of arrangements – Applications – Advantages – Limitation – Interpretation and evaluation.

Radiographic testing: Principles – Interaction of X-ray with matter – Image formation – Image quality – Digital Radiography – Image interpretation – Radiation Shielding.

**Unit 5: Ultrasonic Testing**

Principle of pulse echo method, through transmission method, resonance method – Advantages, limitations – contact testing, immersion testing, couplants–A, B and C scan displays, comparison of contact and immersion method – Advantages and disadvantages of ultrasonic testing.

**Text Books:**


1. Non-Destructive Examination and Quality Control, ASM International, Vol.17, 9th edition (1989).
2. J.Prasad and C. G. K. Nair, Non-Destructive Test and Evaluation of Materials, Tata McGraw-Hill Education, 2nd edition (2011).
3. B.Raj, T. Jayakumar and M. Thavasimuthu, Practical Non Destructive Testing, Alpha Science International Limited, 3 rd edition (2007).
4. T. Rangachari, J. Prasad and B.N.S. Murthy, Treatise on Non-destructive Testing and Evaluation,Navbharath Enterprises, Vol.3, (1983).
5. Ed. Peter.J. Shull, NondestructiveEvaluation : Theory, Techniques, and Applications, Marcel Dekker (2002).
6. B. Raj, C.V. Subramanian and T. Jayakumar, Non Destructive Testing of Welds, Woodhead Publishing, 1st edition (2000).


**Reference Books:**


1. C. Hellier, Handbook of Non-Destructive Evaluation, McGraw-Hill Professional, 1st edition (2001).
2. J. Thomas Schmidt, K. Skeie and P. MacIntire, ASNT Non Destructive Testing Handbook: Magnetic Particle Testing, American Society for Nondestructive Testing, American Society for Metals, 2nd edition (1989).
3. V. S. Cecco, G. V.Drunen and F.L. Sharp, Eddy current Manual: Test method, Vol.1, Chalk River Nuclear Laboratories (1983).
4. B.P.C. Rao, Practical Eddy Current Testing, Alpha Science International Limited (2006).
5. N. A. Tracy, P. O. Moore, Non-Destructive Testing Handbook: Liquid Penetrant Testing,Vol.2, American Society for Nondestructive Testing, 3rd edition (1999).
6. Don E. Bray and Roderic K. Stanley, Nondestructive Evaluation: A Tool in Design, Manufacturing and Service, CRC Press (1996).

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|---|---|---|---|---|---|
| Year: | **III Year** | Subject Code: | **U18EPH606** | Semester: | **VI** |
| Elective - 3 | | Title: | **MEDICAL PHYSICS** | | |
| Credits: | **3** | | | Max. Marks: | **75** |

| | |
|---|---|
| **OBJECTIVES** | To understand about X-rays, radiation effects and their role in diagnosing the different type of diseases.<br>To learn and understand the fundamental principles regarding role of laser in medical field. |
| **COURSE OUTCOME(S)** | |
| **CO1** | To learn about x-rays, different method of X-ray productions and their role in medical field. |
| **CO2** | Acquire knowledge about the basic concepts of radiations and its importance in diagnosing various diseases in human body. |
| **CO3** | To study the different imaging technique using x-rays, electron beam and magnetic field in diagnosing diseases. |
| **CO4** | Acquire knowledge about the basic concepts of radiation therapy and their role in curing diseases. |
| **CO5** | To gain information about the basic concepts of laser and their production. Also about their role in medical field. |

**UNIT – I: X – RAYS**

Electromagnetic spectrum – production of x-rays – s-rays spectra – Brehmsstrahlung – Characteristic of x-ray – X-ray tubes – Coolidge tube –tube cooling– stationary mode – Retting anode x-ray tubes – quality and intensity of x-ray. X-ray generator circuits – half wave and full wave rectification.

**UNIT – II: RADIATION PHYSICS**

Radiation units – exposure – absorbed dose – rad gray – kera relative biological effectiveness – Effective dose – slevert - inverse square law – Interaction of radiation with matter – linear attenuation coefficient – Radiation detectors.

**UNIT – III: MEDICAL IMAGING PHYSICS**

Radiological imaging – Radiography – Filters – grids – cassette – X-ray film – film processing – Fluoroscopy – computed tomography scanner – Principle function display – generations Mammography. Ultrasound imaging – Magnetic resonance imaging – thyroid uptake system – Gamma camera [Only Principle, function and display].

**UNIT – IV: RADIATION THERAPHY PHYSICS**

Radio therapy – kilo voltage machines – deep therapy machines – tele-cobalt machines – Medical linear accelerator. Basic of Teletherapy units – deep x-ray, telecobalt units – radiation protection – external beam characteristics – phantomdose maximum and build up – bolus – percentage depth dose – tissue-air ratio – back scatter factor.

**UNIT – V: LASERS IN MEDICINE**

Introduction to laser – principle and production of laser – effects of laser radiation on tissues, Different types of lasers – photo thermal effects, photochemical effects – photodynamic therapy, Laser applications in therapy and diagnosis-ophthalmology, Fiber optic endoscopy and dentistry. Laser as a beautician's tool – laser hazards – biological effects.

**Books for study:**


1. Basic Radiological Physics Dr. K. Thayalan – Jayapee Brothers Medical Publishing Pvt. Ltd. New Delhi (2003).
2. Physics of Radiation Theraphy : FM Khan – Williamd and Wilkins, Third edition (2003).
3. Lasers in Medicine by R W Wayanant, Plenum Publishing Co.).


**Books for Reference:**


1. The essential physics of Medical imaging: Bushberg, Seibert, leidholdt and Boone Lippincot Williams and Wilkins, Second Edition (2002).
2. HE Johns and Cunningham – The Physics of Radiology.
3. Nuclear medicine Physics: Chandra – LippincotWillams and Wilkins (1998).
4. The Physics of radiology: John R. Gunniingham & Johns – Charles C Thomas USA (1990).
5. Medical Imaging Physics: William R Hendee – Mosby, 3rd edition (1992).
6. Advanced Medical Radiation Dosimetry: Govindarajan KN Prentice – Hall of India Pvt. Ltd., NewDelhi (1992).

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Syllabus for B.Sc. Physics effective from the year 2018-2019

Year: **III Year** Subject Code: **U18SPH601** Semester: **VI**

Skill Based - 4 Title: **EMBEDDED SYSTEMS II (SBS-IV)**

Credits: **2** Max. Marks: **75**

| | |
|---|---|
| **OBJECTIVES** | To study the application capabilities of MSP430 microcontroller in embedded system design |
| **COURSE OUTCOME(S):** On completion of the course, students will be able to | |
| **CO1** | Understand and use the various timers of MSP430 microcontroller |
| **CO2** | Understand the digital input/output applications and interfacing of external devices |
| **CO3** | Understand and apply the comparator and ADC modules of MSP430 for simple applications |
| **CO4** | Understand the concepts of asynchronous and synchronous serial communication systems |
| **CO5** | Understand and apply the USCI module of MSP430 for simple data communication applications |

**UNIT I**

**Timers (Simplified block diagrams only):** Watchdog Timer – Watchdog as an Interval Timer – Basic Timer1 – Real Time Clock – Timer_A – Timer Block – Capture/Compare Channels – Interrupts from Timer_A – Measurement in Capture Mode – Edge Aligned PWM – Timer_B – What Timer Where?

**UNIT II**

**Digital I/O:** Parallel Ports – Circuit of an Input-Output Pin – Interrupts on Digital Inputs – Scanning a Matrix Keypad – Digital Outputs – Simple programs on Digital I/O in C and Assembly – Multiplexed Displays.

**Interfacing:** – Interface between 3V and 5V systems – Driving heavier loads – Opto-Detectors and Opto-Isolators – Working with DC Motors – Servo Motor Interfacing – Variable Reluctance Stepper Motors.

**UNIT III**

**Mixed Signal Systems:** Architecture of Comparator_A+ – Operation of Comparator_A+ - Comparator_A+ Registers – Simple C Program for Comparator_A+ - Architecture of the ADC10 – Basic Operation of the ADC10 – ADC10 Registers – Single Conversion with the ADC10 Triggered by Software – Temperature sensor on the ADC10.

**UNIT IV**

**Serial Communications (Simplified block diagrams only):** Data Communications Fundamental – Types of Serial Channels – Asynchronous Serial Channels – Asynchronous Packet Format – UART Structure and Functionality – UART Interface – UART Configuration and Operation – RS-232 channel – The Universal Serial Bus (USB) – Synchronous Serial Communication – Serial Peripheral Interface (SPI) Bus – Inter-Integrated Circuit (I2C) Bus – I2C Operation.

**UNIT V**

**MSP430 USCI:** USCI Control and Status Registers – Special function interrupt registers IE2 and IFG2 – USCI clocks – USCI modes (UART, SPI and I2C) – Baud rate generation, Transmit/Receive operations, master/slave modes, interrupt programming.

**Books for Study:**


1. Introduction to Embedded Systems Using Microcontrollers & the MSP430 – Manuel Jiménez, Rogelio Palomera, Isidoro Couvertier, Springer, 2014 – ISBN- 978-1-4614- 3142-8.
2. MSP430 Microcontroller Basics – John Davies, Elsevier, 2008 – ISBN-978-0-7506-8276- 3.
3. Programmable Microcontrollers with Applications – C. Unsalan, H.D. Gurhan – McGraw Hill Education Publishers, 2014.


**Reference:**


1. Texas Instrument MSP430 reference Page: http://www.ti.com/lsds/ti/microcontrollers_16-bit_32-bit/msp/overview.page
2. IDE User Guides for MSP430:
    a. Code Composer Studio™ v8.x for MSP430™ User's Guide: http://www.ti.com/lit/ug/slau157ar/slau157ar.pdf
    b. Energia, an open-sourced, community-driven IDE http://energia.nu/guide/

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| Year: | **III Year** | | Subject Code: **U18CEA601** | Semester: | **VI** |
| Part - V | | Title: | **EXTENSION ACTIVITIES** | | |
| Credits: | **1** | | | Max. Marks: | **100** |

All extra-curricular activities like NSS, NCC, Sports, YRC, RRC, Blood Donation, etc., and other co-curricular activities like MOOC, Value-Added Courses, Usage of Library, etc., are considered as part of the Extension Activities under Part V of the Programme.