SENGAMALATHAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE

(AUTONOMOUS)

(*Affiliated to Bharathidasan University*)

(Accredited with "A" Grade by NAAC; An ISO9001:2015 Certified Institution)

SUNDARAKKOTTAI, MANNARGUDI – 614016.

TAMILNADU, INDIA.

B.Sc., PHYSICS

COURSE STRUCTURE WITH REVISED SYLLABUS UNDER CBCS

(*For the candidates admitted in the academic year 2021–2022*)

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TAMILNADU, INDIA.

B.Sc., PHYSICS COURSE STRUCTURE UNDER CBCS
(For the candidates admitted in the academic year 2021 –2022)

ELIGIBILITY: Those who have completed +2 examinations with Physics and Mathematics as two of the core subjects.

Sem.	Part	Nature of the Course	Course Code	Title of the Course	Inst. Hours/ Week	Credit	Exam Hours	CIA	ESE	Total
I	I	Language Course (LC) –I– Tamil */Other Languages ** #	21LC101	Ikkala Ilakkiyam	6	3	3	25	75	100
	II	English Language Course(ELC) – I	21ELC101	Language through Literature –I (Prose and Communication Skills)	6	3	3	25	75	100
	III	Core Course (CC) – I	21PH101	Properties of Matter and Acoustics	6	5	3	25	75	100
		Core Practical (CP) – I	21PH102P	Physics Practical I	3	3	3	40	60	100
		Allied Course (AC) – I	21AMM101	Calculus	4	3	3	25	75	100
		Allied Course – II (AC)	21AMM102	Algebra and Analytical Geometry, 3D	3	2	3	40	60	100
	IV	Value Education		Value Education	2	2	3	25	75	100
		TOTAL			**30**	**21**	**-**	**-**	**-**	**700**
II	I	Language Course (LC) –II– Tamil*/Other Languages ** #	21LC201	Idaikkala Ilakkiyamum Puthinamum	6	3	3	25	75	100
	II	English Language Course (ELC) –II	21ELC201	Language through Literature – II (Poetry and Communication Skills)	6	3	3	25	75	100
	III	Core Course (CC) – II	21PH203	Mechanics and Relativity	6	5	3	25	75	100
		Core Practical (CP) – II	21PH204P	Physics Practical II	3	3	3	40	60	100
		Allied Course –III (AC)	21AMM203	Trigonometry and Fourier Series	3	2	3	25	75	100
		Allied Course –IV (AC)	21AMM204	ODE, PDE and Laplace Transforms	4	3	3	40	60	100
	IV	Environmental Studies		Environmental Studies	2	2	3	25	75	100
		TOTAL			**30**	**21**	**-**	**-**	**-**	**700**
III	I	Language Course (LC) – III Tamil*/Other Languages ** #		-	6	3	3	25	75	100
	II	English Language Course (ELC) – III		-	6	3	3	25	75	100
	III	Core Course (CC) – III		-	6	5	3	25	75	100
		Core Practical (CP) – III		-	3	3	3	40	60	100
		Allied Course (AC) –III		-	4	4	3	25	75	100
		Allied Practical (AP) –III		-	3	2	3	40	60	100

Sem	Part	Course	Title/Component	Hours	Credits	Exam Hrs	Int	Ext	Total
	IV	Non-Major Elective (NME) –I for those who studied Tamil under Part-I a) Basic Tamil for other language students b) Special Tamil for those who studied Tamil upto +2 but opt for other languages in degree Programme	-	2	2	3	25	75	100
		TOTAL		**30**	**22**	**-**	**-**	**-**	**700**
IV	I	Language Course (LC) –IV - Tamil*/Other Languages ** #	-	6	3	3	25	75	100
	II	English Language Course (ELC) – IV	-	6	3	3	25	75	100
	III	Core Course (CC) – IV	-	5	5	3	25	75	100
		Core Practical (CP) – IV	-	3	3	3	40	60	100
		Allied Course – II (AC)	-	3	2	3	25	75	100
		Allied Practical Lab -II (AP)	-	3	2	3	40	60	100
	IV	Non-Major Elective (NME) – II -for those who studied Tamil under Part I a) Basic Tamil for other language students b) Special Tamil for those who studied Tamil upto +2 but opt for other languages in degree Programme	-	2	2	3	25	75	100
		Skill Based Elective (SBE) – I	-	2	2	3	25	75	100
		TOTAL		**30**	**22**	**-**	**-**	**-**	**800**
V	III	Core Course (CC) – V	-	5	5	3	25	75	100
		Core Course (CC) – VI	-	5	5	3	25	75	100
		Core Course (CC) – VII	-	6	5	3	25	75	100
		Core Practical (CP) – V	-	3	3	3	40	60	100
		Major Based Elective (MBE) – I	-	5	5	3	25	75	100
	IV	Skill Based Elective (SBE) – II	-	2	2	3	25	75	100
		Skill Based Elective (SBE) – III	-	2	2	3	25	75	100
		Soft Skills Development	Soft Skill Development	2	2	3	25	75	100
		TOTAL		**30**	**29**	**-**	**-**	**-**	**800**
VI	III	Core Course (CC) – VIII	-	6	5	3	25	75	100
		Core Course (CC) – IX	-	6	5	3	25	75	100
		Core Practical (CP) – VI	-	5	3	3	40	60	100
		Major Based Elective (MBE) – II	-	6	5	3	25	75	100
		Core Course (CC) – X	Project	6	5	3	25	75	100
	V	Extension Activities	Extension Activities	-	1	-	-	-	-
		Gender Studies	Gender Studies	1	1	3	25	75	100
		TOTAL		**30**	**25**	**-**	**-**	**-**	**600**
		G. TOTAL		**180**	**140**				**4300**

CURRICULAM DESIGN

LIST OF ALLIED COURSES

ALLIED COURSE I - MATHEMATICS ALLIED COURSE II - COMPUTER SCIENCE

Subject	No. of Courses	Total Credits
Language Part – I	4	12
English Part –II	4	12
Core Course	9	45
Core Practical	6	18
Allied Course	6	16
Allied Practical	2	4
Non-Major Elective	2	4
Skill Based Elective	3	6
Major Based Elective	2	10
Project	1	5
Environmental Studies	1	2
Value Education	1	2
Soft Skill Development	1	2
Gender Studies	1	1
Extension Activities	1	1
Total	**44**	**140**

For those who studied Tamil upto 10th +2 (Regular Stream)

+ Syllabus for other Languages should be on par with Tamil at degree level

those who studied Tamil upto 10th +2 but opt for other languages in degree level under Part I should study special Tamil in Part IV

** Extension Activities shall be outside instruction hours

Note:

	CIA	ESE
1. Theory	25	75
2. Practical	40	60

3. Separate passing minimum is prescribed for Internal and External marks

FOR THEORY

The passing minimum for CIA shall be 40% out of 25 marks [i.e. 10 marks]
The passing minimum for University Examinations shall be 40% out of 75 marks [i.e. 30 marks]

FOR PRACTICAL

The passing minimum for CIA shall be 40% out of 40 marks [i.e., 16 marks]
The passing minimum for University Examinations shall be 40% out of 60 marks [i.e., 24 marks]

NON MAJOR ELECTIVE (NME) OFFERED BY THE DEPARTMENT

Semester	Part	Course	Title of the Paper
III	IV	NME –I	-
IV		NME –II	-

SKILL BASED ELECTIVE (SBE) OFFERED BY THE DEPARTMENT

Semester	Part	Course	Title of the Paper
IV	IV	SBE-I	-
V		SBE-II	-
V		SBE-III	-

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TAMILNADU, INDIA

DEPARTMENTOF PHYSICS
B.Sc., PHYSICS

(For the candidates admitted in the academic year 2021 –2022)
Question Paper Pattern- (Theory)

Max time: 3 Hours   **Max Marks: 75**

Section – A (10 x 2 = 20)
Answer all the questions
Answer in One or Two sentences each

1. ⎫
2. ⎬   Unit I

3. ⎫
4. ⎬   Unit II

5. ⎫
6. ⎬   Unit III

7. ⎫
8. ⎬   Unit IV

9. ⎫
10. ⎬ Unit V

Section – B (5 x 5 = 25)
Answer all the questions
Each answer should not exceed 500 words

11. a (or)
    b   ⎬   Unit I

12. a (or)
    b   ⎬   Unit II

13. a (or)
    b   ⎬   Unit III

14. a (or)
    b   ⎬   Unit IV

15. a (or)
    b   ⎬   Unit V

Section – C (3 x10 = 30)
Answer any <u>THREE questions</u> in 1200 words

16. Unit I
17. Unit II
18.Unit III
19.Unit IV
20.Unit V

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SEMESTER I

SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE
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DEPARTMENT OF PHYSICS
B. Sc., PHYSICS

Semester: I-CC- I: Properties of Matter and Acoustics

Ins. Hrs. /Week: 6   Course Credit: 5   Course Code:21PH101

OBJECTIVES
- To identify the characteristics of matter in terms of their properties.
- To identify physical properties of matter and the knowledge about the concept of Surface tension.
- To understand the dynamic property of fluids and the basic principles of acoustics.

UNIT- I: Elasticity   (17 Hours)
Introduction-Hooke's law – Stress-Strain diagram – Factors affecting elasticity- Different moduli of elasticity - Relation between the elastic moduli – Poisson's ratio –Twisting couple on a cylinder – Determination of rigidity modulus by static torsion – Work done in twisting a wire -Torsional oscillations of a Body-Torsion pendulum - Determination of rigidity modulus and moment of inertia.

UNIT - II: Bending of Beams   (19 Hours)
Bending of beams - Expression for bending moment – Cantilever – Expression for depression of the loaded end of a cantilever — Young's modulus by measuring the tilt in a loaded cantilever –Oscillation of a cantilever - Non-uniform bending – Expression for depression- Uniform bending – Expression for elevation – Experimental determination of Young's modulus using pin and microscope method (Non-uniform bending – Uniform bending) –Determination of Young's modulus by Mirror and Telescope method- Determination of Young's modulus by Koenig's method-I shape girders.

UNIT - III: Surface Tension   (18 Hours)
Definition – Molecular forces – Explanation of surface tension on kinetic theory – Surface Energy-Interfacial surface Tension –Work done on increasing the area of a surface-Angle of contact -Neumann's triangle-Excess pressure inside a liquid drop and soap bubble -Excess pressure inside a curved liquid surface– Experimental determination of surface tension - Jaeger's method - Drop- weight method -Capillary rise method - Variation of surface tension with temperature.

UNIT- IV: Viscosity   (19 Hours)
Newton's law of viscous flow – streamlined and turbulent motion – Reynold's number - Poiseuille's formula for the flow of a liquid through a horizontal capillary tube – Experimental determination of co-efficient of a liquid by Poiseuille's method -Ostwald's viscometer – Terminal velocity and Stokes's formula and Experimental determination of Stokes's Method- Viscosity of gases – Meyer's formula -Variation of viscosity with temperature and pressure - Lubrication.

UNIT -V: Acoustics (**17 Hours**)

Reverberation – Sabine's Reverberation formula – Factors Affecting the Acoustics of Buildings – Sound distribution in an Auditorium – Requisites for good acoustics – Ultrasonics Production and detection by Piezo electric method.

Total Lecture Hours – 90

COURSE OUTCOME

1. Analyze and comprehend regarding the strength of the solid materials of different size.
2. Understand the physical properties of matter.
3. Study the concept of Surface Tension.
4. Learn the dynamic properties of fluids.
5. Acquire the knowledge about the concept of Acoustics.

TEXT BOOK(S)

1. Barber, J. R , 2010,.Elasticity,Springer
2. R. Murugeshan, 2019, Properties of matter, S. Chand & Co. Pvt. Ltd., Revised edition.
3. Brijlal& N. Subramanian, 2008,A Text Book of Sound, Vikas Publishing. Pvt.Ltd.
4. Murugeshan R., SivaprasathKiruthiga , 30 July 2012, Properties of Matter and Acoustics
5. Paul Filippi, AimeBergassoli , Dominique Habault , & 1 More , 23 September 1998
   Acoustics: Basic Physics, Theory, and Methods

REFERENCE BOOK(S)

1. Fundamentals of General properties of matter, 2012, S. Chand &Co. Pvt. Ltd.
2. Brijlal& N. Subramanian, 2005, Properties of matter, VikasPublishing. Pvt. Ltd.
3. R.L. Saihgal, 1979,A Text Book of Sound, S. Chand & Co. Pvt. Ltd, New Delhi.
4. Basil C McEwen, 12 September 2011,The Properties of Matter.
5. Hanako Ayabito & Mitsuko Katsukawa ,15 April 2013,Ultrasonics: Theory, Techniques & Practical Applications.

E- RESOURCES

1. http://shorturl.at/dkux4
2. https://cutt.ly/Vhlco3J
3.https://youtu.be/amGa5RRrCss

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DEPARTMENT OF PHYSICS
B. Sc., PHYSICS

Semester: I-CP- I: Physics Practical I
(Any Ten Experiments)

Ins. Hrs. /Week: 3   Course Credit: 3   Course Code: 21PH102P

OBJECTIVES
- To motivate and educate the students to acquire skill in physics Experiments.

1. Young's modulus - Uniform bending - Pin & Microscope Method.
2. Young's modulus - Non uniform bending - Pin & Microscope Method.
3. Surface Tension, Interfacial Surface Tension – Drop weight Method.
4. Moment of Inertia - Torsion pendulum.
5. Sonometer – Determine the frequency of a given tuning fork
6. Spectrometer – Refractive index of a solid prism.
7. Surface Tension by Capillary rise method.
8. Long focus convex lens - f, R, refractive index-determination.
9. Newton's ring's – Determination of radius of curvature of a given convex lens.
10. Stokes's method – Viscosity of highly viscous liquid.
11. Determination of the Elastic Constants of a Wire by Searle's method.
12. Comparison of Viscosities of two liquids – Ostwald's Viscometer/ HARE's Apparatus.
13. Young's Modulus by Uniform Bending – Optic Lever method.
14. Determine the diameter of the material using Travelling microscope.
15. Determine the coefficient of a liquid – Poiseuille's method.

Total Lecture Hours – 45

COURSE OUTCOME
1. Perform experiments on any material to identify the strength of the given objects.
2. Deal with liquids based on their viscosity.
3. Commend on the relation between frequency, length and tension of a stretched string under vibration.

TEXT BOOK(S)
1. Dr. S. Somasundaram, Practical Physics, Apsara Publications, Tiruchirappalli, 2012.

REFERENCE BOOK(S)
1. S. Srinivasan, A Text Book of Practical physics, S. Sultan Chand publications. 2005
2. R. Sasikumar, Practical Physics, PHI Learning Pvt. Ltd, New Delhi, 2011.
E - RESOURCES
1.https://youtu.be/GTnPEtksTEc
2.https://youtu.be/veQ-LfJhfxM
3.https://youtu.be/hV0qG7BTJJI

Semester: I/III - AC- I: Allied Physics - I

Ins. Hrs. /Week: 4   Course Credit: 3   Course Code: 21APY101

OBJECTIVES
- To know the basic principles of properties of matter.
- To enable the students to understand the basic concepts of mechanics and Thermodynamics.
- To understand the principles of semiconductor diodes, transistors and their characteristics.

UNIT -I: Properties of Matter   **(14 Hours)**
Elasticity: Stress–Strain–Young'smodulus–stress-strainDiagram–Bendingofbeams–Expression for the bending moment–Measurement of Young's modulus by bending of a beam–Non-uniform bending and uniform bending.
Viscosity: Streamline flow and Turbulent Flow-Critical velocity-Poiseuille's formula – Determination of Coefficient of Viscosity of a liquid (Variable Pressure head)
Surface Tension: Definition-Drop Weight method of determining the surface tension of a Liquid

UNIT-II: Mechanics   **(10 Hours)**

Centre of Gravity – Introduction- Centre of Gravity of a Solid Hemisphere-Hollow Hemisphere-Centre of Gravity of a Solid Cone
States of Equilibrium: Equilibrium of a rigid body – Stable, unstable and neutral equilibrium – Example. Law of Floatation- Stability of Floating bodies –Meta Center-Metacentric Height- Determination of Metacentric of a ship.

UNIT-III: Thermal Physics   **(12 Hours)**

Modes of heat Transfer-Conduction, Convection, Radiation- Coefficient of Thermal Conductivity-Determination of Thermal Conductivity of a bad Conductor by Lee's disc Method.
Radiation: Blackbody-Stefan's Law-Newton's law of Cooling-Newton's law of cooling from Stefan's Law-Wien's displacement Law-Rayleigh-Jeans Law-Planck's law.
UNIT-IV: Optics   **(12 Hours)**

Interference: Introduction-Air Wedge-Newton's Rings-Color of thin films.
Diffraction: Plane Diffraction, Grating-Theory of Plane Transmission Grating
Scattering: Types of Scattering-Raman Scattering-Tyndall Scattering

UNIT-V: Electronics (12 Hours)

Semiconductor and its Properties- Intrinsic and extrinsic semiconductor-PN Junction diode – Biasing of PN junction –V-I characteristics of junction Diode- Zener diode -Transistor-Characteristics of transistor-CB, CE Mode-Transistor as an Amplifier-Transistor as an Oscillator.

Total Lecture Hours - 60

COURSE OUTCOME

The students will be able to,
1.Identify the strength of the given object.
2.Determine and find C.G of a various shapes.
3.Understand different thermal Processes and laws of thermodynamics.
4.Calculate wavelength difference and fringe width from the interference pattern.
5. Learn about the semiconductor and its properties.

TEXT BOOK(S)

1.R. Murugeshan, Properties of matter, 2012. Chand & Co. Pvt.Ltd., Revised edition
2.Narayanamoorthy and N. Nagarathinam, 2005.Mechanics-Part II, The National Publishin Company, Chennai,.
3.Dr.N.Subramaniyam,Brijlal andDr.M.N.Avathanulu,2012.Optics, S. Chand&Co. Pvt.Ltd.-25threvised edition, New Delhi,.
4.V.Vijayendran,S.Viswanathan, 2004.DigitalFundamentals, Printers & Publishers Private Ltd, Chennai.
5.A.B.Gupta and H.P.Roy 2016.Thermal physics,Books&Allied (P) Ltd.,kolkatta.

REFERENCE BOOK (S)

1.R.L. Saihgal, 1979.A Text Book of Sound, S. Chand & Co. Pvt. Ltd, New Delhi.
2.D.S. Mathur, 1990.Mechanics, S. Chand & Company Ltd., New Delhi ..
3.K.Mehta and Rohit Mehta, 2017.Principles of Electronics, Chand & Co. Pvt.Ltd., Revised edition
4.Brijlaland Subramaniyam, 2015.Heat and Thermodynamics & Statistical physics, S. Chand & Co.
5.P.Duraipandian & Muthamizh Jayapragasam, 2018.Chand&Co. Pvt.Ltd., Revised edition.

E- RESOURCES
  1. https://cutt.ly/Vhlco3J
  2.https://youtu.be/amGa5RRrCss
  3.http://shorturl.at/dkux4
  4.http://shorturl.at/lmBFL
  5.https://youtu.be/G0iSEDyJKDo

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DEPARTMENT OF PHYSICS
For the students of I B.Sc. Mathematics / II B.Sc., Chemistry

Semester: I / III - AC- II: ALLIED PHYSICS PRACTICAL - I

(Any 10 Experiments)

Ins. Hrs. /Week: 3   **Course Credit: 2**   **Course Code:21APY102P**

OBJECTIVES

- To acquire basic understanding of laboratory technique and to educate and motivate the students in the field of Physics.
1. Measurements of length (or diameter) using Vernier calipers, Screw gauge and Travelling
     a. Microscope.
2. Non-Uniform bending – Pin and Microscope.
3. Uniform bending-scale and Telescope.
4. Surface tension and Interfacial Surface tension by Drop Weight Method.
5. Coefficient of viscosity of liquid – Variable Pressure Head Method.
6. Thermal conductivity of a bad conductor – Lee's disc Method.
7. Specific heat capacity of liquid – Newton's cooling Method.
8. Spectrometer – Refractive index of a solid prism.
9. Newton's Rings – 'R' determination.
10. Air wedge – Thickness of the given thin wire.
11. Determine the frequency of a given tuning fork – Sonometer.
12. Stokes's method Viscosity of highly viscous liquid.

Total Lecture Hours - 45

COURSE OUTCOME

1. Understand the laboratory technique and to educate and motivate the students in the field of Physics.

TEXT BOOK(S)

1. Dr. S. Somasundaram, Practical Physics, Apsara Publications, Tiruchirappalli, 2012.
2. R. Sasikumar, Practical Physics, PHI Learning Pvt. Ltd, New Delhi2011.

REFERENCE BOOK(S)

1. S. Srinivasan, A Text Book of Practical Physics., Sultan Chand Publications.

E - RESOURCES

1. https://youtu.be/Q8Otf6k3uGk
2. https://youtu.be/8DhfUz0idwM

SEMESTER II

SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE
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DEPARTMENT OF PHYSICS
B. Sc., PHYSICS

Semester: II - CC - II: Mechanics and Relativity

Ins. Hrs. /Week: 6   **Course Credit: 5**   **Course Code:21PH203**

OBJECTIVES
- To understand the basic concept of mechanics.
- To gain the Knowledge of gravitation and the basic concept of flotation.
- To know the knowledge of Newtonian and general theory of relativity.

UNIT - I: Projectile, Impulse and Impact   (17 Hours)
Projectile - particle projected in any direction - Path of a projectile is a parabola - Range of a projectile on plane inclined to the horizontal -Maximum range on the inclined plane - Impulse of a force - Laws of impact - Direct impact between two smooth spheres - oblique impact between two smooth spheres - Impact of a smooth sphere on a smooth fixed horizontal plane - Loss of KE due to direct impact - Oblique impact.

UNIT - II: Dynamics of Rigid Body   (20 Hours)
Moment of Inertia - Kinetic energy and angular momentum of rotating body - Theorems of perpendicular and parallel axes - Acceleration of a body rolling down an inclined plane without slipping - Oscillations of a small sphere on a large concave smooth surface - Compound pendulum – Centre of suspension and Centre of oscillation - Centre of percussion – Minimum period of a compound pendulum.

UNIT - III: Gravitation   (19 Hours)
Newton's law of gravitation - Mass and density of earth - Inertial and Gravitation mass - Determination of G-Boy's experiment -Kepler's Laws of planetary motion -Deduction of Newton's law of gravitation from Kepler's Law - Gravitation - Field - potential -Intensity of Gravitational field -gravitational potential due to a point mass .

UNIT- IV: Centre of Gravity, Centre of Pressure and Floating Bodies   (17 Hours)
Centre of gravity of a body - Centre of Pressure-Pascal's law- rectangular lamina-triangular lamina-Archimedes principle - Conditions of equilibrium of a floating body - Stability of equilibrium of a floating body - Meta -Centre - Experimental   determination of a metacentric height of a ship.

UNIT - V: Relativity   (17 Hours)
Galilean –Newtonian relativity, Galilean transformations-Michelson Morley experiment and its importance- Lorentz transformations and its interpretation- consequence of Lorentz transformation- Length contractor, time dilation-relativistic addition of velocities-Mass energy equivalence-Basic ideas of general theory of relativity.

Total Lecture Hours - 90

COURSE OUTCOME

The students will be able to,

1. Recognize the motion of the charged particle in electromagnetic field.
2. Understand the effect of gravitation on objects.
3. Calculate and find C.G of a various shapes.
4. Understand the concepts of floating bodies.
5. Analyze the general theory of relativity.

TEXT BOOK(S)

1. M. Narayanamurthi and N. Nagarathinam, 2005, Dynamics, The National Publishing Company , Chennai.
2. M. Narayanamurthi and N. Nagarathinam, Statics, 2005, Hydrostatics and Hydrodynamics - The National Publishing Company, Chennai.
3. R. Murugeshan, 2019,Properties of matter, S. Chand & Co. Pvt. Ltd., Revised edition.
4. Steven Weinberg ,2008,Gravitation and Cosmology: Principles and Applications of the General Theory of Relativity (WSE) ,Wiley Publishers,January .
5.Robert Resnick , January 2007, Introduction to Special Relativity ,Wiley publishers.

REFERENCE BOOK(S)

1. R. Murugesan, January 2007,Mechanics and Mathematical Physics, S. Chand & Company Ltd., New Delhi.
2. D.S. Mathur, Mechanics, S. Chand & Company Ltd., New Delhi.
3. James M. Gere , 2017,Mecánica De Materiales, 7th Edition.
4. Russell C. Hibbeler, 22 March 2010,Mechanics of Materials.
5. Albert Einstein , 15 June 2017,Relativity: The Special and the General Theory.

E- RESOURCES

1.https://youtu.be/R8wKV0UQtlo
2.http://shorturl.at/lmBFL

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SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE

(AUTONOMOUS)

SUNDARAKKOTTAI, MANNARGUDI – 614016

(For the Candidate admitted in the academic year 2021-2022)

DEPARTMENT OF PHYSICS

B. Sc., PHYSICS

Semester: II - CP - II: PHYSICS PRACTICAL II

(**Any Ten Experiments**)

Ins. Hrs. /Week: 3	**Course Credit: 3**	**Course Code: 21PH204P**

OBJECTIVES

- To motivate and educate the students to acquire skill in physics Experiments.

1. Cantilever depression—Scale and Telescope Method.
2. Potentiometer – Calibration of an Ammeter.
3. Spectrometer – µ of the hollow Prism.
4. Concave lens – Focal length determination.
5. Meter bridge - Specific resistance determination.
6. Spectrometer – Grating -   Normal incidence method.
7. Meter bridge – Series and parallel circuit.
8 . Spectrometer – Grating – wavelength of the mercury spectral lines.
9 . Compound pendulum – g and k determination.
10. Potentiometer –Determination of resistance.
11. Determination of thickness of thin wire - Air wedge.
12. Viscosity of a liquid – capillary flow method.
13. Young's modulus uniform bending – Optical lever.
14. Rigidity modulus – Static Torsion.
15. Polarimeter.

Total Lecture Hours - 45

COURSE OUTCOME

1.Compare the thermal conductivity of solids.
2.Analyze the heat capacity of liquids.

TEXT BOOK(S)

1.Dr. S. Somasundaram, Practical Physics, Apsara Publications, Tiruchirappalli, 2012.

REFERENCE BOOK(S)

1. S. Srinivasan, A Text Book of Practical physics, S. Sultan Chand Publications. 2005
2. R. Sasikumar, Practical Physics, PHI Learning Pvt. Ltd, New Delhi, 2011.

E - RESOURCES

1.https://youtu.be/5Rk2klHiPBc
2.https://youtu.be/N0lxwqANsd4

Semester: II / IV - AC- III: Allied Physics – II

Ins. Hrs. /Week: 4   **Course Credit: 3**   **Course Code: 21APY203**

OBJECTIVES
- To acquire the Knowledge on the capacitors.
- To learn about magnetic materials and their applications.
- To gain Knowledge of atom models and the fundamentals of electronics and applications

UNIT- I: Electrostatics 					**(12 Hours)**
Coulomb's inverse square law – Gauss theorem and its applications (Intensity at a point due to a charged
Sphere & cylinder) – Principle of a capacitor – Capacity of a spherical and cylindrical capacitors – Energy stored
in a capacitor – Loss of energy due to sharing of charges - Capacitors in series and parallel.

UNIT -II: Magnetism 						**(12 Hours)**
Intensity of magnetization–Magnetic lines of Force-Magnetic Lines of Induction- Magnetic Susceptibility
Magnetic Permeability –– Types of magnetic materials – Properties of para, dia and ferromagnetic materials,
Cycle of magnetization– Hysteresis – B-H curve – Applications of B-H curve– Ferro magnets, ferrimagnetism
and their applications.

UNIT-III: Atomic Physics 					**(11 Hours)**
Bohr Model - Somerfield's and Vector Atom Models – Pauli's exclusion Principle – Various quantum numbers
and quantization of orbits. X-rays: Continuous and Characteristic X-rays – Mosley's Law and importance,
Bragg's law – Determination of Crystal Structure by Laue's method.

UNIT -IV: Nuclear Physics 					**(12 Hours)**
Introduction – Nucleus – Classification of Nuclei – Nuclear Size – Charge – Mass and Spin – Liquid drop model.
Particle Accelerators-Cyclotron– Betatron and –Nuclear reactor- Four types of reactions– Classifications of
Elementary particles.

UNIT -V: Digital Electronics 					**(13 Hours)**
Decimal – Binary – Octal and Hexa Decimal number systems and their Mutual Conversions – Binary arithmetic
(Addition, Subtraction, Multiplication and Division - Basic logic gates – AND, OR, NOT, NAND, NOR and
EXOR gates – NAND and NOR as universal building gates – Boolean Algebra – Laws of Boolean Algebra –
De Morgan's Theorems – Their verifications using truth tables.

Total Lecture Hours - 60

COURSE OUTCOME

The students will be able to,

1.Identify the Presence of static electric charges and field due to static charges.

2.Know about the magnetic materials and their applications.

3.Understand the different atom models.

4.Know about the applications reactors.

5.Understand the Basic Logic gates.

TEXT BOOK(S)

1.Brilal and N. Subrahmanyam, 2000.A Text Book of Electricity and Magnetism, Ratan Prakasan Mandir

Educational &University Publishers,New Delhi.

2.R. Murugesan., Electricity and Magnetism. 2001. Third Revised edition, S. Chand & Co, New Delhi.

3.R. S. Sedha, 2004. A text book of Digital Electronics, S. Chand & Co, New Delhi, First edition.

4.Mehta V.K., 2014. Principles of Electronics, S. Chand and company Ltd, New Delhi,

5.D.C. Tayal, 2009.Nuclear Physics, Himalaya Publishing House.

REFERENCE BOOK(S)

1. Narayanamurthi, 1988.Electricity and Magnetism, The National Publishing Co, First edition.

2.J. B. Rajam, 1990. Atomic Physics., S. Chand & Company Limited, New Delhi, First edition,

3.Malvino, Digital principles and Applications, McGraw-Hill International Editions, New York, 2002.

4.Albert Paul Malvino, Digital principles and Applications, McGraw-Hill International Editions, New York, 2002.

5.R. Murugesan, Kiruthiga Sivaprasath, Modern Physics, S. Chand &Co Ltd., New Delhi, 14th Revised edition, 2014.

E – RESOURCES

1.https://cutt.ly/Vhlco3J

2.https://bit.ly/39S6kEG

3.https://youtu.be/PYScA3BGphA

4.https://youtu.be/wEu4w4jxq30

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SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE
(AUTONOMOUS)
SUNDARAKKOTTAI, MANNARGUDI – 614016
(For the Candidates admitted in the academic year 2021 – 2022)
DEPARTMENT OF PHYSICS
For the students of I B.Sc. Mathematics / II B.Sc., Chemistry

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Semester: II / IV- AC - IV: ALLIED PHYSICS PRACTICAL - II
(Any 10 Experiments)

Ins. Hrs. /Week: 3　　　　**Course Credit: 2**　　　　**Course Code: 21APY204P**

OBJECTIVES

- To acquire basic understanding of laboratory technique and to educate and motivate the students in the field of Physics.
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1. Potentiometer – Ammeter calibration.
2. Carry Foster's Bridge – Resistance Determination.
3. Meter bridge – Specific resistance.
4. Characteristics of a Zener Diode-Break down voltage.
5. Basic logic gates – AND, OR and NOT gates using discrete components.
6. AND, OR and NOT gates using Ic'S.
7. Verification of NAND and NOR as Universal gates.
8. Verification of De Morgan's theorem.
9. Verification of Boolean algebra (any five).
10. Spectrometer – Grating – Normal incidence.
11. Characteristics of a junction diode –Forward resistance and knee voltage.
12. Potentiometer – low range voltmeter.

Total Lecture Hours - 45

COURSE OUTCOME

1. Understand the laboratory technique and to educate and motivate the students in the field of Physics.

TEXT BOOK(S)

1. Dr.S. Somasundaram, Practical Physics, Apsara Publications, Tiruchirappalli, 2012.
2. R. Sasikumar, Practical Physics, PHI Learning Pvt. Ltd, New Delhi2011.

REFERENCE BOOK(S)

1. S. Srinivasan, A Text Book of Practical Physics., Sultan Chand publications.

E - RESOURCES

1. https://youtu.be/aMrGe2r9nco
2. https://youtu.be/x3VvjHVBGDU

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