VIVEKANANDA COLLEGE

College with Potential for Excellence

(Residential & Autonomous-A Gurkula Institute of Life-Training)

(Affiliated to Madurai Kamaraj University)

Re-accredited with 'A' Grade (CGPA 3.59 out of 4.00) by NAAC

TIRUVEDAKAM WEST
MADURAI DISTRICT – 625 234

DEPARTMENT OF PHYSICS

B.Sc. PHYSICS

SYLLABUS

Choice Based Credit System

(For those who joined in June 2016 and after)

(2017-2020 Batch)

ABOUT THE COLLEGE

Vivekananda College was started by Founder-President Swamiji Chidhbhavanandhaji Maharaj of Sri Ramakrishna Tapovanam, Tirupparaithurai, Trichy in 1971 on the banks of the river Vaigai which is blissfully free from the noise and hurry, the crowds and distraction of the city.

Vivekananda College is a residential college functioning under Gurukula pattern. It is Man-making education that is imparted in this institution, Culture, character and curriculam are the three facets of ideal education that make man a better man. This is possible only when the teacher and taught live together, The Gurukula system of Training is therefore a humble and systematic attempt in reviving the age old GURUGRIHAVASA for wholesome education, Attention to physical culture, devotion to duty, obedience to teachers, hospitality to guests, zest for life, love for the nation, and above all, humility and faith in the presence of God etc. are the values sought to be inculcated. All steps are taken to ensure the required atmosphere for the ideal life training.

Vivekananda College, Tiruvedakam West, Madurai District-625 234 is an aided college established in 1971 and offers UG and PG courses. This College is affiliated to the Madurai Kamaraj University, Madurai. The College was reaccredited with 'A' grade (CGPA 3.59 out of 4.00) by NAAC in September 2015. The college was awarded College with Potential for Excellence by UGC in 2016.

VISION AND MISSION

Our Vision: To raise an army of neo-graduates steeped in the hoary culture of the motherland and dedicated to serving her as potential leaders in the manifold spheres of national effort.

Our Mission: A harmonious enrichment of physical, emotional and intellectual facets of a student's personality to bring out his inherent PERFECTION.

OBJECTIVES OF THE INSTITUTION

1. To inculate spiritual, ethical, moral and social values in all disciplines of study.
2. Simultaneous education of the Hand, Heart and Head. Only a sound body can hold a sound mind.
3. Provide opportunities for all round development of the students and excellence in higher education, research and extension in different disciplines.
4. Disseminate the findings of research to the community to facilitate its development.
5. To provide society citizens of sterling character.
6. To cater to the needs of the educationally backward people – the most backward, scheduled caste and tribe.

I Eligibility for Admission

Admission to B.Sc. – Physics Programme is open to candidates with +2 pass with Maths, Physics, Chemistry, Biology as major subjects.

For B.Sc.- Physics course offered in the college, a pass in the Higher Secondary Examination conducted by the Government of Tamil Nadu or an examination accepted as equivalent there to by the Syndicate of the MKU, subject to such conditions as may be prescribed therefore.

II Duration

The course is for a period of three years. Each academic year shall comprise of two semesters viz. Odd and Even semesters. Odd semesters shall be from June to November and Even Semesters shall be from December to April. There shall be not less than 90 working days which shall comprise 450 teaching clock hours for each semester (Exclusive of the days for the conduct of university end-semester examinations) for each semester.

III CBCS System

All Programmes offered in the college are run on Choice Based Credit System (CBCS). It is an instructional package developed to suit the needs of students to keep pace with developments in higher education and the quality assurance expected of it in the light of liberalization and globalization in higher education.

IV Semesters:

An academic year is divided into two semesters. In each semester, courses are offered in 15 teaching weeks. Each week has 30 working hours spread over 6 days a week.

V Credits:

The term 'Credit' refers to the weightage given to a course, usually in relation to the instructional hours assigned to it. The total minimum credits, required for completing the B.Sc. Programme is 140. The details of credits for individual components and individual courses are given in the above table.

VI Course:

Each Course is to be designed variously under lectures / laboratory / seminar / practical training / assignments to meet effective teaching and learning needs.

VII Examinations:

i). There shall be examinations at the end of each semester, for odd semesters in the month of October / November; for even semesters in April/May. A candidate who does not pass the examination in any course(s) shall be permitted to appear in such failed course(s) in the subsequent examinations to be held in October / November or April/May.

ii). A candidate should get registered for the first semester examination. If registration is not possible owing to shortage of attendance beyond condonation limit / regulations prescribed or belated joining or on medical grounds, the candidates are permitted to move to the next semester. Such candidates shall re-do the missed semester after the completion of the programme.

VIII Condonation

Students must have 75% of attendance in each paper for appearing the examination. Students who have 65% to 74% of attendance shall apply for condonation in the prescribed form with the prescribed fee. Students who have 50% to 64% of attendance shall apply for condonation in prescribed form with the prescribed

fee along with the Medical Certificate. Students who have below 50% of attendance are not eligible to appear for the examination. They shall compensate the shortage after the completion of the programme.

IX Question Paper Pattern
Time: 3 Hours
Maximum Marks: 75

SECTION-A (10 X 1 =10 Marks)
Answer All Questions
(1-5) Multiple Choice
(6-10) Fill in the blanks
Two questions from each unit

SECTION-B (5 X 7 = 35 Marks)
Answer All Questions
(11-15) Questions shall be in the format of either (a) or (b)
One question from each unit

SECTION-C (3 X 10 = 30 Marks)
Answer any THREE Questions
(16-20) One question from each unit.

X Evaluation:
Performance of the students are evaluated objectively. Evaluation is done both internally and externally. They will be assessed continuously through Internal Assessment System and finally through summative (end) semester examination. To assess internally, there will be three examinations conducted centrally with a duration of two hours for each paper. In addition to continuous evaluation, the summative semester examination, which will be a written examination of three hours duration, would also form an integral component of the evaluation. The ratio of marks to be allotted to continuous internal assessment and to end semester examination is 25 : 75.

The pattern of internal valuation shall be:
        Test: 20 Marks (the average of best two tests out of three tests)
        Assignment: 5 marks
        Total: 25 marks.

In respect of practical papers, the ratio of marks to be allotted to internal assessment and to summative (end) semester examination is 40 : 60. The internal marks will be calculated on the basis of marks secured at the model examination and marks awarded for the preparation of practical note book. The external marks will be calculated on the basis of the marks awarded by the internal examiner and the external examiner at the summative semester examination.

XI Passing Minimum
There is no passing minimum for Internal Assessment. The passing minimum for external Examinations shall be 27 out of 75 marks and passing minimum for a paper is 40%.

XII Classification of Students
Candidates who have secured not less than 40% of marks in each paper shall be declared to have passed in that paper. Candidates who obtain 40% and above but below 50% shall be declared to have passed in Third Class. Candidates who obtain

50% and above but below 60% of the aggregate marks in Part-III shall be declared to have passed in Second Class and those who obtain 60% of marks and above shall be placed in the First Class. Candidates who obtain 75% and above shall be declared to have passed in Distinction provided he has not re-appeared for any paper during the course of the study.

XIII Failed Candidates

A candidate who has arrears in any paper in a semester examination will be permitted to proceed to the next semester classes. A candidate who has arrears may appear again in these failed papers at the November/April examinations. The internal assessment marks already obtained by him shall be carried over for the subsequent appearance also.

XIV Improvement of Internal Marks

The student desirous of improving the internal assessment marks may request the Head of the Department. After obtaining permission from the Staff Council Meeting by the Head, the student may write improvement examinations in consultation with the course teacher. The marks obtained (when it is more than the previous marks) will be submitted to the Controller of Examinations for further adoption.

XV Study Tour

Students are expected to participate in the field visit and the study tours organized by the department. Though study tour/field trip carries no credit, it is compulsory for the students to attend whereby the students can get an opportunity to gain practical knowledge. As such, observational visit to selected social welfare organizations, industries, trade centres, exhibitions, places of historical importance and the like will be considered as extra-curricular activities.

VISION AND MISSION OF PHYSICS DEPARTMENT

VISION

Inculcating the basic and up to date knowledge in physical science to the first generation students from rural areas – by student cantered learning methods and a mixture of traditional, current, and integrative pedagogical techniques.

The department has dedicated itself for lifelong learning through academicals and social programs.

MISSION

Prepare the student in assets of physics and the principles of analytical methods required for the competitive physical tests in the competitive world.

Kindle the knowledge of students to pursue higher studies and research programs. Making the students self employable with the Physics knowledge gained during their degree course of study.

To provide the tools and skills for advancing our knowledge of the universe and for providing solutions to challenges we face as individuals, communities, and societies.

A Brief History of the Department of Physics

At the time of inception of the college to Madurai University in the year 1971 Prof.R.Murugeshan was the first staff appointed in Physics department as a demonstrator to teach Physics for PUC. Three year B.Sc., Physics Major Course was introduced in the academic years 1973-1974. After the induction of Physics major course Prof M.Muthusamy and Prof. K.S.Srinivasanambirajan were appointed as Assistant Professors. Prof.M.Muthusamy leads the department as head of the department till to his retirement 31-05-2003. Prof.K.S.Srinivasanambirajan also retired from his service in the same academic on 31-05-2003. After that Prof.R.Murugeshan leads the department as head of the department of Physics till to his retirement on 31-05-2004. During his service Prof.R.Murugeshan published several books on different topics of Physics. His book on "Modern Physics" is very popular throughout our nation and is being prescribed as a text book in majority of the Indian Universities for under graduate course. Prof.A.P.Selvarajah acted as HOD from 01-06-2004 to 31-05-2014. Dr.P.K.Veeran acted as HOD from 01-06-2014 to 30.11.2015. Sri.P.Jeyasankar has taken over the charge as HOD of Physics from 01-12-2015 to till date. The department take special interest in teaching medical instrumentation, house hold electrical appliances and house wiring (Certificate Course) which are much useful for self employment. The department took special interest in teaching ideas, concepts and physical laws which is very useful to get through in the competitive examinations for appointments and to get admission in higher studies. Thursday meet is a unique programme conducted in our department which is organised, conducted and participated by our department students by taking seminars on current topics, conducting Science quiz and having a good academic discussion on current topics in the presence of faculty members which is not only useful to enhance their subject skill but to enrich their communicative skills also. Lab on wheel and Science exhibition are other programmes which are very useful for school students in nearby villages. Seminars, Guest lectures are frequently conducted inviting subject experts from Higher Academic Centres like IIT, ISRO, IIAP, etc.,

SCHEME OF EXAMINATION
(For those who joined in 2016 and after)
FIRST SEMESTER

Part	Study Component	Subject Code	Title of the Paper	Hours	Credit	Sessional Marks	Summative Marks	Total
I	Tamil	P1LT11	Tamil: Ikkalak Kavithaiyum Urainadaium	6	3	25	75	100
	Sanskrit	P1LS11	Fundamental Grammar & History of Sanskrit Literature – I					
II	English	P2LE11	Communicative English / Spoken English – I	5 1	2	25	75	100
III	Core	06CT11	Mechanics	4	4	25	75	100
	Core	06CT12	Electromagnetism	4	4	25	75	100
	Core		Major Practical	2	-	-	-	-
	Allied	07AT01	Allied Paper I: Inorganic, Organic. & Physical Chemistry- I	4	4	25	75	100
	Allied		Allied: Volumetric Estimation	2	-	-	-	-
IV	Non Major	06NE11	Non Major Elective Paper I : Space Science	2	2	25	75	100
			TOTAL	**30**	**19**			

SECOND SEMESTER

Part	Study Component	Subject Code	Title of the Paper	Hours	Credit	Sessional Marks	Summative Marks	Total
I	Tamil	P1LT21	Tamil: Ikala Kadhai Ilakkiyamum Makkal Thagavaliyalum.	6	3	25	75	100
	Sanskrit	P1LS21	Poetry, Grammar & History of Sanskrit Literature – II					
II	English	P2LE21	Functional English	5	2	25	75	100
	English	P2LE22	Spoken English-I	1	1	100	--	100
III	Core	06CT21	Thermodynamics and Statistical Mechanics	4	4	25	75	100
	Core	06CT22	Optics and Sound	4	4	25	75	100
	Core	06CP23	Major Practical –I	2	2	40	60	100
	Allied	07AT02	Allied Paper II : Inorganic Organic & Physical Chemistry-II	4	4	25	75	100
	Allied	07AP03	Allied : Volumetric Estimation	2	2	40	60	100
IV	Non Major	06NE21	Non Major Elective Paper II: Electrical Home Appliances	2	2	25	75	100
			TOTAL	**30**	**24**			

THIRD SEMESTER

Part	Study Component	Subject Code	Title of the Paper	Hours	Credit	Sessional Marks	Summative Marks	Total
I	Tamil	P1LT31	Kappiyamum Pakthi Ilakiyamum Nadakamum	6	3	25	75	100
	Sanskrit	P1LS31	Prose , Poetics & History of Sanskrit Literature – III					
II	English	P2LE31	English through Drama & Poetry Spoken English – II	4 1	2	25	75	100
III	Core	06CT31	Principles of Electric Circuits	4	4	25	75	100
	Core	06CT32	Spectroscopy	5	5	25	75	100
	Core		Major Practical	2	-	-	-	-
	Allied	05AT01	Allied paper I : Mathematics – I	6	5	25	75	100
IV	Skill Based	06SB31	Skill Based Paper I: Solar Energy	2	2	25	75	100
			TOTAL	**30**	**21**			

FOURTH SEMESTER

Part	Study Component	Subject Code	Title of the Paper	Hours	Credit	Sessional Marks	Summative Marks	Total
I	Tamil	P1LT41	Sanga Ilakkiyamum Neethi Ilakkiyamum	6	3	25	75	100
	Sanskrit	P1LS41	Drama and History of Sanskrit Literature – IV					
II	English	P2LE41	English through classics	4	2	25	75	100
	English	P2LE42	Spoken English – II	1	1	100		100
III	Core	06CT41	Analog Electronics	5	5	25	75	100
	Core	06CT42	Mathematical Physics	4	4	25	75	100
	Core	06CP43	Major Practical –II	2	2	40	60	100
	Allied	05AT02	Allied Paper IV: Mathematics-II	6	5	25	75	100
IV	Skill Based	06SB41	Skill Based Paper II : Astrophysics	2	2	25	75	100
			TOTAL	**30**	**24**			

FIFTH SEMESTER

Part	Study Component	Subject Code	Title of the Paper	Hours	Credit	Sessional Marks	Summative Marks	Total
II	English	P2LE51	English for Career Development	1	1	100	--	100
III	Core	06CT51	Solid State Physics	6	5	25	75	100
	Core	06CT52	Digital Electronics	6	5	25	75	100
	Core	06CP53	Major Practical –III	8	4	40	60	100
	Elective	06EP51	Object Oriented Programming with C++	5	5	25	75	100
IV	Skill Based	06SB51	Fibre Optic Communication	2	2	25	75	100
	ES	ESUG51	Environmental Studies	2	2	25	75	100
			TOTAL	**30**	**24**			

SIXTH SEMESTER

Part	Study Component	Subject Code	Title of the Paper	Hours	Credit	Sessional Marks	Summative Marks	Total
II	English	P2LE61	English for Professional Excellence	1	1	100	--	100
III	Core	06CT61	Nuclear Physics	4	4	25	75	100
	Core	06CP62	Major Practical-IV	6	4	40	60	100
	Elective	06EP61	Modern Physics	5	5	25	75	100
	Elective	06EP62	Project	6	5	100	--	100
IV	Skill Based	06SB61	Nanotechnology	2	2	25	75	100
	Skill Based	06SB62	Physics for Competitive Exam.	2	2	25	75	100
	Skill Based	06SB63	Medical Instrumentation	2	2	25	75	100
	VE	VEUG61	Value Education	2	2	25	75	100
	EA	EAUG61	Extension Activities		1		100	100
			TOTAL	**30**	**28**			

முதல் பருவம் - பாடத்திட்டம்
(2017-2018 ஆம் கல்வியாண்டு முதல் முதற்பருவத்தில் சேரும் மாணவர்களுக்குரிய பாடத்திட்டம்)

PART-I: Language Tamil Subject		
Subject Title: இக்காலக் கவிதையும் உரைநடையும் - தாள்:1		
Subject Code: P1LT11	Hours per week: 6	Credit: 3
Seasonal Marks: 25	Summative marks: 75	Total Marks: 100

பாடப்பகுதி

அலகு : 1   தமிழ்ச் செய்யுள்   :   மரபுக்கவிதைகள்

அலகு : 2   தமிழ்ச் செய்யுள்   :   புதுக்கவிதைகள்

அலகு : 3   தமிழ் உரைநடை இலக்கியம்   :   சுவாமி சித்பவானந்தரின் சிந்தனைகள்.

அலகு : 4   தமிழ் இலக்கணம்   :   எழுத்து இலக்கணம்

அலகு : 5   தமிழ் இலக்கிய வரலாறும் பயன்பாட்டுத்தமிழும்

பாடப்பகுதியின் உட்பிரிவுகள்

அலகு: 1 தமிழ்ச் செய்யுள் : மரபுக்கவிதைகள்

1. பாரதியார் கவிதைகள்

1. தமிழ் (கவிதை முழுவதும்)
2. நடிப்புச் சுதேசிகள் (கவிதை முழுவதும்)

2. பாரதிதாசன் கவிதைகள்

1. நீங்களே சொல்லுங்கள் (கவிதை முழுவதும்)
2. புதிய உலகு செய்வோம் (கவிதை முழுவதும்)

3. குருதேவர் இராமகிருஷ்ணர்
    நாமக்கல் கவிஞர் வெ.இராமலிங்கம் பிள்ளை

4. கோவில் வழிபாடு
    கவிமணி தேசிக விநாயகம் பிள்ளை

5. மதுரை ஸ்ரீமீனாட்சியம்மை
    சோழவந்தான் அரசஞ்சண்முகனார்

அலகு: 2 தமிழ்ச்செய்யுள் : புதுக்கவிதைகள்

1   அன்னை – கவிஞர் கண்ணதாசன்
2   கிழக்கு விழிக்கும் நேரம் - கவிஞர் வைரமுத்து (கொடிமரத்தின் வேர்கள்)
3   அவர்கள் வருகிறார்கள் - மு.மேத்தா (சுதந்திர தாகம்)
4   புதுக்கவிதைகள் - க.நா.சுப்ரமண்யம் (கவிதை)

5   நாம் இருக்கும் நாடு - தமிழன்பன் (வாக்கு வரம் தரும் தெய்வம்)

6   தீர்த்தக்கரையினிலே - முருகு சுந்தரம் (ஒலிபெருக்கி)

7   ஹைக்கூ கவிதைகள் - க.ராமச்சந்திரன்

அலகு:   3 தமிழ் உரைநடை இலக்கியம் - சுவாமி சித்பவானந்தரின்

சிந்தனைகள் (தமிழ்த்துறை வெளியீடு)

அலகு: 4 தமிழ் இலக்கணம் - எழுத்து

1. முதல் எழுத்துக்கள்
2. சார்பெழுத்துக்கள்
3. மொழி முதல் எழுத்துக்கள்
4. மொழி இறுதி எழுத்துக்கள்
5. வல்லெழுத்து மிகும் இடங்கள்
6. வல்லெழுத்து மிகா இடங்கள்

அலகு: 5 தமிழ் இலக்கிய வரலாறும் பயன்பாட்டுத் தமிழும்

அ) 1. மரபுக்கவிதையின் தோற்றமும் வளர்ச்சியும்

2. புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும்

ஆ)   மரபுப்பிழை நீக்குதல் - பிறமொழிச் சொற்களை நீக்குதல் - பிழையற்ற தொடரைத் தேர்ந்தெடுத்தல் - ஒருமை பன்மை மயக்கம் – ஓர் எழுத்து ஒரு மொழிக்குரிய பொருள் - ஒலி வேறுபாடுகளும் பொருள் வேறுபாடுகளும் - பொருத்தமான பொருள் - பொருத்தமான தொடர் அறிதல்.

பாடநூல்கள்

1. தமிழ்ச் செய்யுள் தொகுப்பு (தமிழ்த்துறை வெளியீடு)

2. சுவாமி சித்பவானந்தரின் சிந்தனைகள் (தமிழ்த்துறை வெளியீடு)

பார்வை நூல்கள்

1. பாரதியார் கவிதைகள் (குமரன் பதிப்பகம்)
2. பாரதிதாசன் கவிதைகள் (சுவாமிமலை பதிப்பகம்)
3. தமிழ் இலக்கிய வரலாறு - முனைவர். பாக்யமேரி
4. தமிழ் இலக்கிய வரலாறு - மு.வரதராசனார்

B.A. / B.Sc. PART-I –LANGUAGE SANSKRIT SYLLABUS: SEMESTER – I:

PAPER – I

(For those who join in June 2017and After)

PART - I Sanskrit Paper I		
Subject Title : **Fundamental Grammar & History of Sanskrit Literature – I**		
Subject Code: **P1LS11**	Hours per week: **6**	Credit: **3**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

FUNDAMENTAL GRAMMAR & HISTORY OF SANSKRIT LITERATURE -I

Following portions for Grammar:

Declension of the following nouns and pronouns:

UNIT-I   Akārānta Mascular, Ākārānta Faminine & Akārānta Neuter.

Asmad and Yuṣmad śabdas

Conjugation of the following verbs in present, past & future tense

Bhav, paṭh, Vad, Gacch, Vas, Driś (Paś), Krīḍ Dhāv

UNIT-II & III History of Sanskrit Literature:

a) Vedas and Purāṇās
b) Itihāsa
c) Court Epics – Mahākāvyas

UNIT –IV

Translation:

a) From Sanskrit to English:
    Passages exercises 2, 3 and 4 from the prescribed texts.

b) From English to Sanskrit:
    Passages exercises 1, 2 and 3 from the prescribed texts.
    UNIT – V. Transliteration
    a)Devanaagari to IPS. b) IPS to Devanaagari

Prescribed text: "SĀHITYA RASAKANĀḤ"

(Published by A.M.G. Publications, Madurai – 625 016)
Sanskrita Sri Patamala Book 1: Publication: Sanskrit Educational Society, Madras – 18.

A short history of Sanskrit Literature (Published by A.M.G. Publications, Madurai – 625 016) year of publication- 1996

(For those who joined in June 2017 and after)

PART II – Paper I		
Subject Title **: Communicative English**		
Subject Code:**P2LE11**	Hours per week: **5**	Credit: **2**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives: Total number of hours per semester: **75 Hrs**

- ❖ *To develop listening and speaking skills*
- ❖ *To increase the vocabulary of students*
- ❖ *To improve reading skills*
- ❖ *To develop competency in grammar*
- ❖ *To develop continuous writing*

Unit – I - Listening, Speaking and Reading Components   15 Hrs

1. Rabindranath Tagore – Cabuliwallah
2. Khushwant Singh – Karma
3. R.K. Narayan – Sweets for Angels
4. K.A.Abbas   – Sparrows

Unit – II   15 Hrs

- Sentences, Clauses, and Phrases
- Parts of Speech
- Nouns
- Pronouns
- Determiners
- Articles
- Adjectives
- Verbs
- Adverbs
- Some Common Adjectives and Adverbs

Unit – III Composition   15 Hrs

- Letter writing – Formal Letters & Informal Letters
- Descriptive Writing – General topics (Paragraph)

Unit – IV - Extensive Reading: Short Stories   15 Hrs

- Young Naren   -   by Brahamachari Amal.
  [From "A Simple life of Swami Vivekananda" Advaita Ashrama, Kolkata]
- A Story of Initiation -   by Sri Aurobindo Society.
  From "Stories and Anecdotes from the Mother" Pondicherry.
- Glory At Twilight   -   Bhabani Bhattacharya
- The Martyr's Corner -   R.K. Narayan

Unit – V - Translation   15 Hrs

Translation of Sentences and Stories from Tamil to English / English to Tamil (Passages will be supplied)

Reference Book:

1. A Textbook of English Grammar and Usage by K.V.Joseph (Page. No.1-184) Second Edition (2012), TATA McGraw Hill Education Private Limited, New Delhi.

PART III: Core Subject Theory		
Subject Title**: MECHANICS**		
Subject Code:**06CT11**	Hours per week : **4**	Credit:**4**
Sessional Marks:**25**	Summative marks:**75**	Total Marks:**100**

Objectives:

- ❖ *To enable the students in order to learn the basic principles, theory and concepts of mechanics.*
- ❖ *To gain knowledge by the students in order to learn motion of bodies.*
- ❖ *To inspire interest for the knowledge of concepts in fluid dynamics.*

UNIT I: MOTION IN ONE DIMENSION AND NEWTON'S LAWS

One Dimensional Kinematics - Motion with Constant Acceleration - Freely Falling Bodies - Newton's First Law - Force - Mass - Newton's Second Law - Newton's Third Law - Weight and Mass.

UNIT II: MOTION IN TWO AND THREE DIMENSIONS

Motion in Three Dimensions with Constant Acceleration - Newton's Laws in Three Dimensional Vector form - Projectile Motion - Uniform Circular Motion - Frictional forces - The Dynamics of Uniform Circular Motion.

UNIT III: MOMENTUM AND SYSTEM OF PARTICLES

Collisions - Linear Momentum - Impulse and Momentum - Conservation of Momentum - Two Body Collisions - Many Particles Systems - Center of Mass of Solid Objects - Conservation of Momentum in a System of Particles.

UNIT IV: ANGULAR MOMENTUM AND WORK AND KINETIC ENERGY

Angular Momentum of a Particle - System of Particles - Angular Momentum and Angular Velocity - Conservation of Angular Momentum - Work done by a Constant Force - Power - Work done by a Variable Force - Kinetic Energy and the Work Energy Theorem - Work and K.E. in Rotational Motion.

UNIT V: FLUID STATICS AND FLUID DYNAMICS

Fluids and Solids - Pressure and Density - Variation of Pressure in Fluid at Rest - Measurement of Pressure - General Concepts of Fluid flow - Streamlines and Equation of Continuity - Bernoull's Equation - Applications of Bernoulli's Equation and Equation of Continuity.

Text Book: Physics, Volume 1, DAVID HALLIDAY, ROBERT RESNICK,& KENNETH S. KRANE 2002, fifth edition, John Wiley & Sons, INC.

Unit I: 2-4, 2-5, 2-6, 3 - 2, 3 - 3, 3 - 4, 3 - 5, 3- 6, 3 - 7
Unit II: 4 -1, 4 -2, 4 - 3, 4 – 5, 5 - 3, 5 - 4
Unit III: 6-1, 6-2, 6-3, 6-4, 6-5, 7 -3, 7-4, 7-5
Unit IV: 10-1, 10-2, 10-3, 10-4, 11-1, 11-2, 11-3, 11-4, 11-6, 11-7
Unit V: 15-1, 15-2, 15-3, 15-3, 15-5, 16-1, 16-2, 16-3, 16-7.

Reference Books:

1. Physics for Scientists and Engineers with Modern Physics, Raymond A. Serway, Fourth Edition, Sounders College Publishing, 1995.
2. Mechanics- D.S. Mathur - S.Chand and Company Ltd., 2007.
3. Modern Physics- R.Murugesan, Kiruthiga Sivaprasath- 14th Revised multicolor Edition 2008
4. Introduction to Solid Mechanics" by I.H. Shames, 2009**.**

PART – III : Core Subject Theory		
Subject Title **: ELECTROMAGNETISM**		
Subject Code: **06CT12**	Hours per week: **4**	Credit: **4**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives: To gain knowledge about the electrical energies in order to
- ❖ *learn motion of charges*
- ❖ *acquire basic knowledge of magnetic properties*
- ❖ *know about the alternating current and its circuits*
- ❖ *get a depth of knowledge in electricity and magnetism*

UNIT I: CHARGE AND FIELDS

Basic concepts - Coulomb's law - Super position Principle - Electric Field - Electric Field due to a point charge - Electric Dipole - Potential Energy of a Dipole in uniform Electric field - Electric field due to an Electric Dipole at an axial point - Electric field at a point on the equatorial line - Electric field due to an Electric dipole at any point - Lines of force - Gauss's law - Differential form of Gauss law - An Insulated conductor - Electric field due to a uniformly charged sphere - Coulomb's theorem

UNIT II: ELECTRIC POTENTIAL AND CAPACITORS

Potential Difference - Electric Potential as line Integral of Electric Field - Potential at a point due to a point charge - Relation between Electric field and Electric Potential. Capacitance of a spherical capacitor (outer and inner sphere earthed) - Capacitance of a cylindrical capacitor, Parallel plate capacitor - Capacitors in series and parallel - Energy stored in a charged capacitor - Change in energy of a parallel plate capacitor - Loss of energy on sharing of charges between two capacitors - Force of attraction between plates of a charged parallel plate capacitor - Types of capacitors

UNIT III: CURRENT AND RESISTANCE MEASUREMENTS

Current and current density - Expression for current density - Equation of continuity-Ohm's law and Electrical conductivity-Carey Foster bridge - Potentiometer - measurement of low resistance (Kelvin Double Bridge method) comparison of capacitances of two capacitors - capacitance of capacitor (Kelvin's null method)

UNIT IV: MAGNETIC EFFECT OF ELECTRIC CURRENT

Introduction - The Biot - Savat Law - Magnetic induction at a point due to straight conductor, circular coil carrying current - Hemholtz Tangent Galvanometer - Magnetic Induction at any point on the axis of a solenoid - moving coil Ballistic Galvanometer - current and voltage sensitivities of moving coil galvanometer measurement of charge sensitiveness - absolute capacitance of a capacitor -

comparison of two capacitance using B.G - Ampere's circuital law - Differential form of Ampere's law – Divergence of magnetic field vector B – Magnetic field inside a long seleniod

UNIT V: AC CURRENT, AC & DC MOTORS

EMF Induced in a coil rotating in a magnetic field - AC circuit containing resistance, inductance and capacitance in Series - Parallel resonant circuit - Power in AC circuit. Containing resistance, inductance and capacitance - wattles current - choke coil - The transformer – Three phase AC generator – Distribution of three phase alternating current – Alternating current dynamo – Two phase AC generator- DC dynamos – Field excitation-DC motor

Text Book:

Electricity and Magnetism by R. Murugeshan, S.Chand & Company Ltd., New Delhi (Fifth Edition - 2003)
Unit - I: Chapter 1 & 2 (1.1 - 1.11, 2.2 - 2.5, 2.11)
Unit - II: Chapter 3 & 4 (3.1 - 3.4, 4.2 - 4.5, 4.8 - 4.13)
Unit - III: Chapter 6 & 7 (6.1 - 6.4, 7.1 - 7.5)
Unit - IV: Chapter 10 (10.1 - 10.6, 10.11-10.15, 10.17-10.20)
Unit - V: Chapter 13 & 14 (13.1 - 13.7, 14.1 – 14.7)

Reference Books:

1. Electricity and magnetism by Brijlal and Subramaniam Ratan Prakashan Educational & University Publishers.
2. Electricity and magnetism by D.C Tayal, Himalaya Publishing house, Mumbai, 2002.
3. Electromagnetism : Problems with solutions, by Ashutosh Pramanik, PHI,2006
4. Electromagnetic Fields, Jean G. Van BladelJohn Wiley & Sons, 2007.

(For those who join in June 2014 and after)

PART III – Allied Course Theory – I		
Subject Title **: Inorganic, Organic and Physical Chemistry – I**		
Subject Code: **07AT01**	Hours per week: **4**	Credit: **4**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives:
To enable the students
- ❖ *To learn the basic Principles of Titrimetry*
- ❖ *To gain basic knowledge about Chemical Bonding*
- ❖ *To understand the theory of Nuclear Chemistry*
- ❖ *To be familiar with Selected Organic Compounds*

UNIT I: PRINCIPLES OF TITRIMETRY   12 Hrs

Concept of molecular weight, Formula weight, Equivalent weight – Concentrations of solutions – Molarity, Normality, Weight percentage. Principle of titrimetry – Primary and secondary standards – Preparing standard solutions – Standardising the secondary standard solutions .

UNIT II: CHEMICAL BONDING – I   12 Hrs

V.B. Theory – postulates of V.B. Theory – application to the formation of simple molecules like H_2 and O_2 – Overlap of atomic orbitals – s-s, s-p and p-p overlap – principle of hybridization – sp, sp^2 and sp^3 hybridisation.

UNIT III: CHEMICAL BONDING – II   12 Hrs

Valence shell electron pair repulsion theory (VSEPR theory).
M.O. Theory: Formation of Molecular orbitals – bonding, anti-bonding and non-bonding molecular orbitals – Molecular orbital diagrams for H_2, He_2 and O_2

UNIT IV: NUCLEAR CHEMISTRY   12 Hrs

1. Composition of nucleus – nuclear forces – mass defect – binding energy – nuclear stability.
2. Soddy's group displacement law – illustration – law of radioactive disintegration.
3. Nuclear fission: Definition – application of fission – the principle of atom bomb.
4. Nuclear fusion: Definition – emission of energy – stellar energy – hydrogen bomb.
5. Applications of radioactivity – In medicine, agriculture, industry and analytical fields – carbon dating.

UNIT V: SOME SELECTED ORGANIC COMPOUNDS 12 Hrs

Preparation, properties and uses of TNT, BHC, Aspirin, Phenolphthalein, Malachite green, Crown Ethers and Lithium Aluminium hydride

Text Book:

1. Ancillary chemistry Dr. K.Ratinamuthu (Study material will be provided) Semester I and II

Refference Books:

1. Advanced Organic Chemistry by Bahl & Arun Bahl, S.Chand & Company Ltd, New Delhi, 2012 Edition.
2. Text book of Inorganic Chemistry by P.L.Soni, Mohan Katyal, Sultan Chand & Sons, New Delhi, 2010 Edition.
3. Essentials of Physical chemistry Arun Bahl, B.S.Bhal & G.D.Tuli, S.Chand Publishing Company, New Delhi, 2010 Edition.

PART – IV : Non Major Elective		
Subject Title **: SPACE SCIENCE**		
Subject Code: **06NE11**	Hours per week: **2**	Credit: **2**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives:

- ❖ *To enable the students in order to learn the concepts of Solar System*
- ❖ *To acquire basic knowledge of communication*
- ❖ *To understand the satellite launching*

UNIT I:

Solar system – The Moon: Closed Neighbor – Veiled Venus – Scorched Mercury – Mars, the Red planet – Jupiter the Giant

UNIT II:

Saturn and its Rocky rings – Mysterious Uranus, Neptune – Other Giant, Pluto, The Far traveller – STATS, Galaxies, and the Universe and how it all began.

UNIT III:

Communication system - Information – Transmitter – Channel – Noise - Receiver

UNIT IV:

Modulation – AM – FM – Band Width requirements – Fiber Optics Technology.

UNIT V:

Satellite and Launching - Multistage Rocket – Pay load – Geo stationary Satellites – Fuel used in satellites – Launching

Text Books:

1. Satellite Operations, John T. Garner and Malcolm Jones 1990
2. Electronic Communication Systems, Kennedy DAVIS, Tata McGraw Hill,1999,
3. The History of Science from 1946 to the 1990's,Ray Spangenburg and Diane K.Moser, The Universities Press Book

Reference Books:

1. Fundamentals of Space Systems, V. L. Pisacane and R. C. Moore, Oxford University Press, 1994
2. Encyclopedia of space, Heather couper, Niqel henbest Publisher: Dorling Kindersley,2009
3. Concepts in Space Sciences Edited by R.R. Daniel,2009

இரண்டாம் பருவம் - பாடத்திட்டம் (2017 - 2018-ஆம் ஆண்டு முதல்)

PART-I: **Language Tamil Subject**		
Subject Title: இக்காலக் கதை இலக்கியமும் மக்கள் தகவலியலும் - தாள்:2		
Subject Code: **P1LT21**	Hours per week: **6**	Credit: **3**
Seasonal Marks: **25**	Summative marks: **75**	Total Marks: **100**

பாடப்பகுதி

அலகு:	1	தமிழ்ச் சிறுகதை இலக்கியம்
அலகு:	2	தமிழ் நாவல் இலக்கியம்
அலகு:	3	மக்கள் தகவலியல்
அலகு:	4	தமிழ் இலக்கணம் - சொல்
அலகு:	5	தமிழ் இலக்கிய வரலாறும் பயன்பாட்டுத்தமிழும்

பாடப்பகுதியின் உட்பிரிவுகள்

அலகு : 1 தமிழ்ச் சிறுகதை இலக்கியம் - பூ மலரும் காலம் (ஜி.மீனாட்சி)

அலகு : 2 தமிழ் நாவல் இலக்கியம் - வேரில் பழுத்த பலா (சு.சமுத்திரம்)

அலகு : 3 மக்கள் தகவலியல் - பாடப்பகுதிகள்

1. இதழ்கள் தொடங்குவதற்குரிய வழிமுறைகள்
2. செய்தித்தாள் நிர்வாக அமைப்பு
3. பேட்டி - அதன் வகைகள்
4. செய்தி - செய்தி விளக்கம்

அலகு : 4 தமிழ் இலக்கணம் - சொல்

1. நான்கு வகைச் சொற்கள்
2. வினா - விடை வகைகள்
3. வேற்றுமைகள்
4. தொகைகள் (வேற்றுமைத் தொகை, வினைத்தொகை, பண்புத்தொகை, உவமைத்தொகை, உம்மைத்தொகை, அன்மொழித்தொகை)

அலகு : 5 தமிழ் இலக்கிய வரலாறும் பயன்பாட்டுத்தமிழும்

அ)   1. சிறுகதையின் தோற்றமும் வளர்ச்சியும்
       2. புதின இலக்கியத்தின் தோற்றமும் வளர்ச்சியும்

ஆ) தொடரும் தொடர்பும் அறிதல் - பிரித்து எழுதுதல் - பொருந்தாச் சொல்லைக் கண்டறிதல் – வழுவுச்சொற்களை நீக்கிய தொடரைக் குறிப்பிடுதல்- சொற்களை அகர வரிசைப்படுத்தல்- வேர்ச்சொல்லைத் தேர்வு செய்தல் - எவ்வகை வாக்கியம் எனக் கண்டு எழுதுதல் - சொற்களை ஒழுங்குபடுத்திச் சொற்றொடர் ஆக்குதல் - ஆங்கிலச்சொல்லுக்கு நிகரான தமிழ்ச் சொல் அறிதல்.

பாடநூல்கள்

1. சிறுகதை – பூ மலரும் காலம் (ஜி.மீனாட்சி)
2. நாவல் - வேரில் பழுத்த பலா (சு.சமுத்திரம்)
3. இதழியல் கலை (டாக்டர் மா.பா.குருசாமி)
4. தமிழ் இலக்கிய வரலாறு (முனைவர் பாக்யமேரி)

பார்வை நூல்கள்

1. மக்கள் தகவல் தொடர்பியல் அறிமுகம் (டாக்டர் கி. இராசா)
2. இதழியல் (ச.ஈஸ்வரன்)
3. இதழியல் (டாக்டர் இரா.கோதண்டபாணி)
4. இதழியல் ஓர் அறிமுகம் (டாக்டர் அந்தோணி இராசு)

5. தமிழ் இலக்கிய வரலாறு (டாகடர் மு.வரதராசனார்)

DEPARTMENT OF SANSKRIT

B.A. / B.Sc. PART-I –LANGUAGE SANSKRIT SYLLABUS: SEMESTER – II:

PAPER – II

(For those who join in June 2017and After)

PART – I Sanskrit Paper II		
Subject Title : Poetry Grammar & History of Sanskrit Literature – II		
Subject Code:P1LS21	Hours per week: 6	Credit: 3
Sessional Marks: 25	Summative Marks: 75	Total Marks: 100

POETRY

Selected portions from the prescribed text: **Kaliviḍambanam** &
Sabhārañjanaśatakam

                             - Published by SADGUNA PUBLLICATIONS
Kalividambanam   Cidambaram (TN)

Unit I. scholars and Teachers Verse No. 1-10,

Unit II. Astrologers & Physicians V. 14-30

Unit III. Relatives & Pseudo monks Vv. 41-50, 84-93.

Sabhārañjanaśatakam

Unit IV Wisdom and it's acquisition Vv. 1-12

Unit V Poetry & Poet Vv. 13-30.

Prescribed text:
LYRICS & CHAMPU KAVYAS
A short history of Sanskrit Literature
(Published by A.M.G. Publications, Madurai – 625 016 Page No. 51 – 60, 42 – 45)
year of publication- 1996

Kaliviḍambanam & **Sabhārañjanaśatakam**
Published by SADGUNA PUBLLICATIONS
Cidambaram (TN). 2014.

PART II – Paper I		
Subject Title **: Functional English**		
Subject Code:**P2LE21**	Hours per week: **5**	Credit: **2**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives: Total number of hours per semester: **75 Hrs**

- ❖ *To develop listening, speaking and reading skills*
- ❖ *To develop Information and Communication Technology (ICT) skills*
- ❖ *To develop presentation skills*
- ❖ *To develop competency in grammar*

Unit – I Listening, Speaking and Reading Components   15 Hrs

Prose

1. My Visions for India   -   A.P.J. Abdul Kalam
2. Mahatma Gandhi   -   V.S.Srinivasa Sastri
3. The Secret of Work   -   Swami Vivekananda
4. The Golden Age of Cricket   -   Neville Cardus
5. Tree Speaks   -   C.Rajagopalachari

Unit – II Language Study   15 Hrs

- Tenses and Their Uses
- Concord or Agreement
- Conditional Sentences
- Active and Passive Voice
- Preposition

Book: *A Textbook of English Grammar and Usage* **by K.V.Joseph**

Second Edition (2012), TATA McGraw Hill Education Private Limited, New Delhi.

Unit – III Composition   15 Hrs

- ➢ Letter writing – Informal Letters
- ➢ Hints Development
- ➢ Descriptive Writing

Unit – IV   Extensive Reading: Short Stories   15 Hrs
    Extensive Reading

1. Upper Division Love   -   Manohar Malgonkar
2. The Tiger in the Tunnel   -   Ruskin Bond
3. A Devoted Son   -   Anitha Desai
4. *The Lost Child*   -   *Mulk Raj Anand*
5. The Cask of Amantilado   -   Edgar Allan Poe

Unit – V Translation   15 Hrs

- Translation of Sentences and Stories from Tamil to English/English to Tamil (Passages will be supplied)

PART – III : Core Subject Theory		
Subject Title **: THERMODYNAMICS AND STATISTICAL MECHANICS**		
Subject Code: **06CT21**	Hours per week: **4**	Credit: **4**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives:

❖ *The aims is to provide the students to understand the basic principle and laws of thermodynamics*

❖ *To understand the concepts of entropy*

❖ *To enable the students in order to learn the basic principles, theory and concepts of Statistical mechanics*

UNIT I: TRANSMISSION OF HEAT

Coefficient of thermal conductivity - Forbe's method to find K - Lee's method for bad conductors – Spherical Shell Method-Cylindrical Flow of a Heat - Wiedemenn - Franz law – Stefan Boltzmann Law - Distribution of energy in Black body spectrum-Derivation of Newton's Law of Cooling from Stefan's Law - Solar constant.

UNIT II: BEHAVIOUR OF REAL GASES

Critical constants - Vander-walls equation of state – Estimation of Critical Canstants - Critical coefficient – Jule Thomson Porous Plug experiment - Joule Kelvin effect - Temperature of inversion - Liquefaction of air(Linde's Process) - Super conductivity.

UNIT III: THERMODYNAMICS FIRST LAW AND SECOND LAW

Thermodynamic system - Zeroth law of thermodynamics - work a path Dependent function - First law of thermodynamics- applications - Isothermal process - Adiabatic process - Isochoric process - Isobaric process - work done during an isothermal process and adiabatic process

Reversible and Irreversible process –Heat engines-Carnot's Ideal Heat engine-Carnot's Cycle- Carnot's engine and refrigerator - Second law of thermodynamics-Carnot's theorem

UNIT IV: STATISTICAL BASIS OF THERMODYNAMICS

Statistical Basis-Probability-Some Basic Rules of Probability Theory -Degrees of Freedom-Phase space- Entropy and Probability-The Equipartition of Energy-Maxwell Boltzman Energy Distribution Law –Appilication of Maxwell Boltzmann Distribution Law- Maxwell's Law of Distribution of Velocity

UNIT V: QUANTUM STATISTICS

Need of Quantum Statistics - Bose Einstein Distribution Law- Photon Gas- Fermi-Dirac Distribution Law – Fermi level and Fermi Energy- Comparison of M-B, B-E and F-D Statistics.

Text Book: Heat and Thermodynamics and Statistical Physics -Brijlal and Subramanyam, Hemne S.Chand & Company 2007.

Units: Unit - I: Chapter – 15&8 (15.1, 15.9, 15.11, 15.13, 15.14, 15.19, 8.12, 8.13, 8.21, 8.26)
Unit - II: Chapter - 2&7 (2.1, 2.8, 2.10, 2.12, 2.21, 2.24, 7.8, 7.19)
Unit - III: Chapter - 4 (4.1, 4.2, 4.5, 4.7, 4.10, 4.10.7, 4.10.4, 4.10.2, 4.10.3, 4.12, 4.13, 4.20, 4.21, 4.23, 4.24, 4.26, 4.28, 4.29)
Unit - IV:Chapter – 9,10&11 (9.1,9.2,9.5,10.1,10.4,10.15,10.18,11.3,11.4,11.6)
Unit - V: Chapter- 12 (12.1, 12.5, 12.6, 12.8, 12.10, 12.15)

Reference Books:

1. Physics Part - II, Robert Rensic and David Halliday Fifth Edition.
2. Thermodynamics by J.P. Holman, McGraw - Hill Book Company, Fourth Edition.
3. Thermodynamics and Statistical Mechanics, J. D. Gale and J. M. Seddon, Wiley-Interscience, New York (2002).
4. Thermodynamics, Kinetic Theory and Statistical Thermodynamics, F. W. Sears and G. L. Salinger, Addison-Wesley.

PART – III : Core Subject Theory		
Subject Title **: OPTICS AND SOUND**		
Subject Code: **06CT22**	Hours per week: **4**	Credit: **4**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives:

- ❖ *To provide a good foundation in optics*
- ❖ *To provide a knowledge of the behaviour of light*
- ❖ *To inspire interest for the knowledge of concepts is physical and geometrical optics*
- ❖ *To gain knowledge by the students in order to learn sound waves*

UNIT I: INTERFERENCE

Total Internal Reflection - The Doppler Effect for Light - Two - Source Interference - Double Slit Interference - Coherence Intensity in Double Slit interference - Michelson's interferometer.

UNIT II – DIFFRACTION

Diffraction and the Wave theory of Light - Single Slit Diffraction - Intensity in Single - Slit Diffraction - Diffraction at a Circular Aperture - Double-Slit interference and diffraction combined – Multiple slits - Diffraction Gratings - Dispersion and Resolving power - X-ray Diffraction - Holography.

UNIT III: POLARIZATION

Polarization of Electromagnetic waves - Polarizing Sheets - Polarization by Reflections - Double Refraction - Circular polarization - Polarization by Scattering.

UNIT IV: OSCILLATIONS

Oscillating systems - The Simple Harmonic Oscillator - Simple Harmonic Motion - Energy in Simple Harmonic Motion - Applications of Simple Harmonic Motion - Simple Harmonic Motion and Uniform Circular motion - Damped Harmonic Motion - Forced Oscillations and Resonance - Two body Oscillations.

UNIT V: SOUND WAVES

Properties of Sound Waves - Travelling Sound Waves - The Speed of Sound - Power and Intensity of Sound Waves - Interference of Sound Waves - Standing longitudinal Waves - Vibrating Systems and Sources of Sound.

Text Books:

1. Physics, Volume 1, David Halliday - Robert Resnick, Kenneth S. Krane 2002,
   Unit IV: Chapter 17:17.1 - 17.9 Units V: Chapters 19: 19.1 - 19.7.
   Unit I: Chapter 39:39.5, 39.6   Unit I: Chapters 41:   41.1 - 41.4, 41.6
   Unit II: Chapter 42: 42.1 - 42.3, 42.5 Unit II: Chapter 43:   43.1 - 43.5
   Unit III: Chapter 44:44.1, 44.2, 44.3, 44.4, 44.5, 44.6.

2. Physics Volume 2, David Halliday -Robert Resnick, Kenneth S.Krane.
   Fifth Edition, John Wiley & Sons, Inc.

Reference Books:
1. Physics for Scientists and Engineers with Modern Physics, Raymond A. Serway, Fourth Edition, - Saunders College Publishing, 1995,
2. A Text Book of Physics, N. Subrahmanyam Brijlal, S.Chand & Company Ltd., 2003.
3. Optics, Sanjay Yadav, Krishna Nandan Kumar, Choice International publisher, 2007.
4. Optics, Ajoy Ghatak , Mc Graw Hill Education ltd, 2008.
5. A Text book of sound – N. Subrahmanyam and Brijlal,Vikas Publishing House,2009.

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B.Sc. Physics CBCS Syllabus - **SEMESTER – II**

(For those who joined in June 2016 and after)

PART – III : Core Subject Practical		
Subject Title **: MAJOR PRACTICAL – I**		
Subject Code: **06CP23**	Hours per week: **2**	Credit: **2**
Sessional Marks: **40**	Summative Marks: **60**	Total Marks: **100**

Objectives:

- ❖ *To develop the practical skills by applying the laws and concepts in physics experiments*

(Any fourteen experiments)
1. Compound Pendulum
2. Bifilar Pendulum
3. Torsional Pendulum
4. Surface Tension & Interfacial Surface Tension by drops
5. Viscocity – Stokes method
6. Helmholtz Resonator
7. Sonometer – Frequency of fork & Verification of Laws
8. Sonometer – Frequency of A.C.
9. Meld's Strings – Frequency of Electrically tuning fork
10. Lee's Disc – Thermal Conductivity of a Bad conductor
11. Spectrometer – A & D
12. Spectrometer – i-d Curve
13. Spectrometer – Dispersive power of prism
14. Spectrometer – Grating -Normal incidence

15. Air wedge
16. Newton's Rings

B.Sc. Physics (Allied Chemistry) CBCS Syllabus - **SEMESTER – II**

(For those who join in June 2014 and after)

PART III – Allied Course Theory – II		
Subject Title **: Inorganic, Organic & Physical Chemistry - II**		
Subject Code: **07AT02**	Hours per week: **4**	Credit:**4**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives:

To enable the students

❖ *To be familiar with fundamentals of periodic properties*
❖ *To gain basic knowledge about Photochemistry*
❖ *To understand the theory of Solid State*
❖ *To be familiar with Electrochemistry*
❖ *To gain basic knowledge about chromatography techniques*

UNIT I: PERIODIC PROPERTIES AND CHEMICAL BONDING   12 Hrs

Periodic Properties - Interpretation of Periodic Properties of the Elements in terms of their electronic configuration – Atomic radius – van der Waals radius - Ionic radius Ionization Potential – Electron affinity - Electronegativity – Determination of Electronegativity by Pauling and Mulliken's Methods.

UNIT II: PHOTOCHEMISTRY   12 Hrs

Definition of photochemical reactions-comparison of thermal and photochemical reactions - laws of photochemistry-Lamber's law and Beer's law, lamberts-Beer's law, Grothus-Drapper law –   Quantum   efficiency   and   its determination – Consequences of light absorption by atoms and molecules – Jabloanski diagram-. Chemiluminescence – Bioluminescence – Photosynthesis.

UNIT III: **SOLID STATE**   12 Hrs

Classification and properties of solids, crystalline state – amorphous substances – polymorphism of the elements allotropy. Crystallography – definition-unit cell-face and edge of crystal-interfacial angle – crystal lattice – space lattice.

UNIT IV: ELECTROCHEMISTRY   12 Hrs

Faraday's law of electrolytes – Specific and equivalent conductance – electrochemical cells – Nernst equation – convention regarding the sign of EMF cell – electrodes – reference electrodes – hydrogen and calomel electrodes – pH measurement using glass electrode.

UNIT V: **CHROMATOGRAPHY TECHNIQUES**   12 Hrs

Definition – Principle and application – Partition and adsorption chromatography – Thin layer chromatography – Column chromatography – Paper chromatography.

Text Book:

1. Ancillary chemistry Dr. K.Ratinamuthu (Study material will be provided) Semester I and II.

Refference Books:

1. Advanced Organic Chemistry by Bahl & Arun Bahl, S.Chand & Company Ltd, New Delhi, 2012 Edition.
2. Text book of Inorganic Chemistry by P.L.Soni, Mohan Katyal, Sultan Chand & Sons, New Delhi, 2010 Edition.
3. Essentials of Physical chemistry Arun Bahl, B.S.Bhal & G.D.Tuli, S.Chand Publishing Company, New Delhi, 2010 Edition.

(For those who joined in June 2016 and after)

PART – IV : Non Major Elective		
Subject Title : **ELECTRICAL HOME APPLIANCES**		
Subject Code: **06NE21**	Hours per week: **2**	Credit: **2**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives:

- ❖ *To enable the students in order to learn the basic principles, theory and concepts of power supplies*
- ❖ *To gain knowledge by the students in order to learn electric lamps and applicances*

UNIT I:

A.C. Supply – Phase – Neutral – Earth connection – Single Phase – Two Phase – Three Phase supply – D.C. supply

UNIT II:

Difference between A.C. and D.C.- Stabilized power supply – A.C. adopter – Transformer – Types – Choke – Uses

UNIT III:

Electric lamps – Incandescent lamp – Fluorescent lamp – Mercury and Sodium vapour lamp – Halogen lamps – Different colours – CFL (Compact Fluorescent Lamp) – LED – Seven segment display

UNIT IV:

Electric heaters – Water heaters – Gaiser heater – Instant water heater – Immersion rod heater

UNIT V:

Mixi – Grinder – Electric iron box – Electric fan (Table and Ceiling fans) – Speed control using regulators in fan

Text Book:

1. Basic Electricity – Van Vakkenburgh, Nooger & Neville, Publisher- Van Nostrand Reinheld Company – Londan.

PART-I: **Language Tamil Subject**		
Subject Title:காப்பியமும் பக்தி இலக்கியமும் நாடகமும் - தாள்:3		
Subject Code: **P1LT31**	Hours per week: **6**	Credit: **3**
Seasonal Marks: **25**	Summative marks: **75**	Total Marks: **100**

பாடப்பகுதி

அலகு: 1   தமிழ்க் காப்பிய இலக்கியம்

அலகு: 2   தமிழ்ப் பக்தி இலக்கியம்

அலகு: 3   தமிழ் நாடகம் (வைகையில் வெள்ளம் வரும்)

அலகு:4   தமிழ் இலக்கணம் (அணிகள்)

அலகு: 5   தமிழ் இலக்கிய வரலாறும் பயன்பாட்டுத்தமிழும்.

பாடப்பகுதியின் உட்பிரிவுகள்

அலகு: 1. தமிழ்க் காப்பிய இலக்கியம்

1. சிலப்பதிகாரம் - வழக்குரை காதை
2. மணிமேகலை - ஆபுத்திரன் திறம் அறிவித்த காதை
3. கம்பராமாயணம் - வாலி வதைப்படலம்
4. வில்லிப்புத்துரார் பாரதம் - கண்ணன் தூதுச்சருக்கம்
5. கந்த புராணம் - அயனைச் சிறை நீக்கும் படலம்

அலகு: 2 தமிழ் பக்தி இலக்கியம்

1. தேவாரம் – திருஞானசம்பந்தர் (திருவேடகப் பதிகம்)
2. திருவாசகம் – மாணிக்கவாசகர் (பிடித்த பத்து)
3. திருமந்திரம் – திருமூலர் (10 பாடல்கள்)
4. திருப்பாவை – ஆண்டாள் (10 பாசுரங்கள் தெரிவு செய்யப்பெற்றவை)
5. பராபரக்கண்ணி – தாயுமானவர் (10 கண்ணிகள் தெரிவு செய்யப்பெற்றவை)

அலகு: 3 நாடகம் – வைகையில் வெள்ளம் வரும்

அலகு: 4 தமிழ் இலக்கணம் – அணிகள்

1. அணிகள் (உவமையணி, உருவக அணி, வேற்றுமை அணி, பிறிது மொழிதல் அணி, வஞ்சப்புகழ்ச்சி அணி)
2. பாவகைகள் (வெண்பா, ஆசிரியப்பா)
3. மடல் வரைதல் – விண்ணப்பம் (புகார்க் கடிதம் – பாராட்டுக் கடிதம்)

அலகு: 5 தமிழ் இலக்கிய வரலாறும் பயன்பாட்டுத்தமிழும்.

அ) 1. காப்பிய இலக்கிய வரலாறு
   2. பக்தி இலக்கிய வரலாறு

ஆ) பத்திரிக்கைச் செய்தி எழுதுதல் - நேர்காணல் எடுத்தல் - துணுக்குகள் எழுதுதல்

பாடநூல்கள்

1. தமிழ்ச் செய்யுட் தொகுப்பு   (தமிழ்த்துறை வெளியீடு)
2. நாடகம் - வைகையில் வெள்ளம் வரும் (பாவை பப்ளிகேஷன்ஸ்).

பார்வை நூல்கள்

1. தமிழ் இலக்கிய வரலாறு (முனைவர் பாக்யமேரி)
2. தமிழ் இலக்கிய வரலாறு (டாக்டர் மு.வரதராசனார்

DEPARTMENT OF SANSKRIT

B.A. / B.Sc. PART-I –LANGUAGE SANSKRIT SYLLABUS: SEMESTER – III:

PAPER – III

(For those who join in June 2017and After)

PART – I Sanskrit Paper III		
Subject Title : Prose ,Poetics & History of Sanskrit Literature – III		
Subject Code: **P1LS31**	Hours per week: **6**	Credit: **3**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

PROSE

Following portions from the prescribed text: 'SAHITYA RASA KANA'
- Published by J.M. Publications, Madurai.

UNIT I & II
1. Gurubhakti
2. Mātaṅgacaritam
3. Samsargajādoṣaguṇā bhavanti
4. Akarṇahrudayo gardabhaḥ
5. Śukanāsopadeśaḥ

POETICS

UNIT III & IV

ALAṄKĀRA (POETICS) FROM THE TEXT BOOK: SĀHITYA RASAKANĀḤ:-

UPAMĀ, ANANVAYA, UTPREKṢĀ, ATIŚAYOKTI, ULLEKHĀ, VYATIREKA, SAMĀSOKTI, ŚLEṢA, ARTHĀNTARANYĀSA.

HISTORY OF LITERATURE

UNIT V
Prose Romance,
Historical Kavyas, Popular Tales.

Prescribed text:
A short history of Sanskrit Literature
(Published by A.M.G. Publications, Madurai – 625 016, Page No. 35 – 40, 40 – 44, 45 - 50) year of publication- 1996

B.Sc. Physics CBCS Syllabus (Part II English) **- SEMESTER III**

PART II – Paper I		
Subject Title : **English through Drama & Poetry**		
Subject Code:**P2LE31**	Hours per week: **4**	Credit: **2**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives: **Total number of hours per semester: 60 hours**

- ❖ *To make students read and appreciate English Plays*
- ❖ *To make students appreciate English poetry*
- ❖ *To motivate students to face Competitive Examinations*
- ❖ *To develop continuous writing in English*
- ❖ *To make students read extensively*

Unit I – One Act Plays   15 Hrs

1. The First and the Last - John Galsworthy
2. Remember Caesar - G.Devoit
3. The Sheriff's Kitchen - Ronald Gow
4. The Boatswain's Mate - W.W.Jacobs and H.C. Sargent

Unit II – Poems   15 Hrs

1. Githanjali (Poem 50) - Rabindranath Tagore
2. The Earthen Goblet - Harindranath Chattopadhyaya
3. La Belle Dame sans Mercy - John Keats
4. Fidelity - William Wordsworth
5. The Tiger and the Deer - Sri Aurobindo

Unit - III   Objective English   10 Hrs

- ➢ Comprehension
- ➢ Spotting the Errors
- ➢ Sentence rearrangement
- ➢ Sentence Fillers
- ➢ Cloze test or Numbered Gaps

Text Book: *Objective English for Competitive Examinations* – Hari Mohan Prasad, Uma Rani Sinha, Tata McGraw Hill Education Private Limited, New Delhi. 2014, 5th Edition

Unit – IV Composition   10 Hrs

- ➢Dialogue Writing
- ➢Paragraph Writing

Unit – V Intensive Reading (Great Speeches)   10 Hrs

Swami Vivekananda – Addresses at the Parliament of Religions

1. Response to Welcome,
2. Why We Disagree,
3. Religion Not the Crying Need of India,
4. Paper on Hinduism,
5. Address at the Final Session

Text: Swami Vivekananda's Chicago Address, Ramakrishna Tapovanam Printing School.

B.Sc. Physics CBCS Syllabus - SEMESTER – III

PART – III : Core Subject		
Subject Title : PRINCIPLES OF ELECTRIC CIRCUITS		
Subject Code: **06CT31**	Hours per week: 4	Credit: 4
Sessional Marks: 25	Summative Marks: 75	Total Marks: 100

Objectives:

➢ *To understand the fundamentals of different combinations of resistive circuits*
➢ *To familiarize of network conversion*
➢ *To study the applications of circuit theorems in electric circuits both in dc and ac*
➢ *To study the phasors and complex numbers in ac circuit*
➢ *To analyze the RC and RL networks for sine waves*

UNIT I: SERIES PARALLEL COMBINATIONS AND CIRCUIT THEOREMS CONVERSIONS Definition of a series-parallel circuit – Circuit identification – Analysis of series-parallel circuit – Circuit ground – The voltage source – The current source – Source conversion – The super position theorem – Thevinin's theorem – Norton's theorem – Millman's theorem – maximum power transfer theorem – delta Wye(Δ-Y) and Wye delta (Y-Δ) network conversion.

UNIT II: AC CHARACTERISTICS AND ANALYSIS Introduction to phasors – The complex number system – Rectangular and Polar forms of complex numbers – Mathematical operation of complex numbers – Non sinusoidal waveforms – Harmonics

UNIT III: RC CIRCUIT ANALYSIS Sinusoidal response of RC circuits – Impedance of a series RC circuit – Analysis of series of RC circuits - Impedance of a parallel RC circuit – Analysis of parallelRC circuits –Series-parallel analysis – Power in RC circuits – Basic applications – Pulse response of RC circuits to periodic pulse waveforms.

UNIT IV: RL CIRCUIT ANALYSIS Sinusoidal response of RL circuits – Impedance of a series RL circuit – Analysis of series of RL circuits - Impedance of a parallel RL circuit – Analysis of parallel RL circuits – Series-parallel analysis – Power in RL circuits – Basic applications Pulse response of RL circuits.

UNIT V: CIRCUIT THEOREMS IN AC ANALYSIS AND FILTERS The super position theorem – Thevinin's theorem – Norton's theorem – Millman's theorem – maximum power transfer theorem – Low-pass filters – high-pass filters – Band-pass filters – Band-stop filters – filter response characteristics.

Text Book: Principles of Electric Circuits, Thomas L. Floyd-A Bell & Howell Company Ltd, 2ndEdition, 1985.

Chapters: UNIT-I : 7.1 – 7.4 & 8.1 – 8.9.UNIT-II: 11.1 – 11.11.
UNIT-III: 14.1 – 14.10.
UNIT-IV: 15.1 – 15.9.   UNIT-V   : 17.1 – 17.5 & 18.1 – 18.5.

Reference Books:

1) Electronics Devices and Circuits – S. Salivahanan, N.Suresh Kumar, A.Vallavaraj Tata McGraw-Hill Publishing company Ltd, Fifteenth Edition, 2015.

2) Electronic Circuit Analysis – U.A.Bakshi, A.V.Bakshi, Technical Publications, 2003.

(For those who joined in June 2016 and after)

PART – III : Core Subject Theory		
Subject Title :**SPECTROSCOPY**		
Subject Code: O6CT32	Hours per week: **5**	Credit: **5**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives:

- ❖ *To understand the developments leading to various atom models.*
- ❖ *To explain the role of different quantum number and electron spin in atomic phenomena*
- ❖ *To enable students to learn microwave spectroscopy*
- ❖ *To familiarize the basic concept of IR spectroscopy*
- ❖ *To acquire the knowledge of Raman spectroscopy*

UNIT I: ATOM MODELS

Introduction-Rutherford experiment on scattering of α –particles-Theory of α – particle scattering-Bohr atom model-Effect of nuclear motion on atomic spectra-Evidences in favour of Bohr theory-Correspondence principle – Critical potentials – Atomic excitation-Experimental determination of Critical potentials – The Vector atom model

UNIT II: QUANTUM NUMBERS AND COUPLING SCHEMES

Quantum numbers associated with the Vector atom model-Coupling schemes-The Pauli exclusion principle-Magnetic dipole moment due to orbital motion of the electron- Magnetic dipole moment due to Spin-The Stern and Gerlach experiment-Spin Orbit coupling – Optical spectra-Zeeman effect –Larmor's theorem-Anomalous Zeeman effect-Stark effect.

UNIT III: MICROWAVE SPECTROSCOPY

The Rotation of Molecules-Rotational Spectra-The Rigid Diatomic Molecule-The Intensities of Spectral Lines-Linear Molecules-Symmetric Top Molecule-Asymmetric Top Molecules-Techniques and Instrumentation-Chemical Analysis By Microwave Spectroscopy-The Microwave oven.

UNIT IV: INFRA-RED SPECTROSCOPY

The Energy of a Diatomic Molecule-The Simple Harmonic Oscillator-The Anharmonic Oscillator-The Diatomic Vibrating Rotator-Techniques and Instrumentation-(Outline, Double and Single Beam Operation only).

UNIT V: RAMAN SPECTROSCOPY

Introduction – Quantum Theory of Raman Effect-Classical Theory of the Raman Effect (Molecular Polarizability)-Linear Molecules-Symmetric Top Molecules-SphericalTopMolecules-Asymmetric Top Molecules-Techniques and Instrumentation.

Text Books:

1. **MODERN PHYSICS**, R.Murugeshan & Kiruthiga Sivaprasath, S.Chand & Company Ltd, New Delhi. 2014.

   UNIT-I -Chapter 6: 6.1 to 6.10, 6.12
   UNIT-II-Chapter 6: 6.13 to 6.15,6.18 to 6.24 and 6.26 to 6.28

2. **FUNDAMENTALS OF MOLECULAR SPECTROSCOPY**,N.BANWELL and M.McCASH,Tata McGRAW HILL Publishing Company,New Delhi,2007

   UNIT-III-Chapter 2: (2.1,2.2,2.3.1,2.4.1,2.4.2,2.4.3,2.5,2.6,2.7)
   UNIT-IV-Chapter 3: (3.1.1,3.1.2,3.1.3,3.2,3.8.1,3.8.2)
   UNIT-V-Chapter 4: (4.1.1,4.1.2,4.2.1,4.2.2,4.2.3,4.6)

Reference Books:

1) **Atomic Physics**, J.B. Rajam, S.Chand & Company Ltd, New Delhi, 2008.
2) **Fundamentals of Molecular Spectroscopy**, Colin N. Banwell and Elaine M.McCash, Tata McGraw-Hill Publishing Company Ltd., New Delhi 2013.
3) **Molecular Structure and Spectroscopy**, G. Aruldhas, Printice Hall of India Publication, 2005.

B.Sc. Physics (Allied Mathematics) CBCS Syllabus - **SEMESTER – III**

(For those who joined in June 2013 and After)

PART – III : **Allied Subject Theory**		
Subject Title : **MATHEMATICS – I**		
Subject Code: **05AT01**	Hours per week: **6**	Credit: **5**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objective

> ❖ *To develop the skill of solving problems.*

Unit – I:

Trigonometry – expression for $\sin n\theta$, $\cos n\theta$ and $\tan n\theta$ – expression for $\sin^n \theta$ and $\cos^n \theta$ – expansion of $\sin\theta$, $\cos\theta$ and $\tan\theta$ as a series in ascending powers of θ – hyperbolic functions and inverse hyperbolic functions.

Unit – II:

Differential calculus – differentiation methods – successive differentiation (up to second order derivative only, omit Leibnitz theorem).

Unit –III:

Integral calculus – properties of definite integrals – reduction formula for $\int \sin^n x\, dx$, $\int \cos^n x\, dx$ and $\int \sin^m x \cos^n x\, dx$ only – double and triple integrals (simple problems).

Unit IV:

Vector differentiation – differentiation of vectors – gradient of a vector – directional derivative and its maximum value – divergence and curl of a vector – solenoidal and irrotational vectors (simple problems only).

Unit V:

Line and surface integrals – Green's theorem, Stoke's theorem and Gauss' divergence theorem (statements only) – verifications (simple problems).

Text Book:

- ✓ Ancillary Mathematics by Dr.S.Arumugam & Issac. Vol I – IV (Relevant Chapters), New Gamma Publishing House, Palayamkottai

Reference Book:

- ✓ Ancillary Mathematics by T.K Manikavasagampillai & Others Viswanathan printers and publishers Pvt. Ltd., Chennai.

PART – IV : Skill Based Subject		
Subject Title **: Solar Energy**		
Subject Code: :**06SB31**	Hours per week: **2**	Credit: **2**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives:

- ❖ *To familiarize the solar radiation and importance*
- ❖ *To study the different solar collectors*
- ❖ *To enable knowledge about air heater*
- ❖ *To develop the solar energy storing devices*

UNIT I:

The structure of the sun – The solar constant – Solar radiation outside the Earth's atmosphere - Solar energy measuring equipments – Pyranaometers – Sunshine recorder

UNIT II:

General description of flat-plate collectors – Effect of dust and shading – Selection of materials for flat-plate collectors

UNIT III:

Solar collectors – Focusing type – Introduction – solar concentrators and Receiver Geometries

UNIT IV:

Solar cell modules – Advantages and Disadvantages of Photovoltaic Solar energy conversion – Applications of Solar Photovoltaic system – PV Technology in India.

UNIT V:

Some additional methods of solar energy utilization – solar furnaces-solar cooking – application of solar energy in space

Text Book:

Solar energy utilization, G.D.Rai, Khanna Publishers, Delhi, 2006.

Unit I: 3.1, 3.2, 3.4, 4.1, 4.3, 4.4 Unit II   : 5.3, 5.11, 5.12
Unit III: 7.1, 7.3. Unit IV: 15.6, 15.7, 15.10, 15.14 Unit V: 16.1, 16.5, 16.8

Reference Book: Non-Conventional Energy Sources, G.D.Rai, Khanna Publishers, Delhi, 2005

PART-I: **Language Tamil Subject**		
Subject Title: சங்க இலக்கியமும் நீதி இலக்கியமும் - தாள்:4		
Subject Code: **P1LT41**	Hours per week: **6**	Credit: **3**
Seasonal Marks: **25**	Summative marks: **75**	Total Marks: **100**

பாடப்பகுதி

அலகு:	1	தமிழ்ச் சங்க இலக்கியம் (பத்துப்பாட்டு)
அலகு:	2	தமிழ்ச் சங்க இலக்கியம் (எட்டுத்தொகை)
அலகு:	3	தமிழ் நீதி இலக்கியம்
அலகு:	4	தமிழ் இலக்கணம்
அலகு:	5	தமிழ் இலக்கிய வரலாறும் பயன்பாட்டுத்தமிழும்.

பாடப்பகுதியின் உட்பிரிவுகள்

அலகு : 1 தமிழ்ச் சங்க இலக்கியம் (பத்துப்பாட்டு)

பத்துப்பாட்டு (முல்லைப்பாட்டு முழுவதும்)

அலகு : 2 தமிழ்ச் சங்க இலக்கியம் (எட்டுத்தொகை)

1. நற்றிணை
2. குறுந்தொகை
3. கலித்தொகை
4. அகநானூறு
5. புறநானூறு

அலகு : 3 தமிழ் நீதி இலக்கியம்

1. திருக்குறள் : செய்ந்நன்றியறிதல் (**அதிகாரம் – 11**)

    காலமறிதல் (**அதிகாரம் – 49**)

    குறிப்பறிதல் (**அதிகாரம் – 71**)

1. பழமொழி நானூறு (**கல்வி அதிகாரம் முழுவதும்**)
2. கொன்றை வேந்தன் (**முதல் 10 பாடல்கள்**)
3. மூதுரை (**முதல் 10 பாடல்கள்**)

அலகு : 4 தமிழ் இலக்கணம் (பொருள்)

1. அகப்பொருள் – அகத்திணைகள் (முதற் கரு உரிப்பொருள்)
2. புறப்பொருள் – புறத்திணைகள் (வெட்சி முதல் பெருந்திணை வரை உள்ள 12 திணைகள்)
3. மரபியல் – பெயர் மரபுகள் – ஆண்பால் – பெண்பால் – இளமைப் பெயர்

அலகு: 5 தமிழ் இலக்கிய வரலாறும் பயன்பாட்டுத்தமிழும்.

அ) 1. சங்க இலக்கிய வரலாறு

   2. நீதி இலக்கிய வரலாறு

ஆ) 1. திரைப்பட விமர்சனம்

   2. புத்தக விமர்சனம்

பாட நூல்

1. தமிழ்ச் செய்யுள் தொகுப்பு (தமிழ்த்துறை வெளியீடு)

பார்வை நூல்கள்

1. தமிழ் இலக்கிய வரலாறு (டாக்டர் மு.வரதராசனார்)
2. தமிழ் இலக்கிய வரலாறு (முனைவர் பாக்யமேரி)

DEPARTMENT OF SANSKRIT

B.A. / B.Sc. PART-I –LANGUAGE SANSKRIT SYLLABUS: SEMESTER – IV: PAPER – IV

(For those who join in June 2017and After)

PART - I Sanskrit Paper IV		
Subject Title : **Drama And History of Sanskrit Literature – IV**		
Subject Code: **P1LS41**	Hours per week: **4**	Credit: **2**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

60 hours to Drama, 30 hours to Spoken Sanskrit.

DRAMA

Following portions from the prescribed text: 'SĀHITYA RASAKANĀḤ'
- Published by J.M. Publications, Madurai.

Unit I, II, III
1. Karṇabhāra of Bhāsa

Unit IV
History of Drama Literature
A short history of Sanskrit Literature

(Published by A.M.G. Publications, Madurai – 625 016
Page No. 59 – 75) year of publication- 1996

Unit V

30 HOURS OF ORAL TRAINING DEVELOPING THE
COMMUNICATION SKILLS THROUGH THE SANSKRIT LANGUAGE.

Department of English (Part –II) - **SEMESTER – IV**
(For those who join in June 2015 onwards)

PART II – Paper I		
Subject Title **: English through Classics**		
Subject Code:**P2LE41**	Hours per week: **4**	Credit: **2**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

OBJECTIVES: **Total number of hours per semester: 60 hours**
❖ To motivate students to read and understand English prose
❖ To make students appreciate English poetry
❖ To enable students to face Competitive Examinations in English
❖ To develop continuous writing of the students
❖ To make students read extensively.

Unit I - Prose

1. Building Self Confidence - by Norman Vincent Peale (Personality Development)
From, English for Enrichment,
Edited by Prof. K. Chellappan.

2. Sport- A Modern Hunting Ritual - by Desmond Morris (Essay),
From, English for Enrichment,
Edited by Prof. K. Chellappan.

3. The Soft Thunder of Lumbini - by Hugh and Colleen,
(A travelogue Feature in a Newspaper)
From, English for Enrichment,
Edited by Prof. K. Chellappan.

4. She is Dancing Back in Life - by Deborach Cowley (A True Life Story)
From, English for Enrichment,
Edited by Prof. K. Chellappan.

5. Within Without - Rabindranath Tagore.

Unit II – Poems

1. Kali the Mother   Swami Vivekananda
2. Lochinvar   Walter Scott
3. Yossouf   James Russell Lowell
4. The Daffodils   William Wordsworth
5. Much Madness   Emily Dickinson
6. The Woman Who is ……(XCII)   Kabir Das
7. Stopping by Woods on a Snowy Evening Robert Frost

Unit III - Objective English

- ➢ Sentence Completion
- ➢ Synonyms
- ➢ Antonyms
- ➢ Idioms and Phrases
- ➢ Substitution

Text Book: *Objective English for Competitive Examinations* – Hari Mohan Prasad, Uma Rani SInha, Tata McGraw Hill Education Private Limited, New Delhi. 2010, Fourth Edition

Unit IV - Composition

- ➢ Descriptive writing - Topics on Personal Experience
- ➢ Resume Preparation
- ➢ SMS and E-Mail Preparation and sending.

Unit V Extensive Reading: Four Scenes from Shakespeare's plays.

1. **The Merchant of Venice.** Act IV – Scene I – Portia's Speech.
2. **Julius Caesar.** Act III – Scene II – Mark Antony and Brutus Speech.
3. **Twelfth Night.** Act V – Scene I – Before Olivia's House.
4. **Othello.** Act V – Scene II – A Bedchamber in the Castle.

PART – III : Core Subject Theory		
Subject Title : **ANALOG ELECTRONICS**		
Subject Code: **06CT41**	Hours per week: **5**	Credit: **5**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives:

- ❖ *To study the characteristics of diodes and their applications*
- ❖ *To familiarize bipolar and unipolar transistor and applications*
- ❖ *To enable knowledge about different transistor amplifier circuits*
- ❖ *To study the different communication systems*

UNIT I:

Crystal diode rectifiers – Half wave rectifier – Efficiency of Half wave rectifier – Full wave rectifier – Centre tap full wave rectifier – Full wave bridge rectifier – Efficiency of full wave rectifier – Nature of rectifier output – Ripple factor – Comparison of rectifiers – Filter circuits – Type of filter circuits – Voltage stabilization – Zener diode – Equivalent circuit of zener diode – Zener diode as voltage stabilizer – Solving zener diode circuits.

UNIT II:

Transistor as an amplifier in CE arrangement – Transistor load line analysis – Operating point – Practical way of drawn CE circuit – Output from transistor amplifier – Performances of transistor amplifier – Cut off and saturation points – Power rating of transistor – Semiconductor devices numbering system – Transistor lead identification – Transistor testing – Types of Field Effect Transistors – Junction Field Effect Transistor (JFET) – Working principle of JFET – Schematic symbol of JFET – Importance of JFET – Difference between JFET and Bipolar Transistor – JFET as an amplifier – Output characteristics of JFET – Importance terms – Expression for Drain current (I) – Advantages of JFET – Parameters of JFET – Relation among JFET parameters – JFET Biasing – JFET connections – Voltage gain of JFET amplifier – JFET applications.

UNIT III:

Transistor biasing – Stability factor – Methods of Transistor biasing – Base resistor method – Biasing with feedback resistor – Voltage divider bias method – Midpoint biasing – Silicon versus Germanium. Practical circuit of transistor amplifier – Phase reversal – DC and AC equivalent circuits – Load line analysis – Voltage gain

– AC emitter resistance – Formula for AC emitter resistance – Voltage gain in terms of AC emitter resistance – Input impedance of an amplifier – Multistage Transistor Amplifier – Important terms – RC coupled transistor amplifier.

UNIT IV:

Positive feedback amplifier – Oscillator – Essentials of transistor oscillator – Explanation of Barkhausen criterion – Colpitts oscillator – Hartley oscillator – Principle of Phase shift oscillators – Phase shift oscillator – Wien bridge oscillator – Limitations of LC and RC oscillators – Piezo electric crystals – Working of Quartz crystal – Equivalent circuit of crystal – Frequency response of crystal – Transistor crystal oscillator – Operational amplifiers – OP-AMP applications.

UNIT V:

Radio Broad casting transmission and reception – Modulation – Types of modulation – Amplitude modulation – Modulation factor – Analysis of amplitude modulated wave – Side band frequencies in AM wave – Transistor AM modulator – Power in AM wave – Limitations of amplitude modulation – Frequency modulation – Demodulation – Essentials in demodulation – AM diode detector – AM radio receivers – Types of AM Radio receivers – Stages of super heterodyne – Radio receiver circuit.

Text Books:

1) **Principles of Electronics,** V.K.Mehta & Rohit Mehta-S.Chand & Company Ltd, 2014
   Chapters: UNIT 1: 9.7 to 9.23
   UNIT 2: 11.15 – 11.25, 22.1 – 22.17
   UNIT 3:12.2, 12.6 –12.10, 12.12 – 12.14, 13.4 – 13.12, 14.1 – 14.3
   UNIT 4: 17.5 – 17.7, 17.10 – 17.20
   UNIT 5: 19.1 – 19.18
2) **Basic Electronics (Solid State),** B.L Theraja, S.Chand & Company Ltd., 2002. UNIT 4: 31.19 – 31.31

Reference Books:

1) Electronic Principles – Albert Paul Malvino (Sixth Edition), Sixth Reprint 2013.
2) Electronic Devices and Circuits – Jacob Millman Christos C. Halkias,1999

(For those who joined in June 2016 and after)

PART – III : Core Subject Theory		
Subject Title : **MATHEMATICAL PHYSICS**		
Subject Code: **06CT42**	Hours per week: **4**	Credit: **4**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives:

- ❖ *To become familiar with vectors and matrices*
- ❖ *To find the roots of transcendental equations by different methods*
- ❖ *To learn the solutions of linear algebraic equations*
- ❖ *To understand the importance of interpolation in different fields*
- ❖ *To become familiar with the numerical differentiation and integration by various methods*

UNIT 1: Vectors: Addition of vectors – Multiplication of vector by a scalar – Product of two vectors – Gradient of a scalar field. Matrices: Special types of matrices – Eigen values, Eigen vectors: Characteristic equation of a matrix – Cayley-Hamilton theorem

UNIT 2: The solutions of Numerical Algebraic and Transcendental equations: The Bisection method – Iteration method (or Method of Successive Approximation) – Regula Falsi method – Newton Raphson method

UNIT 3: Solutions of Simultaneous Linear Algebraic Equations: Gauss elimination method – Gauss seidel method of iteration

UNIT 4: Interpolation, Central Difference Interpolation Formulae: Gregory-Newton forward interpolation formula – Gregory-Newton backward interpolation formula – Gauss's forward interpolation formula – Gauss's backward interpolation formula

UNIT 5: Newton's forward difference formula to get the derivative – Newton's backward difference formula to compute the derivative – Trapezoidal rule – Simpson's one third rule

Text Books:

1. Mathematical Physics – Satya Prakash (Sultan Chand & Sons, New Delhi) Reprint 2005.

Chapters: Unit 1: 1.1(a) to 1.1(d), 1.2, 2.5, 2.31, 2.32

2. Numerical Methods – P.Kandasamy, K.Thilagavathy & K.Gunavathi, (S.Chand & Company Ltd., New Delhi, 2014.

Chapters: Unit 2: 3.1.1, 3.2 to 3.4

Unit 3: 4.2, 4.9

Unit 4: 6.2, 6.3, 7.3, 7.4

Unit 5: 9.2, 9.3, 9.9, 9.13

Reference Books:

1. Mathematical Physics – B.D. Gupta, Third Edition, Vikas Publishing House Pvt. Ltd., (Reprint 2007)
2. Mathematical Physics – P.K. Chattopadhyay, New Age International (P) Ltd., Publishers, New Delhi (Reprint 2004)
3. Computer Oriented Numerical Methods – V. Rajaraman, Prince Hall of India Publication, 2000
4. Introductory Methods of Numerical Analysis – S.S.Sastry, Prince Hall of India Publication, 2003

B.Sc. Physics CBCS Syllabus - **SEMESTER – IV**

(For those who joined in June 2016 and after)

PART III : Core Subject Practical		
Subject Title **: Major Practical - II**		
Subject Code: **06CP43**	Hours per week: **2**	Credit: **2**
Sessional Marks: **40**	Summative Marks:**60**	Total Marks:

(Any fourteen experiments)

1. Potentiometer – Ammeter calibration

2. Potentiometer- Calibration of high range voltmeter

3. Carey Foster Bridge- measurement of low resistance

4. Self Inductance – by Anderson's bridge

5. Quantity sensitiveness of Ballistic Galvanometer

6. Internal resistance of a battery using B.G

7. M1/M2 deflection magnetometer – Tan A, Tan B

8. M & BH –Deflection Magnetometer

9. Field along the axis of circular coil – deflection methods

10. Grating – minimum deviation – dispersive power

11. Spectrometer- small angled prism

12. *i-i'* curve –prism-spectrometer

13. Superposition theorem

14. Maximum power transfer theorem

15. LCR series resonance circuit

16. LCR Parallel resonance circuit

17. Comparision of EMF's –Using spot deflection galvanometer

18. Comparision of Capacitances - Using spot deflection galvanometer

B.Sc. Physics (Allied Mathematics) CBCS Syllabus - **SEMESTER – IV**

(For those who joined in June 2013 and After)

PART – III : Allied Subject Theory		
Subject Title : MATHEMATICS - II		
Subject Code: 05AT02	**Hours per week: 6**	**Credit: 5**
Sessional Marks: 25	**Summative Marks: 75**	**Total Marks: 100**

Objective:

❖ *To develop the skill of Knowledge in Mathematics and Solving problems*

UNIT I:

Formation of differential equation – differential equation of first order and first degree – variables seperable, homogeneous and nonhomogeneous differential equations – linear equations.

UNIT II:

Second order linear differential equations with constant coefficients – methods of finding particular integrals for the funtions of the type e^{ax}, cos ax, sin ax, x^m, $e^{ax}V$ – second order linear differential equations with variable coefficients.

UNIT III:

Laplace transforms – inverse Laplace transforms – solution of differential equations using Laplace transforms.

UNIT IV:

Formation of partial differential equations – definition of complete, particular, singular and general integrals – solving first order partial differential equations.

UNIT V:

Fourier series – Fourier series for even and odd funtions – half range Fourier cosine and sine series.

Text Book:

✓ Ancillary Mathematics by Dr.S.Arumugam & Issac. Vol I – IV (Relevant Chapters), New Gamma Publishing House, Palayamkottai

Reference Book:

✓ Ancillary Mathematics by T.K Manikavasagampillai & Others Viswanathan, printers and publishers Pvt Ltd. Chennai.

B.Sc. Physics CBCS Syllabus - **SEMESTER – IV**

(For those who joined in June 2016 and after)

PART – IV : Skill Based Subject		
Subject Title : **ASTROPHYSICS**		
Subject Code: **06SB41**	Hours per week: **2**	Credit: **2**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives:
- ❖ *To be familiar with Astronomical instruments, stellar motions*
- ❖ *To study about sun and other stars*
- ❖ *To know basic ideas about galaxy and cosmology*

UNIT I: Astronomical Instruments**:** Light and its properties – The earth's atmosphere and the Electro Magnetic Radiation – Optical telescopes – Radio telescopes – The Hubble Space Telescope(HST)

UNIT II: Basic Physics**:** Doppler effect – Zeeman Effect. Motions and Distances of Stars**:** Stellar Positions: The Celestial coordinates – Stellar motions

UNIT III: The Sun**:** Sun-A typical star – The photosphere: Limb-darkening – Solar granulation – The chromosphere – Solar corona – The 11-year solar cycle and sunspots

UNIT IV: Binary and Multiple Stars**:** Introduction – Visual binary – Multiple stars. Variable Stars**:** Classification of variable stars. Erupting and Exploding Stars**:** Introduction - Distribution of Novae in our galaxy – Determination of distance and luminosity of Novae – Light variation of Novae – Spectra of Novae – Cause of Nova outburst – Supernovae

UNIT V: Our Galaxy**:** Introduction – Rotation of the galaxy: Differential rotation – Cosmic rays.Cosmology**:** Introduction – Redshift and the expansion of the Universe

Text Book:
An Introduction to Astrophysics – Baidyanath Basu, Tanuka Chattopadhyay, Sudhindra Nath Biswas PHI Learning Private Limited, New Delhi – Ninth Printing (Second Edition), 2012

      Chapters: Unit 1: 1.1 to 1.5
                     Unit 2: 2.5, 2.6, 3.9, 3.10

Unit 3: 5.1 to 5.3, 5.5, 5.6, 5.8
Unit 4: 7.1, 7.2, 7.5, 8.1, 9.1 to 9.7
Unit 5: 16.1, 16.2, 16.10, 21.1, 21.2

Reference Books:

1. Astrophysics of the Solar system – K.D. Abhyankar, Universities Press (India) Private Ltd., 1999

2. Astrophysics A Modern Perspective – K.S. Krishna Swamy, New Age International (P)Ltd., Publishers, New Delhi, Reprint 2003

3. Schaum's Outline of Theory and Problems of Atronomy – Stacey E.Palen, Department of Astronomy, University of Washington, Schaum's Outline Series, McGraw Hill (2002)

B.Sc. Physics CBCS Syllabus (Part-II English) - **SEMESTER V**
(For those who join in June 2015 onwards)

PART II – Paper I		
Subject Title **: English for Career Development**		
Subject Code:**P2LE51 / P2CE51**	Hours per week: 1	Credit: 1
Sessional Marks: **100**		Total Marks: **100**

Total number of hours: 15 hours

Objectives:

❖ *To make students face Competitive Examinations with confidence*

❖ *To train students in writing book reviews*

❖ *To make them write reports, resolutions, minutes*

❖ *To make them prepare agenda for meeting.*

Unit I

➢ Comprehension

Unit II

➢ Spotting the Errors
➢ Sentence Improvement
➢ Voice
➢ Preposition
➢ Cloze Test or Numbered Gaps

Text Book: *Objective English for Competitive Examinations*, Hari Mohan Prasad
Uma Rani Sinha, Tata McGraw Hill Education Private Limited,
New Delhi.

Unit III

➢ Book Reviews

Unit IV

➢ Report-Writing
➢ Preparation of Agenda, Resolutions, Minutes

B.Sc. Physics CBCS Syllabus - **SEMESTER – V**

(For those who joined in June 2016 and after)

PART – III : Core Subject Theory		
Subject Title : **SOLID STATE PHYSICS**		
Subject Code: **06CT51**	Hours per week: **6**	Credit: **5**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives:

This course aims at study of crystal structure and crystal planes, imperfections in crystals, dielectric and thermal properties, magnetic properties and super conductivity

UNIT I: CRYSTAL STRUCTURE AND CRYSTAL PLANES

Introduction – Space lattice - Stacking sequences in metallic crystal structures - Directions in Crystals - Planes in crystals - Miller indices - Distances of separation between successive (hkl) planes.

UNIT II: IMPERFECTIONS IN CRYSTALS

Imperfections in crystals - Energy of formation of vacancy   - line imperfection - Edge dislocations - Screw dislocations - Surface imperfections - Stacking faults - Twin Boundary - Volume defects - Diffraction of X-rays by crystal planes - X- Ray diffraction methods.

UNIT III: DIELECTRIC AND THERMAL PROPERTIES

Introduction - Various polarization processes - Internal field - Frequency dependence of dielectric constant - Dielectric breakdown - Ferro and Piezo electricity- Phonons of mono atomic and dimensional lattice-Specific heat of solids (classical theory, Einstein's theory of the specific heat, Debye's theory of the specific heat).

UNIT IV: MAGNETIC PROPERTIES

Introduction - Classification of magnetic materials - The quantum numbers - Origin of magnetic moment - classical theory of diamagnetism - Theory of paramagnetism - Ferro magnetism - Antiferro magnetic materials - Ferrimagnetic materials - Applications of different magnetic materials.

UNIT V: SUPER CONDUCTIVITY

 Introduction - Effect of magnetic field - Effect of current - Type I and Type II - Super conductors - Thermal properties - Isotope effect - London equations - BCS

theory - Flux quantization - Josephson Effect - Applications of super conductors - High Tc super conductivity - New developments.

Text Books:

1. Solid State Physics, P.K. Palanisamy, 2004, Scitech Publications (India) Pvt. Ltd., Chennai
2. Solid State Physics, P.K. Palanisamy, 2006, Scitech Publications,(India) Pvt. Ltd., Chennai

     Unit I: 2.1 - 2.3, 3.1 - 3.4   **Unit II**: 3.5, 3.6, 4.1- 4.8

     Unit III: 7.1 - 7.6 & (7.2, 7.3 – 2006 edition)   **Unit IV**: 8.1 - 8.10

     Unit V: 10.1 - 10.12

Reference Books:

(i) Solid State Physics,   S.O. Pillai, Revised Sixth Edition 2005,
                                     New Age International (P) Ltd. New Delhi

(ii) Solid State Physics,   M.A. Wahab, Second Edition 2005,
                                     Structure and Properties of Material
                                     Narosa Publishing House Pvt. Ltd., Delhi.

(iii)Solid State Physics,   S.T. Gupta and V. Kumar, Eighth Edition 2003,
                                     K. Nath & Co Publishers, Meerut.

PART – III : Core Subject Theory		
Subject Title : **DIGITAL ELECTRONICS**		
Subject Code: 06CT52	Hours per week: 6	Credit: 5
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives:

- ❖ *To learn the Digital Electronic fundamentals and circuits such as Number system and Codes, Combinational circuits and Data Processing circuits*
- ❖ *To know more about Arithmetic circuits, Clocks and Timing circuits*
- ❖ *To gain in-depth knowledge about Flip-flops, Registers and Counters, A/D and D/A convertors*
- ❖ *To gain knowledge about Communication systems and Types of Modulation*
- ❖ *To learn about Microprocessor, Arithmetic operators like Addition and Subtraction*

UNIT I: DIGITAL LOGIC, COMBINATIONAL LOGIC CIRCUITS, DATA PROCESSING CIRCUITS AND NUMBER SYSTEMS AND CODES

Basic gates – Universal logic gates- (NOR, NAND) – AND, OR and INVERT gates - Boolean Laws and Theorems - Multiplexers - Demultiplexers - 1 of 16 decoder - BCD to Decimal decoders - Seven segment Decoders - Encoders - Exclusive OR gates - Binary to Decimal conversion - Decimal to Binary conversion - Octal numbers - Hexadecimal numbers - The ASCII code - The excess 3 code - The gray code.

UNIT II: ARITHMETIC CIRCUITS AND CLOCKS AND TIMING CIRCUITS

Binary addition - Binary subtraction - Unsigned binary numbers - Sign-magnitude numbers - 2's complement representation - 2's complement arithmetic - Arithmetic building blocks - The adder subtracter.-Clock waveforms - TTL clock - Schmitt trigger - 555 Timer - Astable - 555 Timer - Monostable.

UNIT III: FLIP – FLOPS RS Flip- Flops - Gated Flip- Flops - Edge triggered RS Flip Flops -   Edge triggered JK flip flops - Flip Flop timing - JK Master Slave flip-flops.

Registers and Counters: Types of Registers – Serial In-Serial Out – Serial In-Parallel Out –   Asynchronous counters - Synchronous counters

D/A Conversion and A/D Conversion Variable, Resister Networks - Binary ladders – D/A converters(Available D/A converters only) - A/D converter (Simultaneous conversion) – A/D techniques – Dual-slope A/D conversion

UNIT IV: COMMUNICATION SYSTEMS

      Theory of Frequency and Phase Modulation – Noise and Frequency Modulation (Effect of Noise on Carrier-Noise Triangle, Pre-emphasis and De-emphasis, Other form of Interference) – Generation of Frequency Modulation – Pulse Modulation

UNIT V: MICROPROCESSOR

      Microprocessor - Initiated operations and 8085 Bus Organization - Internal Data operations and the 8085 Registers - The 8085 microprocessor (Pinout and signals diagram only) - The 8085 A microprocessor functional block diagram - The 8085 instruction set - Review of the 8085 operations - Instruction word size -   Overview of the 8085 instruction set. Addition of two 8-bit numbers; Sum 8 bits – 8 bit subtraction – Find One's Complement of an 8 bit number – Find Two's Complement of an 8 bit number

Text Books:

UNIT I TO UNIT III

Digital Principles and Applications - D.P.Leach and A.P. Malvino. 7th Edition. Tata McGraw Hill Publishing Company Pvt. Ltd., New Delhi Sixth Reprint 2013.

UNIT IV:

Electronic Communication Systems – George Kennedy & Bernard Davis 4th Edition, Tata McGraw Hill Publishing Company Pvt. Ltd., New Delhi 8th Reprint 2001

UNIT V:

1. Microprocessor Architecture, programming and applications with the 8085 Ramesh S. Gaonkar (Fourth Edition), 2006
2. Fundamentals of Microprocessor and Microcomputers – B. Ram (6th Revised and Enlarged Edition) Dhanpat Rai Publications Pvt. Ltd, New Delhi

CHAPTERS:

UNIT I: 2.1 - 2.3, 3.1,4.1 – 4.7, 5.2 -5.8   UNIT II: 6.1 – 6.8, 7.1 – 7.5
UNIT III: 8.1 - 8.3, 8.5 – 8.7, 9.1 – 9.3, 10.1,10.3, 12.1, 12.2, 12.3(Available
          D/A converters only), 12.5, 12.8, 12.9
UNIT IV: 5.1, 5.2.1, 5.2.2, 5.2.3, 5.3, 13.2
UNIT V: 1) 2.11, 2.12, Figure 3.1, Figure 3.7, 5.21, 5.22, 5.31, 5.5
          6.3, 6.4, 6.9, 6.11

Reference Books:

1. Fundamentals of Digital Circuits - A. Anand Kumar, Prentice Hall of India Pvt. Ltd., New Delhi (2001).

2. Digital Electronics- Circuits and Systems - V.K. Puri, Seventh Reprint 2002, Tata McGraw Hill Publishing Company, New Delhi.

B.Sc. Physics CBCS Syllabus - **SEMESTER – V**

(For those who joined in June 2016 and after)

PART III : Core Subject Practical		
Subject Title : **MAJOR PRACTICAL - III**		
Subject Code: **06CP53**	Hours per week: **8**	Credit: **4**
Sessional Marks: **40**	Summative Marks: **60**	Total Marks: **100**

(Any fourteen experiments)

1) Semiconductor Diode Characteristics

2) JFET Characteristics

3) H – Parameters of Transistors

4) Measurement of Op-Amp parameters

5) Calculation of RMS value of Sine and Triangular wave form

6) Split Power supply

7) Study of Logic gates – Using discrete components

8) Study of Logic gates – Using ICs(7408, 7400, 7404, 7432)

9) Integrator, Differentiator using discrete components

10) Clipping and Clamping circuits

11) Characteristics of Zener Diode

12) Characteristics of Bipolar Transistors

13) Study of Half adder and Full adder using 7486 and 7408

14) Study of Half Subtracter and Full Subtracter

15) Rectifiers and Filters

16) Characteristics of Photo diode and Photo Transistor

B.Sc. Physics CBCS Syllabus - **SEMESTER – V**

(For those who joined in June 2016 and after)

PART – III : Elective Subject Theory		
Subject Title : **OBJECT ORIENTED PROGRAMMING WITH C++**		
Subject Code: **06EP51**	Hours per week: **5**	Credit: **5**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives:

> *To learn the most widely used OOP language, the need, principles and applications of OOP.*
> *To know about the basic concepts like Tokens, Expressions, Control structures and Functions in C++.*
> *To familiarize the concepts such as Classes and Objects.*
> *To know about Constructors, their types, Destructors, Operator overloading and Type conversions.*
> *To learn salient features as Inheritance, its types and Virtual Base Class.*

UNIT I:

Principles of Object-Oriented Programming:

Software crisis - Software evolution - A look at procedure - oriented programming - object oriented programming paradigm - Basic concepts of object oriented programming - Benefits of OOP - Object oriented languages - Applications of OOP.

Beginning with C++:

What is C++? - Applications of C++ - A simple C++ program - More C++ statements - An example with class - structure of C++ program - More C++ statements - An example with class - Structure of C++ program - Creating the source file - compiling and linking.

UNIT II:

Token, Expressions and Control Structures:

Introduction - Tokens - Keywords - Identifiers and constants - Basic Data types - User Defined Data Types - Derived Data Types - Symbolic constants - Type compatibility - Declaration of variables - Dynamic initialization of variables - Reference variables - operators in C++ - Scope resolution operator - member Dereferencing operators - Memory management operators - Manipulators - type cast operator - Expressions and their types - Special assignment expressions - Implicit conversions - Operator overloading - Operator precedence - control structures.

Functions in C++:

Introduction - The main function - function prototyping - call by reference - return by reference - Inline functions - Default arguments - const arguments - Function overloading - Friend and Virtual functions - Math Library functions.

UNIT III: Classes and Objects:

Introduction - C structures revisited - specifying a class - Defining member functions - A C++ program with class - Making an outside function inline - Nesting of member functions - private member functions - Arrays within a class - memory allocation for objects - Static Data members - Static member functions - Arrays of objects - Objects as function arguments - Friendly functions.

UNIT IV:

Constructors and Destructors:

Introduction - Constructors - Parameterised constructors - Multiple constructors in a class - constructors with default arguments - Dynamic initialization of objects - copy constructor - dynamic constructors - destructors.

Operator Overloading and Type conversions:

Introduction - Defining operator overloading - Overloading unary operators - Overloading Binary operators - Overloading Binary operators using friends - Rules for overloading operators - Type conversions.

Unit V: Inheritance: Extending classes:

Introduction - Defining Derived classes - Single Inheritance - Making a private member inheritable - Multi level inheritance - Multiple inheritance - Hierarchical inheritance - Hybrid inheritance - Virtual Base Classes - Abstract classes.

Text Book:

Object Oriented Programming with C++ - E. Balagurusamy,(6th Edition)
2013, Tata McGraw Hill Publishing Company Pvt. Ltd., New Delhi.

Chapters: Unit I:1.1 - 1.8, 2.1 - 2.8   Unit II: 3.1 - 3.25, 4.1 - 4.12
Unit III: 5.1 - 5.15   Unit IV: 6.1 - 6.8, 6.11, 7.1 - 7.5, 7.8, 7.9.
Unit V: 8.1 - 8.10

Reference Books:

1. Programming with C++ - John R. Hubbard Schaum's outline series, McGraw Hill (1996)
2. Object oriented programming in Turbo C++ - Robert Lafore Galgotia publications Pvt. Ltd., New Delhi (1999)

PART – IV : Skill Based Subject		
Subject Title **: FIBRE OPTIC COMMUNICATION**		
Subject Code: **06SB51**	Hours per week: **2**	Credit: **2**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives:

➢ *To provide a good foundation in fibre optics*
➢ *To enable the students in order to learn the basic principles, theory and concepts of fibre optics.*
➢ *To gain knowledge about different fibre optic fabrication process.*

UNIT I: REFRACTIVE INDEX AND VELOCITY OF LIGHT

Propagation of light in different media –Propagation of light waves in an optical fibre- Basic structure of an optical fibre and propagation of light wave through it – acceptance cone and numerical aperture

UNIT II: CLASSIFICATION OF OPTICAL FIBRE

Fibre classification – Stepped index fibre – stepped index multimode fibre – graded indiex multimode fibre – plastic fiber

UNIT III: FIBRE FABRICATION

Classification of fibre fabrication-external chemical vapour deposition – axial vapour deposition-internal chemical vapour deposition- multi element glasses- phasil system.

UNIT IV: LED & SEMICONDUCTOR LASER

Basic theory of double hetero junction LED (DHLED) - Different LED structures- basic principles of laser action –-p n junction photodiode – p-i-n photodiode – p-i-n- avalanche diode – phototransistors.

UNIT V: OPTICAL FIBRE COMMUNICATION

Transmitter for Fibre optic communication – digital laser transmitter- analog laser transmitter – Fibre optic receiver- Important applications of integrated optic fibre technology.

Text Book:

Optical fibres and fibre optic communication – Subir Kumar sarkar – S.Chand & Company Ltd., New delhi, Revised Edition 2010.

Unit I: 2.1 to 2.5

Unit II: 3.1 to 3.3, 3.5, 3.6
Unit III: 4.1 to 4.6
Unit IV: 9.2(a), 9.3, 10.6 to 10.9
Unit V: 15.2,15.7,15.8,15.12,18.2

Reference Books:

1. Fibre- optic communication system, Govind P.Agarwal, A.John Wiley & Sons, Edition 2002
2. Optical Communication essentials, Gerd Keiser, n Tata Mc Graw Hill Publishing Pvt. Ltd. New Delhi, 2008.

B.Sc. Physics CBCS Syllabus - **SEMESTER – V**

(For those who joined in June 2014 and after)

Part – IV : Common Subject Theory		
Subject Title : **Environmental studies**		
Subject Code: **ESUG51**	Hours per week: **2**	Credit: 2
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

2hrs/week 24hrs

Objectives:

❖ *Disseminate information of Environment of national and international issues*
❖ *Environmental consciousness creation among the students*
❖ *Facilitation of environmental leadership among students*

Unit I   5 hrs

Introduction – Nature, scope and importance of Environmental studies – Natural Resources and conservation – forest, water and energy.

Unit II   5 hrs

Ecosystem – concept – structure and function, energy flow, food chain, food web and ecological pyramids

Unit III   5hrs

Biodiversity – definition, types – values – India, a mega diversity zone – Hotspots – Endangered and endemic species – threat to biodiversity and conservation

Unit IV   5 hrs

Environmental pollution – Air pollution- causes and effect – Ozone depletion – Global warming – acid rain – Water pollution – Noise pollution – Solid waste management – Nuclear hazard

Unit V   4hrs

Human population and the environment – Population growth – variation among nations – effects of population explosion – family welfare programme – environment and human health.

Text Book:

Environment studies – R.Murugesan (2009), Milleneum Publications. Madurai-16

PART II – Paper I			
Subject Title **:** **English for Professional Excellence**			
Subject Code:**P2LE61, P2CE61**	Hours per week: 1	Credit: 1	
Sessional Marks: **100**		Total Marks: **100**	

Total number of hours: 15 hours

Objectives:

- ❖ *To make students face Competitive Examinations with confidence*
- ❖ *To prepare students to face interviews*
- ❖ *To make students familiar with books and authors in English literature*
- ❖ *To make students prepare resume*
- ❖ *To motivate students to participate in Group Discussion*
- ❖ *To make students read books on Personality Development*

Unit – I

- ➢ Sentence Completion
- ➢ Sentence Fillers
- ➢ Synonym
- ➢ Antonym
- ➢ Idioms and Phrases
- ➢ Substitution

Unit – II

- ➢ Sentence Arrangement
- ➢ Jumbled sentences
- ➢ Paragraph Reconstruction
- ➢ Analogy

Text Book

Objective English for Competitive Examinations, Hari Mohan Prasad
Uma Rani Sinha, Tata McGraw Hill Education Private Limited, New Delhi.

Unit III

- ➢ Interview Skills – mock – interview.
- ➢ Debate, Group Disscussion, Resume Writing

Unit IV

- ➢ Books and authors in English literature

PART III : Core Subject Theory		
Subject Title : **NUCLEAR PHYSICS**		
Subject Code: **06CT61**	Hours per week: **4**	Credit**: 4**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives:

❖ *Introduction to Nucleus, its structure, Detectors of nuclear Radiation and Particle Accelerators*

❖ *To learn about Radioactivity*

❖ *To gain knowledge about Artificial transmutation of elements, Discovery, Properties and Classification of neutron*

❖ *To learn more about Nuclear fission and fusion and Nuclear Reactors*

❖ *To understand the Elementary particles*

UNIT I:

Classification of nuclei – General properties of nucleus – Binding energy – Nuclear stability – Theories of nuclear composition – Nuclear forces – Meson theory of nuclear forces – The Liquid drop model – The Shell model – Ionization chamber – Proportional counter – Geiger-Muller counter – The Wilson cloud chamber – The Cyclotron – The Synchrocyclotron – The Betatron

UNIT II:

Discovery of Radioactivity – Natural Radioactivity – Alpha, Beta and Gamma rays – Properties of Alpha, Beta and Gamma rays – Determination of charge of Alpha particles – Velocity of Alpha particles – Range of Alpha particles – Experimental measurement of Alpha particle - Alpha particle spectra – Beta rays spectra – Magnetic spectrograph – Origin of the line and continuous spectrum – The neutrino theory of Beta decay – Determination of the wavelength of Gamma rays – Origin of Gamma rays – Law of Radioactive Disintegration – The mean life – Measurement of decay constant – Units of Radioactivity

UNIT III:

The discovery of artificial transmutation – Bohr's theory of nuclear disintegration – Threshold energy of endoergic reaction – Preparation of Radioelements – Applications of Radioisotope – The discovery of Neutron – Basic properties of neutron – Classification of neutron – Neutron sources – Neutron deduction

UNIT IV:

Nuclear fission – Energy released in fission – Chain reaction – Atom bomb – Nuclear reactors – Nuclear fusion – Source of stellar energy – Pressurized water reactor – Boiling water reactor – Fast Breeder reactor

UNIT V:

Introduction – Particles and Antiparticles – Antimatter – The fundamental interaction – The Quark model - The Big Bang theory – Thermal history of Universe – Hubble's law – The future of the Universe – Dark matter

Text Book: Modern Physics - R. Murugeshan and Kiruthiga Sivaprasath, 7th Revised Edition 2014, S. Chand & Company Ltd., New Delhi.

Chapters

Unit I:	27.2 – 27.11, 29.3, 29.5, 29.6, 29.7, 30.4, 30.5, 30.6
Unit II:	31.1 – 31.6, 31.8, 31.9, 31.10, 31.11, 31.13, 31.19, 31.20, 31.21, 31.22, 31.24, 31.25, 31.30 – 31.33
Unit III:	34.1, 34.2, 34.6, 34.10 – 31.16
Unit IV:	35.2 – 35.7, 36.1– 36.3
Unit V:	38.1 – 38.4, 38.7, 37.12 – 37.15

Reference Books:

1. Nuclrar Physics – D.C. Tayal – Himalaya Publishing House, Bombay.
2. Concepts of Modern Physics – Arthur Beiser, Shobhit Mahajan, S.Rai Choudhury sixth Edition, 2010 – Tata McGraw Hill Education Pvt. Ltd.,

PART III : Core Subject Practical		
Subject Title : **MAJOR PRACTICAL - IV**		
Subject Code: 06CP62	Hours per week: 6	Credit: 4
Sessional Marks: **40**	Summative Marks: **60**	Total Marks: **100**

(Any fourteen experiments)

1) Verification of De Morgan's Theorem using ICs

2) Summing and Difference Amplifiers using IC 741

3) Op-Amp Schmitt trigger circuits

4) Square and Triangular wave generators using IC 741

5) Study of BCD Seven Segment Decoder

6) Study of Counters

7) Shift Registers IC 7495

8) Digital to Analog Converter

9) Sine wave operator – Wien Bridge Oscillator

10) OP-AMP filters

11) Multivibrator using Transistor

12) Bistable Multivibrator using Transistor

13) Square and Triangular wave generators using IC 555

14) Astable Multivibrator using Transistor

15) Single stage Amplifier

16) Hartley Oscillator

17) Colpitt's Oscillator

18) Assembly Level Programming – Using 8085 Microprocessor Kit (Simple Programs)

PART III : Elective Subject Theory		
Subject Title : **MODERN PHYSICS**		
Subject Code: 06EP61	Hours per week: 5	Credit: 5
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives:

- ❖ *To learn the basic ideas of Lagrangian Mechanics*
- ❖ *To know about Hamiltonian Mechanics*
- ❖ *To gain idea about Particle Properties, Wave Properties of particles*
- ❖ *To learn basic concepts about Quantum Mechanics*
- ❖ *To know ideas of Theory of Relativity*

UNIT I: LAGRANGIAN MECHANICS

Conservation principles - Mechanics of a particle - Mechanics of a system of particles - Constrained motion, constraints, degrees of freedom - Generalized coordinates - Generalized notations(only displacement and velocity)-Limitations of Newton's Laws - Introduction to calculus of variations-Hamilton's variational principles - Deduction of Lagrange's equations of motion from Hamilton's principle (for conservative systems) - D' Alembert's principle - Deduction of Hamilton's principles from D' Alembert's principle - Deduction of Newton's second law of motion from Hamilton's principle - Applications of Lagrange's equations of motion (linear Harmonic oscillator, Simple pendulum, Atwood's machine)

UNIT II: HAMILTONIAN MECHANICS

Phase space and the motion of the system- Hamiltonian - Hamilton's Canonical equations of motion - Physical significance of H - Advantage of Hamiltonian Approach - Deduction of Canonical equations from variational principle - Applications of Hamiltoni equations of motion (simple pendulum, compound pendulum and linear harmonic oscillator).

UNIT III: PARTICLE PROPERTIES Photoelectric effect – Compton effect-

Wave Properties of Particle: De-Broglie waves - waves of prability - Describing a wave - phase and group velocities - Davisson and Germer experiment - Particle in a Box - Uncertainty Principle - Uncertainty principle and its applications.

UNIT IV: QUANTUM MECHANICS

Quantum mechanics - Wave equation - Schrodinger's equation (Time dependent form and Independent form) - Linearity and superposition - Expectation values - operators particle in a Box - Finite Potential Well - Tunnel effect - Harmonic Oscillator - Schrodinger's equation for the hydrogen atom - Separation of Variables.

UNIT V: THEORY OF RELATIVITY

Introduction - Frame of reference - Newtonian relativity - Galilean transformation equations - The Ether hypothesis - The Michelson Morley experiment - Special theory of relativity - The Lorentz transformation equations - Length contraction - Time Dilation - Relativity of simultaneity - Addition of velocity variation of Mass with Velocity - Mass Energy equilibrium - Minkowski's Four Dimensional Space (Time Continuum) - General theory of relativity.

Text Books:

1. Gupta, Kumar, Sharma, Ninteenth edition 2003, Classical Mechanics, Pragati Prakashan, Meerut

Unit I - Chapter 1: 1.2 to 1.8 Chapter 2: 2.1 to 2.5, 2.9(2.9.1, 2.9.2 & 2.9.10)

Unit II - Chapter 3: 3.2 to 3.7 & 3.9 (3.9.1,3.9.2 & 3.9.4)

2. Arthur Beiser, Sixth Edition 2004, Concepts of Modern Physics, Tata McGraw - Hill Publishing Company Limited, New Delhi.

Unit - III: Chapter 2: 2.3 & 2.7   Chapter 3: 3.1 to 3.9

Unit - IV: Chapter 5: 5.1 to 5.11   Chapter 6:   6.1 and 6.2

3. Modern Physics - R. Murugeshan and Kiruthiga Sivaprasath, 17th Revised Edition 2014, S. Chand & Company Ltd., New Delhi.

Unit V: Part I - Relativity - 1.1 to 1.16

Reference Books:

(1) Herbert Goldstein, Charles poole and John Safko, Third Edition, 2002, Classical Mechanics, Pearson Eduction, (Singapore) Pte. Ltd., Delhi.

(2) G. Aruldhas, 2002, Quantum Mechanics,Prentice Hall of India Private Limited, New Delhi.

PART IV : Skill Based Subject		
Subject Title **: NANOTECHNOLOGY**		
Subject Code: **06SB61**	Hours per week: **2**	Credit: **2**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives:

➢ To understand the fundamentals of Nanotechnology
➢ To give a general introduction to crystal growth
➢ To impart basic knowledge on various synthesis and characterization techniques involved in nanotechnology.

UNIT I: Introduction – Nanotechnology – Nanomaterials – Types of nanomaterials – Properties of Nanomaterials

UNIT II: Crystal bonding –Crystal growth – Some important Crystal structure – Rock salt – Wurtzite- Fluortie – Rutile – Cristobalite- Spinel.

UNIT III: Growth techniques of nanomaterials – Role of Bottom-up and Top-Down approaches in nanotechnology-Sol gel process – Electrodepsotion- Sputtering-Spray pyrolysis.

UNIT IV: Characterization tools of nanomaterials – XRD – SEM- -UV-Visible spectroscopy – Photoluminescence Spectroscopy.

UNIT V: Carbon nanotubes - Nanocomposite – Types of nanocomposite – Application of nanomaterial's

Text Book:
Introduction to Nanoscience and Nanotechnology – K.K.Chattopadhyay, A.N. Banerjee – PHI Learning Pvt. Ltd – 2012 Edition
Unit I: 1.1 to 1.4
Unit II: 2.1 to 2.6
Unit III: 6.1, 6.2, 6.4.2, 6.4.7, 6.4.8
Unit IV: 7.1 to 7.4
Unit V: 8.2 to 8.3

Reference Book:

Nanotechnology – Science, Innovation and Opportunity – Lynn E.Foster- Pearson Education – 2008 Edition.

PART – III : Skill Based Subject		
Subject Title :**PHYSICS FOR COMPETITIVE EXAMINATIONS**		
Subject Code: 06SB62	Hours per week: 2	Credit: 2
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives:

➢ *To enable the students to get through in various competitive examinations like Government service, Entrance examinations for higher studies*

➢ *Objective type questions are taken from various areas of Physics like Mechanics, Properties of matter, Thermo dynamics, Optics, Sound, Electricity, Magnetism, Electronics and Modern Physics*

➢ *To enhance the basic principles and ideas of physical concepts, Reasoning can be improved*

UNIT I:

Units of physical quantities and their dimensions – Particle dynamics, projectiles, conservation laws and collision two bodies – Circular motion, Rotating frames of reference, Conical and Foucalt's pendulum – Rotational motion, Centre of mass, moment of inertia – Simple Harmonic motion and Harmonic oscillator – Gravitation, Escape velocity & Artificial satellites – Mechanics of fluids: Surface tension & Viscosity – Elasticity

UNIT II:

Inter molecular forces, Kinetic theory of gases and behaviour of real gases – Laws of thermodynamics – Conduction & Radiation – Nature of light – Interference – Diffraction, Resolving power & Polarization – Geometrical optics and Aids to vision – Superposition of waves – Doppler's effect

UNIT III:

Magnetic properties of matter – Electrostatics – Electric potential – Capacity and Capacitors – Kirchhoff's Laws and steady current – Magnetic effects of current – Potentiometer & Thermoelectricity – Electromagnetic induction – Heating & Chemical effects of current – Alternating current

UNIT IV:

Atomic structure and positive rays – X rays and photoelectric effect – Matter waves, uncertainty principle, wave mechanics and special theory of relativity

UNIT V:

Radioactivity and Atomic Nucleus -Electronics and semiconductors – Solids – Universe-Digital Integrated Circuits

Text Book:

1) Objective Physics by Dr. S.L. Kakani, Sultan Chand & Sons, New Delhi, 6th Edition, 1995

CHAPTERS:

UNIT I:	Chapter 1	Pages 60 to 278
UNIT II:	Chapters 2 & 3	Pages 279 to 471
UNIT III:	Chapter 4	Pages 472 to 617
UNIT IV:	Chapter 4	Pages 618 to 759
UNIT V:	Chapter 4	Pages 760 to 871

B.Sc. Physics CBCS Syllabus - **SEMESTER – VI**
(For those who joined in June 2016 and after)

PART – III : Skill Based Subject		
Subject Title :**MEDICAL INSTRUMENTATION**		
Subject Code: 06SB63	Hours per week: 2	Credit: 2
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives:

❖ *To learn basic design principles of Medical Instruments and their components*
❖ *To know about Electrocardiography – Principles, Lead configuration*
❖ *To study about Electroencephalography – Brain waves, Placement of Electrodes and Analysis*
❖ *To gain knowledge about Operation Theatre Equipments, Surgical diathermy*
❖ *To provide in-depth study of Bio-Medical Instrumentation like Lasers, Nuclear Imaging Techniques, Magnetic Resonance Imaging, Positron Emission Tomography*

UNIT I:

MEDICAL INSTRUMENTS: Introduction − Design of Medical Instruments − Components of Bio-Medical Instrument system

UNIT II:

ELECTROCARDIOGRAPHY (ECG): Origin of cardiac action potential ECG lead configuration – Block diagram of ECG Recording set up

UNIT III:

ELECTROENCEPHALOGRAPHY (EEG): Origin of EEG – Brain waves - Placement of electrodes – Recording set up – Analysis of EEG

UNIT IV:

OPERATION THEATRE EQUIPMENT: Introduction − Surgical diathermy – Ventilators – Anesthesia machine

UNIT V:

ADVANCES IN BIOMEDICAL INSTRUMENTATION. Lasers in Medicine(Basic principle of Laser action, Laser instrumentation, Advantages of Laser surgery) – Nuclear Imaging Techniques – Magnetic Resonance Imaging (MRI) (Magnetic Resonance phenomenon, MRI instrumentation) – Positron Emission Tomography(PET)

Text Book: Bio-Medical Instrumentation – Dr.M. Arumugam

Anuradha Publications, Kumbakonam – Tenth Reprint-2006

Reference Book: Bio-Medical Electronics & Instrumentation

– Prof. S.K. Venkata Ram

CHAPTERS:

Unit I: 2.1 – 2.3   Unit II: 4.1, 4.3   Unit III: 4.4
Unit IV: 6.1, 6.2, 6.8, 6.9   Unit V: 10.3

(Basic principle of Laser action, Laser instrumentation, Advantages of Laser surgery), 10.6, 10.10.1, 10.10.8, 10.11

PART – IV : Common Subject Theory		
Subject Title **: Value Education**		
Subject Code: **VEUG61**	Hours per week: **2**	Credit: **2**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

UNIT I: The heart of Education

Introduction – Eternal Value – Integrated approach to value education - one for all and all for one – Responsibilities of a citizen – Habit Vs wisdom – purifying mind pollution – Respect for all Religions – Parents, teachers and fellow students – The need and benefit of exercise and meditation for students.

UNIT II: The Value of Body and Life Energy

Introduction – what are the causes for paid, Disease and death? Three Basic needs for all living Beings – Personal Hygeine Five Factors of Balance in Life – The need and benefits of physical Exercise – The value and Base of Life energy – The value and Base of Bio-magnetism - You are your own best caretaker.

The Marvelous nature of mind

Introduction- Bio-magnetism – The base of the mind – characterisation of the Genetic Centre – metal frequency – practice for a creative mind - benefits of meditation.

UNIT III: Analysis of Thought

Introduction – An Explosition on the nature of thought– six roots for thoughts – Introspection for analysis of thoughts-practical techniques   for analysis of thoughts.

Benefits of Blessings

Effects of good vibrations – Make Blessing a Daily Habit

UNIT IV: Moralisation of Derive

Introduction – moralization of desire - Analyse your desires – Summary of practice.

Neutralision of Anger:

Introduction – meaning – characteristics of Anger – Anger is a Destructive emotion – Anger spoils our relationship with others – Some common misconception about anger – will power and method   success through awareness – method of neutralisation of anger.

UNIT V: Eradication of Worries

Worry is a mental disease – Nature's Law of cause and effect – factors beyond our control – How to deal with problems – analyse your problem and eradicate worry

Harmonious Relationships

Introduction – Three angles of life – The value of harmony in personal relations – Love and Compassion – pleasant face and loving words – appreciation and gratitude to parents and teachers – Bringing needed reforms in educational institutions – Why should we serve others? Brotherhood – A scientific Basis for Universal

Brotherhood protection of the environment – non-violence and the five fold moral culture.

Text Book: Value Education for Health, Happiness and Harmony
(Based on the Philosophy and Teachings of Swami Vethanthiri Maharisi)
Published By: Brain Trust, Aliyar A Wing of World Community Service Centre

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B.Sc. Physics CBCS Syllabus - **SEMESTER – VI**

(For those who joined in June 2008 and after)

PART – V : Common Subject Theory		
Subject Title : **EXTENSION ACTIVITIES**		
Subject Code: **EAUG61**	Hours per week:	Credit: **1**
Sessional Marks:	Summative Marks: **100**	Total Marks: **100**

UNIT-I: Community Development-I:

Definition – structure and composition – community based issues – need for awareness – Developmental Programmes.

UNIT – II: Community Development–II:

Rural Scenario – need of the Community – need for the community service – role of youth in community building – communal harmony – literacy – Educational Recreation.

UNIT – III: Volunteer Empowerment:

Women's Emancipation – formation of Youth Clubs – Self-Help Groups – Youth and Development

UNIT – IV: Social Analysis:

Social issues – cultural invasion – media infiltration – human rights Education/Consumer Awareness – Adolescents Reproductive – HIV/AIDS/STD – Social harmony/National integration – Blood Donation

UNIT – V: Introduction to NSS:

Basic Concepts – profile – aims – objectives – symbol – Motto – structure – Regular activities – Special Camping Programme – Adventure Programme – National Days and Celebrations.(Applicable to NSS Students)

(OR)

NCC - Origin – Organisation – Ministry of Defence – Armed forces – commands – Defence establishments in Tamil Nadu
Civil Defence – Aid to civil authorities – Disaster management – Leadership – Man management – Adventure activities – Social service

Reference: National Service Scheme Manual (Revised), Ministry of Human Resources Development, government of India.

Allied Subject Theory for Mathematics & Chemistry Major

(For those who joined in June 2016 and after)

PART III : Allied Subject		
Subject Title **: Allied Physics – I**		
Subject Code: **06AT01**	Hours per week: **4**	Credit: **4**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives:
- ➢ To learn about acoustics of buildings
- ➢ To know about elasticity, viscosity and Surface tension
- ➢ To get a knowledge in electricity and magnetism.
- ➢ To provide a good foundation in optics.

UNIT I: Waves and Oscillations

Simple Harmonic Motion – Composition of two Simple Harmonic Motions in a straight line- Composition of two Simple Harmonic Motions of equal time periods at right angles- - Melde's Experiment – Ultrasonics- production –application and uses- – Reverberation – Absorption coefficient - Acoustics of buildings – factors affecting the acoustics of buildings- Sound distribution in an auditorium

UNIT II: Properties of Matter

Elasticity: Introduction- Different moduli of elasticity – Poisson's ratio- Energy stored in a stretched wire - Bending of beams – expression for the bending moment- Theory of Non-uniform bending – Torsion Pendulum – expression for the period of oscillation of a torsion pendulum.

Viscosity: Streamline flow and turbulent flow – Coefficient of viscosity - Derivation of Poiseulle's formula.

Surface Tension: Introduction- experimental determination of surface tension – Jaegar's method.

UNIT III: Thermal Physics

Laws of thermodynamics – Zeroth law of thermodynamics –first law of thermodynamics - second law of thermodynamics- third law of thermodynamics – Heat engine – Entropy – Change of entropy in a carnots cycle.

Unit IV: Electricity and Magnetism

Introduction – Magnetic effect of electric current – Oersted's experiment – BiotSavart law- Magnetic induction at a point on the axis of a circular coil- choke coil-Electric circuit – switches- fuses- circuit breaker – the relay.

Unit V: Geometrical Optics

Introduction – image formation by refraction – Critical angle –Refraction through prism – direct vision spectroscope – coma – Spherical aberration in a lens – methods of minimizing spherical aberration – condition for minimum spherical aberration of two thin lenses separated by a distance - chromatic aberration in a lens- condition for achromatism of two lenses separated by a distance

Text Book:

Allied Physics Paper I and II - R. Murugeshan, M.Shantha Kiruthiga Sivaprasath, S.Chand & Company Pvt. Ltd. New Delhi, Revised Edition, Reprint 2014.

Unit I: 1.1 to 1.3, 1.9, 1.11 to 1.19.
Unit II: 2.1 to 2.7, 2.12, 2.14, 2.15, 2.17, 2.24, 2.29
Unit III: 3.15 to 3.21
Unit IV: 4.1, 4.4 to 4.6, 4.15 to 4.20
Unit V: 5.1, 5.2, 5.4, 5.6, 5.14, 5.16, 5.18 to 5.20, 5.22, 5.27

Reference Books:

1. Electricity and Magnetism - R. Murugeshan -Reprint with correction 2008
2. Principles of Electronics - V.K.Metha & Rohit Metha -Multicolour Illustrative edition – 2006- S. Chand & Company Ltd., New Delhi
3. Modern Physics-R. Murugeshan & Kiruthiga Sivaprasath- Multicolour Edition – 2007- S. Chand & Company Ltd., New Delhi

Allied Subject Theory for Mathematics & Chemistry Major

(For those who joined in June 2016 and after)

PART III : Allied Subject		
Subject Title **: Allied Physics – II**		
Subject Code: **06AT02**	Hours per week: **4**	Credit: **4**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives:
- ➢ *To learn about Atomic and nuclear physics*
- ➢ *To know about elements of relativity*
- ➢ *To get a knowledge in electronics*

UNIT I: PHYSICAL OPTICS

Interference – Introduction – interference in thin films – production of colors in thin films – diffraction – introduction – plane transmission diffraction grating – polarization – introduction – double refraction – specific rotator power - lauret's half shade polarimeter –difference between interference and diffraction.

UNIT II: ATOMIC PHYSICS

Vector atom model – Quantum numbers associated with the vector atom model – the Pauli's exclusion principle – magnetic dipole moment due to spin – the stern and gerlach experiment.

Unit III: NUCLEAR PHYSICS

Models of nuclear structure – The liquid – Drop model - mass defect – binding energy – ionization chamber - nuclear fission-energy released in fission- atom bomb – Nuclear reactor – Nuclear fusion – Distinction between fission and fusion.

UNIT IV: ELEMENTS OF RELATIVITY

Frame of reference - Galilean Transformation Equations – Postulates of Special theory of Relativity – The Lorentz Transformation Equations - derivation – Length Contraction – Time Dilation –Mass Energy Equivalence

UNIT V: ELECTRONICS

Light Emitting Diode (LED) – Zener Diode- experiment to study the characteristics of the zener diode – zener diode as voltage regulator – Logic Gates – AND gate – OR gate- the NOT gate – the NAND gate –NAND gate is a universal gate- the NOR gate –NOR gate is universal gate – Boolean algebra – Postulates and theorem of Boolean algebra - De Morgan's theorem.

Text Book:

Allied Physics Paper I and II - R. Murugeshan, M.Shantha Kiruthiga Sivaprasath, S.Chand & Company Pvt. Ltd. New Delhi, Revised Edition, Reprint 2014.

Unit I: 6.2 to 6.4, 6.8, 6.10, 6.12, 6.14, 6.19, 6.20
Unit II: 7.1, 7.2, 7.4, 7.7, 7.8
Unit III: 8.1, 8.3, 8.4, 8.6, 8.8, 8.9, 8.12, 8.13, 8.14
Unit IV: 10.1 to 10.4, 10.11 to 10.21
Unit V: 9.1 to 9.7, 9.9

Reference Books:
1. Electricity and Magnetism - R. Murugeshan -Reprint with correction 2008
2. Principles of Electronics - V.K.Metha & Rohit Metha -Multicolour Illustrative edition – 2006- S. Chand & Company Ltd., New Delhi
3. Modern Physics-R. Murugeshan & Kiruthiga Sivaprasath- Multicolour Edition – 2007- S. Chand & Company Ltd., New Delhi

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Department of Physics - **SEMESTER – II**
Allied Subject Practical for Mathematics & Chemistry Major
(For those who joined in June 2016 and after)

PART III : Allied Physics Practical		
Subject Title : **Allied Physics Practical**		
Subject Code: **06AP03**	Hours per week: **2**	Credit: **2**
Sessional Marks: **40**	Summative Marks: **60**	Total Marks: **100**

(Any fourteen experiments)
1. Non-Uniform Bending – Pin and Microscope
2. Non-Uniform Bending – Optic lever
3. Uniform Bending – Pin and Microscope
4. Uniform Bending – Optic lever
5. Compound Pendulum
6. Torsion Pendulum
7. Sonometer – Verification of Laws (1st law & 2nd law)
8. Viscosity by Stoke's method
9. Newton's rings – Determination of Radius of curvature
10. Air wedge – Thickness of a paper
11. Spectrometer – Refractive Index
12. Spectrometer – Grating -Normal incidence
13. Carey Foster Bridge
14. Diode Characteristics
15. Zener Diode Characteristics
16. Logic Gates – AND, OR, NOT