

NALLAMUTHU GOUNDER MAHALINGAM COLLEGE (AUTONOMOUS)-POLLACHI

300	B.Sc. Mathematics	Core Elective I: Artificial Intelligence and Machine Learning	21UMS5E2	2021
301	B.Sc. Mathematics	SBE II: Financial Mathematics-II	21UMS6S21	2021
302	B.Sc. Mathematics	Core Elective III: Graph Theory	21UMS6E2	2021
303	B.Sc. Mathematics	Core Elective IV: Introduction to Industry 4.0	21UMS6E4	2021
304	B.Sc. Mathematics	Advanced Learner Course-II: Advanced Operations Research-II	21UMS6AL	2021
305	B.Sc. Mathematics	SBE II: Cryptography	21UMS6S2	2021
306	B.Sc. Mathematics	Programming Lab for Physics Using MATLAB/ Programming Lab for Chemistry Using MATLAB	21UPS2A3/ 21UCY2A3	2021
307	B.Sc. Physics	Mechanics	21UPS507	2021
308	B.Sc. Physics	Advanced Learner Course I: Problem Solving	21UPS5AL1	2021
309	B.Sc. Physics	Programming & Information Security	21UPS6E19	2021
310	B.Sc. Physics	Industrial Instrumentation	21UPS6E20	2021
311	B.Sc. Physics	Python Programming	21UPS6E21	2021
312	B.Sc. Physics	Advanced Learner Course II: Problem Solving	21UPS6AL2	2021
313	B.Sc. Chemistry	Core Paper – I : Inorganic and Organic Chemistry	21UCY101	2021
314	B.Sc. Chemistry	Core Paper-II : Organic and Physical Chemistry	21UCY202	2021
315	B.Sc. Chemistry	Core Practical - I : Inorganic Qualitative Analysis	21UCY203	2021
316	B.Sc. Chemistry	Non Major Elective - I : Introduction to Nanotechnology	21UCY3N11	2021
317	B.Sc. Chemistry	Non Major Elective - II : Textile Chemistry	21UCY4N21	2021
318	B.Sc. Chemistry	Core Paper – VII : Electro Chemistry	21UCY509	2021
319	B.Sc. Chemistry	Core Paper – VIII : Dye Chemistry	21UCY510	2021
320	B.Sc. Chemistry	Core Elective – I : Analytical Chemistry - I	21UCY5E11	2021
321	B.Sc. Chemistry	Core Elective - I : Pharmaceutical Chemistry - I	21UCY5E12	2021
322	B.Sc. Chemistry	Core Elective - I : Leather Chemistry	21UCY5E13	2021
323	B.Sc. Chemistry	Advanced Learner Course – I: Environmental Chemistry (Optional)	21UCY5AL1	2021
324	B.Sc. Chemistry	Core XII: Polymer Chemistry	21UCY614	2021



Metric : 1.2.1

New Course Introduced

Dr. R. MUTHUKUMARAN,
M.A., M.Phil., B.Ed., Ph.D.,
PRINCIPAL
N.G.M. College, Pollachi - 642 001
Coimbatore District

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BoS Minutes
Highlighted



DEPARTMENT OF PHYSICS
NALLAMUTHU GOUNDER MAHALINGAM COLLEGE
POLLACHI – 642 001

20th Board of Studies Meeting in the Department of Physics

Date: 22.5.2021

Time: 10.00 am

Agenda

BoS / PHY 20.1	:	Welcome address and Opening Remarks by Chairman, Board of studies in the Department of Physics
BoS / PHY 20.2	:	Confirmation of the Minutes of the 20 th / Previous meeting of Board of studies in the Department of Physics held on 22.05.2021 and Action taken report of 19 th meeting of Board of studies
BoS / PHY 20.3	:	20.3.1 Syllabus of I BSc PHYSICS under Regulation 2021
		20.3.2 Syllabus of II BSc PHYSICS under Regulation 2021
		20.3.3 Syllabus of III BSc PHYSICS under Regulation 2021
		Any other Discussions if any
BoS / PHY 20.4	:	Suggestion given by BOS Members
BoS / PHY 20.5	:	Any other items

NN – Number of BOS Meeting

DC – Short Form of Department (Eg: PHY – Physics / PHY 20.1)

NALLAMUTHU GOUNDER MAHALINGAM COLLEGE
POLLACHI

DEPARTMENT OF PHYSICS
MINUTES OF BOS MEETING

The 20th Meeting of the Board of studies of the Physics Department was held on 22.05.2021 at 10.00 a.m. in online mode.

1. The following members were present:

1	Dr. T. E. Manjulavalli Head, Department of Physics NGM College, Pollachi	Chairman
2	Mrs. N. Revathi	Internal Members
3	Dr. M. Karthika	
4	Dr. S. Shanmugapriya	
5	Dr. A. Sureshkumar	
6	Mrs. S. Yogeswari	
7	Mr. T. Ponraj	
8	Dr. A. G. Kannan	
9	Ms. M. Gayathri	
10	Mr. K. Raghulkumar	
11	Dr. P. Sivaraj	
12	Dr. L. Senthilkumar Professor, Department of Physics Bharthiar University, Coimbatore	University Nominee
13	Dr. C. Joseph Prabagar Assistant Professor of Physics Loyola College, Chennai.	UG Academic Auditor and Subject Expert
14	Dr. R. Jayaprakash Associate Professor of Physics Sri Ramakrishna Mission Vidyalaya College of Arts and Science, Coimbatore	PG Academic Auditor and Special Invitee
15	Mr. S. P. Senthil Subramaniam Mighty Electronics Equipments Corporation 16, First Street, Palaniappa Nagar Sowri Palayam, Coimbatore	Industrial Expert
16	Ms. C. Kokila Research Scholar, Department of Physics Bharathiar University, Coimbatore.	Alumnus nominated by Principal / HoD
17	S. Meenakshi III BSc Physics (2018-2021 Batch)	Student Member


HoD

BoS/PHY 20.3.2

II BSc Physics (III & IV SEMESTER)

The presented syllabus was accepted by the experts and a few suggestions were given as follows:

- **21UPS304 & Mathematical Physics**

Unit V - Group theory to be deleted and Fourier series to be incorporated

- **21UPS405 & Electricity & Magnetism**

The following papers from Second Year BSc Physics were accepted by the experts fully without further suggestions:

- **21UPS3N1 & Principles of Physics – I**
- **21UPS3N2 & Renewable Energy Sources Paper – I**
- **21UPS4N3 & Principles of Physics –II**
- **21UPS4N4 & Renewable Energy Sources Paper – II**
- **21UPS406 & Physics lab II**
- **21UMS4A5 / 21UCY4A5 & Physics Lab For Mathematics & Chemistry**
- **21UMS3A3 / 21UCY3A3 & Physics for Mathematics and Chemistry – I**
- **21UMS4A4 / 21UCY4A4 & Physics for Mathematics and Chemistry – II**

BoS/PHY 20.3.3

III BSc Physics (V & VI SEMESTER)

The presented syllabus was accepted by the experts and a few suggestions were given as follows:

- **21UPS507 & Mechanics**

Certain structural modifications to be carried out such as

Unit 3 can be moved to unit 1

Unit 1 can be moved to unit 2

Unit 2 can be moved to unit 3

Lagrangian and Hamiltonian Mechanics are not necessary for BSc students.

This paper can be strengthened further by including Newtonian mechanics.

- **21UPS509 & Relativity and Quantum Mechanics**

General relativity to be deleted.

To include discussion on failure of classical mechanics, Discussion on Black body radiation.

- **20UPS615 - The title of the paper Condensed Matter Physics & Statistical**

BoS/PHY 20.1 WELCOME ADDRESS AND OPENING REMARKS BY CHAIRMAN,
BOARD OF STUDIES IN THE DEPARTMENT OF PHYSICS. The Chairman,
BoS of the Department of Physics welcomed and introduced the members of 20th
Board of Studies and thanked each one of them for sparing their valuable time to
attend the meeting.

BoS/PHY 20.2 TO CONFIRM THE MINUTES OF 19th BOS MEETING HELD ON 22.2.2020.
The minutes of the 19th Board of Studies meeting held on 22.2.2020 were
communicated to the members. The comments received have been incorporated
and placed for confirmation. The same was approved by the Academic council
which was held on 11.11.2020.

~ Action Taken Report (Enclosed in Annexure 1)

BoS/PHY 20.3

BoS/PHY 20.3.1

I BSc Physic (I & II SEMESTER)

- **21UPS101 & Properties of Matter**

The presented syllabus was accepted by the experts and a **few suggestions** were given as follows:

Potential and field intensity due to a spherical shell and solid sphere (Inside and outside) –
Potential and intensity at a point due to circular disc – Intensity and potential of the gravitational
field at a point due to an infinite plane **to be changed as** The Gravitational Field and Potential
Spherical Shell – Solid sphere (inside and outside) – circular disc – infinite plane.

- **21UPS202 & Thermal Physics**

The title of the paper **Heat and Thermodynamics (20UPS202)** to be **changed as Thermal Physics**.

The following papers from First Year BSc Physics were accepted by the experts fully
without further suggestions:

- **21UPS203 & Physics lab I**

Mechanics to be changed as **21UPS615 & Solid State Physics & Statistical Mechanics**

Strengthen the solid state Physics portion (Unit I to IV) and delete one unit in statistical mechanics

The following papers from Third Year BSc Physics were accepted by the experts fully without further suggestions:

- **21UPS508 & Optics & Spectroscopy**
- **21UPS5E10 & Basic Electronics & Circuit Systems**
- **21UPS5S1 & Mechanical measurements**
- **21UPS5S2 & Fundamentals of Bio-Physics**
- **21UPS614 & Atomic & Nuclear Physics**
- **21UPS6E19 & Microprocessor & Programming in C**
- **21UPS622 & Electronics Lab**
- **21UPS623 & Digital & Microprocessor Lab**
- **21UPS624 & Computer lab in C**
- **21VAD603 & PCB and Circuit Designing**
- **21UPS6E16 & Digital Principles and application**
- **21UPS6S4 & Fundamentals of Astrophysics**

New Courses Added:

The following papers from Third Year BSc Physics were accepted by the experts fully without further suggestions

- **21UPS5E11 & Communication Electronics**
- **21UPS5E12 & Material Science**
- **21UPS5AL1 & Problem Solving – I**
- **21UPS6E17 & Biomedical Instrumentation**
- **21UPS6E18 & Nanomaterials and applications**
- **21UPS6E20 & Industrial Instrumentation**
- **21UPS6E21 & Python Programming**
- **21UPS6AL2 & Problem Solving - II**

These changes have been made effect for the students admitted in 2021 with (Sem I to VI) semesters accordingly.

BoS/PHY 20.4 SUGGESTIONS GIVEN BY THE BoS MEMBERS

20.4.1: Few papers such as Mathematical Physics (21UPS304), Solid State Physics & Statistical Mechanics (21UPS615), **Mechanics (21UPS507) to be modified.**

20.4.2: Advanced learner course – Problem solving skills in Physics to be included to enhance their ability in solving various problems related to Physics so as to help students to succeed in the competitive exams like JAM, JEST, etc.

The members had a brainstorming discussion and interaction among themselves. After discussion, fruitful suggestions were incorporated appropriately in the Curriculum and Syllabi.

Based on the suggestions given by the members, BOS resolved to recommend the following to the Academic Council for further approval.

- a) The syllabus of First Year BSc Physics under Regulation 2021.
- b) The syllabus of Second Year BSc Physics under Regulation 2021.
- c) The syllabus of Third Year BSc Physics under Regulation 2021.

BoS/PHY 20.3

BoS/PHY 20.3.1

I M.Sc. Physics (I & II Sem)

The following papers from M.Sc. Physics were accepted by the experts fully without further suggestions:

- **21 PPS 101 - Core I: Mathematical Physics**
- **21 PPS 102 - Core II: Classical Mechanics**
- **21 PPS 103 - Core III: Statistical Mechanics**
- **21 PPS 1E1 - Core Elective I: Applied Electronics**
- **21 PPS 205 - Core V: Electromagnetic theory & Electrodynamics**
- **21 PPS 2E2 - Core Elective II: Electronic Communications and Cyber security**
- **21 PPS 207 - Core VII: General Physics lab I**
- **21 PPS 208 - Core VIII: Electronics lab I**
- **21 PPS 2N1 - Non Major Elective: Non-Conventional Energy sources**
- **21 PPS 2N2 - Biomedical Instrumentation**

The following courses were revised with minor modifications

- **21 PPS 204 - Core IV: Quantum Mechanics I**

The presented syllabus was accepted by the experts and a few suggestions were given as follows:

In Unit I, total number of contact hours to be increased and suggested a book for study (Quantum Mechanics by Nouredine Zettili)

BoS/PHY 20.3.2

I M.Sc. Physics (III & IV Sem)

The following papers from M.Sc. Physics were accepted by the experts fully without further suggestions:

- **21 PPS 309 - Core IX: Molecular Spectroscopy**
- **21 PPS 411 - Core XI: Lasers & Non-linear optics**
- **21 PPS 412 - Core XII: Nuclear & Particle Physics**
- **21 PPS 4E4 - Core Elective IV: Microprocessor & Object Oriented Programming with C++**
- **21 PPS 413 - Core XIII: General Physics lab II**
- **21 PPS 414 - Core XIV: Electronics lab II**
- **21 PPS 415 - Core XV: Computer lab in C++**
- **21 PPS 416 - Core XVI: Project**

The following courses were revised with minor modifications

- **21 PPS 310 - Core X: Quantum Mechanics II**

The presented syllabus was accepted by the experts and a few suggestions were given as follows:

Unit II – Indistinguishable particle and spin to be deleted and to introduce semi-classical theory of radiation.

- **21 PPS 3E3 - Core Elective III: Thin films & Nano science**

The presented syllabus was accepted by the experts and a few suggestions were given as follows:

Unit II, III, IV, V to be modified

New Course Added:

The following paper from M.Sc. Physics were accepted by the experts fully without further suggestions

- **21 VAD 301 - Value Added Course: Python Programming**

BoS/PHY 20.4 SUGGESTIONS GIVEN BY THE BoS MEMBERS

1: NPTEL lecture series by Prof. V.Balakrishnan, Dept. of Physics, IIT Madras to be followed

2: Python Programming may be introduced as value added course for M.Sc. Physics students.

3: Any two MOOC courses are compulsory and to be completed at the end of 2nd semester

4: Value added Programme - 21 VAD 301 Python Programming to be completed at the 3rd semester

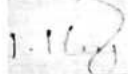
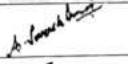
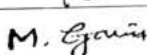
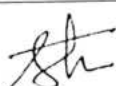
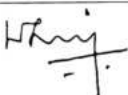
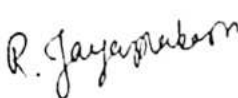
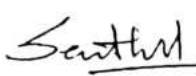
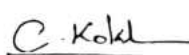
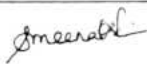
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(a) The syllabus of First Year M.Sc. Physics under Regulation 2021

(b) The syllabus of Second Year M.Sc. Physics under Regulation 2021

Members Present:

Chairman	
Dr. T. E. Manjulavalli Head, Department of Physics NGM College, Pollachi	
Internal Members	
Mrs. N. Revathi, Assistant Professor	
Dr. M. Karthika, Assistant Professor	
Dr. S. Shanmugapriya, Assistant Professor	
Dr. A. Sureshkumar, Assistant Professor	
Mrs. S. Yogeswari, Assistant Professor	
Mr. T. Ponraj, Assistant Professor	
Dr. A. G. Kannan, Assistant Professor	
Ms. M. Gayathri, Assistant Professor	
Mr. K. Raghulkumar, Assistant Professor	
Dr. P. Sivaraj, Assistant Professor	
University Nominee	
Dr. L. Senthilkumar Professor, Department of Physics Bharthiar University, Coimbatore	
Academic Expert	
Dr. C. Joseph Prabagar Assistant Professor of Physics Loyola College, Chennai.	
Special Invitee	
Dr. R. Jayaprakash Associate Professor of Physics Sri Ramakrishna Mission Vidyalaya College of Arts and Science, Coimbatore	
Industrial Expert	
Mr. S. P. Senthil Subramaniam Mighty Electronics Equipments Corporation 16, First Street, Palaniappa Nagar Sowri Palayam, Coimbatore	
Alumnus nominated by Principal / HoD	
Ms. C. Kokila Research Scholar, Department of Physics Bharathiar University, Coimbatore.	
Student Member	
S. Meenakshi III BSc Physics (2018-2021 Batch)	


HOD of Physics

SEMESTER – V

Part	Subject Code	Subjects	Ins. Hrs Per Week	Examinations				Credits
				Dur. Hrs	CIA	ESE	Total	
III	21UPS507	Core VII : Mechanics	5	3	50	50	100	4
	21UPS508	Core VIII: Optics & Spectroscopy	5	3	50	50	100	5
	21UPS509	Core IX: Relativity and Quantum Mechanics	5	3	50	50	100	5
	21UPS5E10 / 21UPS5E11/ 21UPS5E12	Core Elective - I : Basic Electronics & Circuit Systems/ Communication Electronics/ Material Science	5	3	50	50	100	5
	21UPS513	Summer Internship	-	-	-	-	100	3
		Electronics Lab	3					
		Digital & Microprocessor Lab	3					
	21UPS5AL1	Advanced Learner Course - I (Optional) - Problem Solving - Self Study	-	-	50	50	100**	4**
IV	21UPS5S1/ 21UPS5S2	Skill based Elective I: Mechanical measurements/Fundamentals of Bio-Physics	1	2	-	50	50	2
	21GKL501	General Knowledge & General Awareness	SS			50	50	2
	21HEC505	HE - (National values & SKY Yoga Practice - V)	1	2	25	25	50	1
CC	21CFE501	Fluency in English - V	After 3.00 pm					Grade
Total							650+ 100**	27 + 4**

SEMESTER – VI

Part	Subject Code	Subjects	Ins. Hrs Per Week	Examinations				Credits
				Dur. Hrs	CIA	ESE	Total	
III	21UPS614	Core X : Atomic & Nuclear Physics	5	3	50	50	100	4
	21UPS615	Core XI : Solid State Physics & Statistical Mechanics	5	3	50	50	100	5
	21UPS6E16/ 21UPS6E17/ 21UPS6E18	Core Elective II : Digital Circuit systems & Microprocessor / Biomedical Instrumentation/ Nanomaterials and applications	5	3	50	50	100	5
	21UPS6E19/ 21UPS6E20/ 21UPS6E21	Core Elective III: C Programming & Information Security / Industrial Instrumentation/ Python Programming	5	3	50	50	100	5
	21UPS622	Core XII : Electronics Lab	3	3	50	50	100	3
	21UPS623	Core XIII : Digital & Microprocessor Lab	3	3	50	50	100	3
	21UPS624	Core XIV : Computer lab in C	2	3	50	50	100	2
	21UPS6AL2	Advanced Learner Course - II (Optional) – Problem Solving - Self Study			50	50	100**	4**
	21VAD601	Value Added Course: Remote Sensing and Data Fusion using IoT	30					2**
IV	21UPS6S3/ 21UPS6S4	Skill based Elective II:Environmental Instrumentation/Fundamentals of Astrophysics	1	2	-	50	50	2
	21HEC606	HE - (Global values & SKY Yoga Practice - VI)	1	2	25	25	50	1
CC	21CFE601	Fluency in English - VI	After 3.00 pm					Grade
Total							800+ 100**	30 + 6**
Grand Total							3900	140 + 10**

* Certificate Course

** Extra credits for advanced learner and value added course

Programme Code:	B.Sc. PHY			Programme Title:	Bachelor of Science	
Course Code:	21UPS507			Title	Batch:	2021 – 2024
				Core VII: Mechanics	Semester:	V
Lecture Hrs./Week	5	Tutorial Hrs./Sem.			Credits:	5

Course Objective

To acquire a complete knowledge about mechanics and classical dynamics

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the laws involved in Projectiles, Rigid body dynamics and classical mechanics	K1
CO2	Gain a deeper insight into the physical concepts and its application to various physical systems	K2
CO3	Apply these formalisms to obtain equations of motion for simple systems	K3
CO4	Analyze the problem and frame equations of motion	K4
CO5	Ability to Use the necessary skills and tools to write equations for real time problems	K5



Dr. T.E. Manjulavalli, M.Sc., M.Phil., Ph.D.,
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PRINCIPAL
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Mapping

PO / PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	H	H	H	H	M	L	H	H
CO2	H	M	H	H	M	H	H	H
CO3	H	M	H	H	H	H	M	M
CO4	H	M	M	H	H	H	M	M
CO5	H	M	M	H	H	H	M	H

H – High; M – Medium; L – Low



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Units	Content	Hrs
Unit I	PROJECTILES Vertical motion under gravity- motion of particle projected horizontally from a point above the earth - particle projected in any direction - path of projectile is a parabola - range of projectile on a plane inclined to the horizontal maximum range on the inclined plane - angle of projection for a particular range- velocity at a point in the path of a projectile - enveloping parabola.	13
Unit II	NEWTON'S LAWS OF MOTION Newton's Laws of motion - forces and equations of motion - motion of a particle in a uniform gravitational field - Newtonian law of universal gravitation - Examples -electric and magnetic forces on a charged particle - The magnetic field and Lorentz force - Examples - motion of charged particle in a uniform constant electric field. Conservation of momentum - contact forces: friction - Problems.	13
Unit III	CONSERVATION LAWS Definition of concepts - conservation of energy - Work - kinetic and potential energy - Examples - Conservative Forces - Potential energy and conservation of energy in gravitational and electric field - Examples. Conservation of Linear and angular momentum: Internal forces and momentum conservation - center of mass – Examples - General elastic collision of particles of different masses - System with variable mass-Examples- Conservation of angular momentum - Torque due to internal forces - Torque due to gravity - Angular momentum about center of mass.	13
Unit IV	ELEMENTARY RIGID BODY DYNAMICS The equation of motion - angular momentum and kinetic energy - Moment of inertia - parallel axis theorem - Perpendicular axis theorem - examples - Rotation about fixed axis: time dependence of motion - Examples - Rolling without slipping - Torque about center of mass - Example - Rotation about fixed axes: Behavior of angular momentum vector.	13
Unit V	MECHANICS OF SYSTEM OF PARTICLES Conservation theorem for a system of particle: Conservation theorem for linear momentum, angular momentum and energy - Constrained motion - Types of constraints with examples - Forces of constraints - Degrees of freedom - Generalized coordinates - Generalized notation for Displacement, Velocity, Acceleration, Momentum, Force and Potential - Limitations of Newton's Law.	13
	Total Contact Hrs	65

Pedagogy and Assessment Methods:

Chalk and Talk lectures, Group Discussion, Seminar, Interaction, power point presentation


Dr. T.E. Manjulavalli, M.Sc., M.Phil., Ph.D.,
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PRINCIPAL
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Text Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Murugeshan. R	Mechanics and Mathematical Methods	S.Chand & Co Ltd, New Delhi \ Reprint	2006
2	Mathur D.S	Mechanics	S. Chand & Co Ltd, New Delhi \ 2 nd Edition	2012
3	Narayanamurthi. M and Nagarathinam. M	Dynamics	National Publishing Company \ Revised Edition	1988
4	Gupta, Kumar & Sharma	Classical Mechanics	Pragati Prakashan \ 19 th edition	2010
5	Murugeshan. R	Modern Physics	S. Chand & Co Ltd \ Ninth revised edition	2001

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Bhargava& Sharma	A Text Book of Mechanics	Ratan Prakashan Mandir \ 7 th edition	1990
2	Arthur Beiser	Concepts of Modern Physics	TMH-\ 6 th edition	2003


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 PRINCIPAL
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Programme Code:	B.Sc. PHY			Programme Title:	Bachelor of Science	
Course Code:	21UPS5AL1			Title	Batch:	2021 – 2024
				Advanced Learner Course - I - Problem Solving Skills in Physics I	Semester:	V
Lecture Hrs./Week		Tutorial Hrs./Sem.			Credits:	5

Course Objective

Student will be introduced to solve problems in core physics. Every unit must contain minimum 20 problems based on various principles of Physics.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Get motivated to acquire problem solving skills in Physics	K1/K2
CO2	Apply the skills to solve in Mechanics, Thermal Physics and Electricity	K3
CO3	Select and use appropriate concepts and methods to solve problems effectively and creatively	K4
CO4	Identify, evaluate and synthesize information and engage the imagination to explore new possibilities	K5
CO5	Crack problems confidently in competitive examinations like JEST, JAM& TIFR	K6


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 PRINCIPAL
 N. G. M. COLLEGE, POLLACHI

Mapping

PO / PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	H	H	H	M	M	L	H	H
CO2	H	H	M	M	M	L	H	H
CO3	H	H	M	M	M	L	H	H
CO4	H	M	M	M	H	L	H	H
CO5	H	M	M	L	H	L	H	H

H – High; M – Medium; L – Low

Units	Content	Hrs
Unit I	PROBLEMS IN MECHANICS Newton laws of motion for various systems (1, 2 and 3 dimension), Conservation laws and collisions, Rotational mechanics, central force, Harmonic oscillator, special relativity	20
Unit II	PROBLEMS IN THERMAL PHYSICS Kinetic theory- MB distribution-Laws of thermodynamics-Ideal Gas law-Variou Thermodynamic process- Entropy calculation for various process-Heat engine-TS and PV diagram-Free energies various relations	15
Unit III	PROBLEMS IN ELECTRICITY & MAGNETISM Electrostatics- calculation of Electrostatic quantities for various configurations- Conductors	10
	Total Contact Hrs	45


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Text Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Charles Kittel, Walter D knight (in SI units)	Mechanics (in SI units)	Tata McGraw Hill publication \ second edition	2017
2	S.C. Garg, RM Bansal & CK Ghosh	Thermal Physics	Tata McGraw Hill Publications\ first edition	1993
3	E.M.Purcell	Electricity & magnetism (in SI units)	Tata McGraw hill Publication\ second edition	1984

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	H.C. Verma	Concepts of Physics Vol 1 & 2	Bharathi Bhavan Publications	2017
2	Halliday & Resnick	Fundamentals of Physics	Wiley Publications\ 8 th edition	2007
3	Nelkon and Parker	Advanced level Physics	CBS publishers\ 7 th edition	1995
4	AmithAgarwal	Play with Graphs	Arihant Publications\ 10 th edition	2018

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Programme Code:	B.Sc. PHY		Programme Title:	Bachelor of Physics	
Course Code:	21UPS6E19		Title	Batch:	2021 – 2024
Lecture Hrs./Week or Practical Hrs./Week	5	Tutorial Hrs./Sem.	Core Elective III: C Programming & Information Security	Semester:	VI
				Credits:	5

Course Objective

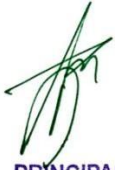
To develop the skill to gain knowledge in Programming in C & Information Security

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic concepts of C programming and information security	K1/K2
CO2	Apply the concepts of C programming to solve problems in Physics	K3
CO3	Analyze the importance of operators, control statements, functions, structures and pointers in problem solving	K4
CO4	Evaluate the impact of various types of attacks on information leakage and security	K5
CO5	Create the advance perspectives on prevention through cyber-crime of wireless digital communications including internet and e-commerce	K6


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Mapping

PO / PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	H	H	H	H	H	H	H	H
CO2	M	H	H	H	H	M	H	H
CO3	M	H	H	H	M	M	H	H
CO4	-	M	M	H	M	M	M	H
CO5	-	L	M	M	M	H	-	H

H – High; M – Medium; L – Low

Units	Content	Hrs
Unit I	INTRODUCTION TO C Basic Structure of C Programs - Character set - Key words and Identifiers - Constants - Variables - Data types – Declaration of variables – Assigning values to variables – Defining symbolic constants - Arithmetic operators - Relational operators - Logical operators - Assignment operators - Increment and decrement operators - conditional operators - Precedence of operators - <i>Formatted input & output statements</i>	13
Unit II	CONTROL STRUCTURES, ARRAYS & STRINGS Simple if - if...else - Nesting of if...else - else if ladder - Switch - while - do...while - for statements - Declaration and initialization of one & two dimensional arrays - Declaring and initializing string variables - String handling functions	13
Unit III	FUNCTIONS, STRUCTURES AND POINTERS Definition of functions - Return values and their types - Category of functions: No arguments and no return values - Arguments but no return values - Arguments with return values - Recursion - Defining a structure - Declaring structure variables - Accessing structure members - Structure initialization - Declaring and initializing pointers - Pointers as function arguments - Pointers and structures	13



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Unit IV	INFORMATION SECURITY Components of Communications System – Transmission Media. Protocol – Definition – Introduction to TCP / IP – Wireless Network – Basics of Internet. Types of Attack: Phishing, Spoofing, Impersonation, Dumpster diving – Information Security Goals. Information Security Threats and Vulnerability: Spoofing Identity, Tampering with data, Repudiation, Information Disclosure, Denial of Service, Elevation of Privilege.	13
Unit V	Authentication – Password Management – E-Commerce Security – Windows Security. Network Security: Network Intrusion and Prevention Systems – Firewalls – Software Security. Web Security: User authentication, Authentication – Secret and Session Management, Cross Site Scripting, Cross Site Forgery, SQL Injection. Computer Forensics – <i>Steganography</i> .	13
	Total Contact Hrs	65

- *Italic font denotes self-study*

Pedagogy and Assessment Methods:

Seminar, Power Point Presentation, Chalk and talk, Quiz, Assignments, Group Task.

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Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	E.Balagurusamy	Programming in Ansi C (Units I-III)	Tata McGraw Hill	2017
2	Michael E. Whitman, Herbert J. Mattord	Principles of Information Security (Units IV & V)	Course Technology 20 Channel Center Boston, MA 02210	2017

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Ravichandran.D	Programming In C	New Age International Publishers	2011
2	Yashvant Kanetkar	Let Us C	BPB Publications	2016
3	Jason Andress	The Basics of Information Security	Syngress; 1st edition	2011


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Programme Code:	B.Sc. PHY			Programme Title:	Bachelor of Science	
Course Code:	21UPS6E20			Title	Batch:	2021 – 2024
				Core Elective	Semester:	VI
Lecture Hrs./Week	5	Tutorial Hrs./Sem.	-	III : Industrial Instrumentation	Credits:	5

Course Objective

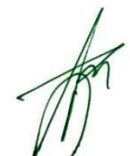
To make the student familiar with measurement techniques of physical quantities and analyze the data

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the principles of instruments used in different industrial sectors	K1
CO2	Elucidate the construction and working of various industrial devices in measuring physical quantities	K2
CO3	Analyze the performance and characteristics of each instrument	K3
CO4	Make the new models for calibration and configuration of instruments	K4
CO5	Formulate the instruments for specific applications in industries	K5


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Mapping

PO / PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	H	H	M	H	M	L	H	H
CO2	H	H	L	H	M	H	H	H
CO3	H	M	M	H	H	H	M	M
CO4	H	H	M	H	M	H	M	M
CO5	H	M	L	M	H	H	M	H

H – High; M – Medium; L – Low

Units	Content	Hrs
Unit I	INDUSTRIAL MEASUREMENTS Measurement of straightness, flatness, roundness and roughness. Force Measurement - Load cell, different types of load cells - elastic load cell-strain gauge load cell. Torque measurement-Using strain gauge and magneto elastic principle, Speed Measurement - Revolution counter-capacitive tacho-drag up type tacho, D.C and A.C tacho generators – stroboscopic methods. Acceleration Measurement- <i>Elementary accelerometer, Seismic accelerometer, Practical accelerometers.</i>	13
Unit II	TEMPERATURE MEASUREMENT & APPLICATION Definition & Standards, Temperature scales, Calibration of thermometers, Bimetallic thermometer, filled- in Thermometers, Vapour pressure thermometers, Resistance thermometers, Thermistors- color code testing and installation procedure, Thermostat, Thermocouples - types and ranges, characteristics, laws of thermocouples, cold junction compensation, IC temperature sensors AD 590, <i>Pyrometers - radiation and optical pyrometers.</i>	13


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Unit III	PRESSURE MEASUREMENT Manometers - different types of manometers, Elastic pressure transducers, Dead weight Tester, Electrical types, Vacuum gauges - McLeod gauge, Knudsen gauge, Thermocouple gauge, Ionization gauge, Differential pressure Transmitter - electrical & pneumatic types, Complete air supply system for pneumatic control equipment and the different components and their function.	13
Unit IV	MEASUREMENT OF FLOW & LEVEL Orifice, Venturi, Pitot tube, flow nozzle rotameter, Doherty tube, Positive displacement meter, Turbine flow meter, Electromagnetic flow meter, Ultrasonic flow meter, Open channel flow measurement, Solid flow measurement. Level: Sight glass, float gauge, displacer, torque tube, bubble tube, diaphragm box, Differential Pressure methods, electrical methods resistance type, capacitance type, ultrasonic level gauging.	13
Unit V	MEASUREMENT OF DENSITY, VISCOSITY, HUMIDITY Hydrometer - continuous weight measurement, liquid densitometer - float principle, air pressure balanced method, using gamma rays - gas density measurements – gas specific gravity measurements - Viscosity terms, saybolt viscometer, rotometer type viscometer, Industrial consistency meters. Humidity terms - dry & wet bulb psychrometers - hot wire electrode type hygrometer, electrolytic hygrometer, Dew point hygrometer.	13
	Total Contact Hrs	65

- *Italic font denotes self-study*

Pedagogy and Assessment Methods:

Chalk and Talk lectures, Group Discussion, Seminar, Interaction, power point presentation


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Text Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Patranabis D.	Principles of Industrial Instrumentation	Tata McGraw Hill, New Delhi	2009
2	Singh. S.K.	Industrial Instrumentation & Control	Tata McGraw Hill, New Delhi	2009
3	Krishnaswamy. K Vijayachitra. S	Industrial Instrumentation	New age International	2008

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Ernest O. Doebelin, Dhanish. N. Manik	Measurement Systems Application & Design	TMH	2004
2	Jain R.K	Mechanical & Industrial Measurements	Khanna Publishers	2004


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Programme Code:	B.Sc. PHY			Programme Title:	Bachelor of Physics	
Course Code:	21UPS6E21			Title	Batch:	2021 – 2024
				Core Elective III:	Semester:	VI
Lecture Hrs./Week or Practical Hrs./Week	5	Tutorial Hrs./Sem.	-	Python Programming	Credits:	5

Course Objective

To provide fundamental knowledge of Python programming and create the ability to interpret physics oriented problems using Python

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the basics, structure and functions of Python programming as useful scripting language	K1 / K2
CO2	Plan to write the algorithm of a program with the knowledge of mathematical operators, logical operators, conditional and looping statements	K3
CO3	Categorize various statements of Python programming into the lists and tuples	K4
CO4	Explain clearly the importance of different function statements and pass the arguments between functions	K5
CO5	Implement and compile the python programming for application in the field of Physics	K6



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Mapping

PO / PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	H	M	-	-	M	-	H	-
CO2	H	H	L	-	H	-	M	M
CO3	M	M	H	M	M	L	M	M
CO4	-	L	M	H	L	M	-	H
CO5	-	-	-	M	-	M	-	H

H – High; M – Medium; L – Low

Units	Content	Hrs
Unit I	INTRODUCTION TO PYTHON LANGUAGE History of Python – features – command Line Arguments - Parsing Command Line Arguments - Python basics – statement and syntax – Identifiers – comments in Python - Basic style guidelines	13
Unit II	VARIABLE TYPES AND BASIC OPERATORS Assigning Values to Variables – Standard Data Types - Python Numbers – Python Strings - Python Lists - Python Tuples - Python Dictionary - Data Type Conversion - Types of Operator - Arithmetic Operators - Comparison Operators - Assignment Operators - Bitwise Operators - Logical Operators - Membership Operators - Identity Operators - Operators Precedence	13


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Unit III	STRING OPERATORS Sequences: Strings, Lists and Tuples – Sequences – Strings and strings operators – String built-in methods – Lists – List type Built in Methods – Tuples	13
Unit IV	CONDITIONAL AND LOOPING STATEMENT Conditionals and loops – if statement – else Statement – elif statement – conditional expression – while statement – for statement – break statement – continue statement – pass statement – Iterators and the iter() function	13
Unit V	PYTHON FUNCTIONS Functional Programming – Functions – calling functions – creating functions – passing functions – Built-in Functions: apply(), filter(), map() and reduce() – Programming using functions	13
	Total Contact Hrs	65

- *Italic font denotes self-study*

Pedagogy and Assessment Methods:

Seminar, Power Point Presentation, Chalk and talk, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Wesley J. Chun	Core Python Programming	Pearson Education Publication	2012


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Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Nageshwara Rao	Core Python Programming	Wiley Publication	2018
2	John V Guttag	Introduction to Computation and Programming Using Python	Prentice Hall	2013
3	Kenneth A. Lambert	Fundamentals of Python – First Programs	CENGAGE Publication	2016


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Programme Code:	B.Sc. PHY			Programme Title:	Bachelor of Science	
Course Code:	21UPS6AL2			Title	Batch:	2021 – 2024
Lecture Hrs./Week		Tutorial Hrs./Sem.		Advanced Learner	Semester:	VI
				Course - II - Problem Solving Skills in Physics II	Credits:	5

Course Objective

Student will be introduced to solve problems in core physics. Every unit must contain minimum 20 problems based on various principles of Physics.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Get motivated to acquire problem solving skills in Physics	K1/K2
CO2	Apply the skills to solve in Magnetism, Quantum Mechanics, General Physics etc	K3
CO3	Select and use appropriate concepts and methods to solve problems effectively and creatively	K4
CO4	Interpret and use written, quantitative, and visual text effectively in presentation of solutions to problems	K5
CO5	Crack problems confidently in competitive examinations like JEST, JAM & TIFR	K6


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Mapping

PO / PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	H	H	H	M	M	L	H	H
CO2	H	H	M	L	M	L	H	H
CO3	H	H	M	M	M	L	H	M
CO4	H	M	M	M	H	L	H	H
CO5	H	M	M	L	H	L	H	H

H – High; M – Medium; L – Low

Units	Content	Hrs
Unit I	PROBLEMS IN MAGNETISM Magneto statics- Calculation of Magnetic quantities for various configurations, Electromagnetic induction, Poynting vector, Electromagnetic waves.	10
Unit II	PROBLEMS IN QUANTUM MECHANICS Origin of Quantum mechanics- Fundamental Principles of Quantum mechanics- potential wells and harmonic oscillator- Hydrogen atom.	20
Unit III	PROBLEMS IN GENERAL PHYSICS & MATHEMATICS Plotting the graphs for various elementary and composite functions-Elasticity-Viscosity and surface tension- fluids-Buoyancy-pressure-Bernoulli's theorem-applications-waves and oscillations, Errors and propagation of errors.	15
	Total Contact Hrs	45


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Text Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	E.M. Purcell	Electricity & magnetism (in SI units)	Tata McGraw hill Publication\ second edition	1984
2	N. Zettili	Quantum mechanics	Wiley Publishers\ second edition	2009
3	David. J. Griffith	Introduction to quantum mechanics	Pearson Publications\ second edition	2015
4	D.S. Mathur	Properties of matter	S. Chand Publications\ 11 th Edition	2010

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	H.C. Verma	Concepts of Physics Vol 1 & 2	Bharathi Bhavan Publications	2017
2	Halliday & Resnick	Fundamentals of Physics	Wiley Publications\ 8 th edition	2007
3	Nelkon and Parker	Advanced level Physics	CBS publishers\ 7 th edition	1995
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