

**ANNEXURE 18B04****V.V. VANNIAPERUMAL COLLEGE FOR WOMEN**

(Belonging to Virudhunagar Hindu Nadars)

An Autonomous Institution Affiliated to Madurai Kamaraj University, Madurai

*Re-accredited with 'A' Grade (3<sup>rd</sup> Cycle) by NAAC*

VIRUDHUNAGAR - 626 001

**CHOICE BASED CREDIT SYSTEM****REGULATIONS AND SYLLABUS****(with effect from Academic Year 2018 - 2019)**

V.V. Vanniaperumal College for Women, Virudhunagar, established in 1962, offers 19 UG Programmes, 14 PG Programmes, 6 M.Phil. Programmes and 3 Ph.D. Programmes. All these programmes, except Ph.D. Programmes, have been framed as per the guidelines given by UGC under Choice Based Credit System (CBCS).

The Departments of Commerce, English and History upgraded as Research Centres offer Ph.D. Programmes as per the norms and regulations of Madurai Kamaraj University, Madurai and do not come under the purview of CBCS.

**CHOICE BASED CREDIT SYSTEM (CBCS)**

The CBCS provides an opportunity for the students to choose courses from the prescribed Courses. The CBCS is followed as per the guidelines formulated by the UGC. The Students' performance will be evaluated based on the uniform grading system. Computation of the Cumulative Grade Point Average (CGPA) is made to ensure uniformity in evaluation system.

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**List of Programmes in which CBCS/Elective Course System is implemented**


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**UG PROGRAMMES**

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|--------------------------|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Arts & Humanities        | : | History (E.M. & T.M.), English, Tamil                                                                                                                                                                                     |
| Physical & Life Sciences | : | Mathematics, Zoology, Chemistry, Physics, Biochemistry, Home Science - Nutrition and Dietetics, Costume Design and Fashion, Microbiology, Biotechnology, Computer Science, Information Technology, Computer Applications. |
| Commerce & Management    | : | Commerce, Commerce with Computer Applications, Commerce with Professional Accounting, Business Administration                                                                                                             |

## **PG PROGRAMMES**

Arts & Humanities	:	History, English, Tamil
Physical & Life Sciences	:	Mathematics, Physics, Biochemistry, Food Processing & Quality Control, Chemistry, Zoology, Computer Science, Information Technology, Computer Applications (MCA*)
Commerce & Management	:	Commerce, Business Administration (MBA*)

\* AICTE approved Programmes

## **PRE-DOCTORAL PROGRAMMES (M.Phil.)**

Arts & Humanities	:	History, English, Tamil
Physical & Life Sciences	:	Mathematics, Biochemistry
Commerce & Management	:	Commerce

## **OUTLINE OF CHOICE BASED CREDIT SYSTEM (UG)**

1. Core Courses
2. Elective Courses
  - 2.1. Discipline Specific Elective Courses (DSEC)
  - 2.2. Dissertation / Project
3. Non Major Elective Courses (NMEC)
4. Generic Elective Courses (GEC)
5. Ability Enhancement Courses (AEC)
  - 5.1 Ability Enhancement Compulsory Courses (AECC)
  - 5.2. Skill Enhancement Courses (SEC)

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**List of Non Major Elective Courses (NMEC) offered**


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**UG PROGRAMMES**

Name of the Course	Semester	Department
Indian National Movement (A.D 1885-1947)	III	History(EM)
இந்திய Njrpய இயக்கம் (கி.பி. 1885 – 1947)	III	History (TM)
Constitution of India	IV	History(EM)
இந்தியாவில் அரர்பயல் அமைப்பு	IV	History(TM)
Communication Skills-I	III	English
Communication Skills-II	IV	
இக்காலநீதி இலக்கியம்	III	Tamil
உரைநடை இலக்கியம்	IV	
Basic Hindi - I	III	Hindi
Basic Hindi - II	IV	
Practical Banking	III	Commerce
Basic Accounting Principles	IV	
Business Management	III	Business Administration
Entrepreneurship Development	IV	
Quantitative Aptitude – I	III	Mathematics
Quantitative Aptitude - II	IV	
Physics in Everyday life	III	Physics
Digital Electronics	IV	
Industrial Chemistry-I	III	Chemistry
Industrial Chemistry-II	IV	
Applied Zoology	III	Zoology
Animal Science	IV	
Basic Food Science	III	Home Science – Nutrition and Dietetics
Basic Nutrition and Dietetics	IV	
Women and Health	III	Biochemistry
Life style associated disorders	IV	
Medical Lab Technology	III	Microbiology
Applied Microbiology	IV	
Infectious Diseases	III	Biotechnology
Organic Farming	IV	
Basics of Fashion	III	Costume Design And Fashion
Interior Designing	IV	
Introduction to Computers and Office Automation	III	Computer Science
Introduction to Internet and HTML 5	IV	
Computer Fundamentals and E-mail	III	Information Technology
Introduction to HTML	IV	
Fundamentals of Computers	III	Computer Applications
Web Design with HTML	IV	
Horticulture – I	III	Botany
Horticulture – II	IV	
மருத்துவ தாவரவியல் - I	III	
மருத்துவ தாவரவியல் - II	IV	
Library and Information Science – I	III	Library Science
Library and Information Science - II	IV	

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**List of Generic Elective Courses (GEC) Offered**

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**GENERIC ELECTIVE COURSES – 1**

1. Human Rights /
2. Women Studies

**GENERIC ELECTIVE COURSES – 2**

1. Constitution of India /
2. Modern Economics /
3. Adolescent Psychology /
4. Disaster Management

**ABILITY ENHANCEMENT COMPULSORY COURSES (AECC)**

1. Environmental Studies
2. Value Education

மேல்நிலை கல்வி வரை தமிழை முதன்மைப் பாடமாக எடுத்து படிக்காத மாணவிகள் கீழ்க்கண்டப் பாடங்களை கட்டாயம் படிக்க வேண்டும்

1. அடிப்படை தமிழ் - எழுத்தறிதல்
2. அடிப்படைத் தமிழ் - மொழித்திறனறிதல்

**ELIGIBILITY FOR ADMISSION**

Candidate should have passed the Higher Secondary Examination conducted by the Board of Higher Secondary Education, Tamil Nadu or any other equivalent Examination accepted by Academic Council with Mathematics as one of the subjects in Higher Secondary Course.

**DURATION OF THE PROGRAMME**

The candidates shall undergo the prescribed Programme of study for a period of three academic years (six semesters).

**MEDIUM OF INSTRUCTION**

English

**COURSES OFFERED**

Part I	:	Tamil/Hindi
Part II	:	English
Part III	:	Core Courses
		Elective Courses: Discipline Specific Electives Courses Dissertation / Field Project
		Allied Courses: 1. Mathematics 2. Applied Electronics and Instrumentation
Part IV	:	Non-Major Elective Courses (NMEC)
		Generic Elective Courses (GEC)
		Ability Enhancement Compulsory Courses (AECC)
		Skill Enhancement Courses (SEC)
Part V	:	National Service Scheme, Physical Education, Youth Red Cross Society, Red Ribbon Club, Science Forum, Eco Club, Library and Information Science, Consumer Forum, Health and Fitness Club

Study Tour/ Field visit is mandatory for UG students.

Internship / Field Project is compulsory for II year UG Science students

**Internship:** A designated activity that carries one credit involving more than 7 days of working in an organization under the guidance of an identified mentor

**Field Project:** Project students need to undertake project that involve conducting surveys inside/outside the college premises and collection of data from designated communities or natural places.

**EVALUATION SCHEME**

Components	Internal Assessment Marks	External Examination Marks	Total Marks
Theory	25	75	100
Practical	40	60	100
Project	40	60	100

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**PART III - Core Courses, Discipline Specific Elective Course**


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**INTERNAL ASSESSMENT****Distribution of Marks****Theory**

<b>Mode of Evaluation</b>		<b>Marks</b>
Periodic Test	:	15
Assignment	:	5
Quiz	:	5
<b>Total</b>	:	<b>25</b>

Three Periodic Tests - Average of the best two will be considered

Two Assignments - Better of the two will be considered

Three Quiz Tests - Best of the three will be considered

**Practical**

<b>Mode of Evaluation</b>		<b>Marks</b>
Model Test	:	30
Performance	:	10
<b>Total</b>	:	<b>40</b>

Two Model Tests - Best one will be considered

Performance - Attendance and Record

**Question Pattern for Periodic Tests****Duration: 2 Hours**

<b>Section</b>	<b>Types of Question</b>	<b>No. of Questions</b>	<b>No. of Questions to be answered</b>	<b>Marks for each Question</b>	<b>Total Marks</b>
A Q.No.(1- 4)	Multiple Choice	4	4	1	4
B Q.No.(5- 6)	Internal Choice	2	2	5	10
C Q.No.(7-9)	Open Choice	3	2	10	20
D Q.No.(10-12)	Open Choice Problems only	3	2	5.5	11
<b>Total</b>					<b>45</b>

**For Core courses - Nano Science, Classical & Statistical Mechanics and Medical Physics.**

**Question Pattern for Periodic Tests**

**Duration: 2 Hours**

Section	Type of Question	No. of Questions	No. of Questions to be answered	Marks for each question	Total Marks
A Q. No.(1- 4)	Multiple choice	4	4	1	4
B Q. No.(5 - 7)	Either or type	3	3	7	21
C Q. No.(8-10)	Open choice	3	2	10	20
<b>Total</b>					<b>45</b>

**EXTERNAL EXAMINATION**

**Question Pattern**

**Duration: 3 Hours**

Section	Types of Question	No. of Questions	No. of Questions to be answered	Marks for each Question	Total Marks
A Q. No.(1- 10)	Multiple Choice (Atleast Two question from each unit)	10	10	1	10
B Q. No.(11 -15)	Internal Choice – Either Or type	5	5	5	25
C Q. No.(16-20)	Open Choice (one question from each unit)	5	3	10	30
D* Q. No.(21-24)	Open Choice – Problems only	4	2	5	10
<b>Total</b>					<b>75</b>

**\*Question pattern for Core courses - Nano Science, Classical & Statistical Mechanics, Medical Physics and Allied Physics & Allied Electronics.**

**Question Pattern****Duration: 3 Hours**

Section	Type of Question	No. of Questions	No. of Questions to be answered	Marks for each question	Total Marks
A Q. No.(1- 10)	Multiple choice (Atleast Two questions from each unit)	10	10	1	10
B Q. No.(11 -15)	Either or type (one set from each unit)	5	5	7	35
C Q. No.(16-20)	Open Choice (one from each unit)	5	3	10	30
<b>Total</b>					<b>75</b>

**ONLINE ASSESSMENT**

Online Test will be conducted for the Core/Discipline Specific Elective Courses in IV, V & VI Semester.

Multiple Choice question Pattern will be followed.

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**PART IV - Skill Enhancement Courses and Non Major Elective Courses**


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**INTERNAL ASSESSMENT****Distribution of Marks****Theory**

Mode of Evaluation		Marks
Periodic Test	:	25
Assignment	:	10
Quiz	:	5
<b>Total</b>	<b>:</b>	<b>40</b>

Three Periodic tests - Average of the best two will be considered

Two Assignments - Better of the two will be considered

Three Quiz Tests - Best of the three will be considered



**Question Pattern****Duration: 1 Hour**

Section	Types of Question	No. of Questions	No. of Questions to be answered	Marks for each Question	Total Marks
A Q. No.(1- 4)	Open Choice	4	3	5	15
B Q. No.(5- 6)	Open Choice	2	1	10	10
<b>Total</b>					<b>25</b>

**EXTERNAL EXAMINATION****Question Pattern****Duration: 2 Hours**

Section	Types of Question	No. of Questions	No. of Questions to be answered	Marks for each Question	Total Marks
A Q. No.(1- 8)	Open Choice	8	6	5	30
B Q. No.(9- 13)	Open Choice	5	3	10	30
<b>Total</b>					<b>60</b>

**PART IV - Generic Elective Courses and Ability Enhancement Compulsory Courses**

- Assessment by Internal Examiner only
- Model Examination is conducted after two periodic tests.
- Book and Study Material prepared by the Faculty Members of the respective departments will be prescribed.

**ASSESSMENT PATTERN**

Mode of Evaluation		Marks
Periodic Test	:	30
Assignment	:	10
Model Examination	:	60
<b>Total</b>	<b>:</b>	<b>100</b>

Two Periodic tests - Best of the two will be considered

Two Assignments - Best of the two will be considered

**Question Pattern for Periodic Test****Duration: 1 Hour**

Section	Types of Question	No. of Questions	No. of Questions to be answered	Marks for each Question	Total Marks
A Q. No.(1- 4)	Open Choice	4	3	6	18
B Q. No.(5- 6)	Open Choice	2	1	12	12
<b>Total</b>					<b>30</b>

**Question Pattern for Model Examination****Duration: 2 Hours**

Section	Types of Question	No. of Questions	No. of Questions to be answered	Marks for each Question	Total Marks
A Q. No.(1- 8)	Open Choice	8	5	6	30
B Q. No.(9- 13)	Open Choice	5	3	10	30
<b>Total</b>					<b>60</b>

**EXTRA CREDIT COURSES (Optional)**
 Assessment by Internal Examiner only
**Question Pattern for Internal Examination****Duration: 2 Hours**

Section	Type of Question	No. of Questions	No. of Questions to be answered	Marks for each Question	Total Marks
A Q. No.(1 -30)	Multiple Choice Questions	30	30	1	30
B Q.No.(31 -38)	Open Choice (one from each unit)	8	5	5	25
C Q. No.(39-43)	Open Choice (one from each unit)	5	3	15	45
<b>Total</b>					<b>100</b>

## ELIGIBILITY FOR THE DEGREE

- i) The candidate will not be eligible for degree without completing the prescribed Courses of study and a minimum Pass marks in all the Courses.
- ii) Attendance, progress and conduct certification from the Head of the Institution will be required for the students to write the examination.
  - No Pass minimum for Internal Assessment.
  - Pass minimum for External Examination is 27 marks out of 75 marks for Core Courses, Allied Courses and Discipline Specific Elective Courses.
  - Pass minimum for External Examination is 21 marks out of 60 marks for Non Major Elective Courses and Skill Enhancement Courses.
  - The aggregate minimum pass percentage is 40.
  - Pass minimum for External Practical Examination is 21 marks out of 60 marks.
  - Pass minimum for Generic Elective Course and Ability Enhancement Compulsory Course is 40.

## ATTENDANCE

The following rules are applicable to the students of all UG, PG and M.Phil. Programmes with effect from 2018-2019.

- a) The students with an attendance of 85% and above are permitted to appear for the Summative Examinations without any condition.
- b) The students with 78% - 84 % of attendance are permitted to appear for the Summative Examinations by paying a fine of ₹500/-
- c) The students with 66% - 77% of attendance can appear for the Summative Examinations only after getting special permission from the Principal. Special permission shall be granted by the Principal only on medical grounds and those students should also pay a fine of ₹1000/- along with the application form for exemption. If permission is not granted, they have to appear for the Summative Examinations in the next Semester by paying a fine of ₹1000/-
- d) The students who have less than 65% of attendance cannot appear for the Summative Examinations and have to repeat the whole semester.
- e) For Part V Courses, the students require 75% of attendance to get the required credit.
- f) For Certificate, Diploma, Advanced Diploma and Post Graduate Diploma Programmes, the students require 75% of attendance to appear for the Theory/Practical Examinations.

**BACHELOR OF PHYSICS**  
**PROGRAM CODE - 2016**

**PROGRAMME OUTCOMES**

- Encourage intellectually disciplined process of thinking in analyzing, synthesizing, evaluating and applying scientific concepts.
- Develop good rapport with fellow-beings through efficient oral, written and technical communication.
- Connect with the society to transform ideas into action.
- Volunteer support in spreading scientific temperament and stand for the national cause in all core issues.
- Uphold the values and beliefs inherent in the nation's tradition and culture.
- Strive to preserve nature in all forms for a sustainable future.
- Develop an independent and self-disciplined specialized learning in tune with the changing socio-technological scenario

**PROGRAMME SPECIFIC OUTCOMES**

- ✚ Provide a route for many careers and opportunities that exists all over the world.
- ✚ Apply ideas and techniques in Physics to drive developments in other related subject areas including Mathematics, Chemistry, Computing, Material Science, Medicine and Life Science.
- ✚ Include knowledge and skills such as, a practical approach to solve problems, the ability to reason out and communicate complex ideas, and the facility to use ICT.
- ✚ Recognize how observation, experiment and theory work together to expand the frontiers of knowledge of the Physical universe.



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### PART I TAMIL

S.No.	Sem.	Code	Title of the Course	Credits	Marks
1.	I	18UTAG11	தாள்: 1 பொதுத்தமிழ்	3	100
2.	II	18UTAG21	தாள்: 2 பொதுத்தமிழ்	3	100
3.	III	18UTAG31	தாள்: 3 பொதுத்தமிழ்	3	100
4.	IV	18UTAG41	தாள்: 4 பொதுத்தமிழ்	3	100
<b>TOTAL</b>				<b>12</b>	<b>400</b>

### PART I HINDI

S.No.	Sem.	Code	Title of the Course	Credits	Marks
1.	I	18UHGD11	Prose – I & II, Ekganki - I, Short stories, Functional Hindi – I & Grammar	3	100
2.	II	18UHGD21	Drama, Ekganki – II, Letter Correspondence, Functional Hindi-II & Grammar	3	100
3.	III	18UHGD31	Ancient poetry, Drama, Indian History, Poetics and functional Hindi-III	3	100
4.	IV	18UHGD41	Modern poetry, History of Modern Hindi Literature and functional Hindi -IV	3	100
<b>TOTAL</b>				<b>12</b>	<b>400</b>

**PART II**

S.No.	Sem.	Code	Title of the Course	Credits	Marks
1.	I	18UENG11A	English for Advanced Learners - I	3	100
		18UENG11B	English for Career Guidance - I		
		18UENG11C	English for Communicative Competence-I		
2.	II	18UENG21A	English for Advanced Learners - II	3	100
		18UENG21B	English for Career Guidance - II		
		18UENG21C	English for Communicative Competence - II		
3.	III	18UENG31A	English for Advanced Learners - III	3	100
		18UENG31B	English for Career Guidance – III		
		18UENG31C	English for Communicative Competence - III		
4.	IV	18UENG41A	English for Advanced Learners - IV	3	100
		18UENG41B	English for Career Guidance – IV		
		18UENG41C	English for Communicative Competence - IV		
<b>TOTAL</b>				<b>12</b>	<b>400</b>

**PART III – CORE, DISCIPLINE SPECIFIC ELECTIVE COURSES**

S.No.	Sem.	Code	Title of the Course	Credits	Marks
1	I	18UPHC11	Mechanics and Properties of matter	4	100
2	I	18UPHC12	Electricity	4	100
3	II	18UPHC21	Electromagnetism	4	100
4	II	18UPHC22	Heat and Thermodynamics	4	100
5	II	18UPHC21P	Core Practical- I	2	100
6	III	18UPHC31	Optics and Spectroscopy	5	100
7	IV	18UPHC41	Atomic Physics, Quantum Mechanics and Relativity	5	100
8	IV	18UPHC41P	Core Practical –II	2	100
9	V	18UPHC51	Nuclear and Particle Physics	4	100
10	V	18UPHC52	Analog Electronics	4	100
11	V	18UPHC53	Classical and Statistical Mechanics	4	100
12	V	18UPHE51/ 18UPHE52	Discipline Specific Elective 1 (DSEC 1) 1. Material Science 2. Cellular Mobile Communication	4	100
13	V	18UGOL51	Online Assessment	1	50
14	VI	18UPHC61	Mathematical Physics	4	100
15	VI	18UPHC62	Digital Electronics	4	100
16	VI	18UPHC63	Nano Science	4	100

17	VI	18UPHE61/ 18UPHE62	Discipline Specific Elective 2 (DSE 2) 1. Medical Physics 2. Micro Controller 8051	4	100
18	VI	18UGOL61	Online Assessment	1	50
19	VI	18UPHC61P	Core Practical –III	3	100
20	VI	18UPHC62P	Core Practical –IV	3	100
21	VI	18UPHC63P	Practical –V	2	100
<b>Total</b>				<b>72</b>	<b>2000</b>

**PART III – ALLIED COURSE I- MATHEMATICS**

S.No.	Sem.	Code	Title of the Course	Credits	Marks
1.	I	18UMTA11	Mathematics –I	4	100
2.	II	18UMTA21	Mathematics – II	3	100
		18UMTA22	Mathematics - III	3	100
<b>Total</b>				<b>10</b>	<b>300</b>

**PART III - ALLIED COURSE II- APPLIED ELECTRONICS AND INSTRUMENTATION**

S.No.	Sem.	Code	Title of the Course	Credits	Marks
1.	III	18UEIA31	Basic Electronics	4	100
2.	IV	18UEIA41	Electronics Instruments and Measuring Techniques	4	100
	IV	18UEIA41P	Allied Practical -I	2	100
<b>Total</b>				<b>10</b>	<b>300</b>

**PART IV - SKILL ENHANCEMENT COURSES**

S.No.	Sem.	Code	Title of the Course	Credits	Marks
1.	II	18UPHS21	Programming in C	2	100
2.	III	18UPHS31	Solar Energy	2	100
3.	IV	18UPHS41	Astrophysics	2	100
4.	V	18UPHS51	Communication Electronics	2	100
5.	V	18UPHS52	Microprocessor	2	100
6.	VI	18UPHS61	Applied Optics	2	100
<b>Total</b>				<b>12</b>	<b>600</b>

**PART IV – NON MAJOR ELECTIVE COURSES**

S.No.	Sem.	Code	Title of the Course	Credits	Marks
1.	I	18UPHN31	Physics in Everyday life	2	100
2.	II	18UPHN41	Fundamentals of Electronics	2	100
<b>Total</b>				<b>4</b>	<b>200</b>

**PART IV – GENERIC ELECTIVE AND ABILITY ENHANCEMENT  
COMPUSORY COURSES**

S.No.	Sem.	Code	Title of the Course	Credits	Marks		
1.	I	18UGVE11	Value Education	2	100		
2.	III	18UGHR31 18UGWS32	Human Rights / Women studies	1	100		
3.	IV	18UGEC41/	Constitution of India /	1	100		
4.		18UGEM42/	Modern Economics /				
6.		18UGEA43/	Adolescent Psychology /				
7.		18UGED44	Disaster Management				
8.		18UPHI41G	Internship/Field Project			1	100
9.		Part V	Extension Activities			1	-
10.	V	18UGES51	Environmental Studies	2	100		
<b>Total</b>				<b>8</b>	<b>500</b>		

**PART –V - EXTENSION ACTIVITIES**

S.No.	Sem.	Code	Title of the Course	Credit
1.	I, II, III & IV	18UVNS1	National Service Scheme	1
2.		18UVNS2	Physical Education	
3.		18UVYR1 18UVYR2	Youth Red Cross Society	
4.		18UVRR1	Red Ribbon Club	
5.		18UVSF1	Science Forum	
6.		18UVEC1	Eco Club	
7.		18UVLI1	Library and Information Science	
8.		18UVCC1	Consumer Forum	
9.		18UVHF1	Health and Fitness Club	

**EXTRA CREDIT COURSES (Optional)**

S.No.	Sem.	Code	Title of the Course	Credits	Total Marks
1.	V	18UPH051	*Project (Internal Only)	2	100
2.	VI	18UPH061	Physics for competitive examination – (Internal only)	2	100

\*Project – Based on Physics/ Electronics / Energy Audit



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## BACHELOR OF PHYSICS

Programme Code – 2016

Semester	Course Code	Courses	Hours per week	Credits	Total Marks		
					Int.	Ext.	
I	Part I	18UTAG11	Tamil/Hindi I	6	3	25	75
	Part II	18UENG11	English I	6	3	25	75
	Part III	18UPHC11	<b>Core Course -1</b> Mechanics and Properties of matter	4	4	25	75
		18UPHC12	<b>Core Course - 2</b> Electricity	4	4	25	75
		18UPHC21P	<b>Core Course</b> Practical – I General Physics -I	2	-	-	-
		18UMTA11	<b>Allied Course –I</b> Mathematics - 1	6	4	25	75
	Part IV	18UGVE11	Value Education	2	2	40	60
<b>TOTAL</b>			<b>30</b>	<b>20</b>	<b>600</b>		

Semester	Course Code	Courses	Hours per week	Credits	Total Marks		
					Int.	Ext.	
II	Part I	18UTAG21	Tamil /Hindi II	6	3	25	75
	Part II	18UENG21	English II	6	3	25	75
	Part III	18UPHC21	<b>Core Course - 3</b> Electromagnetism	4	4	25	75
		18UPHC22	<b>Core Course - 4</b> Heat and Thermodynamics	4	4	25	75
		18UPHC21P	<b>Core Course</b> Practical –I General Physics -I	2	2	40	60
		18UMTA21	<b>Allied Course -I</b> Mathematics - 2	3	3	25	75
		18UMTA22	Mathematics - 3	3	3	25	75
	Part IV	18UPHS21	<b>SEC -1</b> Programming in C	2	2	40	60
		<b>TOTAL</b>			<b>30</b>	<b>24</b>	<b>800</b>

Semester	Course Code	Courses	Hours per week	Credits	Total Marks		
					Int	Ext	
III	Part I	18UTAG31	Tamil/ Hindi III	6	3	25	75
	Part II	18UENG31	English III	6	3	25	75
	Part III	18UPHC31	<b>Core Course -5</b> Optics and Spectroscopy	5	5	25	75
		18UPHC41P	<b>Core Course</b> Practical – 2 General Physics -II	2	-	-	-
		18UEIA31 18UEIA41P	<b>Allied-Course -II</b> Basic Electronics Allied Electronics Practical -1	4 2	4 -	25 -	75 -
	Part IV	18UPHS31	<b>SEC -2</b> Solar Energy harvesting	2	2	40	60
		18UPHN31	<b>NMEC-1</b> Physics in Everyday life	2	2	40	60
	Part IV	18UGHR31 18UGWS32	<b>Generic Elective -1</b> 1.Human Rights/ 2. Women studies	0	1	40	60
		18UGEC41/	<b>Generic Elective -2</b> Constitution of India/	1	-	-	-
		18UGEM42/	Modern Economics/				
		18UGEA43/	Adolescent psychology/				
		18UGED44	Disaster Management				
		<b>TOTAL</b>			<b>30</b>	<b>20</b>	<b>700</b>

Semester	Course Code	Courses	Hours per week	Credits	Total Marks		
					Int	Ext	
IV	Part I	18UTAG41	Tamil /Hindi IV	6	3	25	75
	Part II	18UENG41	English IV	6	3	25	75
	Part III	18UPHC41	<b>Core Course - 6</b> Atomic Physics, Quantum Mechanics and Relativity	5	5	25	75
		18UPHC41P	<b>Core Course</b> Practical –2 General Physics -II	2	2	40	60
		18UEIA41	<b>Allied Course – II</b> Electronics Instruments and measuring techniques Allied Electronics	4	4	25	75
		18UEIA41P	Practical – 1	2	2	40	60
	Part IV	18UPHS41	<b>SEC -3</b> Astrophysics	2	2	40	60
		18UPHN41	<b>NMEC-2</b> Fundamentals of Electronics	2	2	40	60
		18UPHI41G	Internship/Field Project	0	1	100	-
			<b>Generic Elective -2</b>				
		18UGEC41	Constitution of India	1	1	100	-
		18UGEM42	Modern Economics				
		18UGEA43	Adolescent Psychology				
		18UGED44	Disaster Management				
	Part V		Extension Activities	-	1	-	
		<b>TOTAL</b>	<b>30</b>	<b>26</b>	<b>1000</b>		

Semester	Course Code	Courses	Hours per week	Credits	Total Marks		
					Int.	Ext.	
V	Part III	18UPHC51	<b>Core Course – 7</b> Nuclear and Particle Physics	4	4	25	75
		18UPHC52	<b>Core Course - 8</b> Analog Electronics	4	4	25	75
		18UPHC53	<b>Core Course – 9</b> Classical and Statistical Mechanics	4	4	25	75
		18UPHC61P	<b>Core Course</b> Practical -3 General Physics -III	3	-	-	-
		18UPHC62P	<b>Core Course</b> Practical - 4 Electronics	3	-	-	-
		18UPHC63P	<b>Core Course</b> Practical -5 Digital Electronics	2	-	-	-
		18UPHE51 18UPHE52	<b>DSEC -1</b> 1.Material Science 2.Cellular Mobile Communication	4	4	25	75
		18UGOL51	Online Assessment	-	1	50	
	Part IV	18UPHE51	<b>SEC -4</b> Communication Electronics.	2	2	40	60
		18UPHE52	<b>SEC -5</b> Microprocessor	2	2	40	60
		18UGES51	Environmental Studies	2	2	100	-
			<b>TOTAL</b>	<b>30</b>	<b>23</b>	<b>750</b>	

Semester		Course Code	Courses	Hours per week	Credits	Total Marks	
						Int.	Ext.
VI	Part III	18UPHC61	<b>Core Course -10</b> Mathematical Physics	5	4	25	75
		18UPHC62	<b>Core Course -11</b> Digital Electronics	5	4	25	75
		18UPHC63	<b>Core Course -12</b> Nano science	5	4	25	75
		18UPHC61P	<b>Core Course</b> Practical -3 General Physics -III	3	3	40	60
		18UPHC62P	<b>Core Course</b> Practical -4 Electronics	3	3	40	60
		18UPHC63P	<b>Core Course</b> Practical -5 Digital Electronics	2	2	40	60
		18UPHE61 18UPHE62	<b>DSEC -2</b> 1. Medical Physics 2. Micro Controller 8051	5	4	25	75
	18UGOL61	Online Assessment	-	1	50		
	Part IV	18UPHS61	<b>SEC -6</b> Applied Optics	2	2	40	60
<b>TOTAL</b>				<b>30</b>	<b>27</b>	<b>850</b>	



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VIRUDHUNAGAR - 626 001

## B.Sc. PHYSICS (SEMESTER)

(2018 -2019 onwards)

Semester I	<b>MECHANICS AND PROPERTIES OF MATTER</b>	Hours/Week: 4	
Core Course-1		Credits: 4	
Course Code <b>18UPHC11</b>		Internal 25	External 75

### COURSE OUTCOME

On completion of the course, the students shall be able to

- understand the basic laws and concepts of dynamic bodies
- know the concepts of rotational motion
- get an indepth knowledge about gravitation, satellite and rocket propulsion system
- understand the basic concepts of elasticity
- study the motion of viscous liquids
- have an in-depth knowledge about surface tension

### UNIT I

Mechanics of a particle – conservation of linear momentum – conservation of angular momentum - energy conservation principle – central force – central orbit – characteristics of motion under central force – general equation to any central orbit – Kepler's law of planetary motion – law of gravitation from Kepler's law – derivation of Kepler's law – center of mass – velocity and acceleration of center of mass during motion – center of mass of two particles – reduced mass – collision (elastic and inelastic) – laboratory frame and center of mass frame – perfectly elastic collision in one dimension – final velocity after collision in one dimension – coefficient of restitution. (12 Hours)

### UNIT II

Rotational effect of a force – second condition of equilibrium - couple and its torque- angular velocity – angular acceleration - rotation with constant angular acceleration – kinetic energy of rotation (moment of inertia) – work and power in

rotation – torque and angular acceleration - moment of inertia – radius of gyration - angular momentum (angular impulse) – conservation of angular momentum – rectilinear versus rotational motion – moment of inertia - two important theorems – body rolling without slip down an inclined plane. (12Hours)

### UNIT III

Law of universal gravitation - mass and mean density of the earth – determination of gravitational constant: Boy’s method – accepted values of  $G$  and  $\rho$  - properties of gravitation - gravitational field and potential – special cases of potential and attraction.-Laws of simple pendulum – verification of the laws – variation of ‘ $g$ ’ the acceleration due to gravity - compound pendulum – equivalent simple pendulum – properties of center of oscillation and suspension – Rocket – equation of motion of a rocket moving in a straight line – artificial satellites – geo-stationary satellite – perigee and apogee of a satellite – escape velocity. (12 Hours)

### UNIT IV

Elasticity – different moduli of elasticity – relation between the elastic moduli – determination of Poisson’s ratio for rubber - torsion – expression for a torque per unit twist – work done in twisting a wire – Torsional oscillations of a body – rigidity modulus by Torsion pendulum.-Bending of beams – expression for the bending moment – depression of the loaded end of a cantilever – measurement of  $E$  (using microscope) – depression at the mid-point of a beam loaded at the middle – uniform bending of a beam – measurement of Young’s modulus by bending of a beam. (12Hours)

### UNIT V

Viscosity– streamline flow and turbulent flow – Poiseuille’s formula for the flow of a liquid through a capillary tube – determination of coefficient of viscosity of a liquid – terminal velocity and Stokes’ formula – Stokes’ method for the determination of coefficient of viscosity of a viscous liquid – variation of viscosity with temperature and pressure – friction and lubrication.-Surface tension – explanation of surface tension on kinetic theory – work done in blowing a bubble – forms of liquid drops – angle of contact – pressure difference across a liquid surface – excess pressure inside a curved liquid surface – Jaegar’s method. equation of continuity – energy of a liquid - Bernoulli’s theorem – application of Bernoulli’s theorem (Torricelli’s theorem & Venturimeter). (12 Hours)

### TEXT BOOKS

1. Gupta, A.B, (2011), *College Physics (Volume 1) – Mechanics Properties of Matter, Heat and Thermodynamics*. Books and Allied (P) Ltd, Kolkata
2. Murugesan, R, (2016) *Properties of Matter*, Sultan Chand & Company Private Ltd, New Delhi

### BOOK 1:

- UNIT 1: SECTION - 3.1(3.1.1, 3.1.2, 3.1.3),  
SECTION - 8.1(8.1.1), 8.2, 8.4, 8.5, 8.6  
SECTION - 9.1, 9.2, 9.3, 9.4, 9.6 - 9.11
- UNIT 2: SECTION - 5.1, 5.2, (5.2.1, 5.2.2) 5.3 - 5.15, 5.17
- UNIT 3: SECTION - 4.1, 4.2, 4.3(4.3.2), 4.4, 4.5, 4.6, 4.7  
SECTION - 6.1, 6.1.1, 6.1.2, 6.3, 6.5(6.5.1, 6.5.2 )  
SECTION - 10.1 - 10.4, 10.6, 10.7

### BOOK 2:

- UNIT IV : CHAPTER 1 – 1.1, 1.2, 1.7, 1.8, 1.9, 1.12, 1.13  
CHAPTER 1 – 1.14 - 1.17, 1.19 - 1.21
- UNIT V : CHAPTER 2 – 2.1- 2.3, 2.5, 2.8 - 2.11  
CHAPTER 3 – 3.1, 3.2, 3.4, 3.5, 3.6, 3.8, 3.9, 3.11  
CHAPTER 4 – 4.1, 4.2, 4.4

### REFERENCE BOOKS

1. Mathur, D.S, (2012), *Mechanics*, Sultan Chand & Company Private Ltd, New Delhi.
2. Gupta, A.B, (2009), *Classical Mechanics and Properties of Matter*, Books and Allied Private Ltd, Calcutta.
3. Mathur, D.S, (2008), *Elements of Properties of Matter*, Sultan Chand & Company Private Ltd, New Delhi.
4. Haliday Resnick, D & Walker, J, (2006), *Fundamentals of Physics*, 6<sup>th</sup> edition Wiley New York, USA.
5. Brijlal & Subrahmanyam, N, (2016), *Properties of Matter*, Sultan Chand & Company, Private Ltd, New Delhi.





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VIRUDHUNAGAR - 626 001

### B.Sc. PHYSICS (SEMESTER)

(2018 -2019 onwards)

Semester I	<b>ELECTRICITY</b>	Hours/Week: 4	
Core Course-2		Credits: 4	
Course Code <b>18UPHC12</b>		Internal 25	External 75

### COURSE OUTCOME

On completion of the course, the students shall be able to

- know the fundamentals of Electricity
- understand the basic laws of Electricity and its applications.
- know about the basic properties of capacitors.
- understand the construction and working of various types of capacitors.
- acquire knowledge and understanding of fundamental principles of the Magnetic effects of current.
- know about the Thermal effects of current.

### UNIT I

Electrostatics –Electric charge-Coulomb's law of force - the electric field - intensity of electric field - flux of the electric field- electric flux over a closed surface- Gauss's law-application of the Gauss's law-electric field due to a uniformly charged sphere at a point outside, on the surface and inside-field of a line charge-field of a sheet of charge- field of charged conductor-electrostatic energy in the medium surrounding the charged conductor-potential difference-relation between  $\mathbf{E}$  and  $V$ -potential due to point charge-potential and field due to a uniformly charged disc at an axial point, at a long distance point and at the centre of the disc. (12 Hours)

### UNIT II

Electric capacity-capacity of a spherical conductor-energy of charged conductor-sharing of charges-loss of energy-capacitor-expression for the capacity -

parallel plate capacitor-parallel plate capacitor partially filled with dielectric-cylindrical capacitor-spherical capacitor – Energy stored in a capacitor. (10 Hours)

### UNIT III

Current and current density-Ohm's law-Kirchoff's law-application of Kirchoff's laws to Wheatstone's bridge- sensitivity of a Wheatstone's bridge - Carey Foster's bridge-determination of the resistance of the given wire with the necessary theory – potentiometer-uses of the potentiometer-comparison of emf 's of two cells-determination of internal resistance of the cell-measurement of current-measurement high emf-measurement of very small emf. (12 Hours)

### UNIT IV

The Seebeck effect - the variation of the Seebeck electromotive force with temperature–the Peltier effect – distinction between Joule and Peltier effects – Application of Thermodynamics to the thermo electric effect - the Thomson effect– Theory of thermoelectric circuit - Laws of thermoelectric circuits (law of intermediate temperatures, law of intermediate metals) – thermoelectric power. (10 Hours)

### UNIT V

The Biot - Savart law – application of Biot- Savart law – magnetic field due to steady current in a long straight wire – magnetic field along the axis of circular coil – magnetic field at the centre of a circular current loop – field on axis of solenoid - Ampere's law – proof of Ampere's law – moving coil galvanometer – Ballistic Galvanometer – current and voltage sensitivities of moving coil galvanometer – Damping – Application of Ballistic galvanometer – comparison of emfs of two cells – comparison of two capacitances –conversion of galvanometer to ammeter and voltmeter. (16 Hours)

### TEXT BOOKS

1. Tiwari, K.K, (2011), *Electricity and Magnetism*, Sultan Chand & Company Private Lld, New Delhi.
2. Sehgal Chopra Sehgal, (2004), *Electricity and Magnetism*, Sultan Chand & Sons, New Delhi.

## **BOOK I**

UNIT 1: SECTION - 4.1,4.2,4.7,4.12,4.18,4.21,4.24(1,4,7,9), 4.25,4.26

5.2, 5.3, 5.5, 5.15(2)

UNIT II: SECTION - 5.19, 5.20, 6.1-6.3, 6.5, 6.10

UNIT III: SECTION - 8.6, 8.9, 8.17-8.19

UNIT V: SECTION - 10.2, 10.4(1, 4, 5), EX 10.3, 10.7, 10.8, 9.10, 9.13, 9.14, 9.15

## **BOOK II**

UNIT IV: SECTION - 17.2, 17.3,17.5, 17.6, 17.7,17.10, 17.11, 17.14, 17.15, 17.18

UNIT III: SECTION - 15.4, 15.9, 15.10, 15.11.1, 15.11.2, 15.11.4, 15.11.5, 15.11.6

## **REFERENCE BOOKS**

1. Edward M, Purcell, (2008), *Electricity and Magnetism*, Tata Mc Graw-Hill Publishing Company Ltd, New Delhi.
2. Murugesan, R, (2011), *Electricity and Magnetism*, Sultan Chand & Company Private Ltd, New Delhi.
3. JoseRobin,G, Ubald Raj, A, (2013), *Electricity and Magnetism*, Indira Publication, Marthandam.

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VIRUDHUNAGAR - 626 001

**B.Sc / BCA Programmes**

**(2018 -19 onwards)**

Semester I	<b>VALUE EDUCATION</b>	Hours/Week: 2	
Ability Enhancement Compulsory Course		Credits: 2	
Course Code <b>18UGVE11</b>		Internal 100	External -

### COURSE OUTCOMES

On completion of the course, the students will be able to

- instill moral values of life in mind of students
- realize potential of human being and glory of human life
- be aware of Indian culture and heritage
- be aware of their rights as women and thereby enabling them to meet the challenges of life.

#### UNIT: I - Values of Life

Introduction - Definition of Values - Significance of Values - Classification of Values – Need for Value Education.

#### UNIT II: Values for Individual Welfare

Honesty and Integrity- Punctuality- Positive Thinking - Commitment at the Workplace .

#### UNIT III: Values for Familial Welfare/Peace

Respect and Love for Elders – Truthfulness- Harmonious Relationship – Hospitality.

#### UNIT IV: Values for Social Welfare/Prosperity

Patriotism and Non-Violence-Human Rights-Women's Rights.

#### UNIT V: Values for Spiritual Welfare/Well being

Faith in God- Meditation- Purity- Self Surrender.

#### BOOK PRESCRIBED

Maithili.B & Thilakam.C., *et al.* (2014) . *Value Education*. Chennai: New Century Book, House (P) Ltd.



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### B.Sc. PHYSICS (SEMESTER)

(2018 -2019 onwards)

Semester II	<b>ELECTROMAGNETISM</b>	Hours/Week: 4	
Core Course-3		Credits: 4	
Course Code <b>18UPHC21</b>		Internal 25	External 75

### COURSE OUTCOME

On completion of the course, the students shall be able to

- understand the basic concepts of magnetostatics
- comprehend the concepts of electromagnetic induction and growth and decay of charge in LCR circuit
- gain the knowledge of magnetic materials
- understand the significance of Maxwell's equation
- understand the concepts of time varying fields.
- have an idea of alternating current and AC bridges.

### UNIT I

Magnetostatics – magnetic vector potential – magnetic field for a long straight current carrying wire – magnetic scalar potential – application of magnetic scalar potential – magnetic shell – potential at any point due to a magnetic shell – magnetic potential and field at a point on the axis of a flat circular magnetic shell – the Hall effect – quantitative analysis of Hall effect. magnetic dipole – equivalence of a cylinder bar magnet and a current-carrying solenoid – field at a point due to a magnetic dipole in the end on-position (on the axis) - field at a point due to a magnetic dipole in the broad side on-position (on the axis) – magnetic dipole moment of electron orbit and orbital gyro magnetic ratio. (12 Hours)

## UNIT II

Faraday's laws of electromagnetic induction-Inductors and inductance - Calculation of L (solenoid and toroidal coil) –energy stored in magnetic field - Measurement of L by Rayleigh's method - Mutual inductance- measurement of mutual inductance - RL circuit growth and decay of current Helmholtz equation- RC circuit- measurement of high resistance by the method of leakage-comparison of capacities by DeSauty's method- series LCR circuit (charge and discharge)-comparison of inductances by inductance bridge. (12 Hours)

## UNIT III

Magnetic induction – magnetization – magnetic susceptibility – magnetic permeability- properties of dia, para and ferro magnetic materials – anti-ferro magnetism and ferro magnetism – electron theory of magnetism – Langevin's theory of diamagnetism and paramagnetism – Weiss theory of ferromagnetism – experiment to draw M-H curve – experiment to draw B-H curve – energy loss due to hysteresis – importance of hysteresis curve – determination of susceptibility –Curie balance method. (12 Hours)

## UNIT IV

Basic equations- types of currents- vacuum displacement current- Maxwell's equations- Maxwell's equations in free space- electromagnetic waves in free space - Electromagnetic waves in isotropic non-conducting media- energy density of electromagnetic wave and Pointing theorem- energy density per unit volume. (12 Hours)

## UNIT V

Alternating electric current- average value & rms value of ac- ac circuit containing pure R only -ac circuit containing pure L only -ac circuit containing C only- ac circuit with R, C and L in series-parallel resonance circuit- comparative study of a series and parallel resonant- power in ac circuit-choke coil-Transformers-theory– transformers losses- AC Bridges-Maxwell's bridge- Owen bridge - Anderson's bridge – Wien's Bridge . (12 Hours)

### TEXT BOOKS

1. Tiwari, K.K, (2011), *Electricity and Magnetism*, Sultan Chand & Company Private Lld, New Delhi.
2. Murugesan, R, (2011), *Electricity and Magnetism*, Sultan Chand & Company Private Ltd, New Delhi.

### BOOK 1

UNIT II: Sections – 11.3, 11.12 - 11.16, 11.18, 11.23, 11.24– 11.27, 11.29, 11.31.

UNIT IV: Sections-15.1- 15.7, 15.11, 15.12

UNIT V: Sections- 16.1, 16.2, 16.6-16.8, 16.11 -16.17 & 17.5, 17.6

UNIT I: Sections – 22.1 – 22.4, 22.4- 22.6, 22.8, 22.10, 22.11 & 46.1 – 46.7

UNIT III: Sections - 15.1 – 15.18.

### REFERENCE BOOKS

1. JoseRobin, G, Ubald Raj, A, (2013), *Electricity and Magnetism*, Indira Publication, Marthan dam.
2. Edward, M, Purcell, (2008), *Electricity and Magnetism*, Tata Mc Graw-Hill Publishing Company Ltd, New Delhi.
3. Sehgal Chopra Sehgal, (2004), *Electricity and Magnetism*, Sultan Chand & Sons, New Delhi.

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## B.Sc. PHYSICS (SEMESTER) (2018 –2019 onwards)

Semester II	<b>HEAT AND THERMODYNAMICS</b>	Hours/Week: 4	
Core Course-4		Credits: 4	
Course Code <b>18UPHC22</b>		Internal 25	External 75

### COURSE OUTCOME

On completion of the course, the students shall be able to

- gain the knowledge in the laws of Thermodynamics.
- have an idea about Kinetic theory of gases and calorimetry
- understand the process of heat transfer
- know about different methods of liquefaction of gases.
- understand the concept of Entropy.
- gain knowledge about Maxwell's relations and its applications..

### UNIT I

Zeroth law of thermodynamics – internal Energy - first law of thermodynamics – adiabatic process – isothermal process – concept of entropy – change in entropy – change in entropy in adiabatic process –change of entropy in reversible cycle – principle of increase of entropy –change of entropy in irreversible cycle – physical significance of entropy – entropy of a perfect gas – Kelvin's thermodynamics scale of temperature using Carnot's cycle – Third Law of Thermodynamics – Zero Point Energy. (12 Hours)

### UNIT –II

Kinetic model – expression for the pressure exerted by a gas – estimation of rms. speeds of molecules – deduction of Boyle's law – kinetic energy per unit volume of a gas – derivation of gas equation – derivation of gas laws – rms velocity as a function of absolute temperature – degrees of freedom – Maxwell's law of equipartition of energy -Calorimetry –Newton's law of cooling – specific heat of a



liquid-Joule's electrical method—specific heat of a gas at constant volume- Joly's differential steam calorimeter -specific heat of a gas at constant pressure-Renault's method –Dulong and Petit's law – Debye's theory of specific heat of solid.

(12 Hours)

### UNIT III

Coefficient of thermal conductivity – Lee's method for bad conductors – Widemann-Franz Law – practical applications of conduction of heat – Convection – application of convection- black body – black body in practice – emissive power - absorptive Power – Stefan-Boltzmann law – Distribution of Energy in black body Spectrum – Wien's Displacement law – Rayleigh-Jean's law – Planck's Radiation law – Planck's quantum postulates – derivation of Planck's radiation Law – derivation of Stefan's law – derivation of Newton's Law of Cooling from Stefan's law – experimental verification of Stefan's law – solar constant – water flow Pyrheliometer.

(12 Hours)

### UNIT IV

Different methods of liquefaction of gases – methods of freezing mixture– cooling by evaporation under reduced pressure – cooling by adiabatic expansion – Joule-Thomson expansion – liquefaction of gases – principle of regenerative cooling – liquefaction of air- Linde's Process – liquefaction of Helium (K.Onnes Method) – Helium I and Helium II – some peculiar properties of Helium II – production of low temperatures – adiabatic demagnetization.

(12 Hours)

### UNIT V

Reversible and irreversible processes – significance of reversible process - second law of thermodynamics – heat engine and its efficiency – Carnot's engine and its efficiency- Thermodynamics potentials – Internal energy – Helmholtz free energy– enthalpy or total heat function – Gibb's free Energy– Maxwell's relations – thermodynamic variables in terms of thermodynamic potentials - TdS equations expression for  $C_p$ – $C_v$  – Clausius- Clapeyron equation.

(12 Hours)

## TEXT BOOKS

1. Brijilal, N, Subramaniyan and Hemne, P.S, (2014), *Heat, Thermodynamics and Statistical Physics*, Sulton Chand & Company Private Ltd, New Delhi.
2. Saxena, A.K & Tiwari, C.M, (2014), *Heat and Thermodynamics*, Narosa Publishing House Private limited, Chennai.

## BOOK 1

UNIT I: Sections - 4.2, 4.6, 4.7, 4.10.4, 4.10.7

5.1–5.6, 5.8, 5.9, 5.11, 5.15,5.16

UNIT II: Sections- 1.3–1.9, 1.12, 1, 18,1,19

14.1, 14.5, 14.6, 14.10- 14, 12, 14.17, 14.20

UNIT III: Sections-15.1, 15.10, 15.11, 15.19, 15.20, 15.22, 15.23

8.6-8.9, 8.12 – 8.15, 8.17-8.22, 8.26, 8.29 8.9,

8.12–8.15., 8.17- 8.22, 8.26, 8.29

UNIT IV: Sections- 7.1 – 7.8, 7.11 – 7.13, 7.15, 7.16.

## BOOK 2

UNIT V: Sections- 5.1, 5.2, 5.4,5.5,5.6

5.23, 5.23.1, 5.23.2, 5.23.3, 5.23.4, 5.24,

5.26, 5.27, 5.28, 5.30 & Page No.: 26

## REFERENCE BOOKS

1. Mark W. Zemansky, Richard H.Dittman (2011), *Heat and Thermodynamics*, 8<sup>th</sup> Edition, Tata Mc-Graw Hill, New Delhi.
2. Kakani, S.L, (2009), *Heat, Thermodynamics and Statistical Physics*, Sultan Chand & company Private Ltd, New Delhi.
3. Mathur D.S, (2001), *Heat and Thermodynamics*, 4<sup>th</sup> Edition, S.Chand and Sons, New Delhi.



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### B.Sc. PHYSICS (SEMESTER)

(2018 - 2019 onwards)

Semester II	<b>PROGRAMMING IN C</b>	Hours/Week: 2	
Skill Enhancement Course -1		Credits: 2	
Course Code <b>18UPHS21</b>		Internal 40	External 60

### COURSE OUTCOME

On completion of the course, the students shall be able to

- Under stand of programming principles for the effective use of C language.
- develop logical thinking.
- analyze problems in Physics which need computer applications.
- have an idea about arrays and structures.

### UNIT I

C fundamentals: Character set, identifiers – keywords – constants - variables - Data types - Various types of operators – Bitwise operators- Input and Output operations: scanf function- printf function. (6 Hours)

### UNIT II

Simple if statement - simple if –else statement- Block if statement - Block if else statement - looping using while, do – while and for statement (6 Hours)

### UNIT III

Defining an array – one dimensional array – array initialization – two dimensional array - defining a structure - processing a structure - arrays of structures - Unions. (6 Hours)

### UNIT IV

Defining a function – the return statement – calling a function - category of functions – nesting of functions - functions with arrays – recursion. (6 Hours)

## UNIT V

To find the factorial of a number - to find the sum of digits of a given number- To multiply two matrices of order  $(l \times m)$  and  $(m \times n)$  – to prepare the salary bill for employees of company using structure - to sort in the ascending and descending order of a given set of numbers using function - to sum integer values between I-N recursion technique. (6 Hours)

## TEXT BOOK

Ramasamy, S, and Radhaganesan, P, (2005), *Programming in C*, Scitech Publications India Private Limited, Chennai & Hyderabad.

UNIT I: Chapter 2: 2.1-2.7, 2.12 – 2.23, 3.2 - 3.5

UNIT II: Chapter 4: 4.1 – 4.10

UNIT III: Chapter 5: 5.1, 5.2, 5.4, 5.5, 10.1, 10.2, 10.4, 10.10

UNIT IV: Chapter 6: 6.1- 6.6, 6.8

UNIT V: Program

## REFERENCE BOOKS

1. Balaguruswamy, E, (2012), *Programming in ANSIC*, 6<sup>rd</sup> Edition, Tata McGraw Hill Publishing Company Ltd, New Delhi
2. Schaum's outline series & Gottfried, (2006), *Programming with C*, Tata McGrawHill publishing company Ltd, New Delhi



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VIRUDHUNAGAR - 626 001

### B.Sc. PHYSICS (SEMESTER)

(2018 - 2019 onwards)

Semester I/II	<b>GENERAL PHYSICS - 1</b>	Hours/Week: 2	
Core Course Practical- I		Credits: 2	
Course Code <b>18UPHC21P</b>		Internal 40	External 60

#### List of Experiments:

1. Young's Modulus by uniform bending using Microscope
2. Young's Modulus by non-uniform bending using Telescope
3. Young's Modulus of cantilever using Telescope
4. Rigidity Modulus by Torsion pendulum
5. A.C. Frequency by Sonometer
6.  $M_1 / M_2$  using deflection magnetometer
7. Frequency of Vibrator using Melde's apparatus
8. Thermal conductivity of bad conductor by Lee's Disc method
9. Resistance and resistivity using Carey Foster's bridge
10. Surface Tension by Drop weight method
11. Calibration of low range voltmeter using potentiometer
12. Calibration of ammeter using potentiometer
13. Determination of 'g' using compound pendulum
14. Newton's law of cooling
15. Voltage and current sensitivity - spot galvanometer
16. Viscosity of liquid by Stokes's method



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### B.Sc. PHYSICS (SEMESTER)

(2018 - 2019 onwards)

Semester I /III	<b>ALLIED PHYSICS-I</b>	Hours/Week: 4	
Allied Course- 1		Credits: 4	
Course Code <b>18UPHA11/ 18UPHA31</b>		Internal 25	External 75

### COURSE OUTCOME

On completion of the course, the students shall be able to

- gain knowledge about on Mechanics and theory of Relativity.
- know about properties of materials.
- Understand the concept of entropy
- Know the fundamental of electricity

### UNIT I

Gravitation - Kepler's Law of planetary motion – Newton's law of gravitation – mass & density of earth – Determination of G by Boy's method – Variation of g with latitude ,altitude and depth. Relativity - Theory of relativity – Lorentz transformation - Postulates of special theory of relativity – Michelson Morley experiment – Length contraction – Time dilation – variation of mass with velocity – mass Energy equivalence.

(12 Hours)

### UNIT II

Elasticity - Different Moduli of elasticity – Poisson's ratio – Bending of beams – Expression for the bending moment – Determination of Young's modulus by uniform bending – Determination of Young's modulus by non-uniform bending – Torsion of a cylinder – Expression for couple per unit twist – Work done in twisting – Torsional oscillations of a body -Determination of Rigidity modulus by Torsion pendulum.

(12Hours)

### UNIT III

Viscosity - Streamline flow and turbulent flow – Co-efficient of viscosity – Derivation of Poiseuille’s formula – Terminal Velocity – Stokes’ Law – Determination of  $n$  of a highly viscous liquid – lubrication - Surface Tension: Molecular theory of Surface Tension –excess pressure inside a liquid drop – excess Pressure inside a soap bubble.  
(12 Hours)

### UNIT IV

Entropy – change of entropy in a Carnot’s cycle – change of entropy in conversion of ice into steam- Radiation - Stefan’s law – Determination of Stefan’s constant by filament heating method – Energy distribution in black body spectrum – Statement of Planck’s law of radiation – Wien’s law – Rayleigh-Jeans law. (10 Hours)

### UNIT V

Electrostatics - Coulomb’s law – Gauss law – Application of Gauss law at a point outside the charged sphere. Capacitor - principle of a capacitor – capacitance of parallel plate capacitor – Energy stored in a charged capacitor – Loss of energy on sharing of charges between two capacitors. Current Electricity - Kirchhoff’s laws – Application of Kirchhoff’s law to Wheatstone network – Carey-Foster’s bridge – Determination of temperature co-efficient of resistance -Potentiometer – Calibration of ammeter – Calibration of voltmeter (Low range) (14 Hours)

### TEXT BOOK

R.Murugesan, R, (2014), *Allied Physics*, Sultan Chand &Company Private Ltd, New Delhi.

### REFERENCE BOOKS

1. Brijilal, N, Subramaniyan and Hemne, P.S, (2014), *Heat, Thermodynamics and Statistical Physics*, Sul-ton Chand & Company Private Ltd, New Delhi
2. Ubald Raj, A & Jose Robin, G, (2016), *Allied Physics–I*, Indira Publications, Marthandam.

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SEMESTER II/IV  
(2018 - 2019 onwards)

Semester II	<b>ALLIED PHYSICS-II</b>	Hours/Week: 4	
Allied Course- 2		Credits: 4	
Course Code <b>18UPHA21/ 18UPHA41</b>		Internal 25	External 75

## COURSE OUTCOME

On completion of the course, the students shall be able to

- Understand the concepts of Refraction of light through prism and aberration in lens.
- Acquire the knowledge of interference, diffraction and polarisation.
- know about the basics of analog electronics.
- comprehend the basics of digital electronics

## UNIT I

Electromagnetism - Torque on a current loop in a uniform magnetic field – D'Arsonval moving coil Galvanometer (Mirror galvanometer) – current and voltage sensitiveness of a moving coil galvanometer – moving coil Ballistic Galvanometer – comparison of emf's of two cells using B.G.-Alternating Current – Average and rms value - series Resonance circuit – parallel resonance circuit – comparison between series and parallel resonant circuits – power in an a.c circuit containing inductance, capacitance and resistance – wattless current - choke coil (12 Hours)

## UNIT II

Optics - dispersion through a prism – expression for the dispersive power of the material of a thin prism – Achromatism in prism – deviation without dispersion – dispersion without deviation-Interference - condition for interference - Interference in thin films – Air wedge.- Diffraction - plane transmission grating- Polarisation of light – Double refraction – Nicol prism. (12 Hours)



### UNIT III

Fibre Optics - fibre construction – light propagation in fibre – numerical aperture–  
Fibre optic communication system–advantages of fibre optic communication system–  
Spectroscopy: Infra red spectroscopy – properties – sources – detectors.-Raman Effect -  
Experimental study of Raman Effect – characteristics of Raman lines – quantum theory of  
Raman Effect – applications-Wave nature of matter–de-Broglie Wavelength – Electron  
diffraction – G.P. Thomson’s experiment. (13 Hours)

### UNIT IV

Electronics in diode - V-I characteristics of a junction diode – Zener diode – V-I  
characteristics of Zener diode–Light Emitting Diode–Transistor– Characteristics of a  
transistor (CE mode) – Common-Emitter Transistor Amplifier – Hartley Oscillator–  
Number System- Decimal number system–Binary number system–Conversion of Binary  
number into Decimal number–Conversion of Decimal number into Binary number –  
Binary addition – Binary Subtraction. (12 Hours)

### UNIT V

Boolean Algebra – postulates and theorems of Boolean algebra – De Morgan’s  
theorem - Digital Logic Gates – NOT,OR,AND,NOR and NAND gate universal gate –  
NAND gate – NAND gate - The Exclusive OR gate - Half adder – Full adder – Half  
subtractor – Full subtractor. (11 Hours)

### TEXT BOOK

R.Murugesan, R, (2014), *Allied Physics*, Sultan Chand &Company Private  
Lld, New Delhi

### REFERENCE BOOKS

1. Brijlal and Subramaniam, N, (2013), *Text book of Optics*, Sultan Chand &  
Company Pvt.Ltd, New Delhi.
2. Ubald Raj, A & Jose Robin, G, (2016), *Allied Physics–II*, Indira  
Publications, Marthandam.



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### B.Sc. PHYSICS (SEMESTER)

(2018 - 2019 onwards)

Semester I/II III/IV	<b>ALLIED PHYSICS - PRACTICAL- I</b>	Hours/Week: 2	
Allied Course- Practical-I		Credits: 2	
Course Code <b>18UPHA21P/ 18UPHA41P</b>		Internal 40	External 60

#### List of Experiments:

1. Young's Modulus by non- uniform bending - optic lever.
2. Young's Modulus by uniform bending - pin and microscope.
3. Torsion Pendulum - determination of M.I and G.
4. Calibration of voltmeter (low range) – Potentiometer.
5. Resistance and resistivity – Potentiometer.
6. Co-efficient of viscosity - Stoke's method.
7. Melde's string - Frequency of fork.
8. Spectrometer -  $\mu$  of a prism.
9. Air wedge - Thickness of a wire.
10. L.C.R. - Series resonance - determination of L & Q factor.
11. Mirror Galvanometer - voltage and current sensitiveness.
12. Verification of truth table for AND, OR, NOT gates using discrete components.
13. Zener diode characteristics.
14. Comparison of capacitances - DeSauty's method using head phone.