DEPARTMENT OF PHYSICS

MUHAMMED ABDURAHIMAN MEMORIAL ORPHANAGE (MAMO) COLLEGE

[Govt. Aided First Grade College & Affiliated to University of Calicut.
Re-Accredited by NAAC with A Grade]

CHOICE BASED CREDIT AND SEMESTER SYSTEM (CBCSS)

FOR

B. Sc PHYSICS

(2020-21 Admissions Onwards)

MANASSERY, MUKKAM POST,
KOZHIKODE, KERALA, INDIA, 673 602.
EMAIL: mamocollege@gmail.com

OFFICE: 0495-2297319
PRINCIPAL: 0495-2295121

www.mamocollege.org

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Muhammed Abdurahiman Memorial Orphanage College ★ P.O.Manassery Mukkam Pin - 673602

PRINCIPAL
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602

INSTITUTIONAL VISION, MISSION & OBJECTIVES

VISION: Build Scientifically Oriented, Intellectually Accomplished, Morally Upright and Socially Committed youth who can play a constructive role in Nation Building.

MISSION: Intellectual, social and economic empowerment of the youth in general and women, minorities, orphans and the destitute in particular by providing quality, value-based higher-education.

OBJECTIVES: Pursuit of Excellence, Harnessing technology, Thrust on value-based education, Nurturing Excellence and Moulding the youth for Nation Building

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ABOUT THE DEPARTMENT

The Department of Physics was established in the year 2001, with the State Government sanctioning an undergraduate Programme in Physics. The Department expanded its scope with the introduction of the M.Sc Programme in Physics in the year 2004. Currently, the Department has 6 fulltime faculty members and it offers the following programmes and courses:

1. **M.Sc Physics**
2. **B.Sc Physics**
3. **Career-Oriented Skill Enhancement Certificate Courses**

The Department is one of the best Physics Departments in the University and it attracts high quality students from in and around the district. The Department has a reasonably good placement record. Many of the graduates from the Department choose to join some of the best institutions of higher learning in the country. Old students of the Department are working in diverse fields like Government Sector, Research Institutions, Business, Banking and Service Sectors and Private Sector.

Thoroughly revised curriculum and highly motivated students and faculty are the strength of the Department. The curriculum provides students with a broad and strong foundation in Classical and Modern Physics. Students have an opportunity to engage in Course Projects and other student centred and experiential curricular, co-curricular learning activities to strengthen their foundational structure.

In addition, to augment the career-orientation of the prescribed curriculum, the Department offers a multitude of **career-oriented short-term skill enhancement courses** in subjects and other career related areas, in parallel to the normal academic activities.

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The Department also offer students with opportunities to do their internship and course projects by maintaining collaboration with other educational and research institutions within and outside the state. The Department also organizes a host of curricular and co-curricular activities by its own and in collaboration with other institutions of higher learning.

The Department gives special attention to the academic and personal growth of the students through effective mentoring and tutorial system. The Department conducts a host of curricular, co-curricular and extra-curricular activities to keep the students abreast of the recent happenings in the field and also to make them aware of the career opportunities in the field. The Department maintains a healthy Student-Parent-Teacher ecosystem, with frequent meetings, feedbacks and other inputs for the betterment of the students.

The Department has modern facilities for teaching and learning. The Undergraduate and Postgraduate Laboratories have modern state-of-the-art facilities. All the classrooms of the Department are digitally enabled.

True its vision, the Department continuously strive for moulding the graduates and postgraduates of Physics to become scientifically oriented, intellectually accomplished, morally upright and socially committed youth who can play a constructive role in nation building.

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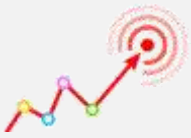
VISION, MISSION, CORE VALUES& OBJECTIVES OF THE DEPARTMENT

In tune with the vision, mission, core values and objective of the College, the Department functions with a set of principles and objectives, as stated below:

VISION: **To build an effective and efficient scenario for the conceptually rich youth to create and revolutionize towards the overall integrity and development of the Nation.**

MISSION:**To provide an effective environment to enhance the scientific temperament and leadership quality through Rationalism, Critical and Logical thinking in the students and thereby promoting them to be a socially committed, employable and responsible youth.**

CORE VALUES: **Innovation, Quality and Excellence, Integrity, Ethical Conscience, Fairness & Justice, Service Mindedness, Professionalism, Global Outlook, Honesty, Discipline & Accountability**.



OBJECTIVES:

(a) Emphasize the role of physics in life and other discipline (Chemistry, Mathematics and Biology)

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(b) Develop the ability of the students to conduct, observe, analyzes and report an experiment and to deal with physical models and formulas mathematically

(c) Improve the fundamental concepts and advanced techniques of Physics and scientific methodology

(d) Enhance intellectual, computational, experimental, communication and analytical skills of the students

(e) Provide the students with the currently modern techniques in Physics

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PROGRAMME REGULATION & CURRICULUM

The College, being affiliated to the University of Calicut, follows the curriculum prescribed by the University. However, for ensuring the specific outcomes, including the Programme Educational Objectives, Programme Specific Outcomes (PSOs), Course Outcomes (COs) and Module Outcomes (MOs), the Department, in consultations with invited subject experts, both from academia and industry has incorporated these outcomes. The Department also mapped the Module Outcome to Course Outcomes and the Course Outcomes. The Continuous Assessment activities specified in the curriculum are fine-tuned and implemented to tracks the achievement levels as per the different levels outcomes.

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File Ref.No.48685/GA - IV - J3/2019/Admn

UNIVERSITY OF CALICUT

Abstract

General and Academic - Faculty of Science - Modified Syllabus of BSc Physics Programme under CBCSS UG Regulations 2019 with effect from 2020 Admission onwards - Implemented- Orders Issued.

G & A - IV - J

U.O.No. 6321/2020/Admn Dated, Calicut University.P.O, 07.07.2020

Read:-1. U.O.No. 4368/2019/Admn dated 23.03.2019
2. U.O.No. 18084/2019/Admn Dated 28.12.2019
3. The item No.5 in the minutes of the meeting of the Board of Studies in Physics UG held on 05.03.2020
4. Remarks of the Dean,Faculty of Science dtd 08.06.2020
5. Order of the Vice Chancellor in the file even no. dtd 11.06.2020

ORDER

1. The Regulations for Choice Based Credit and Semester System for Under Graduate (UG) Curriculum-2019 (CBCSS UG Regulations 2019) for all UG Programmes under CBCSS-Regular and SDE/PrivateRegistration w.e.f. 2019 admission, has been implemented vide paper read first above and the same has been modified vide paper read second above.
2. The meeting of the Board of Studies in Physics (UG) held on 05/06/2020 has recommended the following modifications in the I and II semester of the Syllabus of B.Sc Physics Programme in tune with the new CBCSS UG - 2019 Regulations with effect from 2020 Admission, vide paper read third above.

    - Two units in semester I should be removed. The title of the course changed to Mechanics-I.
    - The syllabus of the unit, "Waves" in the syllabus of semester II is modified with another standard text book as book of study.The title of the course changed to Mechanics-II.

3. The Dean, Faculty of Science has approved the modified syllabus of BSc Physics programme in tune with the new CBCSS UG-2019 Regulations with effect from 2020 Admission onwards, vide paper read fourth above.
4. Considering the urgency of the matter, the Vice Chancellor has accorded sanction to implement the Scheme and Syllabus of B Sc Physics Programme in accordance with the new CBCSS UG Regulations 2019, in the University with effect from 2020 Admission onwards, subject to ratification by the Academic Council.
5. The Modified Scheme and Syllabus of B Sc Physics Programme in accordance with CBCSS UG Regulations 2019, is therefore implemented in the University with effect from 2020 Admission onwards.
6. Orders are issued accordingly. (Syllabus appended).

Arsad M

Assistant Registrar

To

The Principals of all Affiliated Colleges
Copy to: PS to VC/PA to PVC/ PA to Registrar/PA to CE/JCE I/JCE IV/DoA/EX and EG Sections/GA I F/CHMK Library/Information Centres/SF/DF/FC

Forwarded / By Order

Section Officer

DEGREE OF BACHELOR OF SCIENCE (B.Sc.)

IN

PHYSICS

(CHOICE BASED CREDIT AND SEMESTER SYSTEM FOR UNDERGRADUATE CURRICULUM)

UNIVERSITY OF CALICUT

THENHIPALAM, CALICUT UNIVERSITY P.O

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CURRICULUM FOR B.Sc. PHYSICS

UNDER THE FACULTY OF SCIENCE

BOARD OF STUDIES IN PHYSICS (UG)

THENHIPALAM, CALICUT UNIVERSITY P. O
KERALA, INDIA, 673 635.
[2019 ONWARDS]

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1. PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

After 4 to 5 years of graduation, the career and professional accomplishments attained by the PHYSICS Graduates would reflect that the prepared the graduates to deal with the real world, where they could apply and use the skills and knowledge they have learned to good use. Specifically, the graduate would be able to:

PEO1. COMPETENCY SKILLS: To develop strong student competencies and its applications in a technology –rich, interactive environment.

POE2. ADAPTABILITY TO THE CHANGING ENVIRONMENTS: Graduates will communicate effectively, recognize and incorporate societal needs and constraints in their professional endeavors, and practice their profession with high regard to legal and ethical responsibilities.

POE3: ENTHUSIASM IN RESEARCH: To develop strong student skills in research, and interpretation of complex information.

POE4: SUSTAINABLE EXCELLENCE AND GROWTH IN THE CAREER: Have sufficient breadth of understanding to enable continued professional development and lifelong learning throughout their career.

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2. PROGRAMME OUTCOME (POs)

On the successful completion of the B.Sc Physics Programme, the graduates will be able to:

PO 1. SCIENTIFIC TEMPER &KNOWLEDGE: Apply knowledge of physics and its branches to provide solutions to complex problems.

PO 2. PROBLEM SOLVING CAPABILITY: Identify, formulate, review research literature, and analyze complex real-life problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and computing.

PO 3. ANALYTIC SOLUTIONS: Design practical solutions for complex real-life problems through proper case analysis and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO 4. CRITICAL / LOGICAL THINKING: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO 5. ADAPTABILITY THROUGH TECHNOLOGY: Create, select, and apply appropriate techniques, resources, and modern computing and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO 6. THE RATIONALISM AND SOCIETY: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional practice.

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PO 7. ENVIRONMENT AND SUSTAINABILITY: Understand the impact of the professional computing solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO 8. ETHICS& HONESTY: Apply ethical principles and commit to professional ethics and responsibilities and norms of the computing practice.

PO 9. INDIVIDUAL AND LEADERSHIP QUALITY: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO 10. COMMUNICATION SKILLS: Communicate effectively on complex computing activities with the team members and with society at large, such as, being able to comprehend and demonstrate in simple manner, and give and receive clear instructions.

PO 11. PROJECT MANAGEMENT AND FINANCE: Demonstrate knowledge and understanding of the scientific and reasoning principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO 12. LIFE-LONG LEARNING: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

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3. PROGRAMME SPECIFIC OUTCOMES

On the successful completion of the B.Sc Physics Programme, the graduates will be able to:

PSO1: Understand the basic concepts of fundamentals of mechanics, properties of matter and electrodynamics

PSO2: Understand the theoretical basis of quantum mechanics, relativistic physics, nuclear physics, optics, spectroscopy, solid state physics, astrophysics, statistical physics, photonics and thermodynamics

PSO3: Understand and apply the concepts of electronics in the designing of different analog and digital circuits

PSO4: Understand the basics of computer programming and numerical analysis

PSO5: Apply and verify theoretical concepts through laboratory experiments

4. B.Sc. IN PHYSICS – PROGRAMME STRUCTURE

ABBREVIATIONS USED: **CL** – Cognitive level; **U** – understand; **Ap**– apply; **An**– analyze; **C** – create; **KC** – Knowledge category; **C** – conceptual; **F** – factual; **P** – procedural.

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DEPARTMENT OF PHYSICS

CURRICULUM FOR B.ScPHYSICS

SEMESTER - 1

Course Code	Course Title	Total hours	Hours/ Week	Credits
A 01	Common Course I – English	72	4	4
A 02	Common Course II – English	90	5	3
A 07	Common Course III – Language other than English	72	4	4
PHY1 B01	Core course I - Mechanics I	36	2	2
	Core Course V - Practical I	36	2	*
MTS1C01	1st Complementary Course I - Mathematics	72	4	3
CSC1C01	2nd Complementary Course I	36	2	2
	2nd Complementary Course Practical I	36	2	*
EO1	Environment Studies	-	-	4**
	Total	**450**	**25**	**18**

SEMESTER - 2

Course Code	Course Title	Total hours	Hours/ Week	Credits
A 03	Common Course IV – English	72	4	4
A 04	Common Course V – English	90	5	3
A 08	Common Course VI – Language other than English	72	4	4
PHY2 B02	Core Course II - Mechanics II	36	2	2
	Core Course V - Practical I	36	2	*
MTS2C02	1st Complementary Course II - Mathematics	72	4	3
CSC2C02	2nd Complementary Course II	36	2	2

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Course Code	Course Title	Total hours	Hours/ Week	Credits
	2nd Complementary Course Practical II	36	2	*
E02	Disaster Management			4**
	Total	**450**	**25**	**18**

SEMESTER - 3

Course Code	Course Title	Total hours	Hours/ Week	Credits
PHY3 B03	Core Course III – Electrodynamics-I	54	3	3
A 05	Common Course VI – English	90	5	4
A 09	Common Course VIII - Language other than English	90	5	4
	Core Course VI– Practical I	36	2	*
MTS3C03	1st Complementary Course III – Mathematics	90	5	3
CSC3C03	2nd Complementary Course III	54	3	2
	2nd Complementary Course Practical III	36	2	*
E03	Human Rights or Intellectual Property Rights or Consumer protection			4**
	Total	**450**	**25**	**16**

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SEMESTER - 4

Course Code	Course Title	Total hours	Hours/ Week	Credits
A 06	Common Course IX – English	90	5	4
A 10	Common Course X - Language other than English	90	5	4
PHY4 B04	Core Course IV - Electrodynamics II	54	3	3
PHY4 B05	Core Course Practical V – Practical I	36	2	5
MTS4C04	1st Complementary Course IV– Mathematics	90	5	3
CSC4C04	2nd Complementary Course IV	54	3	2
CSC4C05	2nd Complementary Course Practical IV	36	2	4
E04	Gender studies or Gerontology			4**
	Total	**450**	**25**	**25**

SEMESTER - 5

Course Code	Course Title	Total hours	Hours/ Week	Credits
PHY5 B06	Core Course VI - Computational Physics	54	3	3
PHY5 B07	Core Course VII - Quantum Mechanics	54	3	3
PHY5 B08	Core Course VIII - Optics	54	3	3
PHY5 B09	Core Course IX- Electronics (Analog and Digital)	54	3	3
	Open Course – (course from other streams)	54	3	3
	Core Course Practical XIV - Practical II	72	4	*

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Course Code	Course Title	Total hours	Hours/ Week	Credits
	Core Course Practical XV- Practical III	72	4	*
	Core Course XVII Project/Research methodology	36	2	*
	Total	**450**	**25**	**15**

SEMESTER - 6

Course Code	Course Title	Total hours	Hours/ Week	Credits
PHY6 B10	Core Course X - Thermodynamics	54	3	3
PHY6 B11	Core Course XI -Statistical Physics, Solid State Physics, Spectroscopy and Photonics	54	3	3
PHY6 B12	Core Course XII - Nuclear Physics and Particle Physics	54	3	3
PHY6 B13	Core Course XIII - Relativistic Mechanics and Astrophysics	54	3	3
PHY6 B14	Core Course XIV (Elective: EL1 / EL2 / EL3)	54	3	3
PHY6 B15	Core Course Practical XV – Practical II	72	4	5
PHY6 B16	Core Course Practical XVI – Practical III	72	4	5
PHY6 B17 (P/R)	Core Course XVII Project/Research methodology Tour report	36	2	2 1
	Total	**450**	**25**	**28**
			Total Credits	**120**

Tour report shall be evaluated with Practical III

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*Credit for practical / project to be awarded only at the end of Semester 4 and Semester 6.

**Mandatory audit courses for the program, but not counted for the calculation of SGPA or CGPA. Student can attain only pass (Grade P) for these courses.

5. CREDIT & MARK DISTRIBUTION IN EACH SEMESTER

Total Credits: 120; Total Marks: 3075

SEMESTER - 1

Course	Credit	Marks
Common course: English	4	100
Common course: English	3	75
Common course: Additional Language	4	100
Core Course I: Mechanics I	2	75
Complementary course: Mathematics	3	75
Complementary course: II	2	75
Total	**18**	**500**

SEMESTER - 2

Course	Credit	Marks
Common course: English	4	100
Common course: English	3	75
Common course: Additional Language	4	100
Core Course II: Mechanics II	2	75

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Course	Credit	Marks
Complementary course: Mathematics	3	75
Complementary course: II	2	75
Total	**18**	**500**

SEMESTER - 3

Course	Credit	Marks
Common course: English	4	100
Common course: Additional Language	4	100
Core Course III: Electrodynamics-I	3	75
Complementary course: Mathematics	3	75
Complementary course: II	2	75
Total	**16**	**425**

SEMESTER - 4

Course	Credit	Marks
Common course: English	4	100
Common course: Additional Language	4	100
Core Course IV: Electrodynamics-1I	3	75
Core Course V: Physics Practical 1	5	100
Complementary course: Mathematics	3	75
Complementary course: II	2	75
Complementary course: IIPractical	4	100
Total	**25**	**625**

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SEMESTER - 5

Course	Credit	Marks
Core Course VI: Computational Physics	3	75
Core Course VII :Quantum Mechanics	3	75
Core Course VIII:Optics	3	75
Core Course IX: Electronics (Analog and Digital)	3	75
Open course	3	75
Total	**15**	**375**

SEMESTER - 6

Course	Credit	Marks
Core Course X: Thermodynamics	3	75
Core Course XI: Statistical Physics, Solid State Physics, Spectroscopy and Photonics	3	75
Core Course XII: Nuclear Physics and Particle Physics	3	75
Core Course XIII: Relativistic mechanics and Astrophysics	3	75
Core Course XIV: Elective (EL1 / EL2 / EL3)	3	75
Core Course XV: Practical II	5	100
Core Course XVI: Practical III	5	100
Core Course XVII: Project/Research Methodology	2	60
Tour report	1	15
Total	**28**	**650**
Grand Total	**120**	**3075**

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6. CREDIT DISTRIBUTION

Semester	Common course		Core course	Complementary course		Open course	Total
	English	Additional Language		Mathematics	Comple. II		
1	4+3	4	2	3	2	-	18
2	4+3	4	2	3	2	-	18
3	4	4	3	3	2	-	16
4	4	4	3+5*	3	2+4*	-	25
5	-	-	3+3+3+3	-	-	3	15
6	-	-	3+3+3+3+3 +5*+5*+3**	-	-	-	28
Total	22	16	55	12	12	3	120

*Practical **Project

Tour Report to be evaluated with Practical Paper III

7. MARK DISTRIBUTION AND INDIRECT GRADING SYSTEM

Indirect grading system is to be followed for examinations of all courses. After external and internal evaluations marks are entered in the answer scripts. All other calculations, including grading willbedonebytheuniversityusingthesoftware.IndirectGradingSystemin8pointscale is followed. Each course is evaluated by assigning marks with a letter grade (O, A^+, A, B+, B, C, P or F to that course by the method of indirect grading.

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MARK DISTRIBUTION

Sl. No.	Course	Marks
1	English	550
2	Additional Language	400
3	Core course: Physics	1350
4	Complementary course I: Mathematics	300
5	Complementary course II: Computer Science	400
6	Open Course	75
	Total Marks	**3075**

EIGHT POINT INDIRECT GRADING SYSTEM

% of Marks	Grade	Interpretation	Grade Point Average	Range of Grade points	Class
95 and above	O	Outstanding	10	9.5 - 10	First Class with distinction
85 to below 95	A+	Excellent	9	8.5 – 9.49	
75 to below 85	A	Very good	8	7.5-8.49	
65 to below 75	B+	Good	7	6.5 –7.49	First Class
55 to below 65	B	Satisfactory	6	5.5 – 6.49	
45 to below 55	C	Average	5	4.5 – 5.49	Second Class
35 to below 45	P	Pass	4	3.5 – 4.49	Third class
Below 35	F	Fail	0	0 – 3.49	Fail

8. CORE COURSE STRUCTURE

Total Credits: 56 (Internal: 20%; External: 80%)

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DEPARTMENT OF PHYSICS

CURRICULUM FOR B.ScPHYSICS

SEMESTER - 1

Code No	Course Title	Hrs./ Week	Total Hrs.	Credit	Marks
PHY1B01	Core Course I: Mechanics I	2	36	2	**75**
-	Core Course V : Practical-I	2	36	-*	-

SEMESTER - 2

Code No	Course Title	Hrs./ Week	Total Hrs.	Credit	Marks
PHY2B02	Core Course II: Mechanics II	2	36	2	**75**
-	Core Course V : Practical-I	2	36	-*	-

SEMESTER - 3

Code No	Course Title	Hrs./ Week	Total Hrs.	Credit	Marks
PHY3B03	Core Course III: Electrodynamics-I	3	54	3	**75**
-	Core Course V : Practical-I	2	36	-*	-

SEMESTER - 4

Code No	Course Title	Hrs./ Week	Total Hrs.	Credit	Marks
PHY4B04	Core Course IV: Electrodynamics-II	3	54	3	**75**
PHY4B05	Core Course V : Practical-I	2	36	5	**100**

SEMESTER - 5

Code No	Course Title	Hrs./ Week	Total Hrs.	Credit	Marks
PHY5B06	Core Course VI: Computational	3	54	3	**75**

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DEPARTMENT OF PHYSICS
CURRICULUM FOR B.ScPHYSICS

Code No	Course Title	Hrs./ Week	Total Hrs.	Credit	Marks
	Physics				
PHY5B07	Core Course VII: Quantum Mechanics	3	54	3	**75**
PHY5B08	Core Course VIII: Optics	3	54	3	**75**
PHY5B09	Core Course IX: Electronics (Analog and Digital)	3	54	3	**75**
	Core Course XIV: Practical II	4	72	-**	-
	Core Course XV: Practical III	4	72	-**	-
	Core Course XVII: Project Work	2	36	-**	-

SEMESTER - 6

Code No	Course Title		Hrs./ Week	Total Hrs.	Credit	Marks
PHY6B10	Core Course X: Thermodynamics		3	54	3	**75**
PHY6B11	Core Course XI: Statistical Physics, Solid State Physics, Spectroscopy and Photonics		3	54	3	**75**
PHY6B12	Core Course XII: Nuclear Physics and Particle Physics		3	54	3	**75**
PHY6B13	Core Course XIII Relativistic mechanics and Astrophysics		3	54	3	**75**
PHY6B14 (EL1)	Core Course XIV: Elective***	1. Biomedical Physics	3	54	3	**75**
PHY6B14 (EL2)		2. Nanoscience and Technology				
PHY6B14		3. Materials Science				

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Code No	Course Title	Hrs./ Week	Total Hrs.	Credit	Marks
(EL3)					
PHY6B15	Core Course XV: Practical -II	4	72	5**	**100**
PHY6B16	Core Course XVI: Practical-III	4	72	5**	**100**
PHY6B17 (P/R)	Core Course XVII: Project Work /Research Methodology and Tour Report	2 1	36	3**	**60** **15**

* Exam will be held at the end of 4th semester
** Exam will be held at the end of 6th semester
***An institution can choose any one among the three courses.

9. CORE COURSE THEORY: EVALUATION SCHEME

The evaluation scheme for each course contains two parts: *viz.,* internal evaluation and external evaluation. Maximum marks from each unit are prescribed in the syllabus.

INTERNAL EVALUATION

20% of the total marks in each course are for internal evaluation. The colleges shall send only the marks obtained for internal examination to the university.

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Table: Components of Evaluation (Theory)

Sl. No.	Components	Marks for 4/5 credits papers	Marks for 2/3 credits papers
1	Class room participation based on attendance	4	3
2	Test paper: I	8	6
3	Assignment	4	3
4	Seminar/ Viva	4	3
Total Marks		**20**	**15**

Table: Pattern of Test Papers

Duration	Pattern	Total number of questions	Number of questions to be answered	Marks for each question	Marks
2 Hours	Short answer	12	10-12	2	20
	Paragraph/problem	7	6-7	5	30
	Essay	2	1	10	10
Total Marks*					**60**

*90% and above = 6, 80 to below 90% = 5.5, 70 to below 80% = 5, 60 to below 70% = 4.5, 50 to below 60% = 4, 40 to below 50%=3.5, 35 to below 40%=3, 25 to below 30%=2.5, 15 to below 20% =2, less than 15=0.

EXTERNAL EVALUATION

External evaluation carries 80% marks. University examinations will be conducted at the end of each semester.

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Table: Pattern of Question Paper

Duration	Pattern	Total number of questions	Number of questions to be answered	Marks for each question	Marks
2 Hours	Short answer	12	10-12	2	20
	Paragraph/problem	7	6-7	5	30
	Essay	2	1	10	10
Total Marks					**60**

9. CORE COURSE PROJECT: EVALUATION SCHEME

Project evaluation will be conducted at the end of sixth semester.

- Project work should be done as an extension of topics in the syllabus.
- Project can be experimental / theoretical or done in collaboration (association) with a recognized laboratory or organization.
- Project work may be done individually or as group of maximum of six students.
- Asupervisorhastoguideabatchofmaximum24students.Foranadditionalbatchanother supervisor has to be appointed. However the existing work load should be maintained.

GUIDELINES FOR DOING PROJECT

The project work provides the opportunity to study a topic in depth that has been chosen or which has been suggested by a staff member. The students' first

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carryout a literature survey which will provide the background information necessary for the investigations during the research phase of the project.

The various steps in project works are the following:-

a) Wide review of atopic.

b) Investigation on an area of Physics in systematic way using appropriate techniques.

c) Systematic recording of the work.

d) Reporting the results with interpretation in documented and oral forms.

USE OF LOG BOOK

- During the Project the students should make regular and detailed entries in to a personal laboratory log book through the period of investigation.
- The log book will be a record of progress on project and will be useful in writing the final report. It contains experimental conditions and results, ideas, mathematical expressions, rough work and calculation, computer file names etc. All entries should be dated.
- The studentsareexpectedtohaveregularmeetingwiththeirsupervisortodiscussprogress on the project and the supervisor should regularly write brief comments with dated signature.
- The log book and the written report must be submitted at the end of the project.

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INTERNAL EVALUATION

Sl. No	Criteria	Marks
1	Punctuality & Log book	2
2	Skill in doing project work/data	2
3	Scheme Organization of Project Report	3
4	Viva-Voce	5
Total Marks		**12**

EXTERNAL EVALUATION

Individual presentation is compulsory and individual Log book should be submitted

Sl. No	Criteria	Marks
1	Content and relevance of the project, Methodology, Reference, Bibliography	8
2	Project Presentation, Quality of analysis, statistical tools, findings, recommendations	10
3	Project Report (written copy) and Logbook	10
4	Viva-voce	20
Total Marks		48

10. STUDY TOUR

INTERNAL

Minimum two days visit to National research Institutes, Laboratories and places of scientific importance are mandatory. **Study tour report** has to be submitted with photos and analysis along with Practical Paper III for evaluation

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Distribution of marks EXTERNAL

No	Items	External (15)
1	Documented Report	8
2	Outcome/Analysis	4
3	Photos (five photos)	3
	TOTAL	15

11. CORE COURSE: PRACTICAL EVALUATION SCHEME

Internal		External		
Items	Marks	Items	Marks	Marks for Python Programming
Record	4	Record with 20 experiments Max.one mark for each experiment	10	10
Regularity in doing the experiment	4	Formulae, Theory, Principle/ Programme	22	15
Attendance	4	Adjustments& setting /Algorithm	14	15
Test 1	4	Tabulation, Observation and performance/Execution	20	24
Test 2	4	Calculation, result, graph, unit/Result	10	12
		Viva	4	4
Total	20	Total	80	80

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12. PROGRAMME STRUCTURE/SCHEME

The semester-wise scheme of BSc Physics programme is presented here under.

SEMESTER I

Course	Code	Course	Hours	Credit	IE	EE	Total
Common I	ENG1A01	Essential English Language Skills	4	3	15	60	75
Common II	ENG1A02	Ways with Words: Literatures in English	5	3	15	60	100
Common III	ARB1A07	Language Skills in Arabic	4	4	20	80	100
	HIN1A07 (1)	Prose and Drama					
	MAL1A07 (1)	Malayala Sahithyam - 1					
Core 1	PHY1B01	Mechanics I	2	2	15	60	75
Complementary	MTS1C01	Mathematics -1	4	3	15	60	75
Complementary	CSC1C01	Computer Science	2	2	15	60	75
Ability Enhancement/ Audit I	AUD1E01	Environment Studies	--	4	--	100	100

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ENG1A01: TRANSACTIONS: ESSENTIAL ENGLISH LANGUAGE SKILLS

COURSE DETAILS

Course Code	ENG1A01
Title of the course	Transactions: Essential English Language Skills
Semester in which the Course to be Taught	1
Number of Credits	3
Number of Contact Hours	72 (4Hrs. /Wk.)

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	To impart the necessary macro and micro English language skills to the learners to enable them to express their feelings, opinions, ideas and thoughts fluently and accurately in a variety of personal and professional contexts.	Understand
CO2	To create in learners a definitive sense of the stylistic variations of English and how they are used in real life situations.	Apply
CO3	To inculcate in learners a taste for deeper pursuit and acquisition of advanced level of skills in English.	Understand

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CO4	To guide them on how to participate in discussions and make seminar presentations with special focus on specific vocabularies and styles of usage in such contexts.	Analyse

MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	0	0	0	2	2	2	2	3	3	2	2	2	0	0	0	0	0
CO2	0	0	0	2	2	2	2	3	3	2	2	2	0	0	0	0	0
CO3	0	0	0	2	2	2	2	3	3	2	2	2	0	0	0	0	0
CO4	0	2	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0
AVG	0	0.66	0.33	2	2	2	2	3	3	2	2	2	0	0	0	0	0

OBJECTIVES OF THE COURSE

a. To impart the necessary macro and micro English language skills to learners to enable them to express their feelings, opinions, ideas and thoughts fluently and accurately in a variety of personal and professional contexts.

b. To create in learners a definitive sense of the stylistic variations of English and how they are used in real life situations.

c. To inculcate in learners a taste for deeper pursuit and acquisition of advanced level of skills in English.

d. To guide them on how to participate in discussions and make seminar presentations with special focus on specific vocabularies and styles of usage in such contexts.

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COURSE SUMMARY

MODULE	Hrs.
Module 1: Pronunciation	10
Module 2: Vocabulary	10
Module 3: Grammar	14
Module 4: Speaking Skills	12
Module 5: Reading Skills	14
Evaluation	12
Total	**72 Hrs.**

COURSE DETAILS

MODULE 1: PRONUNCIATION

Introduction-speech sounds-vowels-consonants-basics of word/sentence stress-resolving issues of ALL interference-e/m-learning corners.

MODULE 2: VOCABULARY

Introduction- synonyms-collocations-phrasal verbs-idiomatic expressions-vocabulary in everyday social contexts- e/m-learning corner.

MODULE 3: GRAMMAR

Introduction- major tenses-present-past-future-questions and negatives- modals-conditionals-e/m-learning corner.

MODULE 4: SPEAKING SKILLS

Social Communication: Introduction - sounding very polite- making a point/persuading- giving opinions/preferences-encouraging/comforting- making suggestions/regrets.-complimenting-guessing- telephoning in English.

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Academic Communication: discussion skills - presentation skills-debating skills- e/m-learning corner.

MODULE 5: READING SKILLS

Introduction-effective reading comprehension: skills-understanding generic/specific ideas /factual information-vocabulary in context-implications/tone/attitude/ viewpoint.

CORE TEXT:

K. K. Kunhammad & V. A. Latheef (2019). *Transactions: Essential English Language Skills*, University of Calicut.

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ENG1A02: WAYS WITH WORDS: LITERATURES IN ENGLISH

COURSE DETAILS

Course Code	ENGA02
Title of the course	Ways with Words: Literatures in English
Semester in which the Course to be Taught	1
Number of Credits	3
Number of Contact Hours	90(5 Hours / Week)

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	To help students develop the acumen to read, appreciate and discuss literature.	Understand
CO2	To introduce students to the linguistic qualities of a literary text and to unravel the many meanings Of the text	Understand
CO3	To acquaint the students with different genres of literature and to analyse them.	Apply

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MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	0	0	0	2	2	2	2	3	3	2	2	2	0	0	0	0	0
CO2	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0
CO3	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0
AVG	0	0	0.66	2	2	2	2	3	3	2	2	2	0	0	0	0	0

OBJECTIVES OF THE COURSE

a. To help students develop the acumen to read, appreciate and discuss literature.

b. To introduce students to the linguistic qualities of a literary text and to unravel the many meanings of the text

c. To acquaint the students with different genres of literature and to analyze them.

COURSE SUMMARY

MODULE	Hrs.
Module 1: Poetry	23
Module 2: Short Story	25
Module 3: Essay	20
Module 4: One Act Play	10
Evaluation	12
Total	**90 Hrs.**

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COURSE DETAILS

MODULE 1: POETRY

1. Sonnet 29: Shakespeare
2. Ode to autumn: John Keats
3. A Roadside Stand: Robert Frost
4. The House of My Childhood: Dilip Chitre
5. Old Folks Laugh: Maya Angelou
6. Once Upon A Time: Gabriel Okara
7. The Times They Are A-Changing: Bob Dylan

MODULE 2: SHORT STORY

1. Appointment in Samarra: W. Somerset Maugham
2. A Shocking Accident: Graham Greene
3. Lamb to the Slaughter: Roald Dahl
4. It Used to Be Green Once: Patricia Grace

MODULE 3: ESSAY

1. Bores: E. V Lucas
2. Night Walkers and Mystery Mongers: Sense and Nonsense at the Edge of Science: Carl Sagan

MODULE 4: ONE ACT PLAY

Something Unspoken: Tennesee Williams

CORE TEXT:

BoS, University of Calicut (2019). *Ways with Words Literatures in English*, University of Calicut.

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ARB1A07: LANGUAGE SKILLS IN ARABIC

COURSE DETAILS

Course Code	ARB1A07
Title of the course	Language Skills in Arabic
Semester in which the Course to be Taught	1
Number of Credits	4
Number of Contact Hours	72 (4Hrs. /Wk.)

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	To teach the students the basics of interpersonal interaction in Arabic	Understand
CO2	To train the students to communicate in Arabic in selected situations	Apply
CO3	Enhancement of communication skills in Arabic	Understand
CO4	Enhancement of translation skills from Arabic to English and vice versa	Understand
CO5	Demonstrate basic knowledge about environment and acquire skills to help individuals in identifying and solving problem	Analyse

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MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0
CO2	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0
CO3	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0
CO4	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0
CO5	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0
AVG	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0

AIM OF THE COURSE

The aim of the course is enable the students, who take Arabic language as common course to use Arabic language in daily life especially in communication.

OBJECTIVES OF THE COURSE

(a) To enjoy Arabic language through stories, Drama and poems.
(b) To acquire the vocabularies of Arabic language.
(c) To practice the use of Arabic language in various situations and occasions.

COURSE DETAILS

MODULE I

1. *Thahiyyathun Vathaarufun*
2. *La Thanthaqid (Dr. Muhammed Bin Abdurrahman Al areefi)*
3. *Inda Thabeeb – Al Hivar*
4. *Al Nasru Val Qubarathu (Jibran Khaleel Jibran)*

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MODULE II

5. *Uhibbuka Aksaru* (Mahmood DArvesh)
6. *Hal Yua'jibuka Hazal Qamees* – Al Hivar
7. *Tharaefun Arabiyya* (Muhammed Al Javeesh)
8. *Aina Qaimathu Tha'aam* – Al Hivar

MODULE III

9. *Min Youmiyyathi Valeed*
10. *Nazhabu Ila Cinema – AL Hivar*
11. *Salathun Ila Youmin Jadeed*
12. *Muqabalathun Lilvaleef – Al HivarHivarun Baina Thalibi va Usthadihi, Hivarun Baina Thajiri va Zaboonihi*

PRESCRIBED TEXT BOOK

Dr. Muhammed Haneefa (2019). *Ma Ajmalullugha*.

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HIN1A07(1): PROSE & DRAMA

COURSE DETAILS

Course Code	HIN1A07(1)
Title of the course	Prose & Drama
Semester in which the Course to be Taught	1
Number of Credits	4
Number of Contact Hours	72 (4Hrs. /Wk.)

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	Approach literary texts in terms of genre, gender and the canon	Understand
CO2	Understand and use academic conventions: referencing and bibliography.	Understand
CO3	Exposed to the origin and development of Hindi drama and its various themes and forms of different ages and stages	Apply
CO4	Helps students explore how writers use the resources language as a creativity to explore the entire range of human experience through dramas as a literary form.	Analyse

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MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0
CO2	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0
CO3	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0
CO4	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0
AVG	**0**	**1**	**1**	**2**	**2**	**2**	**2**	**3**	**3**	**2**	**2**	**2**	**0**	**0**	**0**	**0**	**0**

AIM OF COURSE

To sensitize the students about the aesthetic, cultural and social aspects of literary appreciation and analysis.

OBJECTIVE OF THE COURSE

(1) To acquaint the students with different forms of thoughts and styles used in Hindi Prose writing. To enable them to express their thoughts in these different forms.

(2) To introduce Hindi Drama to the students for appreciation and critical analysis.

(3) To help them develop their creative thinking and writing.

COURSE DETAILS

MODULE 1: Short stories and Essays

MODULE 2: Other forms of prose

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MODULE 3: Drama for detailed study and evaluation.

PRESCRIBED TEXT BOOKS:

1. Aman Prakashan (2019). *Gadyatara*, Ed. UG Hindi Board of Studies, Calicut University, Rambag, Kanpur.
2. Nadira Zahir Babbaar (2019). *Sakkubai*. Vani Prakashan , New Delhi.

READING LIST:

1. Mridula Garg, *Hari Bindi*.
2. Omprakash Vatmiki. *Shavyatra*.
3. Hazari Prasad Dwivedi. *Nakhun Kyon Badhte Hai*.
4. Mahadevi Varma. *Sona*.
5. Harishankar Parsai. *Sadachar Kaa Taaweez*.
6. Drama: *Sakkubai*

Notes on Course Work: Unit tests are to be conducted bimonthly twice in the semester. A model test is to be conducted on completion of the portion related to the semester. These test results should be considered while awarding grade for internal assessment. All the activities regarding test papers, assignments, seminars and group discussion should be documented.

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MAL1A07(1): *MALAYALA SAHITHYAM* 1

COURSE DETAILS

Course Code	MAL1A07(1)
Title of the course	*Malayala Sahithyam* 1
Semester in which the Course to be Taught	1
Number of Credits	4
Number of Contact Hours	64 (4Hrs. /Wk.)

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	To gain an understanding of the relations between culture, history and texts. They learn to use texts as a gateway to various cultural traditions and interpret them in their historical contexts.	Understand
CO2	To create in learners a definitive sense of the stylistic variations of Malayalam and how they are used in real life situations.	Understand
CO3	To inculcate in learners a taste for deeper pursuit and acquisition of advanced level of skills in Malayalam.	Analyse
CO4	To guide them on how to participate in discussions and make seminar presentations with special focus on specific vocabularies and styles of usage in such contexts.	Apply

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MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0
CO2	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0
CO3	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0
CO4	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0
AVG	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0

AIM OF COURSE

മലയാള സാഹിത്യ വളർച്ചയുടെ വിവിധ കാലഘട്ടങ്ങളിലെ പരിചയപ്പെടുത്തുക. എഴുത്തുകാരുടെ രചനാസവിശേഷതകൾ പൊതുവായി മനസ്സിലാക്കുക.

COURSE DETAILS

MODULE 1

മലയാള കവിത സാഹിത്യത്തിലെ ആദ്യകാല കൃതികൾ. കവിതകളുടെ പൊതുസ്വഭാവങ്ങൾ. കവിതകളെ പറ്റി ഉള്ള സാമാന്യ വിവരങ്ങൾ എന്നിവ. ഒരു കാവ്യ ഭാഗം മാത്രമേ പാഠ്യവിഷയമാകുന്നുള്ളൂ എങ്കിലും സാമാന്യധാരണ വിദ്യാർഥികൾക്ക് ലഭിച്ചിരിക്കണം

1. ചെറുശ്ശേരി കാളിയമർദ്ദനം (കൃഷ്ണഗാഥ)

ബാലകന്മാരുമായി .....

... മസ്തകം കൊണ്ടങ്ങടിച്ചു ചെമ്മേ (80 വരികൾ)

2. എഴുത്തച്ഛൻ: ലക്ഷ്മണസാന്ത്വനം (അദ്ധ്യാത്മരാമായണം)

ലക്ഷ്മണവീരൻ സുമിത്രയാമമ്മയെ ...

... രാഘവൻ തന്നെ പിരിഞ്ഞാൽ പൊറുക്കുമോ? (54 വരികൾ)

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3. പൂന്താനം: ജ്ഞാനപ്പാന

സ്ഥാനമാനങ്ങൾ ചൊല്ലിക്കലഹിച്ചു ...

... നാം വൃഥാ.

4.കുഞ്ചൻനമ്പ്യാർ:രുക്മിണി സ്വയംവരം (ഓട്ടൻതുള്ളൽ)

കുണ്ഡിനവാസികൾ ബോധിക്കേണം ...

MODULE 2

നാടൻ പാട്ട്, വടക്കൻ പാട്ട്, മാപ്പിളപ്പാട്ട്, എന്നിങ്ങനെ വ്യത്യസ്തമാർന്നതും യുള്ളതുമായ സാഹിത്യശാഖയിലേക്കുള്ള പ്രവേശനം.

1. നാടൻപാട്ട് എന്നതന്റെ തീണ്ടലാണ് ...

2. വടക്കൻപാട്ട്

ആറ്റുമ്മണമ്മേൽ ഉണ്ണിയാർച്ച കുത്തു കാണാൻ പോയ കഥ

ആറ്റുമ്മണമ്മേലെ ...

ആ നാടും വീടും കടന്നുപോയി.

3.മാപ്പിളപ്പാട്ട്:

മറിയക്കുട്ടിയുടെ കത്ത്: പുലിക്കോട്ടിൽ ഹൈദർ (കുത്തു പാട്ടിൻറെ ആദ്യഭാഗം മാത്രം)

MODULE 3: കഥകൾ

മലയാള ചെറുകഥാസാഹിത്യത്തിന്റെ വളർച്ചയുടെ വിവിധ ഘട്ടങ്ങൾ പ്രതിനിധാനം ചെയ്യുന്ന കഥകളാണ് മൂന്ന് നാല് മൊഡ്യൂളുകളിൽ ഉൾപ്പെടുത്തിയിരിക്കുന്നത്. ഓരോ കഥാകൃത്തിന്റെയും ഓരോ രചനകൾ മാത്രമേ ഉൾപ്പെടുത്തിയിട്ടുള്ളൂ. എങ്കിലും മുഴുവൻ രചനകളെക്കുറിച്ചും സാമാന്യമായ ധാരണ വിദ്യാർഥികൾക്ക് ലഭിച്ചിരിക്കണം.

1.കാരൂർ: മോതിരം

2.കെ സരസ്വതിയമ്മ: ഡബിൾആക്ട്

3.ഉറൂബ്: രാച്ചിയമ്മ

MODULE 4: കഥകൾ

1.എം പി മുഹമ്മദ്: ഉള്ളുരുക്കം

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2.സി. വി. ശ്രീരാമൻ: ഒട്ടുചെടി

3.ഗീതാഹിരണ്യൻ ഘരെ ബായിയെ

4.പ്രമോദ് രാമൻ: തന്തത്താഴ്

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PHY1B01: MECHANICS – I

COURSE DETAILS

Course Code	PHY1 B01
Title of the course	MECHANICS – I
Semester in which the Course to be Taught	1
Number of Credits	2
Number of Contact Hours	36 (2Hrs. /Wk.)

COURSE OUTCOME (COs)

	Course Outcome	PSO	CL	KC	Class Sessions Allotted
CO1	Understand and apply the basic concepts of Newtonian Mechanics to Physical Systems	PSO1	Ap	C,P	16
CO2	Understand and apply the basic idea of work-energy theorem to physical systems	PSO1	Ap	C,P	8
CO3	Understand and apply the rotational dynamics of rigid bodies	PSO1	Ap	C,P	12

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MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	2	2	1	2	1	1	0	0	1	1	3	0	0	0	0
CO2	2	3	2	2	1	2	1	1	0	0	1	1	3	0	0	0	0
CO3	2	3	2	2	1	2	1	1	0	0	1	1	3	0	0	0	0
AVG	2	3	2	2	1	2	1	1	0	0	1	1	3	0	0	0	0

COURSE CONTENT

UNIT I–NEWTON'S LAWS [16 HRS]

Newton's First Law, Second Law and Third Law – Astronauts in space : Inertial systems and fictitious forces–Standards and units–Some applications of Newton's laws–The astronauts' tug of war, Freight train, Constraints, Block on string, The whirling block, The conical pendulum – The everyday forces of physics–Gravity and Weight; Gravitational force of a sphere; Turtleinan elevator; Gravitational field – Electrostatic force – Contact forces; Block and string; Dangling rope; Whirling rope; Pulleys; Tension and Atomic forces; Normal force; Friction; Block and wedgewithfriction;Viscosity–Linearrestoringforce;Springandblock:Theequationforsimple harmonic motion; Spring and gun : Illustration of initial conditions – Dynamics of a system of particles – The Bola – Centre of mass – Drum major's baton – Centre of mass motion–Conservation of momentum – Spring Gun recoil

[Sections 2.1 to 2.5, 3.1 to 3.3 of *An Introduction to Mechanics* (1st Edn.) by Daniel Kleppner and Robert J. Kolenkow

UNIT II – WORK AND ENERGY [8 HRS]

Integrating the equation of motion in one dimension – Mass thrown upward in a uniform gravitational field; Solving the equation of simple harmonic motion –

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Work-energy theorem in one dimension–Verticalmotioninaninversesquarefiled–Integratingtheequationofmotionin several dimensions – Work-energy theorem – Conical pendulum; Escape velocity – Applying the work-energy theorem – Work done by a uniform force; Work done by a central force; Potential energy – Potential energy of a uniform force field; Potential energy of an inverse square force – What potential energy tells us about force – Stability – Energy diagrams – Small oscillations in a bound system – Molecular vibrations – Non-conservative forces – General law of conservation of energy –Power

[Sections 4.1 to 4.13 of *An Introduction to Mechanics* (1st Edn.) by Daniel Kleppner and Robert J. Kolenkow. The problems in chapter 5 should be discussed with this.

UNIT III –ANGULAR MOMENTUM [12 HRS]

Angular momentum of a particle – Angular momentum of a sliding block; Angular momentum of the conical pendulum – Torque – Central force motion and the law of equal areas – Torque on a sliding block; Torque on the conical pendulum; Torque due to gravity – Angular momentum and fixed axis rotation – Moments of inertia of some simple objects – The parallel axis theorem – Dynamics of pure rotation about an axis – Atwood's machine with a massive pulley – The simple pendulum – The physical pendulum – Motion involving both translation and rotation – Angular momentum of a rolling wheel – Drum rolling down a plane – Work-energy theorem for a rigid body – Drum rolling down a plane : energy method – The vector nature of angular velocity and angular momentum – Rotation through finite angles – Rotation in the -plane – Vector nature of angular velocity – Conservation of angular momentum

[Sections6.1to6.7, 7.1,7.2and 7.5 of *An Introduction to Mechanics*(1st Edn.) by Daniel Kleppner and Robert J.Kolenkow]

BOOK OF STUDY

1. Daniel Kleppner and Robert J. Kolenkow,*An Introduction to Mechanics*, 1st Edn., McGraw-Hill

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REFERENCE BOOK

2. Kittel*et al., Berkeley Physics Course*: *Vol.1: Mechanics*, 2nd Edn. McGraw-Hill

Mark Distribution for Setting Question Paper

Unit/ Chapter	Title	Marks
1	Newton's laws	36
2	Work and Energy	18
3	Angular Momentum	25
Total Marks*		**79**

*Total marks include that for choice of questions in sections A, B and C in the question paper.

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MTS1C01: MATHEMATICS - 1

COURSE DETAILS

Course Code	MTS1C01
Title of the course	Mathematics - 1
Semester in which the Course to be Taught	1
Number of Credits	3
Number of Contact Hours	4 Hrs./Wk.

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	Understand differentiation and limits	Understand
CO2	Understand Second derivative and Antiderivative	Understand
CO3	UnderstandContinuity theorem and drawing of graph	Apply
CO4	Understand fundamental theorem of calculus and integration	Understand

MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	3	2	2	1	2	1	1	2	2	2	0	0	0	2	0
CO2	2	2	3	2	2	1	2	1	1	2	2	2	0	0	0	2	0
CO3	2	2	3	2	2	1	2	1	1	2	2	2	0	0	0	2	0

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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO4	2	2	3	2	2	1	2	1	1	2	2	2	0	0	0	2	0
AVG	2	2	3	2	2	1	2	1	1	2	2	2	0	0	0	2	0

COURSE CONTENT

MODULE I

Introduction to the derivative-instantaneous velocity, slope of tangent line, differentiating simplest functions

Limits- Notion of limit, basic properties, derived properties, continuity, continuity of rational functions, one sided limit, limit involving $\pm\infty$

The derivative as Limit- formal definition, examples, differentiability and continuity, Leibnitz notation,

Differentiating Polynomials-power rule, sum rule etc.

Product and quotients- product, quotient, reciprocal & integral power rule

Linear Approximation and Tangent Lines- equation of tangent line and linear approximation, illustrations

MODULE II

Rate of change and Second derivative- linear or proportional change, rates of change, second derivative,

The Chain Rule- power of a function rule, chain rule,

Fractional Power & Implicit Differentiation-rational power of a function rule, implicit differentiation

Related rates and parametric curves- Related rates, parametric curves, word problems involving related rates

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Anti derivatives- anti differentiation and indefinite integrals, anti differentiation rules

MODULE III

Continuity and Intermediate value theorem-IVT: first and second version

Increasing and decreasing function- Increasing and decreasing test, critical point test, first derivative test

Second derivative and concavity- second derivative test for local maxima, minima and concavity, inflection points

Drawing of Graphs- graphing procedure, asymptotic behaviour

Maximum- Minimum Problems- maximum and minimum values on intervals, extreme value theorem, closed interval test, word problems

The Mean Value Theorem - The MVT, consequences of MVT-Rolles Theorem, horserace theorem

L'Hospital rule - Preliminary version, strengthened version

MODULE IV

Summation- summation, distance and velocity, properties of summation, telescoping sum (quick introduction- relevant ideas only)

Sums and Areas-step functions, area under graph and its counterpart in distance-velocity problem

The definition of Integral- signed area (The counterpart of signed area for our distance-velocity problem), the integral, Riemann sums

The Fundamental Theorem of Calculus -Arriving at FTC intuitively using distance velocity problem, Fundamental integration Method, proof of FTC, Area under graph, displacements and velocity

Definite and Indefinite integral-indefinite integral test, properties of definite integral, fundamental theorem of calculus: alternative version (interpretation and explanation in terms of areas)

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Applications of the Integral- Area between graphs, area between intersecting graphs, total changes from rates of change,

Volume by slice method- the slice method, volume of solid of revolution by Disk method

Average Values and the Mean Value Theorem for Integrals- motivation and definition of average value, illustration, geometric and physical interpretation, the Mean Value Theorem for Integrals

TEXTBOOKS

1. Jerrold Marsden & Alan Weinstein, *Calculus I* (2/e), Springer-Verlag New York Inc(1985), ISBN 0-387-90974-5
2. Jerrold Marsden & Alan Weinstein, *Calculus II* (2/e), Springer-Verlag New York Inc(1985) ISBN 0-387-90975-3

REFERENCES

3. Soo T Tan, *Calculus*, Brooks/Cole, Cengage Learning (2010) ISBN 0-534-46579-X
4. Gilbert Strang, *Calculus*, Wellesley Cambridge Press (1991) ISBN:0-9614088- 2-0
5. Ron Larson, Bruce Edwards, *Calculus* (11/e) Cengage Learning (2018) ISBN: 9 78-1 -337-27534-7
6. Robert A Adams & Christopher Essex : *CalculusSingle Variable* (8/e) Pearson Education Canada (2013) ISBN: 0321877403
7. Joel Hass, Christopher Heil & Maurice D. Weir : *Thomas'Calculus* (14/e) Pearson (2018) ISBN 0134438981
8. Jon Rogawski & Colin Adams :*Calculus Early Transcendentals* (3/e) W. H. Freeman and Company (2015) ISBN: 1319116450.

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CSC1C01 – COMPUTER FUNDAMENTALS

COURSE DETAILS

Course Code	CSC1C01
Title of the course	Computer Fundamentals
Semester in which the Course to be Taught	1
Number of Credits	2
Number of Contact Hours	2 T Hrs./Wk. + 2 L Hrs./Wk.

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	Conversion between various number system	Apply
CO2	Apply Boolean algebra to real-left problems	Apply
CO3	Understand basics of Computers	Understand
CO4	Apply problem solving technique to real-life problems	Apply

MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	3	3	2	1	2	1	1	2	2	2	0	0	0	2	0
CO2	2	2	3	3	2	1	2	1	1	2	2	2	0	0	0	2	0
CO3	2	2	3	3	2	1	2	1	1	2	2	2	0	0	0	2	0

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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO4	2	2	3	3	2	1	2	1	1	2	2	2	0	0	0	2	0
AVG	2	2	3	3	2	1	2	1	1	2	2	2	0	0	0	2	0

COURSE CONTENT

UNIT I [7T+6L]

Number systems- Non-positional numbering systems - positional number systems (Binary, Octal and Hexadecimal), Converting from one number system to another-decimal to a new base, converting to decimal from another bases, converting from base other than ten to base other than ten, short cut method for converting from binary to octal, octal to binary, binary to hexadecimal and hexadecimal to binary, Computer Codes (BCD, EBCDIC, ASCII) error detecting and correcting codes, parity bit, Hamming Code, computer arithmetic, importance of binary, binary addition and subtraction.

UNIT II [6T+7L]

Boolean Algebra and Logic circuits- fundamental concepts of Boolean Algebra, postulates, Principle of duality, theorems of Boolean Algebra, Boolean functions, minimization, complement, canonicals forms, conversion between canonical forms. Logic Gates- AND, OR, NOT, NAND, NOR, XOR and XNOR, logic circuits, converting expression to logic circuit, universal NAND and NOR gates, Exclusive OR and equivalence functions, Design of Combinational circuits (Half Adder, Subtract or and Full Adder)

UNIT III [6T+7L]

Basic Computer Organization-Input Unit, Output Unit, Storage Unit (Direct, Sequential and Random Access), CPU organization, Control Unit (micro

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programmed and hardwired control), primary storage, memory hierarchy, storage locations and addresses, storage capacity, bit, byte, nibble, RAM, ROM, PROM and EPROM, cache memory, registers. Secondary storage devices (Magnetic tape, Hard disk and CD drive)

UNIT IV [7T+6L]

I/O Devices - Input Devices-identification and its use, keyboard, pointing devices (mouse, touch pad and track ball), Video digitizer, remote control, joystick, magnetic stripes, scanner, digital camera, microphone, sensor, and MIDI instruments, Output Devices identification and its use, monitor, printer (laser, inkjet, dot-matrix), plotter, speaker, control devices (lights, buzzers, robotic arms, and motors)

UNIT V [6T+6L]

Planning a Computer program, purpose of program planning, algorithm, flowchart - symbols, sample flowcharts, advantages and limitations.

TEXTBOOK

1. Pradeep K. Sinha and Priti Sinha, *Computer Fundamentals*, BPB

REFERENCES

2. Peter Nortorn, *Introduction to Computer*, TMH
3. Rajaraman, V, *Fundamental of Computers*, Prentice Hall India
4. B. Ram, *Computer Fundamentals*

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AUD1E01: ENVIRONMENTAL STUDIES

COURSE DETAILS

Course Code	AUD1E01
Title of the course	Environmental Studies
Semester in which the Course to be Taught	1
Number of Credits	4
Number of Contact Hours	0 Hrs./Wk.

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	To learn the environment in the Indian context	Understand
CO2	Understand renewable and non-renewable resources	Understand
CO3	To learn structure and function of an ecosystem	Understand
CO4	To learn about biodiversity and its consequences	Understand
CO5	To learn about environmental pollution	Understand

MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0

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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO2	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0
CO3	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0
CO4	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0
CO5	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0
AVG	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0

COURSE CONTENT

MODULE I: INTRODUCTION

Environment in the Indian context: Concept of an ecosystem, Multidisciplinary nature of environmental studies. Components of environment- Atmosphere, hydrosphere, lithosphere and biosphere. Definition, scope and importance. Concept of sustainability and sustainable development.

MODULE 2: NATURAL RESOURCES

Renewable and non-renewable resources: Natural resources and associated problems.

a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people.

b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.

c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.

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d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.

e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. Case studies.

f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification, Role of an individual in conservation of natural resources, Carbon footprint Water conservation, rain water harvesting, watershed management

MODULE 3: ECOSYSTEM

Structure and function of an ecosystem, Producers, consumers and decomposers, Energy flow in the ecosystem, Ecological succession, Food chains, food webs and ecological pyramids, Introduction, types, characteristic features, structure and function of the following ecosystem :- a. Forest ecosystem b. Grassland ecosystem c. Desert ecosystem d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

MODULE 4: BIODIVERSITY AND ITS CONSERVATION

Introduction - Definition : genetic, species and ecosystem diversity, Bio geographical classification of India , Value of biodiversity : consumptive use, productive use, social, ethical, aesthetic and option values , Biodiversity at global, National and local levels, Hot-spots of biodiversity, Threats to biodiversity : habitat loss, poaching of wildlife, man-wildlife conflicts, Endangered and endemic species of India , Conservation of biodiversity :

MODULE 5: ENVIRONMENTAL POLLUTION

Definition , Cause, effects and control measures of :- a. Air pollution b. Water pollution c. Soil pollution d. Marine pollution e. Noise pollution f. Thermal pollution g. Nuclear hazards , Solid waste Management : Causes, effects and

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control measures of urban and industrial wastes, Role of an individual in prevention of pollution.

MODULE 6: ENVIRONMENTAL POLICIES AND PRACTICES

Climate change, Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents.

ESSENTIAL READING

1. Bharucha Erach, *The Biodiversity of India*, Mapin Publishing Pvt. Ltd., Ahmedabad - 380 013, India, Email:mapin@icenet.net (R) c)
2. Brunner R.C., 1989, *Hazardous Waste Incineration*, McGraw Hill Inc. 480p
3. Carson, R. 2002. *Silent Spring*. Houghton Mifflin Harcourt.
4. Gadgil, M., & Guha, R.1993. *This Fissured Land: An Ecological History of India*. Univ. of California Press.
5. Gleeson, B. and Low, N. (eds.) 1999. *Global Ethics and Environment*, London, Routledge.
6. McNeill, John R. 2000. Something New Under the Sun: An Environmental History of the Twentieth Century.
7. Singh, J. S., Singh, S. P. and Gupta, S. R. 2014. *Ecology, Environmental Science and Conservation*. S. Chand Publishing, New Delhi.
8. Sodhi, N. S., Gibson, L. & Raven, P. H. (eds). 2013. *Conservation Biology: Voices from the Tropics*. John Wiley & Sons.
9. Warren, C. E. 1971. Biology and Water Pollution Control. WB Saunders.

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DEPARTMENT OF PHYSICS

CURRICULUM FOR B.ScPHYSICS

SEMESTER II

Course	Code	Course	Hours	Credit	IE	EE	Total
Common IV	ENG2A03	Writing for Academic And Professional	4	4	20	80	100
Common V	ENG2A04	Zeitgeist - Readings on Contemporary Culture	5	4	20	80	100
Common VI	ARB2A08	Appreciating Arabic Literature	4	4	20	80	100
	HIN2A08 (1)	Grammar and Translation					
	MAL2A08 (1)	Malayala Sahithyam - 1					
Core 1	PHY2B02	Mechanics II	2	2	15	60	75
Complementary	MTS2C02	Mathematics	4	3	15	60	75
Complementary	CSC2C02	Computer Science	2	2	15	60	75
Ability Enhancement/ Audit 2	AUD2E02	Disaster Management Studies	--	4		100	100
Total			**25**	**23**			

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ENG2A03: WRITING FOR ACADEMIC AND PROFESSIONAL

COURSE DETAILS

Course Code	ENG2A03
Title of the course	Writing for Academic and Professional
Semester in which the Course to be Taught	2
Number of Credits	4
Number of Contact Hours	72 (4Hrs. /Wk.)

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	To develop writing skills, to learn to integrate writing and thought and to apply the conventions of academic writing correctly.	Understand
CO2	To acquire the correct sense of format, syntax, grammar, punctuation and spelling.	Understand
CO3	To acquire concepts, principles and vocabulary of reasoning and argumentation and use analysis, synthesis, and evaluations to advance arguments.	Understand
CO4	To gain an understanding of discourse conventions ranging from structure and paragraphing to tone and mechanics	Apply

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MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0
CO2	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0
CO3	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0
CO4	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0
AVG	**0**	**1**	**1**	**2**	**2**	**2**	**2**	**3**	**3**	**2**	**2**	**2**	**0**	**0**	**0**	**0**	**0**

OBJECTIVES OF THE COURSE

(a) To develop writing skills, to learn to integrate writing and thought and to apply the conventions of academic writing correctly

(b) To acquire the correct sense of format, syntax, grammar, punctuation and spelling

(c) To acquire concepts, principles and vocabulary of reasoning and argumentation and use analysis, synthesis and evaluation to advance arguments

(d) To gain an understanding of discourse conventions ranging from structure and paragraphing to tone and mechanics.

COURSE SUMMARY

MODULE	Hrs.
Module 1: Process of Writing	18
Module 2: Elements of Writing	12
Module 3: Writing for Professional Purposes I	18

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MODULE	Hrs.
Module 4: Writing for Professional Purposes II	12
Module 5: Reading Skills	14
Evaluation	12
Total	**72 Hrs.**

COURSE DETAILS

MODULE 1: INTRODUCTION TO ACADEMIC WRITING

What is academic writing - Purpose of academic writing - Types of academic writing - Features of academic writing?

Structuring the Essay: Planning an essay- Brain-storming- Organizing and outlining.

Writing a thesis statement: Nature of supporting sentences - Writing paragraphs- Structure of an essay.

Vocabulary for Writing: Selection of vocabulary- Abbreviations- Choice of nouns and adjectives- Appropriate verbs and adverbs- Conjunctions and prepositions- Prefixes and suffixes- Synonyms- Common errors.

Composing the Content: Writing introductions and conclusions- Ordering the paragraphs

Proof-reading and editing- Finalising the final draft.

MODULE 2: ELEMENTS OF WRITING

Shaping Strategies: Discussions, persuasions and arguments- Comparison and contrast- Cause and effect- Defining and classifying Problems and solutions Mechanics and conventions of Writing: Punctuations, Use of articles, Relevance of examples, Generalizations, Academic style.

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MODULE 3: WRITING FOR PROFESSIONAL PURPOSES I

Writing Reviews: Reviewing books - Reviewing movies - Writing product reviews Writing Case Studies

Writing Reports: Feasibility report, Progress reports, Evaluative reports Surveys: Conducting surveys- Designing questionnaires, collecting data – Writing descriptive reports

MODULE 4: WRITING FOR PROFESSIONAL PURPOSES II

Writing CVs Letter Writing: Transmittal and cover letters - Emails Writing summaries writing memos on writing blogs Etiquette in writing.

CORE TEXT:

Dr. Anvar Sadhath V.P. & Dr. Jacob George. *Writing for Academic and Professional Success*

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ENG2A02: ZEITGEIST - READINGS ON CONTEMPORARY CULTURE

COURSE DETAILS

Course Code	ENG2A04
Title of the course	Zeitgeist - Readings on Contemporary Culture
Semester in which the Course to be Taught	2
Number of Credits	4
Number of Contact Hours	90(5 Hours / Week)

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	To inculcate the values enshrined in the constitution of India and to provide an insight on the secular framework of the country.	Understand
CO2	To familiarize the learners with concepts such as conservation, sustainability and the life of the marginalized and their interconnectedness.	Understand
CO3	To foster among the learners an awareness of the diverse problems faced by women and the sexual minorities and to promote a culture of inclusion and mutual respect.	Apply

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Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO4	To understand the "human' as articulated among the various cultures and promote a multicultural and plural understanding of rights.	Understand

MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0
CO2	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0
CO3	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0
CO4	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0
AVG	**0**	**1**	**1**	**2**	**2**	**2**	**2**	**3**	**3**	**2**	**2**	**2**	**0**	**0**	**0**	**0**	**0**

OBJECTIVES OF THE COURSE

(a) To inculcate the values enshrined in the constitution of India and to provide an insight on the secular framework of the country.

(b) To familiarize the learners with concepts such as conservation, sustainability and the life of the marginalized and their interconnectedness.

(c) To foster among learners an awareness of the diverse problems faced by women and the sexual minorities and to promote a culture of inclusion and mutual respect.

(d) To understand the "human" as articulated among the various cultures and promote a multicultural and plural understanding of rights.

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COURSE SUMMARY

MODULE	Hrs.
Module 1: Social Issues	20
Module 2: Environment	20
Module 3: Gender	18
Module 4: Human Rights	20
Evaluation	12
Total	**90 Hrs.**

COURSE DETAILS

MODULE 1: INDIAN CONSTITUTION AND SECULARISM

1. Preamble to the Constitution of India
2. Should Gandhi's Assassin be Killed?: Pearl S. Buck
3. Toba Tek Singh: Hassan Saadat Manto
4. Freedom: Tagore

MODULE 2: SUSTAINABLE ENVIRONMENT

1. *The End of Living and the Beginning of Survival*: Chief Seattle
2. *On Killing a Tree*: Gieve Patel
3. *Zlateh the Goat*: Issac BashevisSinger

MODULE 3: GENDER

1. *The Story of an Hour*: Kate Chopin
2. *The First time I Uttered a Prayer*: Lee Mokobe
3. *Claiming an Education*: Adrienne Rich

MODULE 4: HUMAN RIGHTS

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1. *Refugee Blues*: W H Auden
2. *Amnesty*: Nadine Gordimer
3. *Akkarmashi*: Sarankumar Limbale (Extracts from Chapter 1)
4. *The Meaning of Life*: Yuval Noah Harari (Extracts from Chapter 19)

CORE TEXT:

BoS, University of Calicut (2019). *Zeitgeist: Readings on Contemporary Culture*, University of Calicut.

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ARB2A08: APPRECIATING ARABIC LITERATURE

COURSE DETAILS

Course Code	ARB2A08
Title of the course	Appreciating Arabic Literature
Semester in which the Course to be Taught	2
Number of Credits	4
Number of Contact Hours	72 (4Hrs. /Wk.)

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	To make opportunities before the learner to acquaint with classical Literature having ethical association.	Understand
CO2	To inculcate moral values in the learner through prose literature.	Understand
CO3	Knowledge of the language of the Quran	Understand
CO4	Knowledge of the language of the Hadith	Understand

MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0

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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO2	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0
CO3	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0
CO4	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0
AVG	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0

AIM OF THE COURSE

The aim of the course is enable the students who took Arabic language as common course to use Arabic language in daily life especially in communication.

OBJECTIVES OF THE COURSE

(a) To enjoy Arabic language through stories, Drama and poems.
(b) To acquire the vocabularies of Arabic language.
(c) To practice the use of Arabic language in various situations and occasions..

COURSE DETAILS

MODULE I

1. *Qasasun Qaseerathun Jidda – Rafeeqa,* (Muhammed Thameem Al Urdune)
2. *Qissathu Qaseera – Iblees Yanthasiru* (Thoufeequl Hakeem)

MODULE II

3. *Al Rizau Bi qazailla* (Imam Shafi)
4. *Hivar* – Bathanee Sayanfajiru

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MODULE III

5. *Isna'a Mina Laimoon ShARBn Halvan*
6. *Ya Akhi Al Insan* (Haroon Hashim Rasheed)

MODULE IV

7. *Qissa – Al Gareeb* (Mahmood Al Badavi)
8. *Rihlathun Ila Malasia*

PRESCRIBED TEXT BOOK

Dr. Abdul Majeed T (2019), *Min Vahyil Adab*.

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HIN2A08(1): GRAMMAR AND TRANSLATION

COURSE DETAILS

Course Code	HIN2A08(1)
Title of the course	Grammar and Translation
Semester in which the Course to be Taught	2
Number of Credits	4
Number of Contact Hours	72 (4Hrs. /Wk.)

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	Understand the differences between spoken and written Hindi	Understand
CO2	Understand the factors that influence use of grammar and vocabulary in speech and writing	Understand
CO3	Understand the different ways in which grammar has been described	Understand
CO4	Define the link between translation theory and translation practice.	Analyse
CO5	Define the effects of translation theories on translation practice.	Analyse
CO6	Define the contribution of translation practice to translation theory	Analyse

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MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0
CO2	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0
CO3	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0
CO4	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0
CO5	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0
CO6	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0
AVG	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0

AIM OF COURSE

To enable students to use Hindi language correctlyand efficiently. To make them understand various types of letters both personal and business. To facilitate the use of translation as a tool for communication between different languages.

OBJECTIVE OF THE COURSE

(1) Grammar is essential to the study of language. Developing a correct grammar sense is very important for written communication.
(2) A student who successfully completes the course should be able to write in Hindi independently in their personal and professional life.
(3) Familiarizing the technology of translation with its possibilities.

COURSE DETAILS

MODULE 1: Correct usages of Hindi – Shabdavichar, definition andclassification of words – noun, gender, number, karak

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MODULE 2: Pronoun, adjective, tense, voice

MODULE 3: Adverb, preposition, conjunction, interjection.

MODULE 4: Translation.

PRESCRIBED TEXT BOOKS:

1) Sreekrishna Pandey. Samanya Hindi Vyakaran Tatha Rachana, Lokmangal Prakashan, B-32, Kailash Colony, Shahdara, Delhi.

READING LIST:

1) *Shabda Vichar*, Sangya, Ling, Vachan, Karak
2) *Sarvanaam*, Visheshan, Kriya, Kriya Ke
3) *Roopaanthar* – Kal, Vachya
4) *Kriya Visheshan*, Sambandh Bodhak
5) *Samuchchaya Bodhak*, Vismayaadi Bodhak

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MAL2A08(1): *MALAYALA SAHITHYAM* - 2

COURSE DETAILS

Course Code	MAL2A08(1)
Title of the course	*Malayala Sahithyam* - 2
Semester in which the Course to be Taught	2
Number of Credits	4
Number of Contact Hours	64 (4Hrs. /Wk.)

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	To gain an understanding of the relations between culture, history and texts. They learn to use texts as a gateway to various cultural traditions and interpret them in their historical contexts.	Understand
CO2	To create in learners a definitive sense of the stylistic variations of Malayalam and how they are used in real life situations.	Understand
CO3	To inculcate in learners a taste for deeper pursuit and acquisition of advanced level of skills in Malayalam.	Understand
CO4	To guide them on how to participate in discussions and make seminar presentations with special focus on specific vocabularies and styles of usage in such contexts.	Apply

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MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0
CO2	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0
CO3	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0
CO4	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0
AVG	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0

AIM OF COURSE

മലയാള കവിതാ സാഹിത്യത്തിന്റെ വളർച്ചയുടെ ഘട്ടങ്ങൾ, പ്രസ്ഥാനങ്ങൾ, പുതിയ ഭാവുകത്വങ്ങൾ – ഇവയെപ്പറ്റി ഗദ്യസാഹിത്യത്തിന്റെയും വിമർശന സാഹിത്യത്തിന്റെയും വളർച്ചയെ പറ്റിയും സാമാന്യധാരണ രൂപപ്പെടുത്തുക.

COURSE DETAILS

MODULE 1: കവിതകൾ

മലയാള കവിതയിലെ കാല്പനികത യഥാർത്ഥ പ്രസ്ഥാനങ്ങളെ പരിചയപ്പെടുക. കവിതകളുടെ പൊതുസ്വഭാവവും ഭാവുകത്വ പരിണാമവും വ്യക്തമാക്കണം. ഓരോ കവിയുടെയും പ്രധാന രചനകൾ വിദ്യാർഥികളെ സാമാന്യ ധാരണയിലേക്ക് നൽകേണ്ടതാണ്.

1.കുമാരനാശാൻ: നളിനി

നല്ല ഹൈമവതഭൂവിൽ ...

.. പാട്ടുകേട്ടാപരമാർന്ന കൗതുകം.

2.ജി. ശങ്കരക്കുറുപ്പ്: സൂര്യകാന്തി

3.ഇടപ്പള്ളി: മണിനാദം

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MODULE 2: കവിതകൾ

മലയാള കവിതയുടെ ആധുനിക ഘട്ടം മുതൽ ഇന്നത്തെ മലയാള കവിത വരെ. പ്രമേയ സ്വീകരണം, അവതരണം എന്നിവയിലെ വ്യതിയാനങ്ങളെ പറ്റി വ്യക്തമായ ധാരണ രൂപപ്പെടണം.

1.ക്കിത്തം: കലോപാസകൻ (കരതലാമലകം)

2.അയ്യപ്പപ്പണിക്കർ: കുതിരക്കൊമ്പ്

3. ആറ്റൂർ: പുത്തൻ ചൊല്ല്

4.സാവിത്രി രാജീവൻ: അമ്മയെ കുളിപ്പിക്കുമ്പോൾ

MODULE 3, 4: വിമർശനം/നിരൂപണം

മലയാള സാഹിത്യത്തിലെ വിമർശന രൂപങ്ങളെയും പ്രസ്ഥാനങ്ങളെയും പരിചയപ്പെടുത്തുക.

1.കുട്ടിക്കൃഷ്ണ മാരാർ: അംബ

2.മുണ്ടശ്ശേരി: കാളിദാസനും കാലത്തിൻറെ ദാസൻ

3.കെ. പി. അപ്പൻ: മരണത്തിന്റെ സൗന്ദര്യം (ക്ഷോഭിക്കുന്നവരുടെ സുവിശേഷം)

4.കൽപ്പറ്റ നാരായണൻ: സ്ത്രീയില്ലാത്ത മാതൃഭൂമി (കവിതയുടെ ജീവചരിത്രം)

5.പി. കെ. രാജശേഖരൻ: എഴുത്തും അധികാരവും (അന്ധനായ ദൈവം)

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PHY2B02: MECHANICS – II

COURSE DETAILS

Course Code	PHY2B02
Title of the course	MECHANICS – II
Semester in which the Course to be Taught	1
Number of Credits	2
Number of Contact Hours	36 (2Hrs. /Wk.)

COURSE OUTCOME (COs)

	Course Outcome	PSO	CL	KC	Class Sessions Allotted
CO1	Understand the features of non-inertial systems and fictitious forces	PSO1	U	C	8
CO2	Understand and analyze the features of central forces with respect to planetary forces	PSO1	An	C,P	10
CO3	Understand the basic ideas of Harmonic Oscillations	PSO1	U	C	8
CO4	Understand the analyze the basic concepts of wave motion	PSO1	An	C,P	10

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MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	2	2	1	2	1	1	0	0	1	1	3	0	0	0	0
CO2	2	3	2	2	1	2	1	1	0	0	1	1	3	0	0	0	0
CO3	2	3	2	2	1	2	1	1	0	0	1	1	3	0	0	0	0
CO4	2	3	2	2	1	2	1	1	0	0	1	1	3	0	0	0	0
AVG	2	3	2	2	1	2	1	1	0	0	1	1	3	0	0	0	0

COURSE CONTENT

UNIT I – NONINERTIAL SYSTEMS AND FICTITIOUS FORCES [8 HRS]

Galilean transformations – Uniformly accelerating systems – The apparent force of gravity – Pendulum in an accelerating car – The principle of equivalence – The driving force of the tides – Physics in a rotating coordinate system–Time derivatives and rotating coordinates–Acceleration relative to rotating coordinates–The apparent force in arotating coordinate system–TheCoriolis force–Deflection of a falling mass–Motion on the rotating earth–Weather systems–Foucault's pendulum

[Sections 8.1 to 8.5 of An Introduction to Mechanics (1st Edn.) by Daniel Kleppner and Robert J. Kolenkov

UNIT II – CENTRAL FORCE MOTION [10 HRS]

Centralforce motion as a one-body problem–General properties of central force motion–Motion is confined to a plane – Energy and angular momentum are constants of the motion – The law of equal areas – Finding the motion in real

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problems – The energy equation and energy diagrams – Non-interactingparticles –Planetary motion–Hyperbolic orbits–Satellite orbit–Kepler'slaws–

The law of periods – Properties of the ellipse

[Sections 9.1 to 9.7 of An Introduction to Mechanics (1st Edn.) by Daniel Kleppner and Robert J. Kolenkow]

UNIT III –HARMONIC OSCILLATOR [8 HRS]

Introduction and review – Standard form of the solution – Nomenclature – Initial conditions and the frictionless harmonic oscillator – Energy considerations – Time average values – Average energy – Damped harmonic oscillator – Energy and Q-factor – Q factor of two simpleoscillatorsGraphical analysis of a damped oscillator – Solution of the equation of motion for the undriven damped oscillator – Forced harmonic oscillator – Undamped forced oscillator – Resonance

[Sections10.1to10.3 (exceptthetopic,*The Forced Damped Harmonic Oscillator)* and Note 10.1 of *An Introduction to Mechanics* (1st Edn.) by Daniel Kleppner and Robert J.Kolenkow]

UNIT IV– WAVES [10HRS]

What is a wave? – Normal modes and travelling waves – Progressive waves in one direction – Wave speeds in specific media–Superposition–Wavepulses– Motion of wave pulses of constant shape – Superposition of wave pulses – Dispersion; Phase and Group Velocities – Energy in a mechanical wave – Transport of energy by a wave – Momentum flow and mechanical radiation pressure – Waves in two and three dimensions

[Chapter 7 – Progressive Waves (except the topic, *The Phenomenon of Cut-off*) of Vibrations and Waves by A. P. French]

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BOOKS OF STUDY

1. Daniel Kleppner and Robert J. Kolenkow, *An Introduction to Mechanics*, 1st Edn. — McGraw-Hill

2. A. P. French, *Vibrations and Waves — The M.I.T. Introductory Physics Series*, CBS Publishers &Distributors

REFERENCE BOOKS

3. Kittel *et al.,Berkeley Physics Course:Vol.1: Mechanics*, 2nd Edn., McGraw-Hill

Unit/ Chapter	Title	Marks
1	Non-inertial systems and fictitious forces	18
2	Central force motion	22
3	Harmonic Oscillator	18
4	Waves	21
*Total Marks**		79

*Total marks include that for choice of questions in sections A, B and C in the question paper.

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MTS2C02: MATHEMATICS - 2

COURSE DETAILS

Course Code	MTS2C02
Title of the course	Mathematics - 2
Semester in which the Course to be Taught	2
Number of Credits	3
Number of Contact Hours	4 Hrs./Wk.

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	Understand polar coordinates and Hyperbolic function	Understand
CO2	Understand improper integral and application of numerical integration	Apply
CO3	Understand vector space and matrices	Understand
CO4	Understand inverse of matrices and Eigen value problem	Apply

MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	2	2	2	1	2	1	1	2	2	2	0	0	0	2	0

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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO2	2	2	2	2	2	1	2	1	1	2	2	2	0	0	0	2	0
CO3	2	2	2	2	2	1	2	1	1	2	2	2	0	0	0	2	0
CO4	2	2	2	2	2	1	2	1	1	2	2	2	0	0	0	2	0
AVG	2	2	2	2	2	1	2	1	1	2	2	2	0	0	0	2	0

COURSE CONTENT

MODULE I

(Only representation of points in polar coordinates, relationship between Cartesian and polar coordinates, converting from one system to another and regions represented by inequalities in polar system are required)

Inverse functions-inverse function test, inverse function rule

Graphing in polar coordinates- Checking symmetry of graphs given in polar equation, drawings, tangents to graph in polar coordinates

Hyperbolic functions- hyperbolic sine, cosine, tan etc., derivatives, anti differentiation formulas

Inverse hyperbolic functions- inverse hyperbolic functions (their derivatives and anti derivatives)

Arc lengthand surface area- Length of curves, Area of surface of revolution about x and y axes.

MODULE II

Improper integrals- integrals over unbounded intervals, comparison test, integrals of unbounded functions

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Limit of sequences and Newton's method e-N definition, limit of powers, comparison test, Newton's method

Numerical Integration- Riemann Sum, Trapezoidal Rule, Simpson's Rule

The sum of an infinite series- convergence of series, properties of limit of sequences (statements only), geometric series, algebraic rules for series, the i* term test

The comparison test and alternating series- comparison test, ratio comparison test, alternating series, alternating series test, absolute and conditional convergence

MODULE III

Vector spaces - definition, examples, subspaces, basis, dimension, span

Gram-Schmidt Orthogonalization Process- orthonormal bases for Rn, construction of orthonomal basis of Rn

Systems of Linear Algebraic Equations- General form, solving systems, augmented matrix, Elementary row operations, Elimination Methods- Gaussian elimination, Gauss- Jordan elimination, row echelon form, reduced row echelon form, inconsistent system, networks, homogeneous system, over and underdetermined system

Rank of a Matrix - definition, row space, rank by row reduction, rank and linear system, consistency of linear system

Determinants - definition, cofactor (quick introduction)

Properties of determinant- properties, evaluation of determinant by row reducing to triangular form

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MODULE IV

Inverse of a Matrix - finding inverse, properties of inverse, adjoint method, row operations method, using inverse to solve a linear system

The eigenvalue problem- Definition, finding eigenvalues and eigenvectors, complex eigenvalues, eigenvalues and singular matrices, eigenvalues of inverse

Powers of Matrices- Cayley Hamilton theorem, finding the inverse

Orthogonal Matrices- symmetric matrices and eigenvalues, inner product, criterion for orthogonal matrix, construction of orthogonal matrix

Diagonalization- diagonalizable matrix-sufficient conditions, orthogonal diagonalizability of symmetric matrix, Quadratic Forms

TEXTBOOKS

1. Jerrold Marsden & Alan Weinstein, *Calculus I* (2/e), Springer-Verlag New York Inc (1985) ISBN 0-387-90974-5
2. Jerrold Marsden & Alan Weinstein, *Calculus II* (2/e), Springer-Verlag New York Inc (1985) ISBN 0-387-90975-3
3. Dennis G Zill Jones & Bartlett Learning, *Advanced Engineering Mathematics* (6/e), LLC(2018)ISBN: 978-1-284-10590-2

REFERENCES:

4. Soo T Tan, *Calculus*, Brooks/Cole, Cengage Learning (2010)ISBN 0-534-46579-X
5. Gilbert Strang, Calculus, Wellesley Cambridge Press(1991)ISBN:0-9614088-2-0
6. Ron Larson. Bruce Edwards, *Calculus* (11/e), Cengage Learning(2018) ISBN: 978-1-337-27534-7

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7. Robert A Adams & Christopher Essex : *Calculus Single Variable,* (8/e) Pearson Education Canada (2013) ISBN: 0321877403
8. Joel Hass, Christopher Heil & Maurice D. Weir : *Thomas' Calculus* (14/e) Pearson (2018) ISBN 0134438981
9. Peter VO'Neil, *Advanced Engineering Mathematics* (7/e): Cengage Learning(2012)ISBN: 978-1-111-42741-2
10. Erwin Kreyszig: *Advanced Engineering Mathematics* (10/e) John Wiley & Sons (2011) ISBN: 978-0-470-45836-5
11. lyn James: *Advanced Modern Engineering Mathematics* (4/e) Pearson Education Limited(2011) ISBN: 978-0-273-71923-6

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CSC2C02 – FUNDAMENTALS OF SYSTEM SOFTWARE, NETWORKS AND DBMS

COURSE DETAILS

Course Code	CSC2C02
Title of the course	Fundamentals of System Software, Networks and DBMS
Semester in which the Course to be Taught	2
Number of Credits	2
Number of Contact Hours	64 (2 T Hrs. /Wk. + 2 L Hrs. /Wk.)

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	Understand basics of the system software	Understand
CO2	Understand basics of the Computer Networks	Understand
CO3	Understand basics of the SQL	Understand
CO4	Applydatabase concepts &SQL to solve real-life problems	Apply
CO5	Develop websites for real requirements	Create

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MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	3	3	2	2	2	1	1	2	2	2	0	0	0	2	0
CO2	2	2	3	3	2	2	2	1	1	2	2	2	0	0	0	2	0
CO3	2	2	3	3	2	2	2	1	1	2	2	2	0	0	0	2	0
CO4	2	2	3	3	2	2	2	1	1	2	2	2	0	0	0	2	0
AVG	2	2	3	3	2	2	2	1	1	2	2	2	0	0	0	2	0

COURSE CONTENT

UNIT I [6 T+6L]

System software - classification of programming languages (Machine, assembly & High level), Characteristics and Comparison, language processors (Assembler, Interpreter and Compiler), Operating Systems- Functions, types of OS (batch, multiprogramming, time sharing, real time and distributed)

UNIT II [7 T+6L]

Computer networks- goals of networking, network topologies, types of networks (LAN, MAN and WAN), network model, OSI model- 7 layers, Internet Layer- 5 layers, Communication Media- Guided (Twisted Pair, Coaxial Cable and Fiber Optic) and Unguided (microwave, satellite).

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UNIT III [6 T+7L]

Database Management Systems-definition, structure of Database, data models (Record based Data model, Network model: - Basic Components, Record types, data types, links, relationships, Hierarchical model and Relational model)

UNIT IV [6 T+7L]

Structured query language - Create, insert, select, update, delete, alter, drop commands

UNIT V [7 T+6L]

HTML-hypertext, hyper media, understanding basic HTML tools- HTML editor, web browser, General structure of HTML document, different types of elements- doc type, comment element, structural element, HTML tags and attributes: <html>, <body>, <head>,<title>, <h1>,... ,<h6>,
, <table>, <img>, <hr>, adding links, background image to the body, creating lists.

REFERENCES

1) P. K Sinha, *Fundamentals of Computers*
2) D. M Dhamdhere,*Operating System: A concept based Approach*
3) Behrouz A Forouzan, *Data Communication & Networking*, MC Graw Hill
4) Joel Sklar,*Principles of Web Page Design*, Vikas Publications

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AUD2E02: DISASTER MANAGEMENT

COURSE DETAILS

Course Code	AUD2E02
Title of the course	Disaster Management
Semester in which the Course to be Taught	2
Number of Credits	4
Number of Contact Hours	0 Hrs./Wk.

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	Impart basic knowledge about Hazards and Disasters	Understand
CO2	Impart basic knowledge about Natural Disasters	Understand
CO3	Prepare for disaster Preparedness and Response	Apply
CO4	Prepare for rehabilitation, reconstruction and recovery	Apply

MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0

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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO2	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0
CO3	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0
CO4	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0
CO5	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	0
AVG	0	1	1	2	2	2	2	3	3	2	2	2	0	0	0	0	**0**

COURSE CONTENTS

MODULE I: INTRODUCTION

Introduction - Hazard and Disaster. Concepts of Hazard, Vulnerability, Risks. Different Types of Disaster: A) Natural Disaster: such as Flood, Cyclone, Earthquakes, Landslides etc. B) Man-made Disaster: such as Fire, Industrial Pollution, Nuclear Disaster, Biological Disasters, Accidents (Air, Sea, Rail & Road), Structural failures(Building and Bridge), War & Terrorism etc. Slow Disasters (famine, draught, epidemics) and Rapid Onset Disasters (Air Crash, tidal waves, Tsunami) Causes, effects and practical examples for all disasters.

Water and Climate Disaster: flood, hail storms, cloudburst, cyclones, heat and snow avalanches, cold waves, droughts, sea erosion, thunder and lightning. Geological Disaster: landslides, earthquakes, Tsunami, mine fires, dam failures and general fires. Biological Disaster: epidemics, pest attacks, cattle epidemic and food poisoning. Nuclear and Industrial Disaster: chemical and industrial disasters, nuclear accidents. Accidental Disaster: urban and forest fires, oil spill, mine flooding incidents, collapse of huge building structures.

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MODULE 2: NATURAL DISASTERS

Earthquakes, Tsunami, Floods, Drought, Landslides, Cyclones and Volcanic eruptions. Their case studies. Coastal disasters. Coastal regulation Zone. Risk and Vulnerability Analysis 1. Risk: Its concept and analysis 2. Risk Reduction 3. Vulnerability: Its concept and analysis 4. Strategic Development for Vulnerability Reduction. Disaster Prevention and Mitigation. Refugee operations during disasters, Human Resettlement and Rehabilitation issues during and after disasters, Inter-sectoral coordination during disasters, Models in Disasters.

MODULE 3: DISASTER PREPAREDNESS AND RESPONSE CONCEPT AND NATURE

Disaster Preparedness Plan Prediction, Early Warnings and Safety Measures of Disaster. Role of Information, Education, Communication, and Training, Disaster Management: Role of Government, International and NGO Bodies. Role of IT in Disaster Preparedness Role of Engineers on Disaster Management. Response Disaster Response : Introduction Disaster Response Plan Communication, Participation, and Activation of Emergency Preparedness Plan Search, Rescue, Evacuation and Logistic Management Role of Government, International and NGO Bodies Psychological Response and Management (Trauma, Stress, Rumor and Panic) Relief and Recovery Medical Health Response to Different Disasters.

MODULE 4: REHABILITATION, RECONSTRUCTION AND RECOVERY

Reconstruction and Rehabilitation as a Means of Development. Damage Assessment Post Disaster effects and Remedial Measures. Creation of Long-term Job Opportunities and Livelihood Options, Disaster Resistant House Construction Sanitation and Hygiene Education and Awareness, Dealing with Victims' Psychology, Long¬term Counter Disaster Planning Role of Educational Institute.

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MODULE 5: THE VULNERABILITY ATLAS OF INDIA

Disaster Prevention and Mitigation. Agencies involved in Disaster Management. Warning and Prediction

ESSENTIAL READING

1. Pandey, M., 2014. *Disaster Management*, Wiley India Pvt. Ltd., 240p.
2. Tushar Bhattacharya, *Disaster Science and Management*, McGraw Hill Education (India) Pvt. Ltd
3. Jagbir Singh, *Disaster, Management: Future Challenges and Opportunities*, K W Publishers Pvt. Ltd.
4. J.P. Singhal, *Disaster Management*, Laxmi Publications
5. C. K. Rajan, Navale Pandharinath, *Earth and Atmospheric Disaster Management: Nature and Manmade*, B S Publication
6. Shailesh Shukla, Shamna Hussain, *Biodiversity, Environment and Disaster Management*, Unique Publications

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DEPARTMENT OF PHYSICS

CURRICULUM FOR B.ScPHYSICS

SEMESTER III

Course	Code	Course	Hours	Credit	IE	EE	Total
Common IV	ENG2A03	Writing for Academic And Professional	4	4	20	80	100
Common V	ENG2A04	Zeitgeist - Readings on Contemporary Culture	5	4	20	80	100
Common VI	ARB2A08	Appreciating Arabic Literature	4	4	20	80	100
	HIN2A08 (1)	Grammar and Translation					
	MAL2A08 (1)	Malayala Sahithyam - 1					
Core 1	PHY3B03	Electrodynamics I	3	3	15	60	75
Complementary	MTS3C03	Mathematics	5	3	15	60	75
Complementary	CSC3C03	Computer Science	3	3	15	60	75
Ability Enhancement/ Audit 2	AUD3E03	Human Rights/Intellectual Property Rights/ Consumer Protection	--	4		100	100
Total			**25**	**23**			

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ENG3A05: SIGNATURES: EXPRESSING THE SELF

COURSE DETAILS

Course Code	ENG3A05
Title of the course	Signatures: Expressing the Self
Semester in which the Course to be Taught	3
Number of Credits	4
Number of Contact Hours	90 (5Hrs. /Wk.)

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	To enable the students to read and critically appreciate the different genres of expressing the self.	Understand
CO2	To appreciate the fluid and flexible narratives of self-expression that transcend the conventions of genre	Understand
CO3	To understand how personal narratives intersect with the larger social realities	Understand
CO4	To read personal narratives that move beyond the individual self to express the collective self	Understand
CO5	To understand how the distinctions between fact and fiction blur in personal narratives	Understand

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MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	0	1	1	2	2	2	2	3	3	2	3	3	0	0	0	0	0
CO2	0	1	1	2	2	2	2	3	3	2	3	3	0	0	0	0	0
CO3	0	1	1	2	2	2	2	3	3	2	3	3	0	0	0	0	0
CO4	0	1	1	2	2	2	2	3	3	2	3	3	0	0	0	0	0
CO5	0	1	1	2	2	2	2	3	3	2	3	3	0	0	0	0	0
AVG	0	1	1	2	2	2	2	3	3	2	3	3	0	0	0	0	0

OBJECTIVES OF THE COURSE

(a) To enable the students to read and critically appreciate the different genres of expressing the self

(b) To appreciate the fluid and flexible narratives of self-expression that transcend the conventions of genre

(c) To understand how personal narratives intersect with the larger social realities

(d) To read personal narratives that move beyond the individual self to express the collective self

(e) To understand how the distinctions between fact and fiction blur in personal narratives

COURSE SUMMARY

MODULE	Hrs.
Module 1: Autobiographical Writings and Memoirs	28

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MODULE	Hrs.
Module 2: Speeches and Testimonies	25
Module 3: Diary entries and Letters	25
Evaluation	12
Total	**90 Hrs.**

COURSE DETAILS

MODULE 1: AUTOBIOGRAPHICAL WRITINGS AND MEMOIRS

1. *Memoirs*: Pablo Neruda (Excerpts)
2. *Pilgrim at Tinkercreek*: Annie Dillard (Excerpts)
3. *I Stand With You against the Disorder*: Jeanette Armstrong
4. *When I was Growing Up*: Nellie Wong

MODULE 2: SPEECHES AND TESTIMONIES

1. *Art, truth and Politics*: Harold Pinter
2 *Charlie Chaplin's Final Speech* in the movie *The Great Dictator*
3. *Voices from Chernobyl*: Svetlana Alexievich (Excerpts)
4. Breaking Silence: Janice Miri Kitani

MODULE 3: DIARY ENTRIES AND LETTERS

1. *A Diary of a Young Girl*: Anne Frank (Excerpts)
2. *The Secret Diary of Adrian Mole aged 13 %*: Sue Townsend (Excerpts)
3. *Nenj Amparamba Letters*: M.A. Rahman
4. Gandhi ' s letter to Adolf Hitler

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CORE TEXT:

BoS, University of Calicut(2019). *Zeitgeist: Readings on Contemporary Culture*, University of Calicut.

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ARB3A09: READING ARABIC PROSE AND POETRY

COURSE DETAILS

Course Code	ARB09
Title of the course	Reading Arabic Prose and Poetry
Semester in which the Course to be Taught	3
Number of Credits	4
Number of Contact Hours	90 (5Hrs./Wk.)

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	To make opportunities before the learner to appreciate modern and contemporary poetry.	Understand
CO2	To develop in the learner the capacity to grasp the ideas conveyed by the poets of modern age	Analyse
CO3	Associate human emotions through literature to promote creative, critical uses of language and gain proficiency in Listening, Speaking, Reading, Writing skills with the fundamental knowledge of grammar	Understand

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MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0
CO2	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0
CO3	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0
AVG	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0

AIM OF THE COURSE

The aim of the course is enable the students who took Arabic language as common course to use Arabic language in daily life especially in communication.

OBJECTIVES OF THE COURSE

(a) To enjoy Arabic language through stories, drama and poems.
(b) To acquire the vocabularies of Arabic language.
(c) To practice the use of Arabic language in various situations and occasions...

COURSE DETAILS

MODULE I

1. *Minal Kithab – Soorathul Qasas*
2. *Minal Hikmath - Al Ahadeesul Munthakhaba*

MODULE II

1. *Halavathul Asal – Min Internet*
2. *Zivaju Abo Vida'a* (Abdurahman Ra'afathul Basha)

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3. *Macbeth* (Shakespere)

MODULE III

1. *Fee Sabeelil Vathani* (Mahroofu Rasafi)
2. *Lima Thashthaki* (Eliya Abu Maazi)
3. *La Lil Huzn* (Ashraf Abu Zaid)

MODULE IV

1. *Fannul Kalam* (Ali Thanthavi)
2. *Sinau Sa'aada* (Ibrahim Faqi)
3. *Fil Ilqa'a* (Muhammed Bin Abdurrahman Al Areefi)

PRESCRIBED TEXT BOOK

Abdul Azeez M. (2019). *Al Khavathir*.

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HIN3A08(1): POETRY IN HINDI

COURSE DETAILS

Course Code	HIN3A09(1)
Title of the course	Poetry in Hindi
Semester in which the Course to be Taught	2
Number of Credits	4
Number of Contact Hours	90 (4Hrs. /Wk.)

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	Understand the common techniques underlying free verse and traditional forms of poetry.	Understand
CO2	Identify personal experiences that can be used when writing poetry.	Understand
CO3	Understand the basic terminology and practical elements of poetry.	Understand

MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0
CO2	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0

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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO3	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0
AVG	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0

AIM OF COURSE

To sensitize the students to the aesthetic cultural and social aspects of literacy appreciation and analysis.

OBJECTIVE OF THE COURSE

(1) Appreciation of poetry using the best specimens provided in an anthology.

(2) Understanding the origin and development of Hindi poetry through selected poems.

COURSE DETAILS

MODULE 1: Ancient Hindi poetry - A collection of poems of ancient poets.

MODULE 2: Modern Hindi Poetry - A collection of poems of different periods representing different styles and themes.

MODULE 3: A collection of poems of different periods.

MODULE 4: Khanda kavya.

PRESCRIBED TEXT BOOKS:

(1) UG Hindi Board of Studies, University *of* Calicut (Ed.), *Padya Vihar,*Rajkamal Publications, 1b Netaji Subhash Marg, Dariyaganj, New

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Delhi.

(2) Kanupriya –*Bharateeya Gyaanpeeth,* 18, Industrial Area, Lodhi Road, New Delhi

READING LIST:

(1) KabeerDas - 5 Dohas Soordas - 3 Padas

(2) Tulsidas - 3 Dohas forMaithilee Sharan Gupt - Sakhi Ve Mujhse Kahkar Jaate

(3) Niraalaa - *Jaago Phir Ek Baar*

(4) Naagaarjun - *Ham Bhee Saajheedaar*

(5) Agyey - *Maine Kaha Ped*

(6) Arunkamal - *Putalee Mein Sansaar*

(7) Gyanendrapati - *Beej Vyatha*

(8) Anaamika - *Bejagah*

(9) Jayaprakaash Kardam - *Mere Adhikaar Kahaan Hai*

(10) Dharmveer Bhaarati - *Kanupriya*

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MAL3A09(1): *MALAYALA SAHITHYAM* 3

COURSE DETAILS

Course Code	MAL3A09(1)
Title of the course	*Malayala Sahithyam* 3
Semester in which the Course to be Taught	2
Number of Credits	4
Number of Contact Hours	80 (5Hrs. /Wk.)

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	To write clearly, effectively, and creatively, and adjust writing style appropriately to the content, the context, and nature of the subject.	Understand
CO2	To acquire the correct sense of format, syntax, grammar, punctuation and spelling.	Understand
CO3	To acquire concepts, principles and vocabulary of reasoning and argumentation and use analysis, synthesis, and evaluations.	Understand
CO4	To gain an understanding of discourse conventions ranging from structure and paragraphing to tone and mechanics.	Understand

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MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0
CO2	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0
CO3	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0
CO4	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0
AVG	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0

AIM OF COURSE

നാടകം, തിരക്കഥ, ആത്മകഥ, സഞ്ചാരസാഹിത്യം തുടങ്ങിയ സാഹിത്യശാഖകളെക്കുറിച്ച് സാമാന്യ ധാരണ വിദ്യാർഥികൾക്ക് ലഭിച്ചിരിക്കണം.

COURSE DETAILS

MODULE 1: നാടകം

നാടകം, നാടക സാഹിത്യ ചരിത്രം എന്നിവയെപ്പറ്റി സാമാന്യമായ അറിവ് ലഭിച്ചിരിക്കണം.

1.ജി ശങ്കരപ്പിള്ള: ഭരതവാക്യം

2.വയലാ വാസുദേവൻ പിള്ള: തനതു നാടക ദർശനം (ലേഖനം)(നാടകങ്ങൾ നാടക പഠനങ്ങൾ)

MODULE 2: തിരക്കഥ

ചലച്ചിത്ര കലയെക്കുറിച്ചുള്ള സാമാന്യമായ അറിവ്. തിരക്കഥ എന്ന സാഹിത്യ വിഭാഗത്തെ പരിചയപ്പെടുത്തൽ.

1.എം ടി വാസുദേവൻ നായർ: പെരുന്തച്ചൻ (തിരക്കഥ)

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2. അടൂർ ഗോപാലകൃഷ്ണൻ: സംവിധായകന്റെ കല (ലേഖനം)(സിനിമയുടെ ലോകം)

MODULE 3: ആത്മകഥ/സ്മരണ

ആത്മകഥ, ജീവചരിത്രം തുടങ്ങിയ സാഹിത്യരൂപങ്ങളെ പരിചയപ്പെടുത്തൽ.

1. വി. ടി. ഭട്ടത്തിരിപ്പാട്: കൊടാത്ത തീ നാളങ്ങൾ (കണ്ണീരും കിനാവും)

2.പി. കുഞ്ഞിരാമൻ നായർ: പുഷ്പഗോപുരം (കവിയുടെ കാൽപ്പാടുകൾ)

3. റോസി തോമസ്:നീലക്കടലാസിൽ പൊതിഞ്ഞ പച്ചക്കുതിര (ഇവ്നെന്റെ പ്രിയ സി.ജെ.)

4.ഈച്ചരവാരിയർ കരുതിവെച്ച ഒരിലച്ചോറ്: അച്ഛൻറെ ഓർമ്മകുറിപ്പുകൾ)

MODULE 3, 4: സഞ്ചാരസാഹിത്യം

മലയാള സഞ്ചാര സാഹിത്യ ശാഖയെ കുറിച്ച് സാമാന്യധാരണ രൂപപ്പെടുത്തുക.

1.രാജൻ കാക്കനാടൻ: ഹിമവാന്റെ മുകൾത്തട്ടിൽ.

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PHY3B03: ELECTRODYNAMICS I

COURSE DETAILS

Course Code	PHY3B03
Title of the course	ELECTRODYNAMICS I
Semester in which the Course to be Taught	3
Number of Credits	3
Number of Contact Hours	54 (3Hrs. /Wk.)

COURSE OUTCOME (COs)

	Course Outcome	PSO	CL	KC	Class Sessions Allotted
CO1	Understand and apply the fundamentals of vector calculus	PSO1	Ap	C	10
CO2	Understand and analyze the electrostatic properties of physical systems	PSO1	An	C, P	16
CO3	Understand the mechanism of electric field in matter.	PSO1	U	C,P	8
CO4	Understand and analyze the magnetic properties of physical systems	PSO1	An	C,P	12
CO5	Understand the mechanism of magnetic field in matter.	PSO1	U	C,P	8

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MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	2	1	2	1	1	0	0	1	1	3	0	0	0	0
CO2	3	2	2	2	1	2	1	1	0	0	1	1	3	0	0	0	0
CO3	3	2	2	2	1	2	1	1	0	0	1	1	3	0	0	0	0
CO4	3	2	2	2	1	2	1	1	0	0	1	1	3	0	0	0	0
CO5	3	2	2	2	1	2	1	1	0	0	1	1	3	0	0	0	0
AVG	2	3	2	2	1	2	1	1	0	0	1	1	3	0	0	0	0

COURSE CONTENT

UNIT 1 –VECTORCALCULUS [10 HRS]

Vector Algebra: Vector operations-Vectoralgebra: Component form–Triple products–Position, Displacement and Separation vectors – How vectors transform. Differential Calculus: "Ordinary" derivatives – Gradient – The Del operator – Divergence – Curl – Product rules – Second derivatives. Integral Calculus: Line integral, surface integral and volume integral – Fundamental theoremofcalculus–FundamentaltheoremforGradients, Fundamentaltheoremfordivergences: Gauss's Divergence Theorem (n o proof needed) – Fundamental theorem for curls:Stoke's theorem (no proof needed). Spherical polar coordinates – Cylindrical coordinates – Their relationship to Cartesian coordinates – Expressing differential displacement vector, differential area vectors, differential volume element, gradient operator, divergence operator and curl operator in spherical polar and cylindrical coordinates. Dirac delta function: Divergence of $r\hat{}$– One-dimensionaldelta function–Three-dimensional delta function.Helmholtz theorem(noproofneeded)–Divergence- less vector fields – Curl-less vector fields – Potentials.

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[Sections 1.1 to 1.6 of *Introduction to Electrodynamics* (4th Edn.) by David J Griffiths.]

UNIT 2–ELECTROSTATICS [16 HRS]

Electrostatic field – Coulomb's law, Electric field, Continuous charge distributions - Divergence and curl of electrostatic field, Field lines and Gauss's law, The divergence of **E**, Applications of Gauss law, Curl of **E** – Electric potential – Comments on potential, Poisson's equation and Laplace's equation, The potential of a localized charge distribution, Electrostatic conditions – Work and energy in electrostatics, The work done in moving a charge, The energy of point charge distribution, The Energy of a continuous charge distribution, Comments on Electrostatic energy – Conductors, Basic properties of conductors, Induced charges, The Surface charge on a conductor, The force on surface charge, Capacitors.

[Sections 2.1 to 2.5 of *Introduction to Electrodynamics* by David J Griffiths. Additionalproblems should be done from chapters 1, 2 and 3 of Berkeley Physics Course: Vol.2: *Electricity and Magnetism* (2nd Edn.) by Edward MPurcell.]

UNIT 3 – ELECTRIC FIELDSIN MATTER [8 HRS]

Polarization–Dielectrics,Induced dipoles,Alignment of polar molecules, Polarization–Thefield of a polarized object , Bound charges, Physical interpretation of bound charges, The field insidea dielectric – The electric displacement – Gauss's law in presence of dielectrics, Boundary conditions for D– Linear dielectrics, Susceptibility, Permittivity, Dielectric constant, Boundary value problems with linear dielectrics, Energy in dielectric conditions–Work and energy in electrostatics,The work done in moving a charge,The energy of point charge distribution, The Energy of a continuous charge distribution, Comments on Electrostatic energy – C systems, Forces on dielectrics.

[Sections4.1to4.4 of *Introduction to Electrodynamics* (4thEdn.) by David.J.Griffiths. Additional problems should be done from chapter 10 of

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Berkeley Physics Course: Vol.2: Electricity and Magnetism (2nd Edn.) by Edward MPurcell.]

UNIT 4–MAGNETOSTATICS 12 HRS

The Lorentz force law – Magnetic fields, Magnetic forces, cyclotron motion, cycloid motion, Currents, Linear, Surface and Volume current density – Biot - Savart law, The magnetic field of steady current – Divergence and curl of **B,** Straight line currents, Applications of Ampere's law, Magnetic field of a toroidal coil, Comparison of magnetostatics and electrostatics – Magnetic vector potential, Vector potential, Magnetostatic boundary conditions.

[Sections5.1to5.4.2of *Introduction to Electrodynamics* (4thEdn.)byDavidJGriffiths.Additional problems should be done from chapter 6 of *Berkeley Physics Course: Vol.2: Electricity and Magnetism* (2nd Edn.) by Edward MPurcell.]

UNIT 5 – MAGNETOSTATIC FIELDSINMATTER 8 HRS

Magnetization – Diamagnets, Paramagnets and Ferromagnets, Torques and forces on magnetic dipoles,Effect of a magnetic field on atomic orbits ,Magnetization–Fieldofamagnetised object, Bound Currents, Physical interpretation of bound currents, Magnetic field inside matter – Auxiliary field H, Ampere's law in magnetized materials, Boundary conditions – Linear and nonlinear media, Magnetic susceptibility and permeability, Ferromagnetism.

[Sections6.1to6.4of *Introduction to Electrodynamics* (4thEdn.) by David.J.Griffiths.Additional problems should be done from chapter 11 of *Berkeley Physics Course: Vol.2: Electricity and Magnetism* (2nd Edn.) by Edward MPurcell.]

BOOKS OF STUDY

1. David J Griffiths, In*troduction to Electrodynamics*, 4thEdn., Prentice Hall India Learning Pvt.Ltd.

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2. Edward M.Purcell, *Berkeley Physics Course:Vol.2: Electricity and Magnetism*, 2nd Edn.– McGraw-Hill

REFERENCE BOOKS

1. Arthur F Kip, *Electricity and Magnetism*
2. Resnick and Halliday, *Physics Vol. II.*
3. Hugh D Young and Roger A Freedman, *Electricity and Magnetis.*
4. M R Spiegel,S Lipschutz,D Spellman, *Vector Analysis -Schaum's outline,* McGrawHill
5. Div, Grad, Curl and *et. al*, *An Informal Text on Vector Calculus*, H M Schey (Norton)
6. Edminister, *Electromagnetics– Schaum's Outline*, Tata McGrawHill
7. NPTEL video lectures available online

MARK DISTRIBUTION FOR SETTING QUESTION PAPER.

Unit/Chapter	Title	Marks
1	Vector Calculus	15
2	Electrostatics	22
3	Electric fields in matter	12
4	Magnetostatics	18
5	Magnetostatic fields in matter	12
Total Marks *		**79**

*Total marks include that for choice of questions in sections A, B and C in the question paper.

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MTS3C03: MATHEMATICS - 3

COURSE DETAILS

Course Code	MTS3C03
Title of the course	Mathematics - 3
Semester in which the Course to be Taught	3
Number of Credits	3
Number of Contact Hours	5 Hrs./Wk.

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	Understand vector function , partial derivatives and its application	Understand
CO2	Understand vector calculus and double integrals	Understand
CO3	Understand Tripple integral and complex numbers	Understand
CO4	Understand contour ingral theorem , Cauchy-Goursat Theorem and its application	Apply

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MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	3	3	2	2	2	1	1	2	2	2	0	0	0	2	0
CO2	2	2	3	3	2	2	2	1	1	2	2	2	0	0	0	2	0
CO3	2	2	3	3	2	2	2	1	1	2	2	2	0	0	0	2	0
CO4	2	2	3	3	2	2	2	1	1	2	2	2	0	0	0	2	0
AVG	2	2	3	3	2	2	2	1	1	2	2	2	0	0	0	2	0

COURSE CONTENT

MODULE I

Vector Functions - Vector-Valued Functions, Limits, Continuity, and Derivatives, Geometric Interpretation of r (t), Higher-Order Derivatives, Integrals of Vector Functions, Length of a Space Curve, Arc Length as a Parameter

Motion on a Curve - Velocity and Acceleration, Centripetal Acceleration, Curvilinear Motion in the Plane Curvature and components of Acceleration-definition, Curvature of a Circle, Tangential and Normal Components of Acceleration, The Binormal, Radius of Curvature

Partial Derivatives - Functions of Two Variables, Level Curves, Level Surfaces, Higher-Order and Mixed Derivatives, Functions of Three or More Variables, Chain Rule, Generalizations

Directional Derivative - The Gradient of a Function, A Generalization of Partial Differentiation, Method for Computing the Directional Derivative, Functions of Three Variables, Maximum Value of the Directional Derivative, Gradient Points in Direction of Most Rapid Increase of f

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Tangent planes and Normal Lines - Geometric Interpretation of the Gradient, Tangent Plane, Surfaces Given by z = f(x, y), Normal Line

MODULE II

Curl and Divergence - Vector Fields, definition of curl and divergence, Physical Interpretations

Line Integrals - definition of smooth.closed and simple closed curves, Line Integrals in the Plane, Method of Evaluation-curve as explicit function and curve given parametrically, Line Integrals in Space, Method of Evaluation, Work, and Circulation

Independence of Path - Conservative Vector Fields, Path Independence, A Fundamental Theorem, definition of connected,simply connected and multiconnected regions, Integrals Around Closed Paths, Test for a Conservative Field, Conservative Vector Fields in 3-Space, Conservation of Energy

Double Integral - Integrability, Area, Volume, Properties, Regions of Type I and II, Iterated Integrals, Evaluation of Double Integrals (Fubini theorem), Reversing the Order of Integration, Laminas with Variable Density—Center of Mass, Moments of Inertia, Radius of Gyration

Double Integrals in Polar Coordinates- Polar Rectangles, Change of Variables: Rectangular to Polar Coordinates,

Green's Theorem - Line Integrals Along Simple Closed Curves, Green's theorem in plane, Region with Holes,

Surface Integral - Surface Area, Differential of Surface Area, Surface Integral, Method of Evaluation, Projection of S into Other Planes, Mass of a Surface, Orientable Surfaces, Integrals of Vector Fields-Flux,

Stokes's Theorem - Vector Form of Green's Theorem, Green's Theorem in 3-Space-Stoke's Theorem, Physical Interpretation of Curl

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MODULE III

Triple Integral - definition, Evaluation by Iterated Integrals,Applications, Cylindrical Coordinates, Conversion of Cylindrical Coordinates to Rectangular Coordinates, Conversion of Rectangular Coordinates to Cylindrical Coordinates, Triple Integrals in Cylindrical Coordinates, Spherical Coordinates, Conversion of Spherical Coordinates to Rectangular and Cylindrical Coordinates, Conversion of Rectangular Coordinates to Spherical Coordinates, Triple Integrals in Spherical Coordinates

Divergence Theorem - Another Vector Form of Green's Theorem, divergence or Gauss' theorem, (proof omitted), Physical Interpretation of Divergence

Change of Variable in Multiple Integral- Double Integrals, Triple Integrals

Complex Numbers - definition, arithmetic operations, conjugate, Geometric Interpretation

Powers and roots - Polar Form, Multiplication and Division, Integer Powers of z , DeMoivre's Formula, Roots 17.3: Sets in the Complex Plane- neighbourhood', open sets, domain, region etc.

Functions of a Complex Variable - complex functions, Complex Functions as Flows, Limits and Continuity, Derivative, Analytic Functions - entire functions

Cauchy Riemann Equation - A Necessary Condition for Analyticity, Criteria for analyticity, Harmonic Functions, Harmonic Conjugate Functions,

Exponential and Logarithmic function - (Complex) Exponential Function, Properties, Periodicity, ('Circuits' omitted), Complex Logarithm-principal value, properties, Analyticity

Trigonometric and Hyperbolic functions - Trigonometric Functions, Hyperbolic Functions, Properties -Analyticity, periodicity, zeros etc.

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MODULE IV

Contour integral- definition, Method of Evaluation, Properties, ML- inequality. Circulation and Net

Cauchy-Goursat Theorem- Simply and Multiply Connected Domains, Cauchy's Theorem, Cauchy-Goursat theorem, Cauchy-Goursat Theorem for Multiply Connected Domains,Independence of Path- Analyticity and path independence, fundamental theorem for contour integral, Existence of Antiderivative. Cauchy's Integral Formula - First Formula, Second Formula-C.I.F. for derivatives. Liouville's Theorem, Fundamental Theorem of Algebra

TEXTBOOK

1. Dennis G Zill Jones & Bartlett Learning, *Advanced Engineering Mathematics* (6/e): LLC(2018)ISBN: 9781284105902

REFERENCES

2. Soo T Tan, *Calculs*, Brooks/Cole, Cengage Learning(2010)ISBN 0-534-46579-X
3. Gilbert Strang, *Calculus*, Wellesley Cambridge Press(1991)ISBN:0-9614088-2- 0
4. Ron Larson. Bruce Edwards, *Calculus* (11/e) Cengage Learning(2018) ISBN: 978-1-337-27534-7
5. Robert A Adams & Christopher Essex, *Calculus several Variable* (7/e) Pearson Education Canada (2010) ISBN: 978-0-321-54929-7
6. Jerrold Marsden & Anthony Tromba, *Vector Calculus* (6/e) W. H. Freeman and Company ISBN 978-1-4292-1508-4
7. Peter V O'Neil, *Advanced Engineering Mathematics* (7/e) Cengage Learning(2012)ISBN: 978-1 -111 -42741 -2
8. Erwin Kreyszig, *Advanced Engineering Mathematics* (10/e) John Wiley & Sons(2011) ISBN: 978-0-470-45836-5

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9. Glyn James, *Advanced Modern Engineering Mathematics* (4/e) Pearson Education Limited(2011) ISBN: 978-0-273-71923-6.

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CSC3C03 – PROBLEM SOLVING USING C

COURSE DETAILS

Course Code	CSC3C03
Title of the course	Problem Solving Using C
Semester in which the Course to be Taught	3
Number of Credits	2
Number of Contact Hours	80 (3 T Hrs./Wk. + 2 L Hrs./Wk.)

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	Understand features of the C Language	Understand
CO2	Apply C language features to problem solving	Apply
CO3	Develop solutions to real-life problems using C	Create
CO4	Develop solutions to real-life problems using files	Create

MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	3	3	2	2	2	1	1	2	2	2	0	0	0	2	0
CO2	2	2	3	3	2	2	2	1	1	2	2	2	0	0	0	2	0
CO3	2	2	3	3	2	2	2	1	1	2	2	2	0	0	0	2	0

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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO4	2	2	3	3	2	2	2	1	1	2	2	2	0	0	0	2	0
AVG	2	2	3	3	2	2	2	1	1	2	2	2	0	0	0	2	0

COURSE CONTENT

UNIT I [9T+7L]

Introduction to C- Structure of C program, Character Set/ Keywords, Identifiers, Data Types, Qualifiers, Variables, Declarations, Symbolic Constants, Expressions, Statements, Different Types of Operators (Arithmetic, Logical, Relational & Equality, Unary and Conditional), Operator Precedence and Associativity, Library Functions, Comments, I/O functions-(Formatted scanf() &printf(), getchar (), putchar (), getche(), gets(), puts())

UNIT II [9 T+7L]

Control Statements- Selection Statements (if, if-else, else if ladder, switch), iteration (while, do while, for), jumping (goto, break, continue), Nested Control Statements

UNIT III [10 T+6L]

Structured Data types - Arrays (One dimensional and Two Dimensional), Character and String Functions, Structure (Definition,Processing-period Operator), Union.

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UNIT IV [10 T+6L]

User defined Functions - Advantages, Definition, Accessing functions, formal and ActualParameters, Recursion, Storage Classes- Automatic, External, Static and Register Variable, Argument Passing Mechanism

UNIT V [11T+6L]

Pointers and data files- Pointers, advantages, declaration, operations on pointers, pointers and one dimensional arrays, dynamic memory allocation. Data files (sequential), file handling functions (fopen(), fclose(), fputc(), fgetc(), fgets(), fputs(), fscanf(), fprintf().

1. E Balagurusamy, Programming in Ansi C, Tata McGraw Hill

REFERENCES:

2. Byran Gotfried, Programming with C, Schaum Series
3. Kezningham & Ritchie,Programming in C
4. Yashvant Kanetkar, Let us C, BPB publications
5. Mullish Cooper, The spirit of C, Jasco books
6. Herbert Schildt, The Complete reference C, Tata McGraw Hill

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DEPARTMENT OF PHYSICS

CURRICULUM FOR B.ScPHYSICS

SEMESTER IV

Course	Code	Course	Hours	Credit	IE	EE	Total
Common IX	ENG4A06	Spectrum: Literature and Contemporary Issues	5	4	20	80	100
Common X	ARB4A10	Arabic Literature and Culture	5	4	20	80	100
	HIN4A10 (1)	Novel and Short Stories					
	MAL4A10 (1)	Malayala Sahithyam - 3					
Core 5	PHY4B04	Electrodynamics-1I	3	3	15	60	75
Core 6	PHY4B05	Physics Practicl 1	2	5	20	80	100
Complementary	MTS4C04	Mathematics	5	3	15	60	75
Complementary	CSC4C04	Computer Science	3	3	15	60	75
Complementary	CSC5C05	Computer Science practical	2	4	20	80	100
Ability Enhancement/ Audit 4	AUD4E04	Gender Studies/Gerontology	--	4		100	100
Total			25	23			

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ENG4A06: SPECTRUM: LITERATURE AND CONTEMPORARY ISSUES

COURSE DETAILS

Course Code	ENG4A06
Title of the course	Spectrum: Literature and Contemporary Issues
Semester in which the Course to be Taught	4
Number of Credits	4
Number of Contact Hours	90 (5Hrs. /Wk.)

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	To make the learners aware of the humanist dimensions of literature and media in the contemporary world	Understand
CO2	To enable the learners to understand concepts like globalization, commercialization and intellectual property rights through new literatures.	Understand
CO3	To inculcate the spirit of universal brotherhood by presenting critique of race, xenophobia, war and national borders.	Understand
CO4	To disseminate knowledge about the rights of minorities such as children, animals and the	Apply

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Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
	disabled and thus create a positive change in the societal perception of them.	

MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	0	1	1	2	2	2	2	3	2	2	3	2	0	0	0	0	0
CO2	0	1	1	2	2	2	2	3	2	2	3	2	0	0	0	0	0
CO3	0	1	1	2	2	2	2	3	2	2	3	2	0	0	0	0	0
CO4	0	1	1	2	2	2	2	3	2	2	3	2	0	0	0	0	0
AVG	0	1	1	2	2	2	2	3	2	2	3	2	0	0	0	0	0

OBJECTIVES OF THE COURSE

(a) To make the learners aware of the liberal humanist dimensions of literature and media in the contemporary world.

(b) To enable the learners to understand concepts like globalization, commercialization and Intellectual Property Rights through new literatures.

(c) To inculcate the spirit of universal brotherhood by presenting critiques of race, Xenophobia, war and national borders.

(d) To disseminate knowledge about the rights of minorities such as children, animals and the disabled and thus create a positive change in the societal perception of them

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COURSE SUMMARY

MODULE	Hrs.
Module 1: Literature and Media	15
Module 2: Globalization and IPR	15
Module 3: Nation and its Boundaries	24
Module 4: The Marginalized and their Rights	24
Evaluation	12
Total	**90 Hrs.**

COURSE DETAILS

MODULE 1: LITERATURE AND MEDIA

1) *Divided Times*: Amanda Michalopoulou
2) *Komala*: Santhosh Echikkanam

MODULE 2: GLOBALIZATION AND IPR

1) *Cheriya Meenukalum Valiya Malsyavum*: N. P. Hafis Mohammed
2) *Manjal*: Satchidanandan
3) *What Work Is*: Philip Levine

MODULE 3: NATION AND ITS BOUNDARIES

1) *Home*: Warsan Shire
2) *Love Across the Salt Desert*: K. N. Daruvalla
3) *No Men are Foreign*: James Kirkup
4) *Death Fugue*: Paul Celan
5) *Jamaican Fragment*: A. L. Hendricks

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MODULE 4: THE MARGINALIZED AND THEIR RIGHTS

1) *UN Speech*: Malala Yousufzai (July 12, 2013)
2) *Caring for Animals*: Jon Silkin
3) *The Cry of the Gull*: Emmanuelle Labroire (Excerpts)
4) *Average Waves in Unprotected Waters*: Anne Tyler

CORE TEXT:

BoS, University of Calicut (2019). Spectrum: Literature and Contemporary Issues, University of Calicut.

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ARB4A10: ARABIC LITERATURE AND CULTURE

COURSE DETAILS

Course Code	ARB4A10
Title of the course	Arabic Literature and Culture
Semester in which the Course to be Taught	4
Number of Credits	4
Number of Contact Hours	90 (5Hrs./Wk.)

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	To make opportunities before the learner to acquaint with classical Literature having ethical association.	Understand
CO2	To introduce to the students the Arabic literary contributions of different Indian writers	Analyse
CO3	Understanding the contribution of Indians to Arabic language and literature and drawing inspirations from it.	Understand
CO4	Understanding Arab literary history of the classical and modern period	Understand

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MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0
CO2	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0
CO3	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0
CO4	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0
AVG	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0

AIM OF THE COURSE

The aim of the course is enable the students who opt Arabic language as common course to use Arabic language in daily life especially in communication

OBJECTIVES OF THE COURSE

(d) To enjoy Arabic language through stories, drama and poems.
(e) To acquire the vocabularies of Arabic language.
(f) To practice the use of Arabic language in various situations and occasions..

COURSE DETAILS

MODULE I - ALHIKMATH

1) *Athau Ribaviyya* (Muhammed Muthavalli shiravi)
2) *Ajaibul Ajviba* (Ibnu Asakir
3) Al Haqeeqathul Kamila houfeequl Hakeem)

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MODULE II – ASSEERATH

4) *Al Imam Shafi* (Abo Zahrath)
5) *Ibnul Haisam* (Dr. Abdul Haleem Munthasir)
6) *Moulana Muhammed Ali* (Ahmad Shouqi)

MODULE III- ASSAQAFATH

7) *Al Manara Thathahaddasu* (Abul Hasan Ali Nadvi)
8) *Ibrathul Hijra* (Musthafa Luthful Manfaloothi)
9) *Naseehathu Mina Azkiya* (Zainudheen Makhdoom)

PRESCRIBED TEXT BOOK

Abdul Azeez M. (2019). *Al Ibar*.

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HIN4A10 (1): NOVEL AND SHORT STORIES

COURSE DETAILS

Course Code	HIN4A10(1)
Title of the course	Novel and Short Stories
Semester in which the Course to be Taught	4
Number of Credits	4
Number of Contact Hours	90 (4Hrs./Wk.)

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	Understand the common techniques underlying free verse and traditional forms of poetry.	Understand
CO2	Identify personal experiences that can be used when writing poetry.	Understand
CO3	Understand the basic terminology and practical elements of poetry.	Understand

MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0
CO2	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0

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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO3	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0
AVG	**0**	**1**	**1**	**2**	**2**	**2**	**2**	**3**	**3**	**2**	**3**	**2**	**0**	**0**	**0**	**0**	**0**

AIM OF COURSE

To sensitize the students to aesthetic, cultural and social aspects of literacy appreciation and analysis.To provide them the best specimens of Hindi fiction of eminent authors of different periods.

OBJECTIVE OF THE COURSE

(1) To acquaint the students with different forms of thoughts and styles of Hindi fiction.

(2) To help them develop their thinking and writing.

COURSE DETAILS

MODULE 1: Short stories from the collection.

MODULE 2: Short stories from the collection.

MODULE 3: Novel.

PRESCRIBED TEXT BOOKS:

(1) UG Hindi Board of Studies, University *of* Calicut (Ed.), *Sadabahar Kahaniyan*, Rajpal and Sons, Mad.Rasa Road, Kashmiri Gate, New Delhi.

(2) Sapnon Kee Hom Delivery - Mamata Kaaliaya, Lokbharati Prakashan, Darbari Building, M.G Road, Civil Lines, Allhabaad

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READING LIST:

1. *Eedgaah* -Premchand
2. *Jaj Ka Faisala* - Vishnuprabhaakar
3. *Aparaadh* - Udayprakaash
4. *Pitha* - Gyanranjan
5. *Partition* - Swayamprakaash
6. *Em Dot Com* - S.R.Hrnot
7. *Sapnon Kee Hom Delivery* - Mamta Kaliya

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MAL4A10(1): *MALAYALA SAHITHYAM* - 4

COURSE DETAILS

Course Code	MAL4A10(1)
Title of the course	*Malayala Sahithyam* 4
Semester in which the Course to be Taught	2
Number of Credits	4
Number of Contact Hours	80 (5Hrs. /Wk.)

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	To write clearly, effectively, and creatively, and adjust writing style appropriately to the content, the context, and nature of the subject.	Understand
CO2	To acquire the correct sense of format, syntax, grammar, punctuation and spelling.	Apply
CO3	To acquire concepts, principles and vocabulary of reasoning and argumentation and use analysis, synthesis, and evaluations.	Apply
CO4	To gain an understanding of discourse conventions ranging from structure and paragraphing to tone and mechanics.	Understand

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MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0
CO2	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0
CO3	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0
CO4	0	1	1	2	2	2	2	3	3	2	3	2	0	0	0	0	0
AVG	**0**	**1**	**1**	**2**	**2**	**2**	**2**	**3**	**3**	**2**	**3**	**2**	**0**	**0**	**0**	**0**	**0**

AIM OF COURSE

ഭാഷ എഴുത്ത് വിവർത്തനം സംസ്കാരപഠനം എന്നിവയ്ക്കൊപ്പം നോവൽ എന്ന സാഹിത്യരൂപത്തെയും പരിചയപ്പെടുത്തുക

COURSE DETAILS

MODULE 1:

1. കെ.എം.പ്രഭാകരവാര്യർ: ഭാഷയും ആശയവിനിമയവും (ഭാഷയും മനശാസ്ത്രവും)
2. സി. വി. വാസുദേവ ഭട്ടതിരി: വ്യഥാസ്ഥലത (നല്ല മലയാളം)
3. എം. എൻ. കാരശ്ശേരി തീറ്റയും ജനാധിപത്യവും, ഭംഗിവാക്ക് (താഴ്മൊഴി)
4.പി.പവിത്രൻ: ഡോക്ടർമാരുടെ രോഗം, വേണ്ടത് സൗന്ദര്യാത്മക വിദ്യാഭ്യാസം (മാതൃഭാഷയ്ക്ക വേണ്ടിയുള്ള സമരം)

MODULE 2: വിവർത്തനം

വിവർത്തനം – നിർവചനങ്ങൾ – പൊതുതത്വങ്ങൾ, വിവർത്തനരീതികൾ – ലിപ്യന്തരണം, വിവര്ത്തനതിന്റെ സാംസ്കാരിക ധർമ്മം എന്നിവയെക്കുറിച്ച് സാമാന്യധാരണ രൂപപ്പെടുത്തുക.

1. കെ. പി. ശങ്കരൻ: അപ്രാപ്യമായ ഒരു വിതാനം(ലേഖനം)

2. റൂമി: വ്യാജസൂചനകൾ (കവിത) (വിവർത്തനം. കെ. ജയകുമാർ)

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ഓംപ്രകാശ് വാല്മീകി: എച്ചിൽ(ത്യാഗി ഇന്റർ കോളേജ് ഗ്രാമത്തിനു പുറത്താണ്... കടന്നു വന്നിരുന്നു എന്ന് നിസംശയം വരെ)

കൂടാതെ, ആശയവിനിമയ രീതികളുടെ പരിശീലനം പൊതു വിഷയത്തെ ആസ്പദമാക്കി ഉപന്യാസരചന പരിശീലിക്കൽ, വാക്യങ്ങളിലെ തെറ്റ് തിരുത്താൻ പഠിക്കുക, സത്ത ചോർന്നുപോകാതെ സംഗ്രഹിഹിക്കാൻ പരിശീലിക്കുക.

MODULE 3: സാംസ്കാരിക ചരിത്രം

1.എം. ഗോവിന്ദൻ: അറിവിൻറെ ഫലങ്ങൾ (എം. ഗോവിന്ദന്റെ ഉപന്യാസങ്ങൾ)

2. എം. വി. വിഷ്ണു നമ്പൂതിരി: വ്യക്തിനാമപഠനങ്ങൾ(നാട്ടറിവും നാമപഠനവും 6.1 മുതൽ 6.6 വരെ ഭാഗങ്ങൾ)

3. എം. കെ. സാനു: മനുഷ്യരെല്ലാം സോദരർ(നാരായണഗുരുസ്വാമി അദ്ധ്യായം 12)

MODULE 4: നോവൽ

നന്ദനാർ: അനുഭവങ്ങൾ

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PHY4B04: ELECTRODYNAMICS II

COURSE DETAILS

Course Code	PHY4B04
Title of the course	ELECTRODYNAMICS II
Semester in which the Course to be Taught	4
Number of Credits	3
Number of Contact Hours	54 (3Hrs. /Wk.)

COURSE OUTCOME (COs)

	Course Outcome	PSO	CL	KC	Class Sessions Allotted
CO1	Understand the basic concepts of electrodynamics	PSO1	U	C	15
CO2	Understand and analyze the properties of electromagnetic waves	PSO1	An	C, P	15
CO3	Understand the behavior of transient currents	PSO1	U	C	8
CO4	Understand the basic aspects of ac circuits	PSO1	An	C,P	8
CO5	Understand and apply electrical network theorems	PSO1	Ap	C,P	8

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MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	2	1	2	1	1	0	0	1	1	3	0	0	0	0
CO2	3	2	2	2	1	2	1	1	0	0	1	1	3	0	0	0	0
CO3	3	2	2	2	1	2	1	1	0	0	1	1	3	0	0	0	0
CO4	3	2	2	2	1	2	1	1	0	0	1	1	3	0	0	0	0
CO5	3	2	2	2	1	2	1	1	0	0	1	1	3	0	0	0	0
AVG	3	2	2	2	1	2	1	1	0	0	1	1	3	0	0	0	0

COURSE CONTENT

UNIT 1–ELECTRODYNAMICS [15 HRS]

Electromotive force–Ohm'slaw,electromotive force,motional emf–Electromagnetic induction Faraday's law,induced electric field, inductance,energy in magneticfields– Maxwell'sequations Electrodynamics before Maxwell, Maxwell's modification of Ampere's law, Maxwell's equations, Magnetic charge,Maxwell's equations inside matter,Boundary conditions–Continuity equation – Poynting'stheorem

[Sections 7.1 to 7.3 and 8.1 of Introduction to Electrodynamics by David J Griffiths. Additional problems should be done from chapter 7 of Berkeley Physics Course: Vol.2: Electricity and Magnetism (2nd Edn.) by Edward M Purcell.]

UNIT 2 –ELECTROMAGNETICWAVES [15 HRS]

Waves in one dimension, The wave equation, sinusoidal waves, boundary conditions : reflection and transmission, Polarization – Electromagnetic waves in vacuum , Waveequation for **E** and **B**, monochromatic plane waves in vacuum, energy and momentum ofE.M. waves, Poynting vector – Electromagnetic waves

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in matter, Propagationthroughlinearmedia, reflectionandtransmissionat normal incidence. Potential formulation – Scalar and vector potentials, Gauge transformations, Coulomb gauge and Lorentz gauge.

[Sections9.1to9.3.2and10.1of*IntroductiontoElectrodynamics*byDavidJGriffiths.Additional problems should be done from chapter 9 of *Berkeley Physics Course: Vol.2: Electricity and Magnetism* (2nd Edn.) by Edward MPurcell.]

UNIT 3 –TRANSIENTCURRENTS [8 HRS]

Types of transients – DC transient currents in R-L circuits – Short circuit current – Time constant DC transient currents in R-C circuits – Double energy transients – TheoryofBG

[Sections 22.1, 22.2, 22.4, 22.5, 22.6, 22.8, 22.10 and 10.52 of *Electrical Technology* Vol. 1 by B.L. Theraja and A. K. Theraja]

UNIT 4 –ACCIRCUITS [8 HRS]

A resonant circuit – Alternating current – Alternating current networks – Admittance and impedance – Power and energy in AC circuits

[Sections 8.1 to 8.5of *Berkeley Physics Course: Vol.2: Electricity and Magnetism* (2nd Edn.) by Edward M Purcell. Additional problems should be done from the relevant sections from chapters 13 and 14 of the book of *Electrical Technology* Vol. 1 by B. L. Theraja and A. K. Theraja]

UNIT 5 –NETWORKTHEOREMS [8 HRS]

Kirchhoff's laws, Voltage sign and current direction, Solution of simultaneous equations using determinants, Source conversion, Superposition theorem, Ideal equivalent circuits,Thevenin's theorem, Reciprocity theorem, Delta/Star transformation Star/Delta transformation–Norton's theorem, Maximum powertransfertheorem.

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DEPARTMENT OF PHYSICS
CURRICULUM FOR B.ScPHYSICS

[Sections 2.2 to 2.6, 2.14 to2.23, 2.25, 2.26, 2.27 and 2.30 from *ElectricalTechnology*, Vol. 1 byB. L. Theraja and A. K. Theraja]

BOOKS OF STUDY

1. DavidJGriffiths,*IntroductiontoElectrodynamics*,4thEdn., PrenticeHallIndiaLearning Pvt.Ltd
2. EdwardM.Purcell,*BerkeleyPhysicsCourse:Vol.2:ElectricityandMagnetism*,2nd Edn.,McGraw-Hill
3. B. L. Theraja, A. K. Theraja,*A Text Book of Electrical Technology,* Vol. 1, S. Chand Publishers, 1997

REFERENCE BOOKS

4. Arthur FKip,*Electricity and Magnetism*
5. Resnick andHalliday,*Physics*, Vol. II
6. D.N Vasudeva,*Electricity and Magnetism* (12threviseddedition)
7. K Mann & G J Russell,*Introductory AC Circuit theory,* UniversitiesPress
8. NPTEL video lectures availableonline

MARK DISTRIBUTION FOR SETTING QUESTION PAPER.

Unit/Chapter	Title	Marks
1	Electrodynamics	22
2	Electromagnetic waves	22
3	Transient currents	12
4	AC circuits	12
5	Network theorems	11
Total Marks *		**79**

*Total marks include that for choice of questions in sections A, B and C in the question paper.

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PHY4B05: PRACTICAL I

COURSE DETAILS

Course Code	PHY4B05
Title of the course	PRACTICAL I
Semester in which the Course to be Taught	1-4
Number of Credits	5
Number of Contact Hours	36 (2Hrs. /Wk.)

COURSE OUTCOME (COs)

	Course Outcome	CL	KC	Class Sessions Allotted
CO1	Apply and illustrate the concepts of properties of matter through experiments	Ap	P	36
CO2	Apply and illustrate the concepts of electricity and magnetism through experiments	Ap	P	36
CO3	Apply and illustrate the concepts of optics through experiments	Ap	P	36
CO4	Apply and illustrate the principles of electronics through experiments	Ap	P	36

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MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	3	2	2	2	1	2	2	1	2	2	0	0	0	0	3
CO2	2	3	3	2	2	2	1	2	2	1	2	2	0	0	0	0	3
CO3	2	3	3	2	2	2	1	2	2	1	2	2	0	0	0	0	3
CO4	2	3	3	2	2	2	1	2	2	1	2	2	0	0	0	0	3
AVG	2	3	3	2	2	2	1	2	2	1	2	2	0	0	0	0	3

COURSE CONTENT

ANY 20 EXPERIMENTS

1. Young's modulus-non uniform bending-using pin and microscope-(load-extension graph)
2. Young's modulus-Uniform bending-using optic lever
3. Moment of inertia-Flywheel (Calculate percentage error and standard deviation)
4. Moment of Inertia-Torsion Pendulum
5. Rigidity modulus-static torsion
6. Compound pendulum-acceleration due to gravity, Radius of gyration
7. Katers pendulum- Acceleration due to gravity
8. Liquid lens-Refractive index of liquid and glass -a) determine R using a)water& b) Buoy's method
9. Spectrometer-solid prism-Refractive index of the material of the prism , measuring angle of minimum deviation
10. Spectrometer-solid prism- Dispersive power

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11. a. Searle's vibration magnetometer- ratio of moments b. Searle's and box type vibration magnetometers-m &Bh.
12. Melde's string arrangement-Frequency, relative density of liquid and solid (both modes)
13. Mirror Galvanometer-figure of merit
14. Potentiometer-calibration of ammeter
15. Ballistic Galvanometer- BG constant using HMS-then findBh.
16. Ballistic galvanometer-Comparison of capacitance- Desauty'smethod
17. Spectrometer- i-dcurve
18. Verification of Thevenin's theorem and maximum power transfertheorem
19. Lissajous figures – Measurement of frequency and phase shift of sinusoidal signals using CRO
20. Cantilever –scale and telescope /pin and microscope
21. Single slit diffraction using LASER
22. Determination of dielectric constant of liquid/thin sheet
23. Thermo emf measurement using digital multimeters - study of Seebeckeffect
24. Thermal conductivity of a good conductor by Searle's method.

BOOKS OF STUDY:

1. K. A. Navas, *Electronics Lab Manual*- (vol 1&2)
2. C LArora, *B.Sc Practical Physics*
3. S. L. Gupta & VKumar, *Practical Physics*

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REFERENCE BOOK

4. B L Worksnop and H T Flin,*Advanced Practical Physicsfor students*

MTS4C04: MATHEMATICS - 4

COURSE DETAILS

Course Code	MTS4C04
Title of the course	Mathematics - 4
Semester in which the Course to be Taught	4
Number of Credits	3
Number of Contact Hours	5 Hrs./Wk.

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	Understand linear Diffferntial equation and its application	Apply
CO2	Understand higher order differential equation	Understand
CO3	Understand Laplace transformand Dirac delta function	Understand
CO4	Understand Fourier Series and its Application	Apply

MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	3	3	2	2	2	1	1	2	2	2	0	0	0	2	0

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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO2	2	2	3	3	2	2	2	1	1	2	2	2	0	0	0	2	0
CO3	2	2	3	3	2	2	2	1	1	2	2	2	0	0	0	2	0
CO4	2	2	3	3	2	2	2	1	1	2	2	2	0	0	0	2	0
AVG	2	2	3	3	2	2	2	1	1	2	2	2	0	0	0	2	0

COURSE CONTENT

MODULE I

Ordinary Differential Equations

Definitions and Terminology- definition, Classification by Type, Classification by Order, Classification by Linearity, Solution, Interval of Definition, Solution Curve, Explicit and Implicit Solutions, Families of Solutions, Singular Solution, Systems of Differential Equations

Initial Value Problems-First- and Second-Order IVPs, Existence of solution

Differential Equations as Mathematical Models - some specific differential-equation models in biology, physics and chemistry.

Solution Curves without Solution-Direction Fields ['Autonomous First- Order DEs' omitted]

Separable Equations- definition. Method of solution, losing a solution, An Integral-Defined Function

Linear Equations-definition, standard form, homogeneous and non homogeneous DE, variation of parameter technique, Method of Solution, General Solution, Singular Points, Piecewise-Linear Differential Equation, Error Function

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Exact Equations- Differential of a Function of Two Variables, Criteria for an exact differential, Method of Solution, Integrating Factors,

Solutions by Substitution-Homogeneous Equations, Bernoulli's Equation, Reduction to Separation of Variables

A Numerical Method- Using the Tangent Line, Euler's Method [upto and including Example 2; rest omitted]

MODULE II

Higher Order Differential Equations

Theory of Linear Equations - Initial-Value and Boundary-Value Problems [Existence and Uniqueness (of solutions), Boundary-Value Problem]

Homogeneous Equations [Differential Operators, Superposition Principle, Linear Dependence and Linear Independence, Wronskian]

Nonhomogeneous Equations [Complementary Function, Another Superposition Principle]

Reduction of Order- a general method to find a second solution of linear second order equation by reducing to linear first order equation

Homogeneous Linear Equations with Constant Coefficients- Auxiliary Equation, Distinct Real Roots , Repeated Real Roots , Conjugate Complex Roots, Higher-Order Equations , Rational Roots ['Use of computer' part omitted]

Undetermined Coefficients- Method of Undetermined Coefficients for finding out particular solution

Variation of parameter- General solution using Variation of parameter technique

Cauchy-Euler Equations- Method of solution, Distinct Real Roots, Repeated Real Roots, Conjugate Complex Roots

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Linear Models & Boundary Value Problems- Deflection of a Beam, Eigenvalues and Eigenfunctions [upto and including Example 3: the rest is omitted]

MODULE III

Laplace Transforms

Definition of Laplace Transform- definition, examples, linearity, Transforms of some basic functions, Sufficient Conditions for Existence of transform,

Inverse Transform and Transforms of Derivative- Inverse Transforms:- A few important inverse transforms, Linearity, Partial Fractions, Transforms of Derivatives, Solving Linear ODEs

Translation Theorems- Translation on the s-axis, first translation theorem, its inverse form, Translation on the t-axis, Unit step function, second translation theorem. Its Inverse form, Alternative Form of second translation theorem. Beams

Additional Operational Properties- Derivatives of Transforms, Transforms of Integrals-convolution, convolution theorem (without proof) and its inverse form, Volterra Integral Equation, Series Circuits ['Post Script- Green's Function Redux' omitted],Transform of a Periodic Function

The Dirac delta Function- Unit Impulse, The Dirac Delta Function and its transform.

MODULE IV

Orthogonal Functions- Inner Product, Orthogonal Functions, Orthonormal Sets, Vector Analogy, Orthogonal Series Expansion, Complete Sets,

Fourier Series-Trigonometric Series, Fourier Series, Convergence of a Fourier Series, Periodic Extension, Sequence of Partial Sums,

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Fourier Cosine and Sine Series- Even and Odd Functions, Properties, Cosine and Sine Series, Gibbs Phenomenon, Half-Range Expansions, Periodic Driving Force,

Separable Partial Differential Equations- Linear Partial Differential Equation, Solution of a PDE, Separation of Variables (Method), Superposition Principle, Classification of Equations (- hyperbolic, parabolic, elliptic)

Classical PDE's and BVP's- Heat Equation, Wave Equation, Laplace's Equation, Initial Conditions, Boundary Conditions, Boundary-Value Problems ('Variations' omitted)

Heat Equation- Solution of the BVP (method of Separation of Variables)

TEXTBOOK

1 Dennis G Zill Jones& Bartlett Learning, *Advanced Engineering Mathematics* (6/e), LLC (2018)ISBN: 9781284105902

REFERENCES

2 Peter V O'Neil, *Advanced Engineering Mathematics* (7/e), Cengage Learning(2012), ISBN: 978-1 -111 -42741 -2

3 Erwin Kreyszig, *Advanced Engineering Mathematics* (10/e) John Wiley & Sons(2011), ISBN: 978-0-470-45836-5

4 Alan Jeffrey, *Advanced Engineering Mathematics*, Harcourt/Academic Press (2002) ISBN: 0-12-382592-X

5 Glyn James, *Advanced Modern Engineering Mathematics* (4/e), Pearson Education Limited(2011), ISBN: 978-0-273-71923-6

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CSC4C04 – DATA STRUCTURE USING C

COURSE DETAILS

Course Code	CSC4C04
Title of the course	Data Structure Using C
Semester in which the Course to be Taught	4
Number of Credits	2
Number of Contact Hours	80 (3 T Hrs. /Wk. + 2 L Hrs. /Wk.)

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	Analyse the complexity of algorithms	Analyse
CO2	Apply the linear data structures to real-life problems	Apply
CO3	Apply the non-linear data structures to real-life problems	Apply
CO4	Perform searching and sorting	Apply

MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	3	3	2	1	2	1	1	2	2	2	0	0	0	2	0
CO2	2	2	3	3	2	1	2	1	1	2	2	2	0	0	0	2	0

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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO3	2	2	3	3	2	1	2	1	1	2	2	2	0	0	0	2	0
CO4	2	2	3	3	2	1	2	1	1	2	2	2	0	0	0	2	0
AVG	2	2	3	3	2	1	2	1	1	2	2	2	0	0	0	2	0

COURSE CONTENT

UNIT I [11 T+6L]

Primitive Data types and Abstract DataTypes (ADT) - Introduction to data structures – definition -characteristics of data structures - categories of data structures – algorithm - space complexity and time complexity of an algorithm (concept only).

UNIT II [7 T+6L]

Arrays and Singly Linked Lists - 1D, 2D and Multi-dimensional arrays - operations on arrays - Sparse matrix Representation

UNIT III [9 T+7L]

Lists- LinkedList- Definition -Creation- Operations, Basics of Doubly Linked List, Circular Linked List.

UNIT IV [11 T+7L]

Stack and Queues - Definition and Operations on stack - Implementation of Stack using arrays and linked lists - Applications of Stacks - Polynomial Addition Queues - Definition, Implementations of queue using arrays and linked lists - basics of Circular queue, DE queue - Applications of queues.

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UNIT V [10 T+7L]

Searching and Sorting: Searching: Linear search & Binary search.

Sorting - Linear sort - Bubble sort - Selection sort - Insertion sort - Quick sort - Merge sort - Comparisons and implementations.

TEXTBOOKS

1) Seymour Lipschutz, *Data Structures*, Tata McGraw-Hill Publishing Company Limited, Schaum's Outlines, NewDelhi.
2) Yedidyan Langsam, Moshe J. Augenstein, and Aaron M. Tenenbaum, *Data Structures Using C*, PearsonEducation., NewDelhi.
3) Horowitz and Sahani, *Fundamentals of data Structures*, Galgotia Publication Pvt.Ltd., New Delhi.

REFERENCE BOOKS

4) Trembley, J.P. and Sorenson P. G., *An Introduction to Data Structures With Applications*, MCGraw- Hill International Student Edition, New York.
5) Mark Allen Weiss, *Data Structures and Algorithm Analysis in C*, Addison-Wesley, (An Imprint of Pearson Education), Mexico City.

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CSC4C05 - PROGRAMMING LAB: C AND DATA STRUCTURE

COURSE DETAILS

Course Code	CSC4C05
Title of the course	Programming Lab: C and Data structure
Semester in which the Course to be Taught	4
Number of Credits	4
Number of Contact Hours	0 Hrs.

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	Apply C programming knowledge to solve real-life problems	Apply
CO2	Analyse algorithms to select efficient one	Analyse
CO3	Apply data structures to solve real-life problems	Apply
CO4	Apply files to solve real-life problems	Apply

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MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	3	3	2	1	2	1	1	2	2	2	0	0	0	2	0
CO2	2	2	3	3	2	1	2	1	1	2	2	2	0	0	0	2	0
CO3	2	2	3	3	2	1	2	1	1	2	2	2	0	0	0	2	0
CO4	2	2	3	3	2	1	2	1	1	2	2	2	0	0	0	2	0
AVG	2	2	3	3	2	1	2	1	1	2	2	2	0	0	0	2	0

COURSE CONTENT

C PROGRAMMING: Write programs and draw flowchart/write algorithms to do the following

1. Find roots of a quadratic equation
2. Find the area and nature of a triangle
3. Find the sum of digits and reverse of a number
4. Find the factorial of a number
5. Find Sin(x)
6. Find Cos(x)
7. Display pyramid using „*“
8. Check for leap year
9. To display count of +ves, -ves and zeros in a set of N numbers
10. Find first n prime numbers
11. Find LCM and HCF of 2 numbers
12. To print Armstrong numbers within range

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13. Evaluate the series 1 + x + x2/2! + x3/3! + …. + xn/n!
14. Convert a decimal number to a new base
15. Find the decimal equivalent of a number(base other than 10)
16. Calculate percentage of marks obtained for N students appeared for examination in Msubjects.
17. To calculate standard deviation of N numbers.
18. To merge two arrays
19. To find Nth Fibonacci number
20. To find row and column totals of a matrix
21. Matrix addition, multiplication and transpose
22. To find the trace of a square matrix
23. To sort n numbers
24. Find the strings end with a particular character
25. Find the number of words in a given sentence
26. To check whether given string is palindrome or not
27. Swapping of two numbers using function
28. Reverse a string using recursion
29. Find the number of vowels in a string
30. To find length of a string using pointer
31. To count the occurrence of a word in a sentence.
32. To generate mark list of N students in a class using array of structures.
33. To insert an element at the correct position in a sorted array
34. To store and read from a text file
35. Write odd and even numbers into two files

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DATA STRUCTURE USING C

1. Sort a given list of strings
2. Search an element in a 1-dimensional array
3. Search an element in a 2-dimensional array
4. Merge two sorted array into one sorted array.
5. Search an element in the array using recursive binary search.
6. Implement sparse matrix
7. Implement polynomial using arrays
8. Implement singly linked list of integers.
9. Delete an element from a singly linked list
10. Implement a doubly linked list of integers
11. Implement a circular linked list.
12. Implement polynomial using linked list
13. Addition of 2 polynomials
14. Implement Stack using array
15. Implement Stack using linked list
16. Implement Queue using array
17. Implement Queue using linked list
18. Implement bubble sort
19. Implement selection sort.
20. Implement insertion sort.
21. Implement quick sort.
22. Implement merge sort.

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DEPARTMENT OF PHYSICS

CURRICULUM FOR B.Sc PHYSICS

SEMESTER V

Course Code	Course Title	Total hours	Hours/ Week	Credits
PHY5 B06	Core Course VI - Computational Physics	54	3	3
PHY5 B07	Core Course VII - Quantum Mechanics	54	3	3
PHY5 B08	Core Course VIII - Optics	54	3	3
PHY5 B09	Core Course IX- Electronics (Analog and Digital)	54	3	3
	Open Course – (course from other streams)	54	3	3
	Core Course Practical XIV - Practical II	72	4	*
	Core Course Practical XV- Practical III	72	4	*
	Core Course XVII Project/Research methodology	36	2	*
	Total	**450**	**25**	**15**

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PHY5B06: COMPUTATIONAL PHYSICS

COURSE DETAILS

Course Code	PHY5B06
Title of the course	COMPUTATIONAL PHYSICS I
Semester in which the Course to be Taught	5
Number of Credits	3
Number of Contact Hours	54 (3Hrs./Wk.)

COURSE OUTCOME (COs)

	Course Outcome	PSO	CL	KC	Class Sessions Allotted
CO1	Understand the Basics of Python programming	PSO4	U	C	14
CO2	Understand the applications of Python modules	PSO4	U	C	8
CO3	Understand the basic techniques of numerical analysis	PSO4	U	C	18
CO4	Understand and apply computational techniques to physical problems	PSO4	Ap	C,P	14

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MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	2	3	2	2	1	2	1	2	1	2	0	0	0	3	0
CO2	2	3	2	3	2	2	1	2	1	2	1	2	0	0	0	3	0
CO3	2	3	2	3	2	2	1	2	1	2	1	2	0	0	0	3	0
CO4	2	3	2	3	2	2	1	2	1	2	1	2	0	0	0	3	0
CO5	2	3	2	3	2	2	1	2	1	2	1	2	0	0	0	3	0
AVG	2	3	2	3	2	2	1	2	1	2	1	2	0	0	0	3	0

COURSE CONTENT

UNIT 1

CHAPTER 1: INTRODUCTION TOPYTHONPROGRAMMING [16 HRS]

Introduction to algorithm, flowchart and high-level Computer programming languages Compilers – Interpreters – Introduction to Python language – Advantages and unique features of Python language Interactive mode and script mode- Writing and execution of programs -various data types in Python- Reading keyboard input: The raw input function and input function - print command, formatted printing- open and write function - Variables, operators, expressions and statements- String operations, Lists, list operations (Len, append, insert, del, remove, reverse, sort, +, *, max, min, count, in, not in, sum), sets, set operations (set, add, remove, in, not in, union, intersection, symmetric difference)-Tuples and Dictionaries ,various control and looping statements: (if,if..else, if..ellif, while, for, break, continue) - user defined functions- Modules - File input and file output- Pickling.

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BOOKS FOR STUDY

1) Dr.Sandeep Nagar, *Introduction to Python for Engineers and Scientists*, Apress publications.
2) Dr. B P Ajithkumar,*Python for Education*, IUAC, New Delhi; e-book freely downloadable from www.expeyes.in/documents/mapy.pdf
3) Guido van Rossum, Fred L. Drake, Jr., (Ed),*Python Tutorial Release 3.0.1*, (http://www.altaway.com/resources/python/tutorial.pdf)

CHAPTER 2: NUMPY AND MATPLOTLIB MODULES [6 HRS]

Numpy module: Introduction, creation of arrays and matrices, various array operations, matrix multiplication, inversion. Matplotlib module: Introduction, plot( ), show( ) functions, syntax for plotting graphs , multiple plots, polar plots, labeling, scaling of axes and coloring plots - Plotting of functions – sin(x), cos(x), exp(x), $\sin^2(x)$,$\sin(x^2)$

BOOKS FOR STUDY

1) Dr. B P Ajithkumar, *Python for Education*, IUAC, New Delhi; e-book freely downloadable from www.expeyes.in/documents/mapy.pdf

UNIT 2

CHAPTER 3: NUMERICAL METHODS IN PHYSICS [18 HRS]

Introduction to numerical methods, Comparison between analytical and numerical methods – CurveFitting:Principleofleastsquares,Leastsquarefittingofastraightline-Interpolation:Finite difference operator, Newton's forward difference interpolation formula, difference table, Firstand secondderivativebyNumerical differentiation – Solution of algebraic equations:Bisectionmethod, Newton-Raphson method - Newton Cote's quadrature formula- Numerical integration by Trapezoidal and Simpson's (1/3) method- Solution of differential equations:

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Euler's method, Runge- Kutta method (Second order) -Taylor's Series expansion of Sin(x) andCos(x).

BOOKS FOR STUDY

1) *Introductory methods of numerical analysis*, S.S.Shastry , (Prentice Hall ofIndia,1983)

2) *Python for Education* by Dr. B P Ajithkumar, IUAC, New Delhi; e-book freely downloadable fromwww.expeyes.in/documents/mapy.pdf

UNIT 3

CHAPTER 4: COMPUTATIONAL PHYSICS [14 HRS]

Formulation: From analytical to numerical methods -Significance of Computer in numerical methods- Applications of Euler's method: Theory, and graphical simulation by programming: motions of a freely falling body, a body dropped into a highly viscous medium, two dimensional projectile motion and radioactive decay - Accuracy considerations (elementary ideas)

(All programs should be written using Python language Version 3.0)

BOOKS FOR STUDY

1) Computational Physics, V.K.Mittal, R.C.Verma & S.C.Gupta-Published by AneBooks
2) Introductory methods of numerical analysis, S.S.Shastry , (Prentice Hall ofIndia,1983)
3) Introduction to Python for Engineers and Scientists by Dr.Sandeep Nagar, Apresspublications.

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REFERENCES:

1) Python for Education by Dr. B P Ajithkumar, IUAC, New Delhi; e-book freely downloadable fromwww.expeyes.in/documents/mapy.pdf
2) Programming in Python 3: A Complete Introduction to the Python Language by Mark Summerfield-2nd edition-Developer's library
3) Introduction to Python for Engineers and Scientists by Dr.Sandeep Nagar, Apress publications.
4) www.python.org
5) Python Essential Reference, David M. Beazley, Pearson Education
6) Core Python Programming, Wesley J Chun, Pearson Education
7) Python Tutorial Release 3.0.1 by Guido van Rossum, Fred L. Drake, Jr., editor. (http://www.altaway.com/resources/python/tutorial.pdf)
8) How to Think Like a Computer Scientist: Learning with Python, Allen Downey ,Jeffrey Elkner, Chris Meyers,http://www.greenteapress.com/thinkpython/thinkpython.pdf
9) NumericalMethodsinEngineeringandScience,Dr.BSGrewal,KhannaPublishers,Newdelhi
10) Numerical methods for scientists and engineers, K. Sankara Rao,PHI
11) Introductory methods of numerical analysis, S.S.Shastry , (Prentice Hall ofIndia,1983)
12) Computational Physics, V.K.Mittal, R.C.Verma & S.C.Gupta-Published byAne Books

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CURRICULUM FOR B.ScPHYSICS

MARK DISTRIBUTION FOR SETTING QUESTION PAPER

Unit/Chapter	Title	Marks
1	Introduction to Python Programming	23
2	Numpy and Matplotlib modules	10
3	Numerical Methods in Physics	26
4	Computational Physics	20
Total Marks *		**79**

*Total marks include that for choice of questions in sections A, B and C in the question paper.

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PHY5B07: QUANTUM MECHANICS

COURSE DETAILS

Course Code	PHY5B07
Title of the course	QUANTUM MECHANICS
Semester in which the Course to be Taught	5
Number of Credits	3
Number of Contact Hours	54 (3Hrs. /Wk.)

COURSE OUTCOME (COs)

	Course Outcome	PSO	CL	KC	Class Sessions Allotted
CO1	Understand the particle properties of electromagnetic radiation	PSO2	U	C	8
CO2	Describe Rutherford – Bohr model of the atom	PSO2	U	C	10
CO3	Understand the wavelike properties of particles	PSO2	U	C	10
CO4	Understand and apply the Schrödinger equation to simple physical systems	PSO2	Ap	C,P	16
CO5	Apply the principles of wave mechanics tothe Hydrogen atom	PSO2	Ap	C,P	10

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MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	3	2	1	1	1	0	0	1	1	0	3	0	0	0
CO2	3	3	2	3	2	1	1	1	0	0	1	1	0	3	0	0	0
CO3	3	3	2	3	2	1	1	1	0	0	1	1	0	3	0	0	0
CO4	3	3	2	3	2	1	1	1	0	0	1	1	0	3	0	0	0
CO5	3	3	2	3	2	1	1	1	0	0	1	1	0	3	0	0	0
AVG	3	3	2	3	2	1	1	1	0	0	1	1	0	3	0	0	0

COURSE CONTENT

UNIT 1

PARTICLE LIKE PROPERTIES OFELECTROMAGNETICRADIATION [8 HRS]

Review of electromagnetic waves – Photoelectric effect – Blackbody radiation – ComptoneffectOther photon processes – What is a photon?

[Sections 3.1 to 3.6 of Modern Physics by KennethKrane]

RUTHERFORD-BOHR MODEL OFTHEATOM [10 HRS]

Basic properties of atoms – Thomson model – Rutherford nuclear atom – Line spectra – Bohr model – Frank-Hertz experiment – Correspondence principle – Deficiencies of Bohr model

[Sections 6.1 to 6.8 of *Modern Physics* by KennethKrane]

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UNIT 2: WAVELIKE PROPERTIESOFPARTICLES [10 HRS]

De Broglie hypothesis - Uncertainty relationships for classical waves – Heisenberg uncertainty relationships – Wave packets - Probability and randomness – Probability amplitude

[Sections 4.1 to 4.6 of *Modern Physics* by Kenneth Krane]

UNIT 3

THESCHRODINGEREQUATION [16 HRS]

Justification of the Schrodinger equation – The Schrodinger recipe – Probabilities and normalization – Applications – Free particle, Particle in a box (one dimension), Particle in a box(two dimensions), Simple harmonic oscillator – Time dependence – Potential energy steps and potential energy barriers

[Sections 5.1 to 5.7 of Modern Physics by Kenneth Krane]

HYDROGEN ATOM INWAVEMECHANICS [10 HRS]

Schrodinger equation in spherical coordinates – Hydrogen atom wave functions – Radial probability densities – Angular momentum and probability densities – Intrinsic spin – Energy levels and spectroscopic notation – Zeeman Effect – Fine structure [Sections 7.1 to 7.8 of Modern Physics by Kenneth Krane]

BOOK OF STUDY

1) *Modern Physics*, 2nd Edn. – Kenneth S. Krane – John Wiley & sons

REFERENCE BOOKS

1) Arthur Beiser,*Concepts of Modern Physics*, 7th Edn, Tata McGraw-Hill

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2) Raymond A. Serway, Clement J. Moses, Curt A. Moyer, *Modern Physics*, 3rd Edn., Cengage

3) R.Eisberg & R. Resnick, *Quantum Physics of Atoms, Molecules, Solids, Nuclei & Particles*, John Wiley

4) Randy Harris, *Modern Physics*, 2nd Edn, Pearson

5) John R. Taylor, Chris D. Zafiratos, Michael A. Dubson,*Modern Physics for Scientists and Engineers*, 2nd Edn., Prentice-Hall of India Pvt. Ltd.

6) Wichmann,*Berkeley Physics Course: Quantum Physics*

7) Gautreau & Savin,*Theory and Problems in Modern Physics*, Schaum's Outlines Series, TMH

8) Zettilli N, *Quantum mechanics: Concepts & Applications*, Second Edition, Wiley.

9) NPTEL video lectures available online

MARK DISTRIBUTION FOR SETTING QUESTION PAPER.

Unit/Chapter	Title	Marks
1	Particle like Properties of Electromagnetic Radiation	11
2	Rutherford-Bohr Model of the Atom	15
3	Wavelike Properties of Particles	15
4	The Schrodinger Equation	23
5	Hydrogen Atom in Wave Mechanics	15
Total Marks *		79

*Total marks include that for choice of questions in sections A, B and C in the question paper.

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PHY5B08: OPTICS

COURSE DETAILS

Course Code	PHY5B08
Title of the course	OPTICS
Semester in which the Course to be Taught	5
Number of Credits	3
Number of Contact Hours	54 (3Hrs. /Wk.)

COURSE OUTCOME (COs)

	Course Outcome	PSO	CL	KC	Class Sessions Allotted
CO1	Understand the fundamentals of Fermat's principles and geometrical optics	PSO2	U	C	5
CO2	Understand and apply the basic ideas of interference of light	PSO2	Ap	C, P	14
CO3	Understand and apply the basic ideas of diffraction of light	PSO2	Ap	C, P	13
CO4	Understand the basics ideas of polarization of light	PSO2	U	C	8
CO5	Describe the basic principles of holography and fibre optics	PSO2	U	C	14

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MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	3	2	1	1	1	0	0	1	1	0	3	0	0	0
CO2	3	2	3	3	2	1	1	1	0	0	1	1	0	3	0	0	0
CO3	3	2	3	3	2	1	1	1	0	0	1	1	0	3	0	0	0
CO4	3	2	3	3	2	1	1	1	0	0	1	1	0	3	0	0	0
CO5	3	2	3	3	2	1	1	1	0	0	1	1	0	3	0	0	0
AVG	3	2	3	3	2	1	1	1	0	0	1	1	0	3	0	0	0

COURSE CONTENT

UNIT 1

FERMAT'S PRINCIPLE, VERIFICATION OF LAWS OF REFLECTION AND REFRACTION[2 HRS]

[Sections 2.1 to 2.6 of Brijlal, Subramaniyam, & Avadhanuluand Sections 3.1 to 3.2 ofAjoyGhatak]

REFRACTION AND REFLECTION BY SPHERICAL SURFACES[3HRS]

Refraction and reflection at a single spherical surfaces.Thethin lens,The Principal Foci,and Focal length of a lens, The Newton formula, Lateral magnification.

[Sections 4.1 to 4.7 of Ajoy Ghatak]

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UNIT 2

INTERFERENCE BY DIVISION OF WAVEFRONT[6 HRS]

Superposition of two sinusoidal waves, Interference, coherence ,conditions for interference, the interference patterns, intensity distribution .Fresnel's two mirror arrangement, Fresnel'sBiprism,Determination of λ and dλ of Sodium Light

[Sections 14.1 to 14.4, 14.6 to 14.9 of Brijlal, Subramaniyam, & Avadhanulu, and Sections 14.1 to 14.8 of Ajoy Ghatak. Additional problems should be done from chapter 7 of *Introduction to Optics* by Frank.L, Pedrotti, Leno M Pedrotti and Leno S Pedrotti.]

INTERFERENCE BY DIVISIONOFAMPLITUDE [8HRS]

Interference by a plane film illuminated by a plane wave,cosine law,non reflecting films(the subsections excluded), interference by a film with two nonparallel reflecting surfaces, colours of thin films, Newton's rings, The Michelson interferometer, white light fringes-

[Sections 15.1 to 15.4,15.7, 15.9, 15.11 of Ajoy Ghatak, and Sections 2.1 to 2.6 of Brijlal, Subramaniyam &Avadhanulu.Additionalproblemsshouldbedonefromchapter7of*Introduction to Optics* by Frank.L,Pedrotti, Leno M Pedrotti and Leno SPedrotti.]

UNIT 3

FRAUNHOFERDIFFRACTION [10 HRS]

Preliminaries, single slit diffraction pattern, diffraction by circular aperture, limit of resolution, two slit Fraunhofer diffraction pattern, N slit diffraction pattern, plane diffraction grating, resolving power.

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[Sections 18.1 to 18.3, 18.5 to 18.8 of Ajoy Ghatak. Additional problems should be done from chapters 11 and 12 of Introduction to Optics by Frank.L, Pedrotti, Leno M Pedrotti and Leno S Pedrotti.]

FRESNELDIFFRACTION [3 HRS]

Preliminaries, Fresnel half period zones, explanation of rectilinear propagation of light,zone plate [Sections 20.1 to 20.3 of AjoyGhatak]

UNIT4: POLARIZATION[8 HRS]

Huygene's explanation of double refraction, positive and negative uniaxial crystals, quarter and half wave plates, types of polarized light, production and analysis of plane, circularly and elliptically polarized light, optical activity, Laurentz half shade polarimeter

[Sections 20.9, 20.17 to 20.20, 20.24 of Brijlal, Subramaniyam, & Avadhanulu and corresponding sections of Ajoy Ghatak]

UNIT 5: HOLOGRAPHY [6 HRS]

Principles of holography, theory of construction and reconstruction of Hologram, Applications of Holography. [Sections 23.1 to 23.6 of Brijlal, Subramaniyam & Avadhanulu and Sections 21.1 to21.4 of Ajoy Ghatak]

UNIT6: FIBREOPTICS [8 HRS]

Opticalfibre, Numericalaperture,stepindexfibre, pulsedispersion, gradedindexfibre, fibreoptic sensors.

[Sections 27.4, 27.7, 27.10, 27.12 of Ajoy Ghatak and corresponding sections from Brijlal, Subramaniyam, & Avadhanulu]

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DEPARTMENT OF PHYSICS
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BOOKS OF STUDY

1) Ajoy Ghatak,*Optics*, 4thedition
2) *Optics* by Subramaniam, Brijlal&Avadhanulu –2018(Reprint)
3) *Introduction to Optics* by Frank.L,Pedrotti,Leno M Pedrotti and Leno SPedrotti

REFERENCE BOOKS

4) *Optics* – EugineHetch and ARGanesan
5) *Optics* by D S Mathur– Newedition
6) *Wave Optics and its Applications* – Rajpal S Sirohi – Orient Longman
7) *Optical Communications* – M MukundaRao – UniversitiesPress
8) NPTEL video lectures availableonline

MARK DISTRIBUTION FOR SETTING QUESTION PAPER.

Unit/Chapter	Title	Marks
1	Fermat's Principle, verification of laws of reflection and refraction , Refraction and reflection by spherical surfaces	7
2	Interference by division of wave front	9
3	Interference by division of amplitude	12
4	Fraunhofer Diffraction	15
5	Fresnel Diffraction	4
6	Polarization	12
7	Holography	9
8	Fibre Optics	11
Total Marks *		**79**

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*Total marks include that for choice of questions in sections A, B and C in the question paper.

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PHY5B09: ELECTRONICS (ANALOG & DIGITAL)

COURSE DETAILS

Course Code	PHY5B09
Title of the course	ELECTRONICS (ANALOG & DIGITAL)
Semester in which the Course to be Taught	5
Number of Credits	3
Number of Contact Hours	54 (3Hrs. /Wk.)

COURSE OUTCOME (COs)

	Course Outcome	PSO	CL	KC	Class Sessions Allotted
CO1	Understand the basic principles of rectifiers and dc power supplies	PSO3	U	C	6
CO2	Understand the principles of transistor	PSO3	U	C	14
CO3	Understand the working and designing of transistor amplifiers and oscillators	PSO3	Ap	C, P	12
CO4	Understand the basic operation of Op – Amp and its applications	PSO3	U	C	6
CO5	Understand the basics of digital electronics	PSO3	U	C	16

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MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	3	3	2	2	1	1	1	1	1	2	0	0	3	0	0
CO2	2	2	3	3	2	2	1	1	1	1	1	2	0	0	3	0	0
CO3	2	2	3	3	2	2	1	1	1	1	1	2	0	0	3	0	0
CO4	2	2	3	3	2	2	1	1	1	1	1	2	0	0	3	0	0
CO5	2	2	3	3	2	2	1	1	1	1	1	2	0	0	3	0	0
AVG	2	2	3	3	2	2	1	1	1	1	1	2	0	0	3	0	0

COURSE CONTENT

UNIT 1

SEMICONDUCTOR RECTIFIERS AND DCPOWER SUPPLIES: [6 HRS]

Preliminaries of rectification- Bridge rectifier- Efficiency- Nature of rectified output- Ripple factor- different types of filter circuits- voltage multipliers- Zener diode- voltage stabilization [Sections 6.13-6.15, 6.17 - 6.27 of V.KMehta]

TRANSISTORS [14 HRS]

Different transistor amplifier configurations:-CB,CE,CC and their characteristics- amplification factors- their relationships- Load line Analysis- Expressions for voltage gain- current gain and power gain of C.E amplifier- cut-off and saturation points- Transistor biasing- Different types of biasing - Base resistor, voltage divider bias method- single stage transistor amplifier circuit- load line analysis- DC and AC equivalent circuits

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[Section 8.7 - 8.10, 8.12-8.22, 9.2-9.8, 9.11-9.12, 10.4-10.5, 10.7-10.9 of V K Mehta]

UNIT 2

MULTISTAGETRANSISTOR AMPLIFIERS: [4 HRS]

R.C coupled amplifier- frequency response and gain in decibels- Transformer coupled Amplifiers-Direct Coupled Amplifier-Comparison

[Section 11.1-11.8 of VK Mehta]

FEEDBACK CIRCUITS AND OSCILLATORS: [8 HRS]

Basic principles of feedback- negative feedback and its advantages- positive feedback circuits- Oscillatory Circuits-LC, RC oscillators- tuned collector oscillator- Hartley, Colpitt's, phase shift oscillators - their expressions for frequency

[Sections 13.1-13.5, 14.1 - 14.13 of VK Mehta]

OPERATIONAL AMPLIFIER AND ITS APPLICATIONS: [6 HRS]

Differential amplifier (basic ideas only), OP-amp: basic operation, application, inverting, Non- inverting, summing amplifiers, Differentiator integrator

[Sections 25.1 – 25.5, 25.16, 25.15- 25.17, 25.23-25.26, 25.32, 25.34-25.35, 25.37 of VKMehta]

UNIT 3

NUMBER SYSTEMS [6 HRS]

Binary number system, conversions from one system to another (Binary, octal,

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Hexa decimal), Binary arithmetic, Compliments and its algebra.

[Sections - 2.2 to 2.8 of Aditya P Mathur].

LOGIC GATES AND CIRCUITS [10 HRS]

Fundamental gates, Universal gates,DeMorgan's theorem, ExclusiveORgate, Boolean relations, half adder, Full adder, RS Flip Flop, JK Flip flop

[Sections - 2.2 to 2.4, 3.1 to 3.5, 5.1 to 5.6, 6.3, 6.4, 7.1, 7.3, 7.5, 7.6, 8.2 Malvino & Leach)

TEXT BOOKS FOR STUDY

1) V. K. Mehta, *Principles of Electronics*. 2008 edition. S.Chand.
2) Aditya P Mathur, *Introduction to Microprocessors*, Tata McGarwHill.
3) Leach and Malvino, *DigitalPrinciples and Applications*, Tata McGrawHill.

REFERENCES

4) Malvino,*Electronic Principles*, Tata McGrawHill
5) Thomas. C.Bartee, *Digital Computer Fundamentals*
6) Dilip K Roy,*Physics of Semiconductor Devices*, Second Edition,Universities Press
7) Thomas L Floyd, *Digital Fundamentals*, Pearson Education
8) Paul Herowitz & WinfieldHill,*The Art of Electronics*
9) Virendrakumar, *Digital Technology – Principles and Practice*
10) A. B. Bhattacharya, *Electronic Principles and Applications*
11) NPTEL video lectures available online

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MARK DISTRIBUTION FOR SETTING QUESTION PAPER

Unit/Chapter	Title	Marks
1	Semiconductor rectifiers and DC Power supplies	9
2	Transistors	20
3	Multistage Transistor amplifiers	6
4	Feedback Circuits and Oscillators	12
5	Operational amplifier and its applications	9
6	Number systems	9
7	Logic gates and circuits	14
Total Marks *		**79**

*Total marks include that for choice of questions in sections A, B and C in the question paper.

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Principal: 0495-2295121
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OPEN COURSE – I (DEPT. OF CHEMISTRY)
CHE5D01: ENVIRONMENTAL CHEMISTRY

COURSE DETAILS

Course Code	CHE5D01
Title of the course	Environmental Chemistry
Semester in which the Course to be Taught	5
Number of Credits	2
Number of Contact Hours	2 Hrs./Wk.

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	Recall the technical/scientific terms involved in pollution.	Understand
CO2	Understand the causes, effects and consequences of different types of pollution	Understand
CO3	Describe water quality parameters.	Understand
CO4	Study various pollution control measures.	Understand
CO5	Understand the basics of green Chemistry.	Understand

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MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
CO2	2	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
CO3	2	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
CO4	2	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
CO5	2	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
AVG	2	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0

COURSE CONTENT

MODULE I: ENVIRONMENT (3 HRS)

Concept and scope of environmental chemistry – Segments of environment. Environmental pollution: Concepts and definition – Pollutant, contaminant, receptor and sink – Classification of pollutants - Global, regional, local, persistent and non-persistent pollutants.

MODULE II: AIR POLLUTION (6 HRS)

Major regions of atmosphere – Tropospheric pollution and stratospheric pollution – Major air pollutants: Oxides of carbon, nitrogen and sulphur- Hydrocarbons – Chlorofluorocarbons - Particulates. Smog: London smog and photochemical smog. Automobilepollution. Effects of air pollution: Acid rain, greenhouse effect and depletion of ozone layer. Control of air pollution –Alternaterefrigerants - Bhopal Tragedy (a brief study). Causes, symptoms and drugs used for the treatment of air-borne diseases: Chickenpox, influenza, measles and tuberculosis.

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MODULE III: WATER POLLUTION (9 HRS)

Hydrological cycle – Importance of water - Aquatic pollution – Visible signs of aquatic pollution - Water pollution due to human activity – Pollution due to sewage, domestic wastes, industrial effluents, agricultural discharge, soaps and detergents. Eutrophication. Types of water pollutants: Biological agents, physical agents and chemical agents. Biological magnification andbioaccumulation. Water quality parameters: DO, BOD, COD, alkalianity, hardness, chloride, fluoride and nitrate. Toxic metals in water and their effects: Cadmium, lead and mercury - Minamata disaster (a brief study). Water born diseases: Cholera, dysentery and typhoid – Symptoms and medicines.

MODULE IV: SOIL, NOISE, THERMAL AND RADIOACTIVE POLLUTIONS (6 HRS)

Soil pollution: House hold, municipal and industrial solid wastes. Pollution due to plastics, pesticides, biomedical waste and E-waste (source, effects and control measures) – Non-degradable, degradable and biodegradable wastes. Hazardous waste. Noise pollution, thermal pollution and radioactive pollution (source, effects and control measures) – Hiroshima, Nagasaki and Chernobyl accidents (brief study). Endosulfan disaster in Kerala (brief study).

MODULE V: POLLUTION CONTROL MEASURES (12 HRS)

Air pollution control measures – Gravitational settling chamber, fabric filter, wet scrubber, catalytic converters, stacks and chimneys, cyclone collectors, Cottrell electrostatic precipitator, extraction ventilator, zoning and green belt. Water treatment methods - Primary, secondary and tertiary methods - Aerobic and anaerobic oxidation - Sedimentation, coagulation, filtration, disinfection, desalination and ion exchange - USAB process and deep well injection. Solid waste management: Recycling, incineration, digestion, dumping, land treatment and composting. Introduction to Green chemistry (elementary ideas only). Pollution Control Board: Duties and responsibilities (a brief study).80 Some Environmental movements: Chipco, Narmada, Silent Valley and Plachimada.

REFERENCES

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1. A. K. De, *Environmental Chemistry*, New Age International, New Delhi, 2006.
2. S. S. Dara, *A Textbook of Environmental Chemistry and Pollution Control*, 8th Edition, S. Chand and Sons, New Delhi, 2008 (Reprint).
3. S. E. Manahan, *Environmental Chemistry*, 8th Edition, CRC Press, Florida, 2004.
4. P. K. Goel, *Water Pollution: Causes, Effects and Control*, New Age International, New Delhi, 2006.
5. Kochu Baby Manjooran, *Modern Engineering Chemistry*, Kannatheri Publications, 2009.
6. A. K. Ahluwalia, *Environmental Chemistry*, Ane Books India, New Delhi, 2008.
7. B. K. Sharma & H. Kaur, *Environmental Chemistry*, Goel Publishing House, 1996.

OPEN COURSE – II (DEPT. OF COMMERCE)
BCM5D03: BASIC ACCOUNTING

COURSE DETAILS

Course Code	BCM5D03
Title of the course	Basic Accounting
Semester in which the Course to be Taught	5
Number of Credits	2
Number of Contact Hours	2 Hrs./Wk.

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	To enable the students to acquire knowledge of Accounting Principles	Understand
CO2	Acquire basic skills in handling Subsidiary Books	Apply
CO3	Acquire basic skills in handling Final Accounts	Apply

MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	0	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
CO2	0	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0

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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO3	0	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
AVG	0	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0

COURSE CONTENT

MODULE I

Basic Accounting Concepts: Kinds of accounts - Financial Accounting Vs. Management Accounting - Double Entry book keeping - Rules of debit and credit - Preparation of Journal and Ledger accounts - Problems. (20 Hours, 15 marks)

MODULE II

Subsidiary Books : Cash Book - Types of Cash Book - problems - Purchase Book - Sales Book - Sales Return Book - Purchases Return Book - Journal Proper - Trial Balance (18 Hours, 15 marks)

MODULE III

Final Accounts of sole trading concerns: Trading and Profit & Loss Account - Balance Sheet - Problems with simple adjustments. (10 Hours, 10 marks)

(Theory and Problems may be in the ratio of 40% and 60% respectively)

REFERENCE BOOKS:

1. Grewal T.S., *Double Entry Book Keeping.*

2. Jain and Narang ,*Advanced Accountancy*.

3. Shukla and Grewal, *Advanced Accountancy*.

4. Gupta and Radhaswamy, *Advanced Accountancy*.

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5. Gupta. R.L, *Advanced Accountancy*.

OPEN COURSE – III (DEPT. OF COMP. SCIENCE)
BCS5D01: INTRODUCTION TO COMPUTERS AND OFFICE AUTOMATION

COURSE DETAILS

Course Code	BCS5D01
Title of the course	Introduction to Computers and Office Automation
Semester in which the Course to be Taught	5
Number of Credits	2
Number of Contact Hours	2 Hrs./Wk.

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	Describe the usage of computers and why computers are essential components in business and society.	Understand
CO2	Solve common business problems using appropriate Information Technology applications and systems.	Apply
CO3	Ability to Choose electronic tools best suitable for the business requirements at hand.	Analyse
CO4	Develop new designs that are suitable for a given case.	Create

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MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
CO2	2	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
CO3	2	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
CO4	2	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
CO5	2	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
AVG	2	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0

COURSE CONTENT

UNIT I [7 T]

Introduction to Computers: Types of Computers - Desktop, Laptop, Notebook and Netbook. Hardware: CPU, Input / Output Devices, Storage Devices – System - Software - Operating Systems, Programming Languages, Application Software - Networks - LAN, WAN - Client - Server.

UNIT II [7 T]

Documentation Using a Word Processor (Open Office Writer / M.S. Word) - Introduction to Office Automation, Creating & Editing Document, Formatting Document, Auto-text, Autocorrect, Spelling and Grammar Tool, Document Dictionary, Page Formatting, Bookmark, Advance Features - Mail Merge, Macros, Tables, File Management, Printing, Styles, linking and embedding object, Template.

Unit III [8 T]

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Electronic Spread Sheet (Open Office Calc/MS-Excel) - Introduction to Spread Sheet, Creating & Editing Worksheet, Formatting and Essential Operations, Formulas and Functions, Charts, Advanced features – Pivot table & Pivot Chart, Linking and Consolidation.

UNIT IV [8 T]

Presentation using (Open Office Impress/MS-Power Point): Presentations, Creating, Manipulating & Enhancing Slides, Organizational Charts, Charts, Word Art, Layering art Objects, Animations and Sounds, Inserting Animated Pictures or Accessing through Object, Inserting Recorded Sound Effect or In-Built Sound Effect.

REFERENCES:

1. Michael Miller, Absolute Beginner's Guide to Computer Basics, Prentice Hall.
2. Russell A. Stultz, *Learn Microsoft Office*, BPB Publication.
3. H.M.Deitel, P. J. Diesel, et al., *Internet & World Wide Web - How to program*, Prentice Hall.

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OPEN COURSE – IV (DEPT. OF ECONOMICS)
ECO5D01: ECONOMICS IN EVERYDAY LIFE

COURSE DETAILS

Course Code	BCS5D01
Title of the course	Introduction to Computers and Office Automation
Semester in which the Course to be Taught	5
Number of Credits	2
Number of Contact Hours	2 Hrs./Wk.

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	Familiarizing non economics students with the most basic concepts of economics.	Understand
CO2	Helps them to understand various theories and laws applied in economics	Understand
CO3	Enables them to apply various concepts of economics in their daily life	Apply
CO4	Analyse the manner in which price, income and other variables are determined	Analyse

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MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	0	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
CO2	0	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
CO3	0	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
CO4	0	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
AVG	0	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0

COURSE CONTENT

MODULE I: BASIC CONCEPTS AND THE METHODS OF ECONOMICS

What is economics- Definitions of economics- Basic problems of an economy- how the basic problems are solved by different economic systems – Microeconomics and MacroEconomics?

MODULE II: MICROECONOMIC CONCEPTS

Demand –demand function, demand schedule, demand curve. Supply –supply function, supply curve- market equilibrium. Elasticity: price, income, cross - Determinants of elasticity. Competition vs. Monopoly.
MultinationalCorporations. Cartels – Mergers – Acquisitions

MODULE III: MACRO ECONOMIC CONCEPTS

National income - GNP, GDP, Per Capita income. Fiscal and monetary policies: meaning and instruments, bank rate, repo rates, reverse repo rate. (Concepts only). Inflation – meaning, types and effects. Budget - Revenue Expenditure and

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capital expenditure – Deficit: Revenue Deficit, Fiscal Deficit. Balance of trade and balance of payments - Current account and capital account.FDI and FPI.

REFERENCES

1. Dominick Salvatore, *Microeconomics: Theory and Applications*, Oxford University press, New Delhi
2. Gregory Mankiw, *Macro economics*, 6th Edn. Tata McGraw Hill.
3. Errol D'Souza, *Macro Economics,* Pearson Education 2008.
4. B. Alvin Prakash, *The Indian Economy Since 1991: Economic Reforms and Performance*, Pearson Education India
5. SubratoGhatak, *Introduction to Development Economics*, Routledge
6. Lekhy, *Public Finance and Public Economics*, Kalyanipublications
7. *Indian Economy Since Independence*, 24/ed , Kapila U, Academic Foundation, NewDelhi Oxford Dictionary of Economics
8. *The Penguin Dictionary of Economics*
9. *The New Palgrave Dictionary of Economics* (http://www.dictionaryofeconomics.com/ dictionary).

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OPEN COURSE – V (DEPT. OF ENGLISH)
ENG5D01: ENGLISH FOR COMPETITIVE EXAMINATIONS

COURSE DETAILS

Course Code	ENG5D01
Title of the course	English for Competitive Examinations
Semester in which the Course to be Taught	5
Number of Credits	2
Number of Contact Hours	2 Hrs./Wk.

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	Understand the historical background of travel in India	Understand
CO2	Identify important tourist destinations in India	Apply
CO3	Analyse the basic components of Tourism	Analyse
CO4	Understand the cultural heritage of Kerala	Create
CO5	Classify important tourist attractions in India based on their nature.	

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MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	0	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
CO2	0	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
CO3	0	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
CO4	0	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
CO5	0	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
AVG	0	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0

COURSE CONTENT

MODULE 1: WORD BASED QUESTIONS

Synonyms, antonyms, analogy, one-word substitution, idiomatic use of verbs, test of spellings, correct use of prepositions and articles.

MODULE 2: SENTENCE BASED QUESTIONS

Error identification, Sentence correction, Jumbled words in a sentence, Sentence completion.

MODULE 3: PASSAGE BASED QUESTIONS

Jumbled sentences in a paragraph, Reading comprehension, English comprehension.

READING LIST:

1) Edgar Thorpe and Showick Thorpe, *Objective English for Competitive Exams*.
2) Michael Swan, *Practical English Usage*.
3) Wren and Martin, *High School English Grammar & Composition*.

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OPEN COURSE – VI (DEPT. OF HISTORY)
HIS5D02: HISTORICAL TOURISM

COURSE DETAILS

Course Code	HIS5D02
Title of the course	Historical Tourism
Semester in which the Course to be Taught	5
Number of Credits	2
Number of Contact Hours	2 Hrs./Wk.

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	Understand the historical background of travel in India	Understand
CO2	Identify important tourist destinations in India	Identify
CO3	Analyse the basic components of Tourism	Analyse
CO4	Understand the cultural heritage of Kerala	Understand

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MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	0	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
CO2	0	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
CO3	0	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
CO4	0	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
AVG	0	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0

COURSE CONTENT

MODULE I HISTORICISING TRAVEL IN INDIA

Travelogues – Ancient – Megasthanese- Pliny – Fa –Hien Medieval – Marcopolo – Ibn BatutaModern – Ralf Fitch –Buchanan

MODULE II- TOURIST DESTINATIONS IN INDIA

Religious Destinations – Puri, Haridwar, Ajmir, Sabarimala, Sravanabelgola, Velam kanni Cultural Destinations – Santinekethan , Wardha, Thunchan Paramba Historical Destinations – Udayagiri, Khandagiri Caves, Edakkal Cave, Mahabalipuram, Hampi, Ajanta Ellora, Taj Mahal Landscape Destinations – Shimla, Ooty, Alappuzha Sanctuary Destinations – Vedantangal, Gir, Silent Valley

MODULE III- KERALA AND HER TOURIST POTENTIAL

Natural and Cultural heritage – Hill Stations of Idukki and Wayanad Forts: Palakkad – Bekal – St. Angelo Palaces: Padmanabhapuram- Tripunithura- Mattancherry- Arakkal Sacred Kerala: Guruvayur – Cheraman Mosque –

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Malayattur Church, Parassinikadavu. Fairs and Festivals: Kodungallur Bharani – Thrissur Pooram –Boat race Recent developments: Muziris Heritage Project

BOOK LIST

1. Viswanath Ghosh, *Tourism and Travel Management*
2. S.P Gupta, *Cultural Tourism*
3. Ratan Deep Singh, *Infrastructure Tourism in India*
4. Salini Modi, *Tourism and Society*.

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OPEN COURSE – VII (DEPT. OF MANAGEMENT)
BBA5D1E- COMMERCE

COURSE DETAILS

Course Code	BBA5D1
Title of the course	E-Commerce
Semester in which the Course to be Taught	5
Number of Credits	2
Number of Contact Hours	2 Hrs./Wk.

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	Analyse the impact of E- E-Commerce Describe	Analyse
CO2	Describe the major types of E E-Commerce	Describe
CO3	Explain the process that should be followed in building an E-Commerce	Apply presence.
CO4	Identify the key security threats in the E-Commerce	Commerce environment.

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MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	0	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
CO2	0	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
CO3	0	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
CO4	0	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
AVG	0	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0

COURSE CONTENT

UNIT I – INTRODUCTION TO E- COMMERCE

Meaning and concept – E- Commerce v/s Traditional Commerce- E- Business & E- Commerce – History of E- Commerce – EDI – Importance , features & benefits of E- Commerce – Impacts, Challenges &Limitations of E- Commerce – Supply chain management & E – Commerce – E –Commerce infrastructure. (15 hours)

UNIT II – BUSINESS MODELS OF E – COMMERCE

Business to Business – Business to customers – customers to customers - Business to Government – Business to employee – E – Commerce strategy – Influencing factors of successful E- Commerce. (10 hours)

UNIT III – ELECTRONIC PAYMENT SYSTEM

Introduction – Online payment systems – prepaid and post-paid payment systems – e- cash, e- cheque, Smart Card, Credit Card ,Debit Card, Electronic purse – Security issues on electronic payment system – Solutions to security issues – Biometrics – Types of biometrics. Legal and ethical issues in E-Commerce: Security issues in E - Commerce- Regulatory frame work of E-

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commerce, (25 hours)

BOOKS:

1. Turban, Efraim, David King et. el., *Electronic Commerce: A Managerial Perspective*, Pearson Education Asia, Delhi 2002.
2. Kalakota, Ravi: *Frontiers of Electronic Commerce*, Addison - Wesley, Delhi 1999.
3. Rayport, Jeffrey F and Jaworksi, Bernard J: *Introduction to E-Commerce*, Tata McGraw Hill, New Delhi 2003.
4. Smantha Shurety, *E-Business with Net Commerce*, Addison - Wesley, Singapore

OPEN COURSE – VIII (DEPT. OF MATHEMATICS)
MAT5D02: MATHEMATICS FOR NATURAL SCIENCES

COURSE DETAILS

Course Code	MTA5D02
Title of the course	Mathematics for Natural Sciences.
Semester in which the Course to be Taught	5
Number of Credits	2
Number of Contact Hours	2 Hrs./Wk.

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	Explain the basic mathematical ideas of functions, their graphs and their applications in daily life for those students not having mathematics as a course in their degree programme.	Analyse
CO2	Familiarise the important concepts of limits, continuity and differentiation to needy students.	Describe
CO3	Enable them to apply these ideas in daily life.	Apply presence.

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MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
CO2	2	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
CO3	2	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
AVG	2	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0

COURSE CONTENT

MODULE I (20 HRS)

The idea of sets. Operation on sets. Relations and functions. Variables and graphs (Chapter 1 of text 1). Frequency distributions (Chapter 2 of text 1). The Mean, Median, Mode and other measures of central tendency (Chapter 3 of text 1). Dispersion or variation, The Range, The Mean deviation, The Semi-inter quartile Range, Then 10-90 Percentile range.

MODULE II (16 HRS)

The standard deviation. Properties of standard deviation. The variance. Short methods of computing standard deviation (Relevant section of Chapter 4 of text 1). Moments, Moments for grouped data, relation between moments, Computation of moment for grouped data. Skewness and Kurtosis. (relevant sections of Chapter 5 from text 1).

REFERENCES

1. Hogg & Craig: Introduction to Mathematical Statistics.
2. Freund & Walpole: Mathematical Statistics.

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OPEN COURSE – IX (DEPT. OF MOCROBIOLOGY)
MBG5D01: PUBLIC HEALTH AND EMERGING MICROBIAL DISEASES

COURSE DETAILS

Course Code	MBG5D01
Title of the course	Public Health and Emerging Microbial Diseases
Semester in which the Course to be Taught	5
Number of Credits	2
Number of Contact Hours	2 Hrs./Wk.

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	Provides learning opportunities in the basic principles of public health	Understand
CO2	It covers mechanism of infectious disease transmission and its spreading pattern.	Evaluate
CO3	Principles of aseptic practice and role of human body's normal flora.	Apply
CO4	Give general awareness on emerging microbial disease._ understand	Create

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CO5	Importance of personal hygiene and its role in disease control practices,_ understand	Understand

MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
CO2	2	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
CO3	2	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
CO4	2	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
CO5	2	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
AVG	2	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0

COURSE CONTENT

UNIT 1

Concept of health, Dimensions of health, Human development index, Human poverty index, Gender related development index and gender empowerment measure. Determinants of health. Responsibility for health- Individual,Community, State and International responsibility. Indicators of health.

UNIT 2

Infectious disease epidemiology. Definition of terms:-infection (primary, secondary, cross, nosocomial, iatrogenic, exogenous, endogenous, clinical , subclinical), contamination, infestation, host, infectious disease, communicable disease, epidemic, pandemic, endemic, sporadic, exotic, zoonotic, epizootic

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enzootic and epornithic diseases. Sources of infection and modes of transmission. Reservoirs, carriers and vectors of communicable diseases. Role of WHO in pandemic alerts.

UNIT 3

Symptomatology, epidemiology, preventive measures of disease- Hepatitis,- A,B,E, HIV, Tuberculosis, Enteric fever, Weil's disease, microbial food poisonings. Emerging diseases- Dengue fever, Chikungunya, Swine flu. Bio-terrorism.

SUGGESTED READINGS

1. Ananthanarayan R and Paniker CKJ. (2005). Textbook of Microbiology. 7th edition (edited by Paniker CKJ). University Press Publication.
2. Brooks GF, Carroll KC, Butel JS and Morse SA. (2007).Jawetz, Melnick and Adelberg's Medical Microbiology. 24th edition. McGraw Hill Publication.
3. Goering R, Dockrell H, Zuckerman M and Wakelin D. (2007). Mims' Medical Microbiology.4th edition. Elsevier.
4. Joklik WK, Willett HP and Amos DB (1995). Zinsser Microbiology. 19th edition. Appleton- Centuary- Crofts publication.
5. Willey JM, Sherwood LM, and Woolverton CJ. (2008). Prescott, Harley and Klein'sMicrobiology. 7th edition. McGraw Hill Higher Education.
6. Medical Microbiology: David Greenwood, Slack, Peutherer
7. Satish Gupte (2005). The Short Textbook of Medical Microbiology. Eighth edition, Synonyms, antonyms, analogy, one-word substitution, idiomatic use of verbs, test of spellings, correct use of prepositions and articles.

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OPEN COURSE – X (DEPT. OF PHY. EDUCATION)
PE5D03: PHYSICAL ACTIVITY - HEALTH & WELNESS

COURSE DETAILS

Course Code	PE5D03
Title of the course	Physical Activity - Health & Welness
Semester in which the Course to be Taught	5
Number of Credits	2
Number of Contact Hours	2 Hrs./Wk.

COURSE OUTCOME (COs)

Sl.No	Skill/Knowledge Attainment Outcome Expected	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	Impart concepts of physical education and fitness	Understand
CO2	Practice basic exercise principles, first aid and nutrition	Apply
CO3	Introduce yoga, stress management and postural deformities	Apply
CO4	Basic knowledge on vital signs, lifestyle/hypokinetic diseases and its management	Apply

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MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
CO2	2	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
CO3	2	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
CO4	2	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0
AVG	2	2	2	3	2	2	3	2	1	1	2	2	0	0	0	0	0

COURSE CONTENT

MODULE I: CONCEPTS OF PHYSICAL EDUCATION AND FITNESS

Definition, aim, objectives and importance of physical education - Physical fitness components –speed, strength, endurance, flexibility and coordinative abilities - Types of physical fitness- Health related physical fitness, Performance related physical fitness and Cosmetic fitness - Fitness balance

MODULE II: EXERCISE PRINCIPLES, FIRST AID AND NUTRITION

Principles of exercise programme, Exercise and heart rate zone, BMR - Definition of First Aid, Aim of First Aid, Principles of First Aid, RICE, ABC of First Aid, First Aid for Fracture, Bleeding, Drawning and Snake Bite - Nutritional balance, Nutritional deficiency diseases

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MODULE III: YOGA, STRESS MANAGEMENT AND POSTURAL DEFORMITIES

Definition and meaning of Yoga, Asana, and Pranayama - Eight limbs of Ashtanga Yoga –Yama, Niyama, Asana, Pranayama, Prathyahara, Dharana, Dhynam, Samadhi - Asanas - Ten Asanas and its effects.

SL.NO	TYPES	ASANAS
1	Standing (Balancing)	Vrikshasana
2	(Forward bending)	Padahasthasana
3	(Backward bending)	Ardha Chakrasana
4	(Twisting)	Trikonasana
5	Kneeling	Ushtrasana
6	Sitting (Meditative)	Vajrasana
7		Padmasana,
8	Prone line	Bhujangasana,
9		Salabhasa
10	Supine (Relaxative)	Savasana

Pranayamas - Three Pranayamas and its effects: (1) Surya Bedhana (Heating), (2) Chandra bedhana (Cooling) and (3) Nadisudhi (Balancing)

Postural deformities and corrective measures: Meaning of good posture, causes of poor posture, importance of good posture - Postural deformities- Kyphosis, Lordosis, Scoliosis, Bow leg, Knock knee, Flat foot

Stress Management - Definition of stress, causes of stress and stress management

MODULE IV: VITAL SIGNS, LIFESTYLE/HYPOKINETIC DISEASES AND ITS MANAGEMENT

Vital signs- Pulse rate, Respiratory rate, Blood pressure, Body temperature,

Diseases- Diabetes, Hypertension, Obesity, Osteoporosis, CHD, Back pain.

Fitness assessment- Body mass index, Waist to Hip Ratio.

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SEMESTER VI

Course Code	Course Title	Total hours	Hours/ Week	Credits
PHY6 B10	Core Course X - Thermodynamics	54	3	3
PHY6 B11	Core Course XI -Statistical Physics, Solid State Physics, Spectroscopy and Photonics	54	3	3
PHY6 B12	Core Course XII - Nuclear Physics and Particle Physics	54	3	3
PHY6 B13	Core Course XIII - Relativistic Mechanics and Astrophysics	54	3	3
PHY6 B14	Core Course XIV (Elective:EL1 / EL2 / EL3)	54	3	3
PHY6 B15	Core Course Practical XV – Practical II	72	4	5
PHY6 B16	Core Course Practical XVI – Practical III	72	4	5
PHY6 B17 (P/R)	Core Course XVII Project/Research methodology Tour report	36	2	2 1
	Total	**450**	**25**	**28**

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PHY6B10: THERMODYNAMICS

COURSE DETAILS

Course Code	**PHY6B10**
Title of the course	Thermodynamics
Semester in which the Course to be Taught	6
Number of Credits	3
Number of Contact Hours	54 (3Hrs./Wk.)

COURSE OUTCOME (COs)

	Course Outcome	PSO	CL	KC	Class Sessions Allotted
CO1	Understand the zero and first laws of thermodynamics	PSO2	U	C	14
CO2	Understand the thermodynamics description of the ideal gas	PSO2	U	C	8
CO3	Understand the second law of thermodynamics and its applications	PSO2	U	C, P	12
CO4	Understand the basic ideas of entropy	PSO2	U	C	8
CO5	Understand the concepts of thermodynamic potentials and phasetransitions	PSO2	U	C	12

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MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	3	2	1	1	1	0	0	1	1	0	3	0	0	0
CO2	3	2	3	3	2	1	1	1	0	0	1	1	0	3	0	0	0
CO3	3	2	3	3	2	1	1	1	0	0	1	1	0	3	0	0	0
CO4	3	2	3	3	2	1	1	1	0	0	1	1	0	3	0	0	0
CO5	3	2	3	3	2	1	1	1	0	0	1	1	0	3	0	0	0
AVG	3	2	3	3	2	1	1	1	0	0	1	1	0	3	0	0	0

COURSE CONTENT

UNIT 1:

ZEROTH LAW AND FIRSTLAW OF THERMODYNAMICS [14HRS]

Microscopicpoints of view – Scope of Thermodynamics – Thermal equilibrium and Zeroth Law – Concept of temperature – Ideal-Gas temperature – Thermodynamic equilibrium – Equation of state – Hydrostatic systems – Intensive and extensive coordinates – Work – Quasi-static process – Work in changing the volume of a hydrostatic system – PV diagram – Hydrostatic work depends on the path– Calculation of work for quasi-staticprocesses–WorkandHeat–Adiabaticwork– Internal energy function – Mathematical formulation of First Law – Concept of Heat – Differential form of the First Law – Heat capacity – Specific heat of water; the Calorie – Quasi-static flow ofheat; Heat reservoir

[Sections 1.1 to 1.6, 1.10, 2.1 to 2.3, 2.10, 3.1 to 3.6 and 4.1 to 4.8, 4.10 of Heat and Thermodynamics by Zemansky and Dittman]

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UNIT 2: IDEAL GAS [8HRS]

Equation of state of a gas – Internal energy of a real gas – Ideal gas – Experimental determination of heat capacities–Quasi-static adiabatic process– The microscopic point of view–Kinetic theory of the ideal gas

[Sections 5.1 to 5.5, 5.8 and 5.9 of Heat and Thermodynamics by Zemansky and Dittman]

UNIT 3: SECOND LAW OF THERMODYNAMICS [12HRS]

Conversion of work in to heat and viceversa–Heat engine;Kelvin-Planck statement of theSecond Law – Refrigerator; Clausius' statement of the Second Law – Equivalence of Kelvin-Planck and Clausius statements – Reversibility and Irreversibility – Conditions for reversibility – Carnot engineandCarnotcycle– Carnotrefrigerator–Carnot's Theorem and corollary–Thermodynamic temperature scale – Absolute zero and Carnot efficiency – Equality of ideal-gas and thermodynamic temperatures

[Sections 6.1, 6.6 to 6.9, 6.14, 7.1 and 7.3 to 7.7 of Heat and Thermodynamics by Zemansky and Dittman]

UNIT 4: ENTROPY [8HRS]

Reversible part of the Second Law – Entropy – Entropy of the ideal gas – TS diagram – Entropy and reversibility – Entropy and irreversibility – Irreversible part of the Second Law – Heat and entropy in irreversible processes – Principle of increase of entropy – Applications of the Entropy Principle – Entropy and disorder – Exact differentials

[Sections 8.1, 8.2, 8.4 to 8.9, 8.11 to 8.14 of Heat and Thermodynamics by Zemansky and Dittman]

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UNIT 5: THERMODYNAMICS POTENTIALS AND PHASE TRANSITIONS [12 HRS]

Characteristic functions–Enthalpy–Joule-Thomson expansion–Helmholtz and Gibbs functions– Condition for an exact differential – Maxwell's relations – TdS equations – PV diagram for a pure substance – PT diagram for a pure substance; Phase diagram – First-order phase transitions and Clausius-Clapeyron equation – Clausius-Clapeyron equation and phase diagrams

[Sections 10.1 to 10.6, 9.1, 9.2, 11.3 and 11.4 of Heat and Thermodynamics by Zemansky and Dittman]

BOOKS OF STUDY

1. *Heat and Thermodynamics*, 7thEdn. – Mark W. Zemansky and Richard H. Dittman – McGraw-Hill

REFERENCE BOOKS

1. Ashley H. Carter, *Classical and Statistical Thermodynamics*, Pearson,2012
2. Evelyn Guha *Basic, Thermodynamics,* Narosa,2002
3. D. S. Mathur, *Heat and Thermodynamics,* S. Chand Publishers,2008
4. NPTEL video lectures availableonline

MARK DISTRIBUTION FOR SETTING QUESTION PAPER.

Unit/Chapter	Title	Marks
1	Zeroth Law and First Law of Thermodynamics	20
2	Ideal Gas	12
3	Second Law of Thermodynamic	18
4	Entropy	12
5	Thermodynamic Potentials and Phase transitions	17
Total Marks *		**79**

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*Total marks include that for choice of questions in sections A, B and C in the question paper.

PHY6B11: STATISTICAL PHYSICS, SOLID STATE PHYSICS, SPECTROSCOPY & PHOTONICS

COURSE DETAILS

Course Code	**PHY6B11**
Title of the course	**Statistical Physics, Solid State Physics, Spectroscopy & Photonics**
Semester in which the Course to be Taught	6
Number of Credits	3
Number of Contact Hours	54 (3Hrs. /Wk.)

COURSE OUTCOME (COs)

	Course Outcome	PSO	CL	KC	Class Sessions Allotted
CO1	Understand the basic principles of statistical physics and its applications	PSO2	U	C	16
CO2	Understand the basic aspects of crystallography in solid state physics	PSO2	U	C	14
CO3	Understand the basic elements of spectroscopy	PSO2	U	C	4
CO4	Understand the basics ideas of microwave and infra-red spectroscopy	PSO2	U	C	10
CO5	Understand the fundamental ideas of photonics	PSO2	U	C	10

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MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	3	2	1	1	1	0	0	1	1	0	3	0	0	0
CO2	3	2	2	3	2	1	1	1	0	0	1	1	0	3	0	0	0
CO3	3	2	2	3	2	1	1	1	0	0	1	1	0	3	0	0	0
CO4	3	2	2	3	2	1	1	1	0	0	1	1	0	3	0	0	0
CO5	3	2	2	3	2	1	1	1	0	0	1	1	0	3	0	0	0
AVG	3	2	2	3	2	1	1	1	0	0	1	1	0	3	0	0	0

COURSE CONTENT

UNIT 1: STATISTICALPHYSICS [16 HRS]

Statistical Analysis – Classical versus quantum statistics – Distribution of molecular speeds – Maxwell-Boltzmann distribution–Quantum Statistics– Applications of Bose-Einstein statistics–Blackbody radiation – Applications of Fermi-Dirac statistics [Sections 10.1 to 10.7 of Modern Physics by Kenneth Krane]

UNIT 2: SOLID STATE PHYSICS [14 HRS]

LatticePoints and Space Lattice Basis and crystal structure,unitcells and latticeParameters,Unit cells versus primitive cells, Crystal systems, Crystal symmetry, Bravais space lattices – Metallic crystal structures – simple cubic, body-centered cubic, face-centered cubic and hexagonal closed packed structure – Other crystal structures – Diamond, Zinc sulphide, Sodium chloride, Caesium chloride–Directions, Planes and Miller indices–Important features of Miller indices–Important planes and directions, distribution of atoms and separation between lattice planes in a cubic crystal X-Ray diffraction – Bragg's law –

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Bragg's X-ray spectrometer – Powder crystal method [Sections 4.1 to 4.7, 4.14 to 4.22 and 5.7 to 5.10 of Solid State Physics by S.O.Pillai]

UNIT 3

BASIC ELEMENTS OF SPECTROSCOPY [4 HRS]

Quantization of Energy-Regions of Spectrum-Representation of Spectra-Basic Elements of Practical Spectroscopy-Signal to Noise Ratio-Resolving Power-Width and Intensity of Spectral Transitions

[Sections 1.2 to 1.7 of Fundamentals of Molecular Spectroscopy by Banwell and McCash]

MICROWAVESPECTROSCOPY [5HRS]

Rotation of molecules – Rotational spectra – Rigid diatomic molecules – Bond length of CO molecule – Intensities of spectral lines

[Sections 2.1 to 2.3.2 of Fundamentals of Molecular Spectroscopy by Banwell and McCash]

INFRARED SPECTROSCOPY [5 HRS]

Energy of a diatomic molecule – Simple harmonic oscillator – Anharmonic oscillator – Morse curve–Selectionrulesandspectra–ThespectrumofHCl–Hotbands–DiatomicvibratingrotatorBorn-Oppenheimerapproximation

[Sections3.1 to 3.2 of Fundamentals of Molecular Spectroscopy by Banwell and McCash]

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UNIT 5: PHOTONICS [10 HRS]

Interaction of light with matter Absorption,spontaneous emission,stimulated emission,Einstein coefficients – Einstein relations – Light amplification – condition for stimulated emission to dominate spontaneous emission – condition for stimulated emission to dominate absorption – population inversion – metastable states – components of laser – lasing action – types of laser – Rubylaser, NdYAGlaser,He-Nelaser,semiconductorlaser–Applications– Ramaneffect–Classical explanation – quantum theory

[Sections 22.4 to 22.9, 22.14, 22.15, 22.19 and 22.20 of Textbook of optics by Brijlal, Subramanium & Avadhanulu]

BOOKS OF STUDY:

1. S. O. Pillai, *Solid State Physics*, 3rd Edn. New Age International Pvt.Ltd.
2. Colin N. Banwell and Elaine M., *Fundamentals of Molecular Spectroscopy*, 4th Edn., McCashMcGraw-Hill
3. Subrahmanyam and Brijlal, *A Text Book of Optics*, 25th Edn. S.Chand & Company Ltd.,2016

REFERENCEBOOKS

1. M. A. Wahab, *Solid State Physics*.
2. G. Aruldhas, *Molecular Structure & Spectroscopy*.
3. G. M. Barrow, *Introduction to Molecular Spectroscopy*.
4. Long D. A., *Raman Spectroscopy*
5. NPTEL video lectures available online

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DEPARTMENT OF PHYSICS

CURRICULUM FOR B.Sc PHYSICS

MARK DISTRIBUTION FOR SETTING QUESTION PAPER.

Unit/Chapter	Title	Marks
1	Statistical Physics	23
2	Solid State Physics	21
3	Basic Elements of Spectroscopy	6
4	Microwave Spectroscopy	7
5	Infra-Red Spectroscopy	7
6	Photonics	15
Total Marks *		**79**

*Total marks include that for choice of questions in sections A, B and C in the question paper.

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PHY6B12: NUCLEAR PHYSICS AND PARTICLE PHYSICS

COURSE DETAILS

Course Code	PHY6B12
Title of the course	Nuclear Physics And Particle Physics
Semester in which the Course to be Taught	6
Number of Credits	3
Number of Contact Hours	54 (3Hrs. /Wk.)

COURSE OUTCOME (COs)

	Course Outcome	PSO	CL	KC	Class Sessions Allotted
CO1	Understand the basic aspects of nuclear structure and fundamentals of radioactivity	PSO2	U	C	14
CO2	Describe the different types of nuclear reactions and their applications	PSO2	U	C, P	12
CO3	Understand the principle and working of particle detectors	PSO2	U	C, P	8
CO4	Describe the principle and working of particle accelerators	PSO2	U	C, P	8
CO5	Understand the basic principles of elementary particle physics	PSO2	U	C	12

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MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	3	2	1	1	1	0	0	2	2	0	3	0	0	0
CO2	3	2	2	3	2	1	1	1	0	0	2	2	0	3	0	0	0
CO3	3	2	2	3	2	1	1	1	0	0	2	2	0	3	0	0	0
CO4	3	2	2	3	2	1	1	1	0	0	2	2	0	3	0	0	0
CO5	3	2	2	3	2	1	1	1	0	0	2	2	0	3	0	0	0
AVG	3	2	2	3	2	1	1	1	0	0	2	2	0	3	0	0	0

COURSE CONTENT

UNIT 1

1. NUCLEAR STRUCTUREAND RADIOACTIVITY [14 HRS]

Nuclear Constituents – Nuclear sizes and shapes – Nuclear masses and binding energies – Liquid drop model–Shellmodel-Nuclear force–Radioactive decay– Conservation laws in radioactive decay – Alpha decay – Beta decay – Gamma decay – Natural radioactivity – Mossbauer effect [Sections 12.1 to 12.11 of Modern Physics by Kenneth Krane; Sections 11.5, 11.6 ofBeiser]

2. NUCLEAR REACTIONSANDAPPLICATIONS [12 HRS]

Types of nuclear reactions – Radioisotope production in nuclear reactions – Low-energy reaction kinematics – Fission – Fission reactors – Fusion – Fusion processes in stars – Fusion reactors – Applications of nuclear physics – Neutron activation analysis, Medical radiation physics, Alpha decay applications, Synthetic elements

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[Sections 13.1 to 13.6 of Modern Physics by Kenneth Krane]

UNIT 2

1. PARTICLEDETECTORS [8 HRS]

Particle Detectors – Wilson Cloud Chamber – Bubble Chamber – Ionization Chambers – Proportional Counter – Geiger-Muller Counter – Scintillation Counters and Semiconductor Counters – Spark Chamber – Cerenkov Counter – Neutron Counting – The Photographic Plate. [Sections 17.1 to 17.11of Atomic and Nuclear Physics – An Introduction by Littlefield and Thorley]

2. PARTICLE ACCELERATORS [8 HRS]

Particle Accelerators – Cockcroft-Walton Proton Accelerator – Van de Graaff Electrostatic Generator–Linear Accelerator–Lawrence Cyclotron–Synchrocyclotron–Electron Accelerating Machines : Betatron– Electron Synchrotron – Proton Synchrotron – Alternating-Gradient Synchrotron – Intersecting Beam Accelerators – The Growth and Future of Large Accelerating Machines

[Sections 18.1 to 18.12 of Atomic and Nuclear Physics – An Introduction by Littlefield and Thorley]

UNIT 3

ELEMENTARY PARTICLES [12 HRS]

The four basic forces – Particles and antiparticles – Families of particles – Conservation laws – Particle interactions and decays–Resonance particles–Energetics of particle decays–Energetics of particle reactions – The Quark Model – The Standard Model

[Sections 14.1 to 14.9 of Modern Physics by Kenneth Krane]

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DEPARTMENT OF PHYSICS

CURRICULUM FOR B.Sc PHYSICS

BOOKS OF STUDY:

1. *Modern Physics*, 2ndEdn., Kenneth S. Krane, John Wiley &sons
2. *Atomic and Nuclear Physics*, An Introduction, 3rdEdn., T.A. Littlefield and N. Thorley, Springer
3. *Concepts of Modern Physics*, 7thEdn., Arthur Beiser, Tata McGraw-Hill

REFERENCE BOOKS:

1. Raymond A. Serway, Clement J. Moses, Curt A. Moyer, *Modern Physics, 3rdEdn.*, Cengage
2. R.Eisberg & R. Resnick, *Quantum Physics of Atoms, Molecules, Solids, Nuclei & Particles* By John Wiley
3. , Gautreau & Savin, *Theory and Problems in Modern Physics*, Schaum's Outlines Series, TMH
4. John R. Taylor, Chris D. Zafiratos, Michael A. Dubson, *Modern Physics for Scientists and Engineers*, 2nd Edn., Prentice-Hall of India Pvt.Ltd
5. Randy Harris, *Modern Physics*, 2ndEdn, Pearson
6. K. Muraleedhara Varier, *A practical approach to Nuclear Physics*, 1st Edition, Narosa PublishingHouse
7. NPTEL video lectures availableonline

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Unit/Chapter	Title	Marks
1	Nuclear Structure and Radioactivity	20
2	Nuclear Reactions and Applications	18
3	Particle Detectors	12
4	Particle Accelerators	12

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5	Elementary Particles	17
Total Marks *		**79**

*Total marks include that for choice of questions in sections A, B and C in the question paper

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PHY6B13: RELATIVISTIC MECHANICS AND ASTROPHYSICS

COURSE DETAILS

Course Code	**PHY6B13**
Title of the course	**Relativistic Mechanics And Astrophysics**
Semester in which the Course to be Taught	6
Number of Credits	3
Number of Contact Hours	54 (3Hrs. /Wk.)

COURSE OUTCOME (COs)

	Course Outcome	PSO	CL	KC	Class Sessions Allotted
CO1	Understand the fundamental ideas of special relativity	PSO2	U	C	18
CO2	Understand the basic concepts of general relativity and cosmology	PSO2	U	C	8
CO3	Understand the basic techniques used in astronomy	PSO2	U	C	10
CO4	Describe the evolution and death of stars	PSO2	U	C	12
CO5	Describe the structure and classification of galaxies	PSO2	U	C	12

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MAPPING OF COs WITH POs & PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	3	2	1	1	1	0	0	1	1	0	3	0	0	0
CO2	3	2	2	3	2	1	1	1	0	0	1	1	0	3	0	0	0
CO3	3	2	2	3	2	1	1	1	0	0	1	1	0	3	0	0	0
CO4	3	2	2	3	2	1	1	1	0	0	1	1	0	3	0	0	0
CO5	3	2	2	3	2	1	1	1	0	0	1	1	0	3	0	0	0
AVG	3	2	2	3	2	1	1	1	0	0	1	1	0	3	0	0	0

COURSE CONTENT

UNIT 1: SPECIAL RELATIVITY [18 HRS]

The need for a new mode of thought – Michelson-Morley experiment – Postulates of Special Relativity – Galilean transformations – Lorentz transformations – Simultaneity – The order of events : Time like and space like intervals – Lorentz length contraction – The orientation of a moving rod–Time dilation–Muondecay–Roleoftimedilationinanatomicclock-Relativistic transformation of velocity – Speed of light in a moving medium - Doppler effect – Doppler shift in sound – Relativistic Doppler effect – Doppler effect for an observer off the line of motion – Dopplernavigation–Twinparadox–Relativistic Momentum and Energy– Momentum–Velocity dependence of the electron's mass – Energy – Relativistic energy and momentum in an inelastic collision – The equivalence of mass and energy – Massless particles – Photoelectric effect – Radiationpressureoflight– Photon picture of the Dopplereffect–Does light travel at the velocity of light ? – The rest mass of the photon – Light from apulsar

[Sections 11.1 to 11.5, 12.1 to 12.6, 13.1 to 13.4 of An Introduction to Mechanics (1st Edn.) by Daniel Kleppner and Robert J. Kolenkow]

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UNIT 2: GENERAL RELATIVITYAND COSMOLOGY [8 HRS]

The principle of equivalence – General theory of relativity – Tests of general relativity – Stellar evolution–Nucleosynthesis–Whitedwarfstars–Neutronstars–Blackholes–Theexpansion of theuniverse–Cosmic microwave background radiation–Dark matter–Cosmology and general relativity – The big bang cosmology – Formation of nuclei and atoms – Echoes of the big bang–The future of the universe [Sections 15.1 to 15.8 and 16.1 to 16.8 of Modern Physics (2nd Edn.) by Kenneth Krane]

UNIT 3

1. BASIC TOOLS OF ASTRONOMY [10 HRS]

Stellar distance – Relationship between stellar parallax and distance – Brightness and luminosity Relationship between Luminosity, brightness and distance – Magnitudes – Apparent magnitude and brightness ratio – Relationship between apparent magnitude and absolute magnitude – Color and temperature of stars – Size and mass of stars – Relationship between flux, luminosity and radius – Star constituents – Stellar spectra – Stellar classification – Hertzsprung-Russell diagram H-R diagram and stellar radius – H-R diagram and stellar luminosity – H-R diagram and stellar mass

[Sections 1.1 to 1.12 of Astrophysics is Easy : An Introduction for the Amateur Astronomer by Mike Inglis]

2. STELLAR EVOLUTION [12 HRS]

Birth of a Star–Pre-Main-Sequence evolution and the effect of mass–Galactic star clusters–Star formation triggers – The Sun – Internal structure of the sun – Proton-proton chain – Energy transport from the core to the surface – Binary stars – Masses of orbiting stars – Life times of main-sequence stars – Red giant stars - Helium burning – Helium flash – Star clusters, Red giants and the H-R diagram – Post-Main-Sequence star clusters : Globular clusters – Pulsating stars

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– Why do stars pulsate – Cepheid variables and the period-luminosity relationship – Temperature and mass of Cepheids – Death of stars – Asymptotic giant branch – The end of an AGB star's life– Planetary nebulae – White dwarf stars – Electron degeneracy – Chandrasekhar limit – White dwarf evolution – White dwarf origins – High mass stars and nuclear burning – Formation of heavier elements – Supernova remnants – Supernova types – Pulsars and neutron stars – Black holes[3.1, 3.2, 3.4 to to 3.15, 3.19 to 3.24 of Astrophysics is Easy : An Introduction for the Amateur Astronomer by Mike Inglis]

3. GALAXIES [6 HRS]

Galaxy types – Galaxy structure – Stellar populations – Hubble classification of galaxies – Observing galaxies spiral, barred spiral, elliptical, lenticular galaxies– Active galaxies and active galactic Nuclei (AGN) – Gravitational lensing – Hubble's law – Clusters of galaxies[Sections 4.1 to 4.11 of Astrophysics is Easy : An Introduction for the Amateur Astronomer by Mike Inglis]

BOOKS OF STUDY:

1. Daniel Kleppner and Robert J. Kolenkow, *An Introduction to Mechanics*, 1st Edn., McGraw-Hill
2. Kenneth S. Krane, *Modern Physics*, 2nd Edn., John Wiley & Sons
3. Mike Inglis, *Astrophysics is Easy : An Introduction for the Amateur Astronomer*, Springer

REFERENCE BOOKS

1. Robert Resnick, *Introduction to Special Relativity*, Wiley &Sons
2. A P French, *Special Relativity*, Viva Books India
3. Baidyanath Basu, *An introduction to Astrophysics*, PHI
4. J.V.Narlikar, *Introduction to Cosmology*, 3rd Edn. Cambridge University Press, 2002.

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5. Michael Berry, *Principles of Cosmology and Gravitation*, Overseas Press, 2005.
6. Arthur Beiser, *Concepts of Modern Physics*, TataMcGraw-Hill
7. G. Venkataraman, *The Big and the Small (Vol II)*, Universities Press(India)
8. G. Venkataramn, *Chandrasekhar and His Limit*, Universities Press(India)
9. Stephen Hawking, *A Brief History of Time*, BantamBooks
10. NPTEL video lectures available online

MARK DISTRIBUTION FOR SETTING QUESTION PAPER.

Unit/Chapter	Title	Marks
1	Special Relativity	27
2	General Relativity and Cosmology	12
3	Basic Tools of Astronomy	15
4	Stellar Evolution	17
5	Galaxies	8
Total Marks *		**79**

Total marks include that for choice of questions in sections A, B and C in the question paper.

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PHY6B14 (EL1): BIOMEDICAL PHYSICS

COURSE DETAILS

Course Code	**PHY6B14(E11)**
Title of the course	Biomedical Physics
Semester in which the Course to be Taught	6
Number of Credits	3
Number of Contact Hours	54 (3Hrs. /Wk.)

COURSE OUTCOME (COs)

	Course Outcome	CL	KC	Class Sessions Allotted
CO1	Understand the basic principles of biophysics	U	C	14
CO2	Understand the fundamentals of medical instrumentation	U	C	11
CO3	Understand the principles of ultrasound and x-ray imaging	U	C	10
CO4	Understand the basic principles of NMR	U	C	10
CO5	Describe the applications of lasers in medicine	U	C	9

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MAPPING OF COs WITH POs & PSO

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	2	3	2	1	1	0	0	1	2	0	3	0	0	0
CO2	3	3	2	2	3	2	1	1	0	0	1	2	0	3	0	0	0
CO3	3	3	2	2	3	2	1	1	0	0	1	2	0	3	0	0	0
CO4	3	3	2	2	3	2	1	1	0	0	1	2	0	3	0	0	0
CO5	3	3	2	2	3	2	1	1	0	0	1	2	0	3	0	0	0
AVG	3	3	2	2	3	2	1	1	0	0	1	2	0	3	0	0	0

COURSE CONTENT

UNIT 1: PHYSICAL FOUNDATIONSOF BIOPHYSICS [14 HRS]

Free energy, Internal energy, Thermodynamics and Statistical mechanics, Reaction kinetics. *(Sections 4.1to4.4 from "Biophysics: An Introduction "by Rodney Cotterlie ,Wiley.)* Transport Processes: Diffusion, Osmosis, Surface tension, Viscosity, thermal conduction. *(Sections 5.1 to 5.3 from "Biophysics: An Introduction "by Rodney Cotterlie, Wiley.* Oxidation and reduction, redox potential, examples of redox potential in biological systems.

Sections 4.5 and 9.3 from Biophysics: An Introduction by Rodney Cotterlie, Wiley.

Membrane Physics: Diffusion through cell membrane, factors affecting diffusion Membrane potentials: Resting potentials, action potentials, Hodgkin-Huxley model for membrane transport .Donnan equilibrium, Goldman equation.

(Sections 11.1, 11.2, 12.1, 12.2 from Biophysics: An Introduction by Rodney Cotterlie, Wiley. Alsorefer: Principles of Biomedical engineering by Sundararajan V Madihally, Artech house.)

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UNIT 2: FUNDAMENTALS OF MEDICAL INSTRUMENTATION [11 HRS]

Physiologicalsystems of the body, sources of biomedical signals,basic medical instrumentation systems, performance, constraintsandregulations, intelligent medical instrumentation systems. Origin of bioelectric signals, ECG, EEG, EMG.Recording electrodes and microelectrodes. Transducers andbiosensors.

(Sections1.1to1.8,2.1to2.8&3.1to3.10from"HandbookofBiomedicalInstrumentation", R S Khandpur, Tata McgrawHill)

UNIT 3: ULTRASOUND AND X RAY MEDICALIMAGINGSYSTEMS [10 HRS]

Ultrasonic Imaging-properties of ultrasound, modes of ultrasound transmission-pulsed, continuous, pulsed Doppler, ultrasound imaging, ultrasonic diagnosis, and ultrasonic transducers. *(Sections 9.2, 9.3 from Leslie Cromwell, "Biomedical Instrumentation and measurement", Prentice hall of India, New Delhi)*

X-rays- Instrumentation for diagnostic X-rays, visualization of X-rays-fluoroscopy, X-ray filters, X-ray films, Image intensifiers, Special technique-grid, contrast media, Angiography. *(Sections 14.1 to 14.3 from Leslie Cromwell, "Biomedical Instrumentation and measurement", Prentice hall of India, New Delhi)*

X-ray computed tomography – Computed tomography, basic principle, contrast scale, system components-scanning system, processing unit, viewing part, storage unit, and Helical CT scanner. *(Sections 20.1, 20.2 from Handbook of Biomedical Instrumentation by R S Khandpur, Tata Mc GrawHill)*

UNIT 4: NUCLEAR MEDICAL IMAGING SYSTEMS [10 HRS]

Nuclear Medical imaging systems-radio isotopes in medical imaging systems, physics of radioactivity, uptake monitoring equipment, radioisotope rectilinear

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scanner, gamma camera, Emission computed tomography, Positron emission tomography (PET Scanner)

(Sections 21.1, 21.2 from Handbook of Biomedical Instrumentation by R S Khandpur, Tata Mc GrawHill)

Principles of NMR, Image reconstruction techniques, Basic NMR components, Biological effects of NMR imaging, advantages of NMR imaging.

(Sections 22.1, 22.2, 22.3, 22.4, 22.5 from Handbook of Biomedical Instrumentation by R S Khandpur, Tata Mc GrawHill Publications)

(Reference- Medical Imaging Physics, William Hendee, John Wiley and Sons Publications)

UNIT 5 LASERS IN MEDICINE [9 HRS]

Special properties of laser beam (coherence, collimation, monochromaticity), laser active medium, focal length of the laser lens, Laser-tissue interactions, Basic principles of Nd-YAG, CO2, and Argon Lasers, An overview of their clinical applications with special reference to Gynecology, pulmonary, neurosurgery, dermatology, ophthalmology. Photodynamic therapy, Laser safety measures.

(Sections ofChapter1, Chapter 2, Chapter 3, Chapter 5 from Lasers in Medicine - An Introductory Guide, Gregory Absten, Springer Science Publications)

BOOKS OF STUDY

1. Biophysics: *An Introduction" by Rodney Cotterlie*,Wiley
2. *Handbook of Biomedical Instrumentation*", R S Khandpur, Tata Mcgraw Hill
3. "*Biomedical Instrumentation and measurement*", Leslie Cromwell, Prentice hall ofIndia

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4. *Lasers in Medicine - An Introductory Guide*, Gregory Absten, Springer Science Publications

BOOKS FOR REFERENCE

1. J. R. Cameron and J G Skofonick, *Medical Physics*, Wiley Eastern
2. S. Webb, *The physics of medical imaging*, HilgerPublications
3. K. Mahesh and D. R. Vij, *Techniques for radiation dosimetry*, Wiley EasternLimited
4. Maisey, Britton, Chapman and Hall, *Clinical Nuclear Medicine*
5. F Duck,*Ultra sound in Medicine*, IOPPublications
6. John G. Webster, *Medical Instrumentation Application and Design*, John Wiley and sons, New York
7. John M. Brown, *Introduction to Biomedical Equipment Technology*, John Wiley and sons, New York
8. W.R.Hendee & E.R.Ritenour, *Medical Imaging Physics* (3rdeds), Mosbey Inc.,

MARK DISTRIBUTION FOR SETTING QUESTION PAPER.

Unit/Chapter	Title	Marks
1	Physical foundations of biophysics	20
2	Fundamentals of medical instrumentation	16
3	Fundamentals of medical instrumentation	15
4	Nuclear medical imaging systems	15
5	Lasers in medicine	13
Total Marks *		**79**

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Total marks include that for choice of questions in sections A, B and C in the question paper.

PHY6B14 (EL2): NANOSCIENCE AND TECHNOLOGY

COURSE DETAILS

Course Code	**PHY6B14(EL2)**
Title of the course	Nanoscience And Technology
Semester in which the Course to be Taught	6
Number of Credits	3
Number of Contact Hours	54 (3Hrs. /Wk.)

COURSE OUTCOME (COs)

	Course Outcome	CL	KC	Class Sessions Allotted
CO1	Understand the elementary concepts of nanoscience	U	C	6
CO2	Understand the electrical transport mechanisms in nanostructures	U	C	10
CO3	Understand the applications of quantum mechanics in nanoscience	U	C	13
CO4	Understand the fabrication and characterization techniques of nanomaterials	U	C	19
CO5	Enumerate the different applications of nanotechnology	U	C	6

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MAPPING OF COs WITH POs & PSO

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	2	3	2	1	1	0	0	1	2	0	3	0	0	0
CO2	3	3	2	2	3	2	1	1	0	0	1	2	0	3	0	0	0
CO3	3	3	2	2	3	2	1	1	0	0	1	2	0	3	0	0	0
CO4	3	3	2	2	3	2	1	1	0	0	1	2	0	3	0	0	0
CO5	3	3	2	2	3	2	1	1	0	0	1	2	0	3	0	0	0
AVG	3	3	2	2	3	2	1	1	0	0	1	2	0	3	0	0	0

COURSE CONTENT

UNIT 1: INTRODUCTION [6 HRS]

Length scales in Physics-nanometer Nanostructures Zero, One Two and Three dimensional nanostructures (Chapter 3, Text2)

Band Structure and Density of State at Nano scale: Energy Bands, Density of States at low dimensional structures. (Chapter 3, Text1)

UNIT 2: ELECTRICAL TRANSPORT IN NANOSTRUCTURE [10 HRS]

Electrical conduction in metals, the free electron model. Conduction in insulators/ionic crystals Electron transport in semiconductors - Various conduction mechanisms in 3D (bulk), 2D(thin film) and low dimensional systems: Thermionic emission, field enhanced thermionic emission (Schottky effect), Field assisted thermionic emission from traps (Poole-Frenkel effect), Arrhenius type activated conduction, Variable range, Hopping conduction, Polaron conduction. (Chapter 4, Text1)

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UNIT 3: INTRODUCTORY QUANTUM MECHANICSFORNANOSCIENCE [13HRS]

Size effects in small systems, Quantum behaviors of nanometric world: Applications of Schrodinger equation - infinite potential well, potential step, potential box; trapped particle in 3D (nanodot), electron trapped in 2D plane (nanosheet), electrons moving in lD (nanowire, nanorod, nanobelt), Excitons, Quantum confinement effect in nanomaterials (Chapter 5, Text 1)

UNIT 4: GROWTH TECHNIQUES OF NANOMATERIALS (ELEMENTARYIDEASONLY) [9 HRS]

Top down vs. bottom up techniques, Lithographic process, Non Lithographic techniques: Plasma arc discharge, sputtering. Evaporation: Thermal evaporation, Electron beam evaporation, Chemical Vapour Deposition (CVD),Pulsed Laser Deposition,Molecular Beam Epitaxy,Sol-Gel Technique,Electro-deposition.,Ball-milling .(Chapter6,Text.1:Sections6.1,6.2.6.3,6.4.1,6.4.2,6.4.2.1, 6.4.3, 6.4.3.1. 6.4.3.2, 6.4.4, 6.4.5, 6.4.6,6..7,6.4.8,6.4.9)

UNIT 5: CHARACTERISATION TOOLSOF NANOMATERIALS [10 HRS]

Scanning Probe Microscopy (SPM): Basic Principles of SPM techniques, details of STM, tunnelingcurrent, localbarrierheight, localdensityofstates.SomeapplicationsofSTM.

(Section 7.1.1- 7.1.3.3, 7.1.3.5, Text 1), General concepts of AFM(Section- 7.2.4, Text-l), Electron microscopy (7.3.1-7.3.6, Text-1).

UNIT 6: APPLICATIONS OF NANOTECHNOLOGY (ELEMENTARYIDEAS ONLY) [6 HRS]

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Buckminster fullerene, Carbon nanotube, nano diamond, BN Nanotube, Nano electronicssingle electron transistor(no derivation), Molecular machine, Nanobiometrics (Chapter 8, Text 1).Applications of nanomaterials in energy, medicine and environment (Text2)

TEXT BOOKS

1. K. K. Chattopadhyaya and A. N. Banerjee, *Introduction to Nanoscience & Nanotechnology*, Publisher: PHI Learning and Private Limited
2. Rakesh Rather, Nanotechnology, S Chand & Company, New Delhi

REFERENCES

1. M. Hosokawa, K. Nogi, M. Naita, T.Yokoyama (Eds.), *Nanoparticle Technology Handbook*, Elsevier2007
2. Brundle, Evans and Wilson, Butterworth (Eds.), *Encyclopedia of Materials Characterization, Surfaces, Interfaces, Thin Films*, Heinmann,1992
3. *Bharat Bhushan* (Ed.), *Springer Handbook of nanotechnology,* Springer-Verlag, Berlin, 2004
4. V. S Muraleedharan and A Subramanian, *Nano Science and Technology*, Ane BooksPvt.Ltd, New Delhi
5. John D, Miller, *A Handbook on Nanophysics*, Dominant Publishers and Distributors, Delhi-51
6. Charles P Poole Jr. and Frank J Owens, *Introduction to Nanotechnology*, Wiley Students Edition
7. K Ohno *et. al*, *Nano-and micro Materials*, Springer International Edition 2009, New Delhi

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DEPARTMENT OF PHYSICS

CURRICULUM FOR B.Sc PHYSICS

MARK DISTRIBUTION FOR SETTING QUESTION PAPER

Unit/Chapter	Title	Marks
1	Introduction	9
2	Electrical transport innanostructure	15
3	Introductory Quantum Mechanicsfor Nanoscience	19
4	GrowthtechniquesOfnanomaterials	12
5	Characterization tools ofnanomaterials	15
6	Applications of Nanotechnology	9
Total Marks *		**79**

Total marks include that for choice of questions in sections A, B and C in the question paper

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PHY6B14 (EL3): MATERIALS SCIENCE

COURSE DETAILS

Course Code	PHY6B14(EL3)
Title of the course	Materials science
Semester in which the Course to be Taught	6
Number of Credits	3
Number of Contact Hours	54 (3Hrs. /Wk.)

COURSE OUTCOME (COs)

	Course Outcome	CL	KC	Class Sessions Allotted
CO1	Understand the basic ideas of bonding in materials	U	C	7
CO2	Describe crystalline and non-crystalline materials	U	C	8
CO3	Understand the types of imperfections and diffusion mechanisms in solids	U	C	12
CO4	Describe the different properties of ceramics and polymers	U	C	15
CO5	Describe the different types of material analysis techniques	U	C	12

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MAPPING OF COs WITH POs & PSO

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	2	3	2	1	1	0	0	1	2	0	3	0	0	0
CO2	3	3	2	2	3	2	1	1	0	0	1	2	0	3	0	0	0
CO3	3	3	2	2	3	2	1	1	0	0	1	2	0	3	0	0	0
CO4	3	3	2	2	3	2	1	1	0	0	1	2	0	3	0	0	0
CO5	3	3	2	2	3	2	1	1	0	0	1	2	0	3	0	0	0
AVG	3	3	2	2	3	2	1	1	0	0	1	2	0	3	0	0	0

COURSE CONTENT

UNIT1 [15 HRS]

INTRODUCTION

What is material science, Classification of materials-metals, ceramics, polymers, composites, Advanced materials, smart materials. (Section 1.1 to 1.6 of Callister's Material science and Engineering)

BONDS IN MATERIALS

Atomic bonding in solids-bonding forces and energies, Primary bonding - Ionic bonding, Covalent bonding, metallic bonding, Secondary bonding- van der waals bonding, fluctuating induced dipole bonds, polar molecule induced dipole bonds, permanent dipole bonds example of anomalous volume expansion of water. (Section 2.5 to 2.8 of Callister's Material science and Engineering)

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CRYSTALS

Crystalline and Non Crystalline materials -Single crystals, polycrystals, Anisotropy, metallic crystal structures, atomic packing factors of FCC, BCC, Hexagonal close packed crystal structure, Density computations, Linear and planar densities, polymorphism and allotropy, non crystalline solids . (Section3.8to3.11,4.2to4.9ofCallister'sMaterialscienceandEngineering)

UNIT 2 [12 HRS]

IMPERFECTIONS IN SOLIDS

Point defects, Vacancies and selfinterstitials, substitutional impurities, atomic point defects- Schottky defect, Frenkel defect, Dislocations-edge and screw dislocations, burgers vector, Interfacial defects-External surfaces, Grain boundaries, twin boundaries, stacking faults, Bulk and volume defects.(Section 5.2 to 5.8 of Callister's Material science and Engineering)

Diffusion in solids

Introduction, Diffusion mechanism, Vacancy diffusion, Interstitial diffusion, Steady state diffusion and Non-steady state diffusion, Fick's laws, Factors that influence diffusion- temperature, diffusion species, example of aluminium for IC interconnects. Diffusion in ionic and polymeric materials (section 6.1 to 6.8 of Callister's Material science and Engineering)

UNIT 3 [15 HRS]

CERAMICS AND ITS PROPERTIES

Glasses, Glass ceramics, properties, refractories -fire clay and silica refractories, Abrasives, cements, advanced ceramics-optical fibers, ceramic ball bearings, and piezo electric ceramics, stress strain behavior ofceramics, flexural strength and elastic behaviour.

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(Section12.1to12.8,12.11 of Callister's Material science and Engineering)

POLYMERS AND ITS PROPERTIES

Different forms of Carbon-Diamond, Graphite, Fullerenes, and Carbon nano tubes. (Qualitative aspects only)(Section 4.17 of Callister's Material science and Engineering)

Hydro carbon molecules, polymer molecules, homo polymers and copolymers, molecular weight calculation, linear polymers, branched polymers, cross linked polymers, network polymers, thermo setting and thermo plastic polymers, stress-strain behaviour and viscoelastic deformation of polymers. (Section 13.1 to 13.9, 14.2, 14.3, 14.4 of Callister's Material science and Engineering)

UNIT 4 [12 HRS]

MATERIAL ANALYSIS TECHNIQUES

Single crystal and powder diffraction techniques with diffractometer, Laue's technique and rotating crystal method, Microscopic techniques-Optical microscopy, electron microscopy, transmission electron microscopy, scanning electron microscopy, Scanning probe microscopy, construction and working of each device, Grain size determination technique. (Section 4.20, 5.12, 5.13 of Callister's Material science and Engineering)

BOOK FOR STUDY

1. William D. Callister, R. Balasubramanyam (IIT, Kanpur), Material Science and Engineering,, Wiley India Pvt Ltd (Reprint 2011)

BOOK FORREFERENCE

2. V Raghavan, *Materials Science and Engineering*, Vth Edn, (PHI)
3. *Material science* by S.L.Kakani & Amit Kakani, 2nd edition 2010,reprint 2011

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4. R.K. Rajput, *Material Science & Engineering*, Jain BookAgency
5. I. P. Singh, & Subhash Chander, *Material Science and Engineering*, Jain Book Agency

MARK DISTRIBUTION FOR SETTING QUESTION PAPER.

Unit/Chapter	Title	Marks
1	Unit 1	22
2	Unit 2	18
3	Unit 3	22
4	Unit 4	17
Total Marks *		**79**

*Total marks include that for choice of questions in sections A, B and C in the question paper.

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B.Sc. PROGRAMME IN PHYSICS (CORE) PRACTICAL

All centers must arrange sufficient number of apparatus before the Practical Examination. All apparatus must be in proper condition before the Practical examination.

The external practical examination will be conducted at the end of 4th& 6th semesters. At the time of external examination, a student has to produce **certified fair record** with a minimum of **75%** of the experiments, listed in the syllabus. Valuation of the record must be done internally and externally. **A maximum of 1/2 mark can be awarded to an experiment which is neatly recorded.** Total mark for record in external valuation is 10. The principle or the logic and the relevant expressions of the experiment must be shown at the time of examination

Two test papers for practical internals could be conducted by including test papers in any two convenient cycles in the place of an experiment. A batch of students can be evaluated in each class. If there are a total of 4 cycles for a practical course, a test paper each can be included in the 3rd and 4th cycles. If there are a total of 3 cycles for a practical course, a test paper each can be includedinthe2ndand3rdcycles.Amodelexaminationcanalsoconductedaftercompleti onofall cycles. Internal grade for test papers can be awarded based on the best two performances. Digital balance is allowed for mass measurements.

Number of questions in the question paper shall be 8 for Paper I & II: and 6 from Electronics& 2 from Python programs PAPER- III: out of these a minimum of 75% of the questions are to be set for the examination at a centre

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PHY6B15: PRACTICAL II

COURSE DETAILS

Course Code	PHY6B15
Title of the course	PRACTICAL II
Semester in which the Course to be Taught	5&6
Number of Credits	5
Number of Contact Hours	72 (4Hrs. /Wk.)

COURSE OUTCOME (COs)

	Course Outcome	CL	KC	Class Sessions Allotted
CO1	Apply and illustrate the concepts of properties of matter through experiments	Ap	P	36
CO2	Apply and illustrate the concepts of electricity and magnetism through experiments	Ap	P	36
CO3	Apply and illustrate the concepts of optics through experiments	Ap	P	36
CO4	Apply and illustrate the principles of electronics through experiments	Ap	P	36

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MAPPING OF COs WITH POs & PSO

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	3	2	2	2	1	2	2	1	2	2	0	0	0	0	3
CO2	2	3	3	2	2	2	1	2	2	1	2	2	0	0	0	0	3
CO3	2	3	3	2	2	2	1	2	2	1	2	2	0	0	0	0	3
CO4	2	3	3	2	2	2	1	2	2	1	2	2	0	0	0	0	3
AVG	2	3	3	2	2	2	1	2	2	1	2	2	0	0	0	0	3

COURSE CONTENT

ANY 20 EXPERIMENTS

1. e/m measurement -Thomson's apparatus
2. Spectrometer-Cauchy's constants
3. Spectrometer-Diffraction Grating-Normal incidence
4. Spectrometer- Diffraction Grating-minimum deviation
5. Spectrometer i1 – i2curve
6. Laser-wavelength using transmission grating
7. Spectrometer-Quartz prism-Refractive indices of quartz for the ordinary and extra ordinary rays
8. Newton's rings-wavelength of sodium light
9. Air wedge-angle of the wedge, radius of a thin wire
10. Lee's Disc –thermal conductivity of a bad conductor
11. Potentiometer-calibration low range and high range voltmeters

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12. Potentiometer- Reduction factor ofTG
13. Variation of field with distance-Circular coil-moment of magnet &Bh
14. Resolving power of grating
15. Carey Foster's bridge-Temperature coefficient of Resistance
16. Conversion of Galvanometer to voltmeter and calibrating using Potentiometer. (Plot using software)
17. Conversion of Galvanometer to ammeter and calibrating using Potentiometer.
18. BG Absolute Capacity
19. BG-High resistance by leakage method
20. Dispersive power of grating
21. Planck's constant using LED's (Minimum 4nos.)
22. Polarimeter-Specific rotation of sugar solution.
23. Numerical aperture of an optical fibre by semiconductor laser
24. Frequency of AC usingSonometer

BOOKS OF STUDY

1. K A Navas, *Electronics Lab Manual* (vol 1&2)
2. C. L. Arora, *B.Sc. Practical Physics*
3. S. L. Gupta & V. Kumar, *Practical Physics*

REFERENCE BOOKS

4. B. L. Worsnop and H. T. Flint. *Advanced Practical Physics for Students*
5. K. Muraleedhara Varier, *A Practical Approach to Nuclear Physics*, 1st Edition, Narosa Publishing House.

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PHY6B16: PRACTICAL III

COURSE DETAILS

Course Code	PHY6B16
Title of the course	PRACTICAL III
Semester in which the Course to be Taught	5&6
Number of Credits	5
Number of Contact Hours	72 (4Hrs. /Wk.)

COURSE OUTCOME (COs)

	Course Outcome	CL	KC	Class Sessions Allotted
CO1	Apply and illustrate the principles of semiconductor diode and transistor throughexperiments	Ap	P	36
CO2	Apply and illustrate the principles of transistor amplifier and oscillator through experiments	Ap	P	36
CO3	Apply and illustrate the principles of digital electronics through experiments	Ap	P	36
CO4	Analyze and apply computational techniques in Python programming	Ap	P	36

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MAPPING OF COs WITH POs & PSO

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	3	2	2	2	1	2	2	2	2	2	0	0	0	0	3
CO2	2	3	3	2	2	2	1	2	2	2	2	2	0	0	0	0	3
CO3	2	3	3	2	2	2	1	2	2	2	2	2	0	0	0	0	3
CO4	2	3	3	2	2	2	1	2	2	2	2	2	0	0	0	3	0
AVG	2	3	3	2	2	2	1	2	2	2	2	2	0	0	0	0.75	2.25

COURSE CONTENT

UNIT 1: ANY 15 EXPERIMENTS

1. Construction of full wave a) Centre tapped and b) Bridge rectifiers
2. Characteristics of Zener diode and construction of Voltage regulator.
3. Transistor input, output & transfer characteristics in Common Base Configuration and calculation of current gain.
4. Transistor input, output & transfer characteristics in Common emitter Configuration and calculation of current gain
5. CE Transistor Amplifier-Frequency response.(Design the circuit for a given collector current IC)
6. Negative feedback amplifier
7. Half adder using NANDgates
8. Full adder using NAND gates-construction &verification
9. LC Oscillator (Hartley orColpitt's)
10. Phase shift oscillator

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11. Operational Amplifier –inverting, non-inverting, Voltage follower
12. LCR circuits-Resonance usingCRO
13. Construction of basic gates using diodes (AND, OR) & transistors (NOT), verification by measuring voltages
14. Voltage multiplier (doubler, Tripler) (Connections to be realized through soldering. The de- soldering has to be carried out at the end of the experiment.)
15. Multivibrator using transistors.
16. Flip-Flop circuits –RS and JK using IC's
17. Verification of De-Morgan's Theorem using basic gates.
18. Photo diode V-I characteristics. Determine quantum efficiency and responsivity of thePD
19. Study the characteristics of LED (3 colours) andLDR.
20. Wave shaping R-C circuits -integrator and differentiator
21. OPAMP- adder,subtractor

UNIT II: NUMERICAL METHODS USING PYTHON (MINIMUM 5 PROGRAMS TO BE DONE)

22. Solution of equations by bisection and Newton-Raphsonmethods
23. Least square fitting – straight line fitting.
24. Numerical differentiation using difference table.
25. Numerical Integration – Trapezoidal and Simpson's 1/3 rdrule.
26. Taylor series - Sin θ, Cosθ
27. Solution of 1st order differential equation Runge-Kutta method
28. Simulationoffreelyfallingbody. Tabulationofposition, velocityandacceleration, as function of time.

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29. Simulation of projectile – Tabulation of position, velocity and acceleration as a function of time – Plot trajectory in graph paper from tabulated values.

BOOKS OF STUDY

1. K A Navas, *Electronics Lab Manual* (vol 1&2).
2. C. L. Arora, *B.Sc. Practical Physics.*
3. S. L. Gupta & V. Kumar, *Practical Physics*.
4. V. K. Mittal, R. C. Verma & S. C. Gupta, *Computational Physics,* AneBooksI
5. S. S. Shastry, *Introductory Methods Of Numerical Analysis*, Prentice Hall of India, 1983
6. Dr.Sandeep Nagar, *Introduction to Python for Engineers and Scientists,* Apress publications.
7. Dr. B P Ajithkumar, *Python for Education*, IUAC, New Delhi; e-book freely downloadable from www.expeyes.in/documents/mapy.pdf

REFERENCE BOOK

8. B. L. Worksnop and H. T. Flint, *Advanced Practical Physics for Students*

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PHY6B17 (P) – PROJECT

COURSE DETAILS

Course Code	PHY6B17(P)
Title of the course	PROJECT
Semester in which the Course to be Taught	5&6
Number of Credits	2
Number of Contact Hours	36 (2 Hrs. /Wk.)

COURSE OUTCOME (COs)

	Course Outcome	CL	KC	Class Sessions
CO1	Understand research methodology	U	P	18
CO2	Understand and formulate a research project	C	P	18
CO3	Design and implement a research project	C	P	18
CO4	Identify and enumerate the scope and limitations of a research project	C	P	18

MAPPING OF COs WITH POs & PSO

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	3	3	2	2	2	3	2	2	2	2	0	0	0	0	3
CO2	2	3	3	3	2	2	2	3	2	2	2	2	0	0	0	0	3
CO3	2	3	3	3	2	2	2	3	2	2	2	2	0	0	0	0	3
CO4	2	3	3	3	2	2	2	3	2	2	2	2	0	0	0	0	3
AVG	2	3	3	3	2	2	2	3	2	2	2	2	0	0	0	0	3

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MODEL QUESTON PAPER

B. Sc PHYSICS CORE SEMESTER 1

Name.....

Reg.No.....

FIRST SEMESTER B.Sc. DEGREE EXAMINATION ....., 20.....

(CBCSS-UG)

CORE COURSE – PHYSICS: PHY1B01 – MECHANICS-I

Time: 2Hrs. Maximum: 60 Marks

The symbols used in this question paper have their usual meanings

SECTION A – SHORT ANSWER TYPE.

(Answer all questions in two or three sentences, each correct answer carries a maximum of 2 marks)

1. What is meant by an operational definition? Give an example.
2. What is a fictitious force? How it is related to the apparent force on system?
3. What is a central force? Show that the work done by the central force is independent ofthe path.
4. Name the fundamental forces in nature and compare their strengths
5. State and explain Newton's law of gravitation
6. State and explain work energy theorem
7. What are conservative forces? Give examples
8. Sketch and explain the energy diagram of a two atom system

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9. Show that angular momentum is conserved for a particle in central force motion
10. State and prove parallel axis theorem
11. What is moment of Inertia? How it is related to angular momentum?
12. Find the moment of inertia of a ring of radius 'R' and mass 'M' about an axis passing through the center and perpendicular to the plane of the ring.

(Ceiling – 20)

SECTION B – PARAGRAPH / PROBLEM TYPE

(Answer all questions in a paragraph of about half a page to one page, each correct answer carries a maximum of 5 marks)

13. What is the fundamental difference between Newtonian Mechanics and Lagrangian/ Hamiltonian formulations of Mechanics? Explain the areas where Newtonian mechanics fail.
14. A Drum Major's Baton consists of two masses m1 and m2 separated by a thin rod of length l. the baton is thrown into air. Find the center of mass and equation of motion for center of mass of the baton
15. A 5 kg mass moves under the influence of a force$F = (4t^2\mathbf{i} - 3t\mathbf{j})N$. It starts from the origin att=0. Find its velocity and position at t=1s. Find its velocity and position att=1s
16. Obtain an expression for moment of inertia of a uniform thin hoop of mass m and radius r about an axis passing through the center and perpendicular to the plane of the hoop
17. Show that the acceleration of the masses m1 and m2 suspended over a pulley of mass mp in an Atwood's machine is a=(m1-m2)g/(m1+m2+mp/2)
18. AuniformdrumofradiusbandmassMrollsdownaplaneinclined atan angleθ.Findits acceleration along the plane. The moment of inertia of the drum about its axis isI0=Mb2/2

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19. Discuss the general steps involved in applying Newton's laws to a system. Consider the case of two bodies placed on a table top as an example...

(Ceiling – 30)

SECTION C – ESSAY TYPE

(Essays - Answer in about two pages, any one question. Answer carries l0 marks)

20. Define potential energy. Obtain potential energies of a uniform force field and an inverse square force

21. State the law of conservation of angular momentum. Prove that the angular momentum of a rigid body is equal to the sum of the angular momentum about the centre of mass and the angular momentum of the centre of mass about the origin (1 x 10 =10)

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