

ANNEXURE 18B03**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 (3rd 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.

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

UG PROGRAMMES

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)

List of Non Major Elective Courses (NMEC) Offered

UG PROGRAMMES

Name of the Course	Semester	Department
History of India upto A.D.1858	III	History(EM)
இந்திய வரலாறு கி.பி. 1858 வரை	III	History (TM)
Indian National Movement (A.D 1885-1947)	IV	History(EM)
இந்திய தேசிய இயக்கம் (கி.பி. 1885 – 1947)	IV	History(TM)
English for Professions I	III	English
English for Professions 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	IV	
Quantitative Aptitude – I	III	Mathematics
Statistics and Operation Research	IV	
Physics in Everyday life	III	Physics
Fundamentals of Electronics	IV	
Industrial Chemistry	III	Chemistry
Drugs and Natural Products	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	

List of Generic Elective Courses (GEC) Offered

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, National Cadet Corps

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 comprising of maximum 5 members in a team 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

PART III - Core Courses, Discipline Specific Elective Course

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

Mode of Evaluation		Marks
Periodic Test	:	15
Assignment	:	5
Quiz	:	5
Total	:	25

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

Two Assignments - Best of the two will be considered

Three Quiz Tests - Best of the two will be considered

Practical

Mode of Evaluation		Marks
Model Test	:	30
Performance	:	10
Total	:	40

Two Model Tests - Best one will be considered

Performance - Attendance and Record

Question Pattern for Periodic Tests**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- 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
Total					45

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
Total					45

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
Total					75

***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
				Total	75

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.

PART IV - Skill Enhancement Courses and Non Major Elective Courses

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

Mode of Evaluation		Marks
Periodic Test	:	25
Assignment	:	10
Quiz	:	5
Total	:	40

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

Two Assignments - Best 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
Total					25

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
Total					60

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
Summative Examination Internal	:	60
Total	:	100

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
Total					30

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
Total					60

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
Total					100

Extra Two Credits per course for Online Open Learning Courses

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.
 - Pass minimum for External Practical Examination is 21 marks out of 60 marks and aggregate minimum pass percentage is 40.
 - Pass minimum for Generic Elective Course and Ability Enhancement Compulsory Course is 40.

**BACHELOR OF PHYSICS
PROGRAM CODE - 2016**

PROGRAMME OUTCOMES

- Encourage intellectually disciplined process of thinking, 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, self-disciplined and specialized learning in tune with the changing socio-technological scenario

PROGRAMME SPECIFIC OUTCOMES

- ✚ Provide a route to 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, Nano Science 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	18UTAG21N	தாள்: 2 பொதுத்தமிழ்	3	100
3.	III	18UTAG31	தாள்: 3 பொதுத்தமிழ்	3	100
4.	IV	18UTAG41	தாள்: 4 பொதுத்தமிழ்	3	100
TOTAL				12	400

PART I HINDI

S.No.	Sem.	Code	Title of the Course	Credits	Marks
1.	I	18UHDG11	Prose – I & II, Ancient Stories - I, General Essays, Functional Hindi – I & Grammar	3	100
2.	II	18UHDG21	Drama, Ancient Stories - II, Letter Correspondence, Functional Hindi-II & Grammar	3	100
3.	III	18UHDG31	Ancient Poetry, Drama, Indian History, Hindi Grammar & Functional Hindi III	3	100
4.	IV	18UHDG41	Modern Poetry, Hindi Literary Essays, Letter Correspondence, Conversation & Functional Hindi IV	3	100
TOTAL				12	400

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		
TOTAL				12	400

PART III – CORE, DISCIPLINE SPECIFIC ELECTIVE COURSES

S.No.	Sem.	Code	Title of the Course	Credits	Marks
1	I	18UPHC11N	Mechanics and Properties of matter	4	100
2	I	18UPHC12N	Electricity	4	100
3	II	18UPHC21	Electromagnetism	4	100
4	II	18UPHC22	Heat and Thermodynamics	4	100
5	II	18UPHC21PN	Core Practical- I	2	100
6	III	18UPHC31	Optics	5	100
7	IV	18UPHC41	Modern Physics	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
Total				72	2000

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
Total				10	300

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	Electronic Devices and Instrumentation	4	100
	IV	18UEIA41P	Allied Practical -I	2	100
Total				10	300

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 and Energy Harvesting	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
Total				12	600

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
Total				4	200

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	18UGEH31 18UGEW32	Human Rights/ Women Studies	1	100
3.	IV	18UGEC41	Constitution of India/	1	100
4		18UGEM42	Modern Economics/		
5		18UGEA43	Adolescent Psychology/		
6		18UGED44	Disaster Management		
8		18UPHI41G	Internship/Field Project		
9		PART-V	Extension Activities	1	-
10	V	18UGES51	Environmental Studies	2	100
Total				8	500

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	
10		18UVNC1 18UVNC2	National Cadet Corps	

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	18UPHC11N	Core Course -1 Mechanics and Properties of matter	4	4	25	75
		18UPHC12N	Core Course - 2 Electricity	4	4	25	75
		18UPHC21P	Core Course Practical – I General Physics -I	2	-	-	-
		18UMTA11	Allied Course –I Mathematics - 1	6	4	25	75
	Part IV	18UGVE11	Value Education	2	2	40	60
TOTAL			30	20	600		

Semester	Course Code	Courses	Hours per week	Credits	Total Marks		
					Int.	Ext.	
II	Part I	18UTAG21N	Tamil /Hindi II	6	3	25	75
	Part II	18UENG21	English II	6	3	25	75
	Part III	18UPHC21	Core Course - 3 Electromagnetism	4	4	25	75
		18UPHC22	Core Course - 4 Heat and Thermodynamics	4	4	25	75
		18UPHC21PN	Core Course Practical –I General Physics -I	2	2	40	60
		18UMTA21 18UMTA22	Allied Course -I Mathematics - 2 Mathematics - 3	3 3	3 3	25 25	75 75
	Part IV	18UPHS21	SEC -1 Programming in C	2	2	40	60
		TOTAL			30	24	800

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	Core Course -5 Optics	5	5	25	75
		18UPHC41P	Core Course Practical – 2 General Physics -II	2	-	-	-
		18UEIA31 18UEIA41P	Allied-Course -II Basic Electronics Allied Electronics Practical -1	4 2	4 -	25 -	75 -
	Part IV	18UPHS31	SEC -2 Solar Energy and Energy Harvesting	2	2	40	60
		18UPHN31	NMEC-1 Physics in Everyday life	2	2	40	60
	Part IV	18UGEH31 18UGEW32	Generic Elective -1 1.Human Rights/ 2. Women Studies	0	1	40	60
		18UGEC41/ 18UGEM42/ 18UGEA43/ 18UGED44	Generic Elective -2 Constitution of India/ Modern Economics/ Adolescent Psychology/ Disaster Management	1	-	-	
	TOTAL			30	20	700	

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	Core Course - 6 Modern Physics	5	5	25	75
		18UPHC41P	Core Course Practical –2 General Physics -II	2	2	40	60
		18UEIA41	Allied Course – II Electronic Devices and Instrumentation	4	4	25	75
		18UEIA41P	Allied Electronics Practical – 1	2	2	40	60
	Part IV	18UPHS41	SEC -3 Astrophysics	2	2	40	60
		18UPHN41	NMEC-2 Fundamentals of Electronics	2	2	40	60
		18UPHI41G	Internship/Field Project	0	1	100	-
			Generic Elective -2	1	1	100	-
		18UGEC41/ 18UGEM42/ 18UGEA43/ 18UGED44	Constitution of India/ Modern Economics/ Adolescent Psychology/ Disaster Management				
	Part V		Extension Activities	-	1	-	
			TOTAL	30	26	1000	

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

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



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VIRUDHUNAGAR - 626 001

B.Sc. PHYSICS (SEMESTER)

(2018 -2019 onwards)

Semester III	OPTICS	Hours/Week: 5	
Core Course-5		Credits: 5	
Course Code 18UPHC31		Internal 25	External 75

COURSE OUTCOMES

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

- get an idea about the geometrical and physical nature of light.
- understand the geometrical aspects of light and to the design of optical systems with an emphasis on image forming systems.
- analyze and understand the phenomenon of interference of light waves.
- gain an insight into the theories of diffraction and comprehend the concepts of polarization of light.
- know about the construction and classification of fibers.
- acquire basic idea about molecular spectroscopy.

UNIT I

Geometrical Optics:

Refraction through a thin lens-equivalent focal length of two thin lenses separated by a distance -dispersion through a prism-Cauchy's formula-achromatism in prisms-dispersion without deviation-direct vision spectroscope-aberrations- spherical aberration - methods and conditions for minimising spherical aberration of two thin lenses separated by a distance-aplanatic lens-chromatic aberration-condition for achromatism of two lenses placed in contact and separated by a finite distance-Huygen's eyepiece-Ramsden's eyepiece-comparison of eyepieces. (15 Hours)

UNIT II

Interference and Fresnel Diffraction:

Theory of interference fringes-colours of thin films-production of colours in thin films-wedge-shaped film-Newton's rings-determination of wavelength of light-

Michelson's interferometer-uses of Michelson's interferometer-construction and working of Fabry-Perot interferometer-determination of wavelength-Fresnel's explanation of rectilinear propagation of light-zone plate-comparison of a zone plate with a convex lens.

(15 Hours)

UNIT III

Fraunhofer Diffraction and Polarisation:

Diffraction at a single slit-Fraunhofer diffraction at a single slit-plane transmission diffraction grating-determination of wavelength(normal incidence)-Rayleigh criteria-resolving power of a plane diffraction grating.

Double refraction-Nicol prism-plane, circularly and elliptically polarized light-quarter wave plate-half wave plate-production and detection of plane, circularly and elliptically polarized light-optical activity-specific rotation-Laurent's half shade polarimeter.

(15 Hours)

UNIT IV

Optical Fibre and its Losses:

Fibres : classification-materials-single-mode fibers-multimode step index fibers - multimode graded index fibers-comparison-plastic-clad fibers-all-plastic fibers-mode field diameter-propagation modes in single-mode fibers-monomode and multimode step-index fibers-attenuation in optical fibers-absorption losses-bending losses.

(15 Hours)

UNIT V

Spectroscopy:

Types of spectra-Infrared spectra-Ultraviolet spectra-Rayleigh's scattering-Molecular spectra-theory of origin of pure rotational spectra-vibrational-rotational spectra of a molecule-non-rigid rotator-vibrating diatomic molecule as a harmonic oscillator-electronic spectra of molecules-Raman effect-experimental study-quantum theory-applications of Raman effect.

(15 Hours)

TEXT BOOKS

1. Murugesan, R. & Kiruthiga Sivaprasath, (2014). *Optics and Spectroscopy*, New Delhi: S.Chand & Company Pvt Ltd, 17th Revised Edition.

2. Murugesan, R. & Kiruthiga Sivaprasath, (2014). *Modern Physics*, New Delhi: S.Chand & Company Pvt. Ltd, 17th Revised Edition.

BOOK 1

UNIT –I Chapter 1- Sections : 1.3, 1.4, 1.7 -1.11, 1.15-1.22, 1.25-1.28.

UNIT –II Chapter 2 – Sections: 2.1, 2.2, 2.5-2.9, 2.11, 2.12, 2.18 -2.20, 3.1-3.3, 3.5.

UNIT –III Chapter 3 - Sections: 3.7, 3.10, 3.12, 3.17, 3.19, 3.24.

Chapter 4 - Sections: 4.1, 4.5, 4.8, 4.10, 4.12-4.15, 4.19, 4.20

UNIT –IV Chapter 42 - Sections: 42 .1- 42 .8, 43.10 – 43.12, 44.1, 44.3, 44.6

UNIT – V Chapter 5 – Sections: 5.1 – 5.4

BOOK 2

UNIT –V Chapter 19 - Sections: 19.6-19.8

Chapter 23 - Sections: 23.9- 23.11

Chapter 19 - Sections: 19.9, 19.11- 19.14

REFERENCE BOOKS

1. Banwell, C.N.(1995). *Fundamentals of Molecular Spectroscopy*, New Delhi: Tata McGraw Hill Publishing Company Limited.
2. Aruldas, G. (2005). *Molecular Structure and Spectroscopy*, New Delhi: Prentice- Hall of India Pvt. Limited.
3. Ajoy Ghatak,(2005). *Optics*, New Delhi: McGraw Hill Company, 3rd Edition.
4. Gupta Kumar Sharma (2008). *Elements of Spectroscopy*, Meerut: Pragathi Prakashan, 20th Edition.
5. Subramanyam Brijal, N. & Avadhanulu, M.N. (2012). *Optics*, New Delhi: S.Chand Company Ltd, 24th Revised Edition.



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VIRUDHUNAGAR - 626 001

B.Sc. PHYSICS (SEMESTER)

(2018 -2019 onwards)

Semester III	BASIC ELECTRONICS	Hours/Week: 4	
Allied Course-II		Credits: 4	
Course Code		Internal	External
18UEIA31		25	75

COURSE OUTCOMES

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

- analyze the basic concepts, principles and working of electronic devices.
- understand the design and function of various solid state devices.
- get an idea about the fundamental properties of semiconductors and rectifiers.
- explain the structure and operation of transistor and analyze the various biasing circuits.
- apply the fundamental circuit theorems to analyze electronic circuits.
- understand the operation of amplifier circuits using transistors.

UNIT I

Passive Circuit Elements:

Resistors, resistor types - wire wound resistors, carbon composition resistors, metal film resistors, variable resistors, potentiometer and rheostats, color-code resistors - Thermistor inductor - inductance of an inductor, mutual inductance, variable inductors, reactance and impedance offered by a wire, Q - of a coil, capacitors - capacitance - types of capacitors, fixed, variable capacitors. (12 Hours)

UNIT II

Semiconducting Devices:

Types of semiconductors - intrinsic, extrinsic semiconductors - PN junction diode - construction, working, V-I - characteristics - Zener diode - Rectifiers - half wave rectifier - full wave rectifier - bridge rectifier - filters - filters - LC-filter. (12 Hours)

UNIT III

Transistor and Transistor Biasing:

Transistor - Transistor action- transistor connections - common base - common emitter - common collector - load line analysis - operating point - methods of transistor biasing - base resistor - emitter bias - biasing with collector feedback - voltage divider bias. (12 Hours)

UNIT IV

Network Theorems:

Super position theorem - Thevenin's theorem - Norton's theorem- h-parameters - types of filters - low pass filter - high pass filter - band pass filter - band stop filter. (12 Hours)

UNIT V

Transistor Amplifiers:

Transistor amplifier-C.E mode - analysis of a transistor CE amplifier using h-parameters - power amplifier - classification of power amplifier - single ended class - A power amplifier - Push Pull amplifier (class B power amplifier) - cross - over distortion. (12 Hours)

TEXT BOOKS

1. Theraja, B.L. (2014). *Basic Electronics*, New Delhi: S.Chand & Company Ltd.
2. Mehta, V. K. & Rohit Mehta (2013). *Principles of Electronics*, New Delhi: S.Chand & Company Ltd.

BOOK 1:

UNIT I: Chapter 5 – Sections: 5.1- 5.12, 5.14, 5.15, 5.19 - 5.21, 5.23, 5.25, 5.32-5.35, 5.37, 5.39- 5.41

UNIT II: Chapter 12 - Sections: 12.23-12.25.

Chapter 14 - Sections: 14.1

Chapter 15 - Sections: 15.1, 15.2

Chapter 17 - Sections: 17.5-17.9, 17.13, 17.14

UNIT IV: Chapter 4 – Sections: 4.2, 4.5-4.8

Chapter 21 – Sections: 21.14.

Chapter 11 – Sections: 11.15-11.19

Chapter 15– Sections: 15.12

BOOK 2:

UNIT III: Chapter 8 – Sections: 8.4, 8.5, 8.7-8.10, 8.12, 8.13, 8.16-8.18

Chapter 9 – Sections: 9.2, 9.7-9.12

UNIT V: Study Material

REFERENCE BOOKS

1. Ambrose & Vincent Devaraj, (1993). *Elements of Solid State Electronics*, Meera Publications.
2. Jose Robin & Ubaldraj, A. (2008). *Analog Electronics and Digital Electronics*, Marthandam: Indira Publications.
3. Chattopadhyay, D. & Rakshit, P.C. (2010). *Electronics Fundamentals and Applications*, New Delhi: New Age International Publishers, 11th Edition.
Gupta, B.R. (2010). *Electronics and Instrumentation*, New Delhi: S.Chand & Company Ltd.
4. Setha, R.S. (2008). *A Text Book of Applied Electronics*, New Delhi: S.Chand & Company Ltd.

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B.Sc. PHYSICS (SEMESTER)

(2018 -2019 onwards)

Semester III	SOLAR ENERGY AND ENERGY HARVESTING	Hours/Week: 2	
SEC - 2		Credits: 2	
Course Code 18UPHS31		Internal 40	External 60

COURSE OUTCOMES

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

- understand the fundamental aspects of renewable energy source and its applications.
- know the basis of solar energy.
- understand the principle of solar thermal gadgets.
- design and estimate thermal efficiency of solar thermal gadgets.
- know about the solar cell classification and selection of materials.
- acquaint with Solar photovoltaic systems, PV Module and PV applications.

UNIT I

Solar Energy Basics:

Importance of non – conventional energy source - salient features - solar energy basics - the sun as a source of energy - extraterrestrial and terrestrial radiations - spectral energy distribution of solar radiation - depletion of solar radiations (no derivation) - measurements - Pyranometer. (6 Hours)

UNIT II

Solar Thermal System:

Solar collectors - classification - comparison of concentrating and non - concentrating types (flat –plate type) - performance indices - liquid flat-plate collector - Flat-plate air heating collector - evacuated tube collector. (6 Hours)

UNIT III

Solar Thermal Gadgets:

Modified flat plate collector - Compound Parabolic Concentrator (CPC) – cylindrical parabolic concentrator - solar cooker - box-type solar cooker - paraboloidal dish-type solar cooker - community solar cooker - advanced solar cooker - solar distillation. (6 Hours)

UNIT IV

Solar Cell Fundamental:

Solar photovoltaic systems - photo conduction - solar cell - I-V characteristics - energy losses and efficiency - cell size - energy payback period (EPP) – solar cell classification - on the basis of thickness of active material - on the basis of junction structure. (6 Hours)

UNIT V

Solar PV Panel and Applications:

Solar cell - Solar PV Module - Solar PV Panel - Solar PV array - Solar PV classification - Solar PV applications - water pumping – lighting - medical refrigeration - Telecommunication and signaling. (6 Hours)

*Assignment Based on Field Visit Report related to Solar Energy center.

TEXT BOOK

Khan, B.H. (2009). *Non – Conventional Energy Resources*, New Delhi: Tata McGraw-Hill Education Private Limited, Third Reprint.

UNIT –I Chapter 1 - Sections: 1.5, 1.9, 4, 4.1, 4.4, 4.5, 4.6, 4.7, 4.7.1

UNIT –II Chapter 2 - Sections: 5.1, - 5.1.1, 5.1.2, 5.1.3, 5.1.4, 5.1.6, 5.1.7

UNIT –III Chapter 3 - Sections: 5.1.8, 5.1.9, 5.1.10, 5.2, 5.6, 5.6.1, 5.6.2, 5.6.3, 5.6.4, 5.10

Chapter 4 - Sections: 4.1, 4.5, 4.8, 4.10, 4.12-4.15, 4.19, 4.20

UNIT –IV Chapter 42 - Sections: 6, 6.1.4, 6.2, 6.2.4, 6.2.5, 6.2.6, 6.2.7, 6.3, 6.3.1, 6.3.2

UNIT –V Chapter 42 - Sections: 6.4.1, 6.4.2, 6.4.3, 6.4.4, 6.8.1, 6.9.2, 6.9.3, 6.9.4, 6.9.6

REFERENCE BOOKS

1. Rai, G.D. (2004). *Solar Energy Utilization*, Delhi: Khanna Publications.
2. Sukhatme, S.P. (1998). *Solar Energy*, Delhi: Tata McGraw Hill.
3. Tiwari, G.N. (2006). *Solar Energy Fundamentals, Design, Modelling and Applications*, New Delhi: Narosa Publishing House.

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B.Sc. PHYSICS (SEMESTER) (2018 -2019 onwards)

Semester III	PHYSICS IN EVERYDAY LIFE	Hours/Week: 2	
Course- NMEC-1		Credits: 2	
Course Code 18UPHN31		Internal 40	External 60

COURSE OUTCOMES

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

- gain an insight into the Physics of home appliances used in everyday life.
- get a knowledge about basic principles of fuse and lamp circuits in house.
- understand the principles and working of electrical appliances used in kitchen.
- acquire basic idea about the principles behind and working of commonly used things in bathroom.
- have a foundation of the mechanism of appliances used in living room.

UNIT I

General Appliances:

DC - AC - Choke coil - Fuse - Lamp circuit - Transformer. (6 Hours)

UNIT II

Kitchen:

Pressure cooker - Microwave oven - Toaster - Mixer grinder - Grinder - Refrigerator. (6 Hours)

UNIT III

Washroom:

Geyser - Solar water heater - Vacuum cleaner - Water purifier - Washing machine. (6 Hours)

UNIT IV

Living Room:

Fan - Remote controller - Tube light - CFL - LED - TV. (6 Hours)

UNIT V

Office:

Fax machine – Printer - Photocopier - Inverter - Air conditioner. (6 Hours)

TEXT BOOKS

Material - Prepared by the Department of Physics

REFERENCE BOOKS

1. Jose Robin, G. & Ubald Raj, A. (2016). *Maintenance of Electrical Equipment*, Marthandam: Indira Publication.
2. How things work volume 1 and 2.

REFERENCE SITE

www.How stuffs work.com.

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Semester: III	HUMAN RIGHTS (2018 -19 onwards)	Hours/Week: 0	
Generic Elective - 1		Credits : 1	
Course Code: 18UGEH31		<u>Internal</u> 100	<u>External</u> -

COURSE OUTCOMES

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

- understand the basic concepts on Human Rights and Human values.
- learn the definition and the development of Human Rights.
- understand the various theories on Human Rights.
- know the International instruments and conventions on human Rights.
- acquire idea of the evolution of Human Rights in India.
- imbibe the knowledge of Human Rights violation in India.

UNIT I

Human Rights - Definition - Development of Human Rights: The Magna Carta (1215) - The Declaration on Rights of Man and Citizen (1789) - The Bill of Rights (1791).

UNIT II

Universal Declaration of Human Rights (1948) - International Covenant on Civil and Political Rights - International Covenant on Economic, Social and Cultural Rights.

UNIT III

Human Rights in India - Constitutional Guarantees on Human Rights - The Protection of Human Rights Act (1993).

UNIT IV

National Human Rights Commission - State Human Rights Commission - Human Rights Court.

UNIT V

Human Rights Violations in India - Children - Women - Refugees - Minorities - SCs & ST - Trans-gender.

TEXT BOOK

Study Material prepared by the faculty in Department of History.

REFERENCE BOOKS

1. Basu,L.N. (2006). *Human Rights: Practice and Limitations*, Jaipur: Pointer Publishers.
2. Chauhan,S.R, and Chauhan,N.S (ed.), (2007). *International Dimension of the Human Rights*, Vol. I – III, New Delhi: Rajdhani Publishers.
3. Gupta,U.N. (2004). *Human Rights*, Vol.I – IV, New Delhi: Atlantic Publishers.
4. Natarajan,A. (2004). *Human Rights in International Perspectives*, Madurai: Munnetra Pathipagam.
5. Raja Muthirulandi, E. (2003). *Manidha Urimaigal (Tamil)*, Madurai: BPI Publishers.

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Semester: III	WOMEN STUDIES (2018 -19 onwards)	Hours/Week: 0	
Generic Elective - 1		Credits : 1	
Course Code: 18UGEW32		<u>Internal</u> 100	<u>External</u> -

COURSE OUTCOMES

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

- understand the concept of Feminism.
- acquire the knowledge on the atrocities committed against women.
- know more of women's organisations and political rights.
- know about the various Government welfare schemes for women.
- gain knowledge on the legal rights of women.
- analyse the real empowerment of women in all fields.

UNIT I

Women Studies - Definition - Feminism - Kinds of Feminism.

UNIT II

Violence Against Women - Female Foeticide - Domestic violence - Problems of working women - Eve-Teasing - Sexual Harassment - Portrayal of women in Mass Media.

UNIT III

Women Indian Association - National Council of Women in India - Self Help Groups - Panchayat Raj and role of women in politics - NGOs and women Development.

UNIT IV

Central Government's Social Welfare schemes - State Government's Social Welfare Programmes for Women - Women and Children.

UNIT V

Dowry Prohibition Act 1961 - Equal Remuneration Act 1976 - Hindu Women's Right to Property Act 1989 - Prohibition of indecent Representation of Women Act 1987 - Domestic Violence (Prevention) Act 2005 - POCSO Act 2012.

TEXT BOOK

Study Material prepared by the faculty in Department of History.

REFERENCE BOOKS

1. Anwarul Yaquin, Badar Anwar, (1982). *Protection of Women Under the Law*, New Delhi.
2. Chatterjee, B.B, (1971). *Impact of Social Legislation on Social Change*, Calcutta.
3. Gandhi,M.K., (1962). *Women and Social Injustice*, Ahemadabad.
4. Gangrade,K.D, (1978). *Social Legislation in India, Vol.I and II*, Delhi.
5. Mandakini Das, Pritirekha, Das Pathnayak (ed)., (2010). *Empowering Women: Issues and Challenges and Strategies*, New Delhi.

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Semester: III & IV	CONSTITUTION OF INDIA	Hours/Week: 1 + 1	
Generic Elective - 2		Credits : 1	
Course Code: 18UGEC41		(2018 -19 onwards)	<u>Internal</u> 100

COURSE OUTCOMES

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

- understand the basic tenets of the Constitution.
- realize the duties and responsibilities as a citizen of India.
- shine in competitive examinations.
- understand that the constitution is a base for the functioning of the Government
- aware of the actual working of political institutions.
- know the powers of Judiciary in the protection of citizen.

UNIT I

Constituent Assembly - Sources - Salient Features of the Constitution -
Fundamental Rights - Fundamental Duties - Directive Principles of State Policy.

UNIT II

President and Vice-President - Election, Position, Powers and Functions - Prime
Minister and his cabinet.

UNIT III

Indian Parliament - Lok Sabha and Rajya Sabha - Composition - Powers and
Functions.

UNIT IV

Process of Law making - Committee system - Mode of Amendments - Constitutional Amendments.

UNIT V

Judiciary - Supreme Court - Composition - Powers and Functions - Judicial Review - State Government - Governor - Chief Minister - High court.

TEXT BOOK

Study Material prepared by the faculty in Department of History.

REFERENCE BOOKS

1. Gomathinayagam,P& Anusuya,R. (1980). *Modern Governments*, Rajapalayam: Sri Vinayaga Pathipagam.
2. Kapur,A.C. (1975). *Select Constitutions*, New Delhi: S.Chand & Co.
3. Kasthuri,J. (1998). *Modern Governments*, Udumalpet, Ennes Publications.
4. Mahajan, V.D. (1969). *Select Modern Governments*, New Delhi: S.Chand & Co.
5. Ramalingam, T.S. (1971). *Modern Governments*, Madurai, T.S.R. Publications.

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Semester: III & IV	MODERN ECONOMICS (2018-2019 Onwards)	Hours/Week: 1 +1	
Generic Elective - 2		Credits: 1	
Course Code 18UGEM42		Internal 100	External -

COURSE OUTCOMES

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

- understand the economic development and the various sectors of Indian Economy.
- get clear knowledge about economic issues.
- get introduced to the framework of Budgets and Income and Expenditure of the Government.
- understand the role of banks in economic development.
- apply the E-payment methods in day to day life.

UNIT I: Economic Development: Economic Development – Meaning – Nature of Indian Economy – Features of Indian Economy - Agriculture and Economic Development – Industrial Sector and Economic Development – LPG – Advantages and Disadvantages – MNCs – Obstacles to Economic Development.

UNIT II: Economic Issues: Population growth in India –Causes – Measures –Poverty – Causes – Measures – Unemployment – Causes – Types – Measures.

UNIT III: Government Budget and the Economy: Meaning –Types –Principles of Budgeting –Budgetary Procedure –Direct and Indirect Taxes –Merits –Demerits –Causes for Growth of Public Expenditure.

UNIT IV: Role of Commercial Banks in Economic Development: Commercial Banks – Classifications – Public Sector Banks – Merits - Private Sector Banks – Merits – Differences between Public Sector Banks and Private Sector Banks - Role of Commercial

Banks in Economic Development —Innovative Schemes for developing Infrastructure – Demonetization – Reasons for Demonetisation – Merits and Demerits of Demonetisation.

UNIT V: E-Banking: E-Banking – Advantages – Disadvantages – Mobile Banking – Facilities – Advantages – Disadvantages - Internet Banking – Types – Features – Advantages – Disadvantages – Electronic Payment System (EPS) – Meaning – Benefits – Disadvantages – Methods of EPS– ATM – Debit Card – Credit Card – Smart Card– Electronic Clearing Service (ECS) – National Electronic Funds Transfer (NEFT) – Real Time Gross Settlement (RTGS) - Risks involved in E-Payments – Security tips to overcome Risks in E-Payments

TEXT BOOK

Study Material prepared by the faculty in Department of Commerce and Economics.

REFERENCE BOOKS

1. Sankaran .S, (2012). *Micro Economics*, Chennai: Margham Publications.
2. Sankaran. S, (2012). *Monetary Economics*, Chennai: Margham Publications.
3. Ruddar Dutt and Sundharam. K.P.M., (2017). *Indian Economy*, New Delhi: S. Chand & Company Ltd.
4. Mithani.D.M., (2010). *Money, Banking, Trade and Public Finance*, Mumbai: Himalaya Publishing House.
5. Rama. A and Aruna Devi. A. (2019). *Banking Technology*, Chennai: New Century Book House (P) Ltd.

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Semester: III & IV	ADOLESCENT PSYCHOLOGY	Hours/Week: 1+ 1	
Generic Elective- 2		Credits: 1	
Course Code 18UGEA43		Internal 100	External -

COURSE OUTCOMES

On completion of the course, students will be able to

- gain knowledge regarding the changes in different domains of development during adolescence.
- develop and maintain good relationship with parents and peers.
- aware of the issues challenging adolescents and measures to be taken to prevent those issues.
- face the challenges they face across the life span
- adopt a few counseling techniques.

UNIT I

Adolescence- Age of adolescence, characteristics, problems of adolescence. Biological transitions, Emotional transitions, Social transitions, Cognitive transitions, Changes in moral behavior, Developmental tasks.

UNIT II

Challenges of Adolescents-Health issues, Sexually transmitted diseases, Mental health issues, Social issues- Sexual abuse, Substance abuse, Influence of electronic media.

UNIT III

Development of Self- Identity development and autonomy, self - esteem, Gender and self- regulation. Self-reliance and personal decision making process. Peer Pressure and Family conflicts.

UNIT IV

Counselling – Styles of Counselling – An effective Counseling relationship-
Managing crises – Effective Counselor - Maintain boundaries – Taking care of
ourselves.

UNIT V

Qualities of a good Counsellor

Empathy – open mindedness – Genuine and Trust Winning – Maintaining
confidentiality – certain Do's and Dont's.

Related Experience

Discussion about the problems confronting adolescents today.

Group discussion on the use and misuse of electronic media by adolescents.

Discussion on issues relating to parent, adolescents relationship.

To study about the health problems of adolescents.

To make a study on the stress experience by adolescents.

Critical Analyses issues and debates in Counseling psychology.

Reflect on the their role in different fields of Counseling.

TEXT BOOK

Study Material prepared by the faculty in Department of Home Science.

REFERENCE BOOKS

1. Chauhan S. (1983), *Psychology of Adolescence*, New Delhi: Allied Publishers Private Limited.
2. Elizabeth B Hurlock (1985). *Developmental Psychology A Life - Span Approach*, New York: TMH Edition.
3. Aron, A., & Aron, E.N. (1994). *Statistics for Psychology*. New Jersey: Prentice Hall.
4. Miles, J. (2001). *Research Methods and Statics*, Exeter: Crucial.

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Semester: III & IV	DISASTER MANAGEMENT	Hours/Week: 1+ 1	
Generic Elective- 2		Credits: 1	
Course Code 18UGED44		Internal 100	External -

COURSE OUTCOMES

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

- get a general insight in the dimensions of disasters caused by nature as well as the disasters and environmental hazards induced by human developmental activities
- become aware of the fundamentals of disaster assessment and environmental impact assessment
- become sensitized to the various institutional agencies for disaster management
- be aware of disaster recovery plan
- understand the association at National, State and District level of cope up with disaster

UNIT I

Disaster – Features and Effects of Disaster – Process of Disaster – Hazards and its Classification – Vulnerability and its Categories - Stages in Disaster – Disaster Management and its Activities – Disaster Management Cycle.

UNIT II

Earthquake - Factors Determining Earthquakes –Seismic Waves in Earthquake Processes - Magnitude and Intensity - Earthquake Damages - Disaster Management and Earthquake.

Volcanoes - Active and Non-Active Volcanoes - Types of Volcanoes – Landslides - Basic Causes of Landslides – Tsunami - Causes of Tsunami - Tsunami Warning System - Disaster Management Team and Tsunami – Flood - Types of Flood - Damages due to Floods.

UNIT III

Damage Assessments for Different Disaster – Objectives, Features, Levels, Types: Damage to Buildings, House Property, Land, Crops and Live Stock – Impact of Human Lives – Assessment Damages - Damage Reports: Flash Report, Initial Report, Interim Report, Specialist Report and Final Report – Points to be Considered while Preparing Reports - Reporting Format and Quantification of Needs– Disaster Assistance: Individual Assistance and Public Assistance.

UNIT IV

National Crisis Management Committee (NCCM), State Crisis Management Group (SCMG): Task, District Disaster Management Committee, Disaster-Related Roles and Resources, Disaster Agencies, Site Operations Centre and Rescue Camps.

UNIT V

Disaster Mitigation Strategies in Floods and Water Hazards, Earthquakes, Volcanic Eruptions, Landslides, Drought and Desertification – Main Mitigation Strategies - - The Disaster Recovery Planning: Objectives and Phases - Reconstruction and Rehabilitation: Physical, Social, Psychological and Economic rehabilitation.

TEXT BOOK

Study material prepared by the faculty in Department of Commerce.

REFERENCE BOOKS

1. Rajdeep Dasgupta. (2011). *Disaster Management and Rehabilitation*, New Delhi: Mittal Publications.
2. Sunder.I. & Sezhiyan.T. (2012). *Disaster Management*, New Delhi : Sarup and Sons.
3. Ramana Murthy.K. (2004). *Disaster Management*, New Delhi: Dominant.



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VIRUDHUNAGAR - 626 001

B.Sc. PHYSICS (SEMESTER)

(2018 -2019 onwards)

Semester IV	MODERN PHYSICS	Hours/Week: 5	
Core Course-6		Credits: 5	
Course Code 18UPHC41		Internal 25	External 75

COURSE OUTCOMES

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

- understand the concepts of Atomic and quantum mechanics.
- gain an insight into the theories of various atom model.
- understand the concept of Zeeman Effect, Photo electric effect and the characteristic properties of X – Rays.
- know the formalism of wave function and Schrodinger equation.
- solve the Schrodinger equation for various potential functions.
- understand the relativistic variation of length, time and mass

UNIT I

Structure of Atom:

Critical potentials - experimental determination of critical potential - Davis' and Goucher's method - Sommer field relativistic atom model - vector atom model - quantum numbers associated with vector atom model - coupling schemes - Pauli's exclusion principle - periodic classification of elements - magnetic dipole moment due to orbital motion and spin of the electron - Stern and Gerlach experiment. (15 Hours)

UNIT II

X-rays:

Optical spectra - Zeeman Effect - Larmor's theorem - quantum mechanical explanation of the normal Zeeman Effect - anomalous Zeeman effect - Paschen Back effect - Stark effect.

X-rays - Bragg's law - Bragg X-ray spectrometer - Powder crystal method - X-ray spectra - Characteristics of X-ray spectrum - Mosley's law - Compton scattering. Photoelectric effect - Experimental investigation on the photoelectric effect - Einstein's photoelectric equations - Photoelectric cells. (15 Hours)

UNIT III

Wave Mechanics:

Wave mechanics - De Broglie wavelength- expression for group velocity - experimental study of matter waves - Heisenberg's uncertainty principle - basic postulates of wave mechanics - derivation of time dependent form of Schrodinger equation - properties of the wave function - the particle in a box. (15 Hours)

UNIT IV

Quantum Mechanics:

Potential step - barrier penetration problem - linear harmonic oscillator - Hydrogen atom, linear, Hermitian, commutators and angular momentum operators - probability current density - Ehren Fest's theorem - mathematical proof for uncertainty principle for one dimensional wave packet. (15 Hours)

UNIT V

Relativity:

Frames of reference - Galilean transformations - Michelson Morley experiment - Special theory of relativity - Lorentz transformation equations - length contraction - time dilation - addition of velocities - variation of mass with velocity - energy mass relation - general theory of relativity and prediction. (15 Hours)

TEXT BOOK

Murugesan, R. and Kiruthiga Sivaprasath, (2014). *Modern Physics*, New Delhi: S.Chand & Company Pvt Ltd, 17th Revised Edition.

UNIT I – Chapter 6 - Sections: 6.8, 6.10(2), 6.11-6.16, 6.18-6.20

UNIT II –Chapter 6 – Sections: 6.22-6.28

Chapter 7 – Sections: 7.1, 7.6-7.8, 7.11-7.14

Chapter 8 – Sections: 8.1, 8.4-8.6

UNIT III - Chapter 11- Sections: 11.1-11.4, 11.7-11.10

UNIT IV - Chapter 11-Sections: 11.11-11.14

Chapter 12-Sections: 12.1, 12.2, 12.6, 12.7

UNIT V - Chapter 1 -Sections: 1.1, 1.2, 1.4, 1.6-1.10, 1.12- 1.14, 1.16, 1.17

REFERENCE BOOKS

1. Arthur Beiser, (1983). *Concepts of Modern Physics*, New Delhi: Mc Graw – Hill International Book Company, 3rd Edition.
2. Chattopadhyay, D. and Rakshit, P.C. (2008). *Quantum Mechanics Statistical Mechanics & Solid State Physics*, New Delhi: S. Chand & Company LTD, 8th Revised Edition.
3. Subramanian, M. & Brijlal Jivan Seshan, (2008). *Atomic & Nuclear Physics*, New Delhi: Chand & Company.
4. Aruldas, G. (2002). *Molecular Structure and Spectroscopy*, New Delhi: Prentice Hall of India Pvt. Limited.
5. Gupta, A.B. (2015). *Foundation of Quantum Mechanics*, Calcutta: Books and Allied (P) Ltd.



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B.Sc. PHYSICS (SEMESTER)

(2018 -2019 onwards)

Semester IV	ELECTRONIC DEVICES AND INSTRUMENTATION	Hours/Week: 4	
Allied Course-2		Credits: 4	
Course Code 18UEIA41		Internal 25	External 75

COURSE OUTCOMES

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

- understand the operation of electronic instruments and their measuring techniques.
- describe different terminology related to measurements.
- analyze various wave forms with the help of storage oscilloscope.
- know about basic switching devices and their operation in measurements.
- know the applications of various types of transducers

UNIT I

Performance Characteristics:

Functional elements of an instrument – performance characteristics – static characteristics – accuracy – precision – sensitivity – resolution – threshold – linearity – dynamic characteristics – instrument classification – sources of errors – types of errors – gross – systematic – random errors – statistical analysis. (12 Hours)

UNIT II

Electronic Devices:

Electronic multimeter – uses of multimeter – d.c. voltage – an ammeter – a.c. voltage – resistance measurements – advantages and disadvantages – magnetic measurements – flux meter – measurements of flux density – electronic voltmeter – Vacuum Tube Voltmeter (VTVM) - applications of VTVM – merits and demerits of VTVM. (12 Hours)

UNIT III**Oscilloscope:**

Cathode Ray Tube (CRT) – basic principle of signal display – block diagram of simple oscilloscope – front panel controls of simple CRO - CRO measurements – voltage – current – period and frequency – need of CRO in electronic practicals – Lissajous figures – measurement of phase difference and frequency. (12 Hours)

UNIT IV**Power Electronics:**

SCR – construction, working, equivalent circuit, VI characteristics – half wave and full wave rectifiers using SCR – applications of SCR – Diac – construction, operational characteristics and applications (lamp dimmer, heat control) – Triac – construction, operational characteristics and applications (High power lamp switch, Electronic changeover of transformer) – UJT – applications – relaxation oscillator using UJT. (12 Hours)

UNIT V**Transducer:**

Classification of transducers – active and passive transducers – characteristics of transducers – passive transducers – resistive transducer – potentiometric resistance transducer – Resistance Temperature Detector (RTD) – Linear Variable Differential Transducer (LVDT) – capacitive pressure transducer – active transducer – piezoelectric transducer. (12 Hours)

TEXT BOOKS

1. Bakshi, U.A. & Bakshi, A.V. (2013). *Measurements & Instrumentation*, Fifth Revised Edition, Technical Publications.
 - UNIT I – Chapter 1 – Sections: 1.1, 1.2, 1.3, 1.4, 1.4.1, 1.4.2, 1.4.4 – 1.4.7, 1.5, 1.12, 1.17, 1.18 – 1.18.2, 1.18.3, 1.19
 - UNIT II – Chapter 2 - Sections: 2.36, 2.38 - 2.40
 - UNIT III– Chapter 5- Sections: 5.9 – 5.13, 5.22 - 5.23
 - UNIT V– Chapter 6 - Sections: 6.1- 6.3, 6.5 - 6.7, 6.9, 6.12, 6.13.3, 6.14, 6.16
2. Mehta, V.K. (2008). *Principles of Electronics*, S.Chand & Company Ltd.
 - UNIT II – Chapter 22 - Sections: 22.7 – 22.10
 - UNIT IV– Chapter 20 - Sections: 20.1 – 20.5, 20.9, 20.10
 - Chapter 21 - Sections: 21.1 – 21.3, 21.5, 21.6, 21.8 - 21.15

REFERENCE BOOKS

1. Theraja, B.L. (2014). *Basic Electronics Solid State*, Revised Edition, S.Chand & Company Ltd.
2. Ubald Raj, A. & Jose Robin, G. (1997). *Basic Electronics*, Edition, Indira Publications.
3. Sedha, R.S. (2008). *A Text book of Applied Electronics*, Revised Edition, S.Chand & Company Ltd.



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VIRUDHUNAGAR - 626 001

B.Sc. PHYSICS (SEMESTER)

(2018 -2019 onwards)

Semester IV	ASTROPHYSICS	Hours/Week: 2	
SEC-3		Credits: 2	
Course Code 18UPHS41		Internal 40	External 60

COURSE OUTCOMES

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

- apply the basic laws of Physics to explore the astronomical and astrophysical concepts.
- gain knowledge about the properties of the sun.
- know about characteristics and evolution of stars.
- understand the different types of galaxies.
- have an idea about cosmology.
- know about the fundamentals of Astronomical instruments.

UNIT I

The Sun:

Electromagnetic spectrum – Sun – ordinary gases – Sun's continuous spectrum – solar absorption line spectrum – physical properties of the sun – structure of the sun – solar atmosphere – active sun – Sunspots – Sunspot Cycle – butterfly diagram – solar wind – Auroras. (6 hours)

UNIT II

The Universe of Stars:

Birth of stars – chemical composition and energy generation of the stars – Hertzsprung – Russell diagram – luminosity of a star – theoretical evolution of stars – supernova explosion – observational evidence of stellar evolution – white dwarfs – black holes – neutron stars – pulsars. (6 hours)

UNIT III

Galaxies:

Classification of galaxies – milky way galaxy – galactic clusters – differential galactic rotation – spiral structure in the milky way – optical tracers of spiral structure – radio tracers of spiral structure – galactic center – distribution of material near the center – a massive black hole. (6 hours)

UNIT IV

Cosmology:

Cosmological methods – big bang theory – steady state theory – Hubble's Law – Olber's Paradox – interstellar extinction – dark matter. (6 hours)

UNIT V

Astronomical Instruments:

Telescopes: an introduction – elements of telescope – properties of the image – kinds of optical telescopes – refracting telescope – reflecting telescope – difference between reflecting and refracting telescopes – radio telescope – spectrograph – photographic photometry – photoelectric photometry – spectrophotometry – detectors and image processing. (6 hours)

*Assignment based on Field Visit related to astronomical observatory.

TEXT BOOK

1. Mujiber Rahman, A. (2018). *Concepts of Astrophysics*, Scitech Publications (India) Pvt. Ltd.

Unit I – Chapter 1 - Sections: 1.7

Chapter 2 – Sections: 2.1 to 2.6, 2.8 to 2.12

Unit II – Chapter 3 – Sections: 3.1 to 3.3, 3.6, 3.8 to 3.12

Unit III – Chapter 5 – Sections: 5.1 to 5.6, 5.9 to 5.11, 5.13

Unit IV – Chapter 6 – Sections: 6.1 to 6.8

Unit V – Chapter 7 – Sections: 7.1 to 7.11

REFERENCE BOOKS

1. Kumaravelu, Susheelakumaravelu, S.(2009). *Astronomy*, Sivakasi: A.Bhaskara Selvan Printers.
2. William Kaufmann, (1999). *Astronomy: The Structure of the Universe*, New York: MacMillan Publishing Co.inc.
3. Thiruvengkatacharya, V. (1972). *A Text Book of Astronomy*, New Delhi: S. Chand and Co., Pvt Ltd.

4. Abhyankar, K.D. (1989). *Astrophysics, Stars and Galaxies*, New Delhi: Tata McGraw Hill Publications.
5. Nick Kaiser, (2002). *Elements of Astrophysics* (online version)



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VIRUDHUNAGAR - 626 001

B.Sc. PHYSICS (SEMESTER)

(2018 -2019 onwards)

Semester IV	FUNDAMENTALS OF ELECTRONICS	Hours/Week: 2	
NMEC-2		Credits: 2	
Course Code 18UPHN41		Internal 40	External 60

COURSE OUTCOME

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

- understand the basic concepts of electronics.
- know about the concepts of amplifier and oscillator.
- have an idea about modulation.
- get an in depth knowledge about number system.
- explain the Boolean laws and binary address.
- understand the basic concepts of logic gates.

UNIT I

Electronics:

Junction diodes – types of diodes (LED and Zener) – half wave rectifier using diodes – transistors – oscillators – comparison between an amplifier and an oscillator.

(6 Hours)

UNIT II

Operational Amplifier:

Modulation – types of modulation – operational amplifiers – op-amp and its characteristics – inverting amplifier – op-amp as adder and subtractor. (6 Hours)

UNIT III

Number systems:

Number systems – conversion of decimal number into binary number – binary to decimal conversion – binary addition – 1's and 2's complement – hexadecimal numbers – octal numbers. (6 Hours)

UNIT IV

Boolean Algebra:

Codes – excess-3 code – binary coded decimals – gray code – boolean algebra – boolean postulates – De Morgan’s laws – binary adders – half adder – full adder.

(6 Hours)

UNIT V

Logic Gates:

Digital circuits – logic gate – gate and switch – binary concept – positive and negative logic system – basic logic gates – the AND gate – the OR gate – the NOT gate.

(6 Hours)

TEXT BOOKS

1. Murugesan. R. (2016). *Electricity and Electronics*, First Edition.
2. Theraja, B.L. (2014). *Basic Electronics*, New Delhi: S.Chand &Co Pvt Ltd.
3. Jose Robin.G, Ubald Raj. A. (2014). *Digital Electronics*, Marthantam: Indira Publication.

BOOK 1:

UNIT I: Chapter 4 – Sections: 4.1- 4.6, 4.9

UNIT II: Chapter 4 – Sections: 4.16-4.18, 4.22, 4.24, 4.25

BOOK 2:

UNIT III: Chapter 1 – relevant sections

UNIT IV: Chapter 1, chapter 2, Chapter 4 – relevant sections

UNIT V: Chapter 2 – relevant sections

BOOK 3:

UNIT I: Sections – 17.6, 28.1, 28.2

REFERENCE BOOKS

1. Jose Robin, G. Ubald Raj, A. (2004). *Basic Electronics and Applied Electronics*, Marthantam: Indira Publications, 1st Edition.
2. Chattopadhyay, D. & Rakshit, P.C. *Electronics Fundamentals and Applications*, Chennai: New Age International Publishers, 11th Edition.

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B.Sc. PHYSICS (SEMESTER) (2018 -2019 onwards)

Semester IV	CORE PRACTICAL -2 GENERAL PHYSICS - II	Hours/Week: 2	
Core Course-2		Credits: 2	
Course Code 18UPHC41P		Internal 40	External 60

List of Experiments

1. Determination of specific rotatory power using polarimeter
2. Determination of resistance & resistivity using potentiometer
3. Calibration of high range voltmeter using potentiometer
4. Conversion of galvanometer into ammeter using spot galvanometer
5. Determination of charge sensitiveness using spot galvanometer
6. Determination of L by Owens' bridge
7. Comparison of capacitances by Desauty's bridge
8. Determination of dispersive power of the prism using spectrometer
9. Determination of refractive index of a liquid using hollow prism by spectrometer
10. Determination of N and d of grating by spectrometer
11. Determination of refractive index of a small angled prism by spectrometer
12. Determination of thickness of a wire by Air wedge.
13. Determination of wavelength of sodium light by Newton's rings method.
14. Determination of specific heat capacity of water using Joules Calorimeter.
15. Determination of ece of copper using copper voltameter.
16. Determination of impedance and power factor of LR circuit.



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B.Sc. PHYSICS (SEMESTER)

(2018 -2019 onwards)

Semester IV	ALLIED ELECTRONICS PRACTICAL - 1	Hours/Week: 2	
Allied Course-2		Credits: 2	
Course Code 18UEIA41P		Internal 40	External 60

List of Experiments:

1. Measurement of R, L and C using multimeter.
2. Zener diode characteristics
3. Thermistor characteristics.
4. Logic gates using discrete components.
5. Bridge rectifier
6. Diode wave shaping circuits
7. UJT relaxation oscillator
8. Transistor characteristics –common emitter mode.
9. Emitter follower
10. Logic gates using IC gates
11. Verification of De Morgan's theorem using IC
12. IC voltage regulator
13. Pulse generator using NAND
14. Half adder and Half subtractor

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B.Sc. PHYSICS (SEMESTER) (2018 - 2019 onwards)

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

COURSE OUTCOMES

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

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

REFERENCE BOOKS

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



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B.Sc. PHYSICS (SEMESTER)

(2018 - 2019 onwards)

Semester IV	ALLIED PHYSICS-II	Hours/Week: 4	
Allied Course- 2		Credits: 4	
Course Code 18UPHA41		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

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

REFERENCE BOOKS

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



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B.Sc. PHYSICS (SEMESTER)

(2018 - 2019 onwards)

Semester III/IV	ALLIED PHYSICS - PRACTICAL- I	Hours/Week: 2	
Allied Course- Practical-I		Credits: 2	
Course Code 18UPHA41P		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 - μ 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.