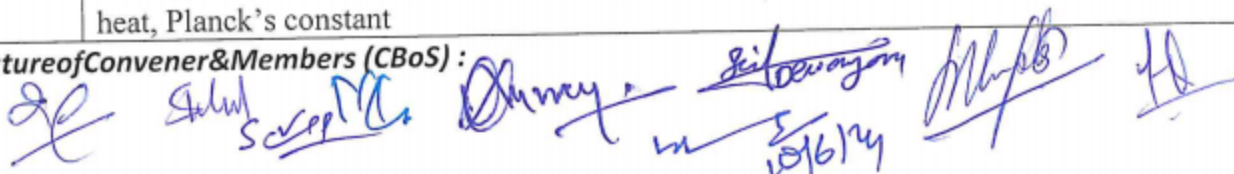


**FOUR YEARS UNDERGRADUATE PROGRAM (2024 – 28)**  
**DEPARTMENT OF PHYSICS**  
**COURSE CURRICULUM**

PART – A: INTRODUCTION				
Program: Bachelor in Science (Diploma/ Degree/ Honors)		Semester: III		Session: 2024-25
1	Course Code	PHSC- 03P		
2	Course Title	Heat and Thermodynamics		
3	Course Type	Discipline Core Course		
4	Pre-requisite (if any)	As per Program		
5	Course Learning Outcomes (CLO)	<ul style="list-style-type: none"><li>➤ Lab Proficiency: Thermometers, pressure gauges, calorimeters, heat transfer apparatus, experimental setup, data acquisition.</li><li>➤ Hands-on Learning**: Heat transfer, work done, entropy, phase transitions, experiments.</li><li>➤ Data Analysis: Experimental data, theoretical discrepancies, analysis.</li><li>➤ Predictive Skills: Thermodynamic behavior, varying conditions, experimentation.</li><li>➤ Theory-Practice Integration: Theoretical knowledge, practical lab work, synthesis, applications.</li></ul>		
6	Credit Value	01 Credit	1 Credit = 30 Hours Laboratory Work	
7	Total Marks	Maximum Marks: 50	Minimum Pass Marks: 20	
PART – B: CONTENT OF THE COURSE				
Total No. of learning-Training/performance Periods -30 Periods (30 Hours)				
Sr. No.	Objects (At least 10 of the following or related Experiments)			No. of Periods
1	To determine the thermal conductivity of a non-conducting material by Lee's disc method.			30
2	To study the variation of thermo emf across two junctions of a thermocouple with temperature.			
3	To verify Newton's law of cooling.			
4	To determine the temperature co-efficient of resistance by Platinum resistance thermometer.			
5	To determine the coefficient of thermal conductivity(k) of a rubber tube.			
6	To study the heat efficiency of an electric kettle with varying voltage.			
7	To determine the ratio of specific heat at constant pressure and constant volume ( $\gamma=C_p/C_v$ ) of air Clement and Desorme's method.			
8	To determine the coefficient of thermal conductivity of copper by Searle's Apparatus.			
9	To study the variation of thermos-Emf of thermos couple with Difference of Temperature of its Two Junctions.			
10	To determine Mechanical Equivalent of Heat, J, by Callender and Barne's constant flow method.			
11	Measurement of Planck's constant using black body radiation.			
12	To determine Stefan's Constant.			
Keywords:	Thermal conductivity, Thermocouple, Newton's law of cooling, Temperature coefficient of resistance, Heat efficiency, Specific heat ratio, Mechanical equivalent of heat, Planck's constant			

**Signature of Convener & Members (CBOs):**



## PART – C: LEARNING RESOURCES

### Text Books, Reference Books and Others

#### Text Books Recommended-

1. Advanced Practical Physics for students, B.L.Flint&H.T.Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
3. A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.
4. A Laboratory Manual of Physics for Undergraduate Classes, D.P. Khandelwal, 1985, Vani Publication.
5. Unified Practical Physics B.Sc II : R P Goyal, Shival Agrawal & Sons Publications

#### Reference Books Recommended-

1. Practical Physics by C.L. Arora
2. Practical Physics by S.L. Gupta and Vijay Kumar
3. Advanced Practical Physics for Students by B.L. Worsnop and H.T. Flint

### Online Resources (e-books/ learning portals/ other e-resources)

Link for e-Books for Physics Practical and Virtual labs

1. Thermal Physics and Statistical Mechanics: Laboratory Collection <https://egyankosh.ac.in/handle/123456789/67450>
2. Virtual Lab : <https://vlab.amrita.edu/index.php?sub=1&brch=194>
3. <https://vlab.amrita.edu/index.php?sub=1&brch=194&sim=802&cnt=1>
4. <https://vlab.amrita.edu/index.php?sub=1&brch=194&sim=801&cnt=4>
5. <https://srmap.edu.in/seas/physics-virtual-lab/>
6. <https://sites.google.com/view/vlab-bnmitmech/home/heat-transfer-lab>  
<https://www.pbslearningmedia.org/resource/lsp07-sci-phys-thermalenergy/thermal-energy-transfer/#.WdJiOJrLIU>

## PART – D: ASSESSMENT AND EVALUATION

### Suggested Continuous Evaluation Methods:

Maximum Marks: 50 Marks

Continuous Internal Assessment(CIA):15 Marks

End Semester Exam(ESE):35 Marks

<b>Continuous Internal Assessment(CIA):</b> (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar + Attendance -05 Total Marks - 15	Better marks out of the two Test / Quiz + Marks obtained in Assignment shall be considered against 15 Marks
	Laboratory Performance: On spot Assessment Performed the Task based on lab. work - 20 Marks Spotting based on tools & technology (written) - 10 Marks Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status

Name and Signature of Convener & Members of CBoS:

