



# PRESIDENCY UNIVERSITY

(Established under the Presidency University Act, 2013 of the Karnataka Act 41 of 2013)

**Name of the School:** SOE

**Name of the Department:** Physics

**Area of Specialization:** Solar Energy

**Name of the Faculty Member:** Dr. Mohan Kumar Naidu

**Title of the Value Added Course:** Photovoltaic Solar Energy

**Course Duration:** [30 hours] [AY-2021-22]

**Course Code:** PHY V 001

## **Introduction to the Course:**

The main objective of this course is to study the fundamentals of solar energy and its applications. This course covers the overview of semiconductors, its properties and fundamentals of photovoltaic conversions. This course is also covers the different methods of synthesis of photovoltaic cells and students can able to study the Characterization of synthesized materials using IV characteristics, open-circuit voltage and operating voltage of a PV cell, standard rating and performance indicator for PV modules.

**Course Outcomes:** On successful completion of the course the students shall be able to :

1. Enabling the Students to learn the basics of solar energy
2. Impart basic knowledge on various synthesis and characterization techniques involved in solar cells
3. Explain the future use of photovoltaic cells in different areas.



## Course Content (Syllabus):

### Module -1

Overview of semiconductors, properties, the electron band structure of semiconductors, n-type doping , p-type doping, direct and indirect band gap semiconductors, exciton formation, fundamentals of photovoltaic conversions- photon energy, electron-hole concentration and Fermi –level, p-n junction, light absorption in a semiconductor, solar cell materials.

[15 Hrs] [Blooms level selected: Knowledge]

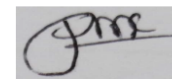
### Module: 2:

Generations of photovoltaic cells, Voltage and current characteristics of photovoltaic devices (i-v curve), open-circuit voltage and operating voltage of a PV cell, dependence of voltage and current on temperature, different types of photovoltaic devices, standard rating and performance indicator for PV modules, photovoltaic system schematic design, photovoltaic applications.

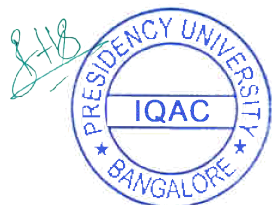
[15 Hrs] [Blooms level selected: Application]

### Reference Books

1. Solar Energy, Fundamentals and Applications, H P Garg and J Prakash, Mc Graw Hill.
2. Solar Energy, Technologies and Project Delivery for Buildings, Andy Walker, Wiley.



Approval by the HOD.



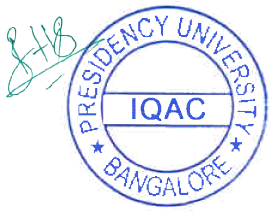
Presidency University, Bengaluru  
 Department of Physics  
 School of Engineering

**NOTE:1.** If 1 or more classes are engaged on same day. Then change timings by repeating date  
**2.** Enter date and timings according to the VAC class engaged

VAC DETAILS  
 Total number of hours:30  
 Value added Course(VAC) Name and Code: Photovoltaic Solar Energy, PHY V001  
 Name of the Instructor: Dr P Mohan Kumar Naidu

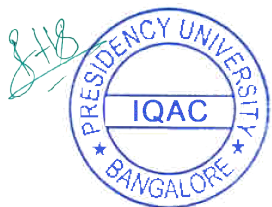
SNo	STUDENT ID NO	STUDENT NAME	17-02-2022	17-02-2022	18-02-2022	19-02-2022	20-02-2022	23-02-2022	23-02-2022	24-02-2022	04-02-2022	03-02-22	03-02-22	03-03-22	03-06-22	03-09-22	03-09-22	03-10-22	03-10-22	16-03-22	16-03-22	20-03-2022	21-03-2022	23-03-2022	23-03-2022	24-03-2022	24-03-2022	04-06-22	04-06-22	20-04-2022	20-04-2022	Total classes conducted	Total classes attended	Percentage attended	
			1:30 to 2:30	2:30 to 3:30	3:30 to 4:30	2 to 3	3 to 4	2 to 3	3 to 4	2 to 3	3 to 4	2 to 3	3 to 4	2 to 3	3 to 4	7 to 8	2 to 3	3 to 4	2 to 3	3 to 4	2 to 3	3 to 4	7 to 8	7 to 8	2 to 3	3 to 4	2 to 3	3 to 4	2 to 3	3 to 4	2 to 3	3 to 4			
1	20211COM0002	SUPRITA	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	29	97
2	20211COM0005	NIKHITHA G	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	28	93
3	20211COM0007	NIKHIL N	A	A	A	A	A	A	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	18	60
4	20211COM0008	RAASHITHA K B	A	P	P	P	P	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	27	90
5	20211COM0010	MEGHANA N	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	30	100
6	20211COM0011	DEEKSHA K V	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	29	97
7	20211COM0013	SHRUSTI G S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	29	97
8	20211COM0015	VINAY KUMAR G R	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	29	97
9	20211COM0019	NIKHIL RAJA	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	30	100
10	20211COM0020	HARSHITHA M	P	P	P	P	P	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	27	90	
11	20211COM0026	NEELRAJ	P	A	A	A	A	A	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	18	60
12	20211COM0028	SRUSHI N	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	30	100
13	20211COM0032	TAANISHKA P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	30	100
14																																			
15																																			
16																																			

Signature of Course Instructor



**Presidency University, Bengaluru**  
**Value Added Course Marksheet**  
**School of Engineering**

<b>Course Code :</b>		<b>PHY V 001</b>			<b>Academic Year :</b>		<b>2019-2020</b>	
<b>Course Name :</b>		<b>Photovoltaic Solar Energy</b>			<b>Semester :</b>		<b>Odd</b>	
					<b>Instructor-in-Charge Name :</b>		<b>Dr P Mohan Kumar Naidu</b>	
					<b>Instructor-in-Charge Employee ID :</b>		<b>PUNIV0023</b>	
<b>S. No</b>	<b>UID No</b>	<b>Roll No</b>	<b>Name</b>	<b>SoE</b>	<b>Attendance (in %)</b>	<b>Marks</b>	<b>Eligible for Certificate (Y/N)</b>	<b>Remark</b>
1		20211COM0002	SUPRITA	SoE	97	82	Y	NIL
2		20211COM0005	NIKHITHA G	SoE	93	83	Y	NIL
3		20211COM0007	NIKHIL N	SoE	60	50	N	NIL
4		20211COM0008	RASHMITHA K B	SoE	90	77	Y	NIL
5		20211COM0010	MEGHANA N	SoE	100	72	Y	NIL
6		20211COM0011	DEEKSHA K V	SoE	97	91	Y	NIL
7		20211COM0013	SHRUSTI G S	SoE	97	68	Y	NIL
8		20211COM0015	VINAY KUMAR G R	SoE	97	78	Y	NIL
9		20211COM0019	NIKHIL RAJ A	SoE	100	88	Y	NIL
10		20211COM0020	HARSHITHA M	SoE	90	77	Y	NIL
11		20211COM0026	NEELRAJ	SoE	60	60	N	NIL
12		20211COM0028	SRUSHTI N	SoE	100	89	Y	NIL
13		20211COM0032	TAANISHQKA P	SoE	100	82	Y	NIL





# PRESIDENCY UNIVERSITY

(Established under the Presidency University Act, 2013 of the Karnataka Act 41 of 2013)

**Name of the School:** SoE

**Name of the Department:** Physics

**Area of Specialization:** Condensed Matter Physics

**Name of the Faculty:** Dr. Harish Sharma Akkera

**Title of the Value Added Course:** Semiconductor Optoelectronic devices

**Course Code:** PHY-301

**Course Duration:** [30 hours]

## **Introduction to the Course:**

The main objective of this course is to study the concepts of semiconductor optoelectronics that help develop the ability to fabricate, design, and apply to engineering applications. This course covers the areas, namely, semiconductor physics, semiconductor light sources, and optoelectronic photodetector devices. The course includes the concepts of band gap engineering, heterostructure p-n junction diodes, Schottky junctions, and fabrication of heterostructure devices are discussed in a detailed manner. It also emphasizes LED device structure and output characteristics, materials for LED, Lasers, semiconductors & quantum well lasers. Finally, general characteristics of photodetectors, photoconductors, semiconductor photo-diodes, PIN diodes, and APDs: structure, materials, characteristics, and device performance, other photodetectors: Photo-Transistors, Solar cells, and CCDs are discussed.

**Course Outcomes:** On successful completion of the course the students shall be able to:



**01. Explain the properties of semiconductors, semiconductor light sources and optoelectronic photodetector devices.**

**02. Apply the knowledge of semiconductor physics in various optoelectronic device applications.**


**Course Content:**

Module 1: Review on Semiconductors; Introduction to semiconductors, Types of Semiconductors, Band gap engineering, heterostructure p-n junction diodes, Schottky Junctions and Ohmic contacts, Fabrication of Heterostructure devices.

Module 2: Semiconductor light sources; Injection Electroluminescence, Light Emitting Diode: Device structure and output characteristics, modulation bandwidth, materials for LED, and applications, Laser basics, semiconductor laser: Device structure and output characteristics, Quantum well lasers, Practical laser diodes & handling

Module 3: Semiconductor Photodetectors; General characteristics of photodetectors, the Impulse response of photodetectors, Photoconductors, semiconductor photo-diodes, PIN diodes, and APDs: Structure, Materials, Characteristics, and Device performance, Other photodetectors: Photo-Transistors, Solar cells, and CCDs.

**Approval by the HOD.**



Department of Physics  
School of Engineering  
PRESIDENCY UNIVERSITY  
Pajankunte, Yelahanka, Bengaluru -54



**Presidency University, Bengaluru**

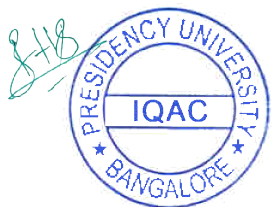
**Department of Physics**

**School of Engineering**

VAC DETAILS  
 Total number of hours:30  
 Value added Course(VAC) Name and Code: Semiconductor optoelectronic devices  
 Name of the Instructor: Dr. Harish Sharma Akkera

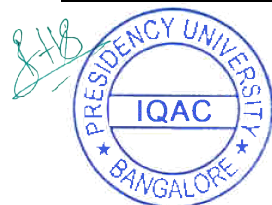
**NOTE:1.** If 1 or more classes are engaged on same day. Then change timings by repeating date  
**2.** Enter date and timings according to the VAC class engaged

S.No.	STUDENT ID NO	STUDENT NAME	12/07/2021	13/07/2021	15/07/2021	16/07/2021	17/07/2021	18/12/2020	19/07/2021	21/07/2021	22/07/2021	23/07/2021	24/07/2021	26/07/2021	27/07/2021	28/07/2021	30/07/2021	Total classes conducted	Total classes attended	Percentage attended
			5-7 PM	5-7 PM	5-7 PM	5-7 PM	5-7 PM	5-7 PM	5-7 PM	5-7 PM	5-7 PM	5-7 PM	5-7 PM	5-7 PM	5-7 PM	5-7 PM	5-7 PM			
1	20211ECE0188	AMIREDDY YASHWANTH SAI	P	A	P	P	A	P	P	P	A	P	P	P	P	P	P	30	24	80%
2	20211ECE0002	EDIGA PAVAN KUMAR	P	P	P	P	P	A	P	P	P	P	P	P	A	P	P	30	26	87%
3	20211ECE0048	AMAN KUMAR MANGALAM	A	P	P	P	A	P	P	P	A	P	P	P	A	P	P	30	22	73%
4	20211ECE0047	VEMULA RAHUL REDDY	P	P	P	P	P	A	P	P	P	P	P	P	A	P	A	30	24	80%
5	20211ECE0046	THAMMIREDDY LAKSHMI PRASANNA	P	A	0	P	A	P	P	P	P	P	A	P	P	P	P	30	22	73%
6	20211ECE0044	KUNCHAPU TARUN SAI	P	P	P	P	P	P	P	A	P	P	P	P	A	P	P	30	26	87%
7	20211ECE0309	JITIEESH. P	P	A	P	A	P	P	P	P	P	P	P	A	P	A	P	30	22	73%
8	20211EEE0045	METTANI NAGA CHETHAN	P	P	P	P	P	P	P	A	P	P	A	P	P	P	P	30	26	87%
9	20211ECE0303	BANDI NARENDRA REDDY	A	P	P	P	P	P	P	A	P	P	P	P	P	A	P	30	24	80%
10	20211EEE0001	PENUGONDA CHARAN	P	P	P	A	A	A	A	A	A	A	A	A	P	A	A	30	8	27%
11	20211ECE0182	P BAHUGUNA	A	P	P	P	P	P	P	P	A	P	P	P	A	P	P	30	24	80%
12	20211ECE0183	P VISHNU	P	A	P	P	P	A	P	P	P	P	P	P	P	P	P	30	26	87%
13	20211ECE0001	PADATAPU PENCHALAI AH	P	P	P	P	A	A	P	P	P	P	P	P	P	P	A	30	24	80%
14	20211ECE0043	CHAKALI VINOD	A	P	P	P	A	P	P	P	P	P	P	P	P	P	P	30	26	87%
15	20211ECE0008	MARAMREDDY SANTHOSH REDDY	P	P	P	A	P	P	P	P	P	P	P	P	P	P	A	30	24	80%



**Presidency University, Bengaluru**  
**Value Added Course Marksheet**  
**School of Engineering**

<b>Course Code :</b>		<b>PHY V 009</b>			<b>Academic Year :</b>		<b>2021-2022</b>	
<b>Course Name :</b>		<b>Semiconductor Optoelectronic Devices</b>			<b>Semester :</b>		<b>Odd Semester</b>	
					<b>Instructor-in-Charge Name :</b>		<b>Dr. Harish Sharma Akkera</b>	
					<b>Instructor-in-Charge Employee ID :</b>		<b>PUNIV01155</b>	
<b>S. No</b>	<b>UID No</b>	<b>Roll No</b>	<b>Name</b>	<b>School (e.g. SoE/SoL etc)</b>	<b>Attendance (in %)</b>	<b>Marks</b>	<b>Eligible for Certificate (Y/N)</b>	<b>Remark</b>
1		2021ECE0188	AMIREDDY YASHWANTH SAI	SoE	80%	84	Y	NIL
2		2021ECE0002	EDIGA PAVAN KUMAR	SoE	87%	91	Y	NIL
3		2021ECE0048	AMAN KUMAR MANGALAM	SoE	73%	89	Y	NIL
4		2021ECE0047	VEMULA RAHUL REDDY	SoE	80%	88	Y	NIL
5		2021ECE0046	THAMMIREDDY LAKSHMI PRASANNA	SoE	73%	67	N	NIL
6		2021ECE0044	KUNCHAPU TARUN SAI	SoE	87%	77	Y	NIL
7		2021ECE0309	JITIEESH. P	SoE	73%	89	Y	NIL
8		2021EEE0045	METTANI NAGA CHETHAN	SoE	87%	74	Y	NIL
9		2021ECE0303	BANDI NARENDRA REDDY	SoE	80%	71	Y	NIL
10		2021EEE0001	PENUGONDA CHARAN	SoE	27%	23	N	NIL
11		2021ECE0182	P BAHUGUNA	SoE	80%	72	Y	NIL
12		2021ECE0183	P VISHNU	SoE	87%	81	Y	NIL
13		2021ECE0001	PADATAPU PENCHALAI AH	SoE	80%	78	Y	NIL
14		2021ECE0043	CHAKALI VINOD	SoE	87%	81	Y	NIL
15		2021ECE0008	MARAMREDDY SANTHOSH REDDY	SoE	80%	87	N	NIL







# PRESIDENCY UNIVERSITY

(Established under the Presidency University Act, 2013 of the Karnataka Act 41 of 2013)

**Name of the School:** SOE

**Name of the Department:** Physics

**Area of Specialization:** Materials Science

**Name of the Faculty Member:** Dr. Naveen C S

**Title of the Value Added Course:** Metal oxide nanomaterials for gas sensor applications.

**Course Duration:** [30 hours]

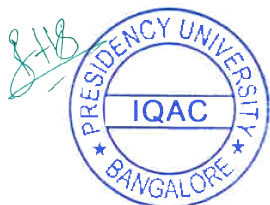
**Course Code:** PHYV007

## **Introduction to the Course:**

The main objective of this course is to study the basic concepts of Metal oxide nanomaterials and their application in the field of gas sensors. The course includes the introduction to classification of nanomaterials, quantum size effect, Distinction between bulk materials and nanomaterials. It also includes different methods of preparation techniques and structural characterizations of metal oxide nanomaterials. Further, the classification of gas sensors, gas sensing mechanism, choice of sensing material and gas sensor characteristics are included. Class 11<sup>th</sup> and 12<sup>th</sup> Physics and Chemistry are course prerequisites.

**Course Outcomes:** On successful completion of the course the students shall be able to:

- 01 Understand the basic concept of nanomaterials and metal oxide nanomaterials.
- 02 Know the different types of preparation techniques and structural characterizations of metal oxide nanomaterials.
- 03 Apply the knowledge of preparation and structural characterizations of metal oxide nanomaterials in gas sensing applications.



## Course Content (Syllabus):

**Module:1: Introduction:** Definitions, Classification of nanostructures- 1D, 2D and 3D, Effects of making into small, Distinction between nanomaterials and bulk materials in terms of energy band, Quantum size effect- Quantum confinement in 1D, 2D and 3D, Metal oxides- Types of metal oxides nanomaterials, Applications.

**[10 Hrs] [Blooms level selected: Knowledge]**

**Module: 2: Preparation and Structural Characterizations of Metal oxide nanomaterials:** Preparation techniques: Top Down method - Ball milling, Bottom up method - Sol gel process, Solution combustion method and Hydrothermal Process. Structural Characterizations: UV-Visible spectrophotometer, Fourier-transform infrared spectrometer (FTIR), X-ray Diffractometer (XRD), Scanning Electron Microscopy (SEM), Energy dispersive X-ray analysis (EDAX), ; Transmission Electron Microscope (TEM)

**[12 Hrs] [Blooms level selected: Comprehension]**

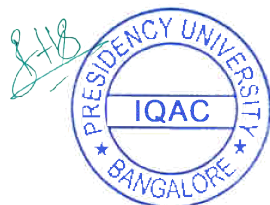
**Module: 3: Metal oxide gas sensors:** Introduction, Gas sensor terminology, Classification of gas sensors, General sensing mechanism, Ideal gas sensor characteristics, Choice of sensing material, Advantages and disadvantages of metal oxide gas sensors, Future perspectives.

**[08 Hrs] [Blooms level selected: Application]**

## References

- R1. NANO: The Essentials: Understanding Nanoscience and Nanotechnology by T Pradeep, McGraw-Hill education.
- R2. Materials Characterization by Yang Leng, JohnWiley & Sons (Asia) Publications.
- R3. Introduction to Nanotechnology by Charles Poole and Frank J. Owens, Wiley Publications.
- R4. Metal Oxide Nanostructures: Synthesis, Properties and Applications by Daniela Nunes, Ana Pimentel, Lidia Santos, Pedro Barquinha, Elvira Fortunato, Luis Pereira, Rodrigo Martins, Elsevier Science Publications.
- R5. Gas Sensors: Principles, Operation and Developments by G. Sberveglieri, Springer Publications.

Approval by the HOD.

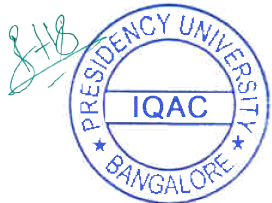


**Presidency University, Bengaluru**  
**Department of Physics**  
**School of Engineering**

VAC DETAILS  
 Total number of hours:30  
 Value added Course(VAC) Name and Code:PHYV007  
 Name of the Instructor: Dr Naveen C S

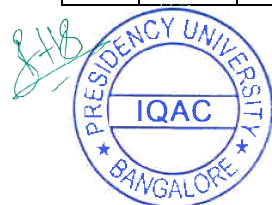
**NOTE:1.** If 1 or more classes are engaged on same day. Then change timings by repeating date  
**2.** Enter date and timings according to the VAC class engaged

S.No.	STUDENT ID NO	STUDENT NAME	3/12/20	6/12/20	7/12/20	11/12/20	13/12/20	14/12/20	16/12/20	17/12/20	20/12/20	21/12/20	22/12/20	24/12/20	26/12/20	28/12/20	29/12/20	Total classes conducted	Total classes attended	Percentage attended
			6-8 PM	6-8 PM	6-8 PM	6-8 PM	6-8 PM	6-8 PM	6-8 PM	6-8 PM	6-8 PM	6-8 PM	6-8 PM	6-8 PM	6-8 PM	6-8 PM				
1	20211CSE0087	POLU RAJESH REDDY	p	P	p	p	p	p	p	A	p	p	p	p	A	p	A	30	28	93%
2	20211CSE0094	RAJ KUMAR CHANDA	p	A	A	p	p	p	p	A	p	p	p	p	P	p	P	30	24	80%
3	20211CSE0762	BANDI RAGHAVENDRA	p	P	p	p	p	p	p	P	p	A	p	P	p	P		30	28	93%
4	20211CSE0029	DHARISASAJ JASWANTH	p	p	p	p	A	p	p	p	p	p	p	A	p	p	p	30	24	80%
5	20211CSE0057	MUKT HALA KIRAN KUMAR	p	p	p	p	p	p	p	A	P	p	p	p	p	p	p	30	28	93%
6	20211CSE0043	ANT HAPU CHARAN KUMAR REDDY	p	p	A	p	p	p	p	a	a	p	p	p	A	p	A	30	20	67%
7	20211CSE0026	SHAIK MAHAMMAD SAMEER	p	p	p	p	p	p	p	P	p	A	p	p	p	p	p	30	28	93%
8	20211CSE0863	CHOPPARA ANVESH	A	p	p	p	p	p	A	a	p	p	p	p	p	p	p	30	24	80%
9	20211CSE0063	VENNAPUSA DAMODHAR REDDY	p	p	p	p	p	p	P	p	p	p	p	p	A	p	p	30	28	93%
10	20211CSE0151	S SARASWATHI SREE MOULYA	A	p	p	P	A	p	P	a	p	A	A	p	p	p	p	30	20	67%
11	20211CSE0190	BUDDAREDDY GARI UDAY KUMAR REDDY	p	p	p	A	p	A	a	p	p	A	p	A	p	p	A	30	18	60%
12	20211CSE0345	BHANU PRAKASH N	p	A	A	P	p	p	P	a	p	P	p	p	A	A	A	30	20	67%



**Presidency University, Bengaluru**  
**Value Added Course Marksheet**  
**School of Engineering**

Course Code :		PHYV007		Academic Year :			2021-2022	
Course Name :		Metal oxide nanomaterials for gas sensor applications		Semester :			Odd Semester	
				Instructor-in-Charge Name :			Dr Naveen C S	
				Instructor-in-Charge Employee ID :			Dr Naveen C S	
S. No	UID No	Roll No	Name	School (e.g. SoE/SoL etc)	Attendance (in %)	Marks	Eligible for Certificate (Y/N)	Remark
1		20211CSE0087	POLU RAJESH REDDY	SOE	80%	75	Y	NIL
2		20211CSE0094	RAJ KUMAR CHANDA	SOE	80%	56	Y	NIL
3		20211CSE0762	BANDI RAGHAVENDRA	SOE	93%	78	Y	NIL
4		20211CSE0029	DHARISA SAI JASWANTH	SOE	80%	78	Y	NIL
5		20211CSE0057	MUKTHALA KIRAN KUMAR	SOE	93%	45	Y	NIL
6		20211CSE0043	ANTHAPU CHARAN KUMAR REDDY	SOE	67%	40	Y	NIL
7		20211CSE0026	SHAIK MAHAMMAD SAMEER	SOE	93%	50	Y	NIL
8		20211CSE0863	CHOPPARA ANVESH	SOE	80%	85	Y	NIL
9		20211CSE0063	VENNAPUSA DAMODHAR REDDY	SOE	93%	85	Y	NIL
10		20211CSE0151	S SARASWATHI SREE MOULYA	SOE	67%	56	Y	NIL
11		20211CSE0190	BUDDAREDDY GARI UDAY KUMAR REDDY	SOE	67%	76	Y	NIL
12		20211CSE0345	BHANU PRAKASH N	SOE	67%	25	N	NIL





# PRESIDENCY UNIVERSITY

(Established under the Presidency University Act, 2013 of the Karnataka Act 41 of 2013)

**Name of the School: Engineering**

**Name of the Department: Physics**

**Area of Specialization: Games**

**Name of the Faculty Member(s): Dr. Pradeep Bhaskar**

**Title of the Value Added Course: Introduction to Polymers and Plastics**

**Course Code: PHY V 010**

**Course Duration: 30 hours [From Jan 28 to Feb 21 2022]**

**Introduction to the Course:** Synthetic plastics and plastics product manufacturing is the downstream industry of the wider petroleum industry. This course introduces the engineering field of polymers with emphasis on plastics, the most widely used synthetic polymers. The course also informs the students regarding engineering aspects of tyres, adhesives and some specialty polymers.

Computer science and related students would find this course advantageous in expanding their knowledge base and understanding of the traditional industry and manufacturing sector. This would help them in future when making software for this industry. Mechanical engineering and Civil engineering students would find the industrial manufacturing process, including dies and moulds, testing and design for stiffness of products beneficial.

The course is designed to enhance the students understanding and knowledge of polymers, plastics industry, testing process and common terms used in this field. This course emphasizes the engineering aspect Engineering Physics, the application of physics especially in the design, fabrication and testing of polymers will be highlighted. This is a beginner level course and is suitable for curious students of all branches.

**Course Outcomes: On successful completion of the course the students shall be able to:**




- 01) Define common terminology used in the Plastics industry
- 02) Understand and explain the physics behind major testing methods
- 03) Apply knowledge for evaluating various solutions to select the best for an application

**Course Content:**

1. Module 1: Introduction to different types of plastics and common properties, manufacturing processes, properties and applications of major plastics.
2. Module 2: Basics of special polymers, important testing methods, fabrication processes, major additives and recycling.
3. Module 3: Rubber and introduction to tyre technology, mould and die design, design for stiffness, basics of adhesives.

**Approval by the HOD**



Dr. M. A. S.  
Department of Physics  
School of Engineering  
PRESIDENCY UNIVERSITY  
Rajalakshmi, Yelahanka, Bengaluru -54



**Presidency University, Bengaluru**  
**Department of Physics**  
**School of Engineering**

VAC DETAILS  
Total number of hours:30  
Value added Course(VAC) Name and Code: Introduction to Polymers and Plastics PHY V010  
Name of the Instructor: Dr. Pradeep Bhaskar

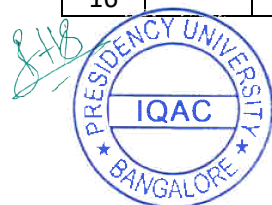
**NOTE:1.** If 1 or more classes are engaged on same day. Then change timings by repeating date  
**2.** Enter date and timings according to the VAC class engaged

S.No.	STUDENT ID NO	STUDENT NAME	28-01-2022	31-02-2022	1-02-2022	2-02-2022	3-02-2022	4-02-2022	7-02-2022	8-02-2022	9-02-2022	10-02-2022	11-02-2022	14-02-2022	17-02-2022	18-02-2022	21-02-2022	Total classes conducted	Total classes attended	Percentage attended
			5:00pm-7:00pm	5:00pm-7:00pm	5:00pm-7:00pm	5:00pm-7:00pm	5:00pm-7:00pm	5:00pm-7:00pm	5:00pm-7:00pm	5:00pm-7:00pm	5:00pm-7:00pm	5:00pm-7:00pm	5:00pm-7:00pm	5:00pm-7:00pm	5:00pm-7:00pm	5:00pm-7:00pm	5:00pm-7:00pm			
1	20211CSE0512	SATYAM MANU PATHAK	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P	30	28	93%
2	20211CSE0005	MULAGIRI KISHORE KUMAR	P	P	A	P	P	P	P	P	P	P	P	P	P	A	P	30	26	87%
3	20211CSE0047	SHOVAN PATRA	P	P	P	P	A	P	P	P	A	P	P	P	P	P	P	30	26	87%
4	20211CSE0141	AYAN BHAT TACHARYA	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	30	100%
5	20211CSE0125	DARISI PHANI BALA JASWANTH	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P	30	28	93%
6	20211CSE0050	SWASTIK RATNA GURUNG	A	P	A	P	P	P	P	P	A	P	A	A	A	A	A	30	14	47%
7	20211CSE0198	MUNT IMADUGU ZAID	P	P	P	P	P	P	P	P	P	P	P	P	P	A	P	30	28	93%
8	20211CSE0754	CHANDRA SHEKHAR REDDY	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	30	100%
9	20211CSE0516	DESAM SAI ESWARA REDDY	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	30	28	93%
10	20211CSE0719	GUNDALA BHARATH KALYAN	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	30	28	93%
11	20211CSE0511	DASARI BALASAI	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	30	100%
12	20211CSE0134	TRIPURARI VINAY SATYA KRISHNA KARTHIK	P	P	P	P	P	A	P	P	P	P	P	A	P	P	P	30	26	87%
13	20211CSE0072	ASAM VIDHYADHARI	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	30	100%
14	20211CSE0073	PADIGAPATI SUDHARSHAN REDDY	P	P	A	P	P	P	P	P	P	P	P	P	P	P	P	30	28	93%
15	20211CSE0066	JAGELATI SREE LEKHA	P	P	P	P	P	P	A	P	P	P	P	P	P	P	A	30	26	87%
16	20211CSE0056	KOUDAGANI RAKSHAN	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	30	28	93%
17	20211CST0091	MEKALAMADHAVAN	A	P	P	P	P	P	P	P	A	P	P	P	A	P	P	30	24	80%




**Presidency University, Bengaluru**  
**Value Added Course Marksheet**  
**School of Engineering**

<b>Course Code :</b>		<b>PHY V 010</b>			<b>Academic Year :</b>		<b>2021-2022</b>	
<b>Course Name :</b>		<b>Introduction to Polymers and Plastics</b>			<b>Semester :</b>		<b>Even Semester</b>	
					<b>Instructor-in-Charge Name :</b>		<b>Dr. Pradeep Bhaskar</b>	
					<b>Instructor-in-Charge Employee ID :</b>		<b>Dr. Pradeep Bhaskar</b>	
<b>S. No</b>	<b>UID No</b>	<b>Roll No</b>	<b>Name</b>	<b>School</b>	<b>Attendance (in %)</b>	<b>Marks</b>	<b>Eligible for Certificate (Y/N)</b>	<b>Remark</b>
1		20211CSE0512	SATYAM MANU PATHAK	SoE	93%	95	Y	NIL
2		20211CSE0005	MULAGIRI KISHORE KUMAR	SoE	87%	83	Y	NIL
3		20211CSE0047	SHOVAN PATRA	SoE	87%	99	Y	NIL
4		20211CSE0141	AYAN BHATTACHARYA	SoE	100%	72	Y	NIL
5		20211CSE0125	DARISI PHANI BALA JASWANTH	SoE	93%	71	Y	NIL
6		20211CSE0050	SWASTIK RATNA GURUNG	SoE	47%	39	N	NIL
7		20211CSE0198	MUNTIMADUGU ZAID	SoE	93%	98	Y	NIL
8		20211CSE0754	CHANDRA SHEKHAR REDDY UDUMALA	SoE	100%	72	Y	NIL
9		20211CSE0516	DESAM SAI ESWARA REDDY	SoE	93%	95	Y	NIL
10		20211CSE0719	GUNDALA BHARATH KALYAN	SoE	93%	71	Y	NIL
11		20211CSE0511	DASARI BALA SAI	SoE	100%	91	Y	NIL
12		20211CSE0134	TRIPURARI VINAY SATYA KRISHNA KARTHIK	SoE	87%	92	Y	NIL
13		20211CSE0072	ASAM VIDHYADHARI	SoE	100%	65	Y	NIL
14		20211CSE0073	PADIGAPATI SUDHARSHAN REDDY	SoE	93%	59	N	NIL
15		20211CSE0066	JAGELATI SREE LEKHA	SoE	87%	79	Y	NIL
16		20211CSE0056	KOUDAGANI RAKSHAN	SoE	93%	83	Y	NIL

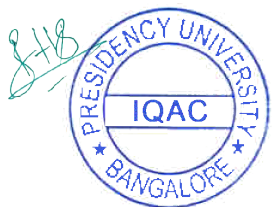




17		20211CST0091	MEKALA MADHAVAN	SoE	80%	74	Y	NIL
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Department of Physics  
School of Engineering  
PRESIDENCY UNIVERSITY  
Rajarajwade, Yelahanka, Bengaluru -54

**Signature of HoD**





# PRESIDENCY UNIVERSITY

(Established under the Presidency University Act, 2013 of the Karnataka Act 41 of 2013)

**Name of the School: Engineering**

**Name of the Department: Physics**

**Area of Specialization: Nanomaterials**

**Name of the Faculty Member(s): Dr. Anindita B**

**Title of the Value Added Course: Nanostructured Materials**

**Course Code: PHY V 008**

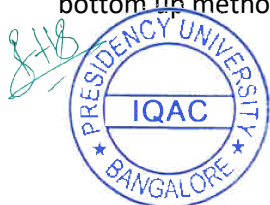
**Course Duration: 30 hours [From December 1, 2021 to Jan 05, 2022]**

**Introduction to the Course:** Nanotechnology is considered as the base of next technological revolution. This course is intended to make students aware of different nanostructured materials. Students will be given knowledge of different synthesis techniques of nanomaterial, characterization of nanomaterial by several techniques. Student should be able to analyze the need of proper characterization technique for a particular material. Applications of nanostructured materials in different fields of technology will be discussed.


**Course Outcomes: On successful completion of the course the students shall be able to:**

1. Understand different nanostructured materials, their properties and synthesis techniques.
2. Demonstrate different nanostructured materials, their properties and synthesis techniques
3. Explain the application of nanomaterials in different technological fields.

**Course Content:** Topics include Introduction to nanomaterials, effects of nanosize, mesoscopic state, Effect of size on material properties: scaling effect on the properties of materials, Different nanostructures : nanofilm, nanowire, quantum dot, Synthesis of nanomaterials : top down and bottom up method, Characterization techniques like TEM, SEM, UV spectrometer, properties and applications of nanomaterials.



Approval by the HOD

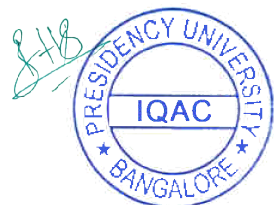


Department of Physics  
School of Engineering  
PRESIDENCY UNIVERSITY  
Rajalakshmi, Yelahanka, Bengaluru -64

<b>Presidency University, Bengaluru</b>	
<b>Department of Physics</b>	
<b>School of Engineering</b>	
<b>VAC DETAILS</b>	
Total number of hours:30	
Value added Course(VAC) Name and Code:PHY V008, Nanostructured Materials	
Name of the Instructor: Dr Anindita B	

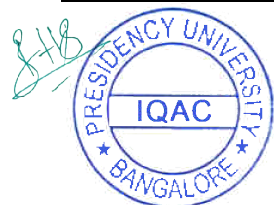
**NOTE:1.** If 1 or more classes are engaged on same day. Then change timings by repeating date  
**2.** Enter date and timings according to the VAC class engaged

S.No.	STUDENT ID NO	STUDENT NAME	1/12/21	3/12/21	4/12/21	7/12/21	9/12/21	11/12/21	14/12/21	16/12/21	18/12/21	21/7/21	22/12/21	23/12/21	28/12/21	30/12/21	31/12/21	Total classes conducted	Total classes attended	Percentage attended
			6-8 PM	6-8 PM	6-8PM	6-8 PM	6-8 PM	6-8 PM	6-8 PM	6-8 PM	6-8 PM	6-8 PM	6-8 PM	6-8 PM	6-8 PM	6-8 PM				
1	20211CAI0065	SIRIHG	p	P	p	p	p	p	p	A	p	p	p	p	p	p	p	30	28	93%
2	20211CAI0081	VIDHYASHREEV	p	A	p	p	p	p	p	p	p	p	p	p	P	p	p	30	28	93%
3	20211CAI0083	PRAKRUTHIDR	p	P	p	p	p	p	p	P	p	A	p	p	P	p	P	30	28	93%
4	20211CAI0094	SALAPAKSHISAGAR	p	p	A	p	A	p	p	p	p	p	p	A	p	p	p	30	24	80%
5	20211CAI0118	VAIBHAVGUPTA	p	p	p	p	p	p	p	A	P	p	p	A	A	p	p	30	24	80%
6	20211CAI0134	NANDISHBS	p	p	A	p	p	p	p	p	p	p	p	p	A	p	p	30	26	87%
7	20211CAI0140	VIGNESHV	p	p	p	p	A	p	p	P	p	A	p	p	p	p	p	30	26	87%
8	20211CAI0199	RAHULREDDY	A	p	p	p	p	p	A	p	p	p	A	A	p	p	p	30	22	73%
9	20211CAI0201	VDEEKSHITHA.	p	p	p	p	p	p	P	p	A	p	p	p	A	p	p	30	26	87%
10	20211CCS0002	KOTHAKOTARAJKUMAR	A	p	p	P	A	p	P	p	p	A	A	p	p	p	p	30	22	73%
11	20211CCS0018	KRAMAKRISHNA	p	p	p	A	p	A	p	p	p	A	p	A	p	p	p	30	22	73%
12	20211CCS0025	INDUPURUYESWANTHREDDY	p	A	A	P	A	A	P	a	p	A	A	p	A	A	A	30	10	33%
13	20211CCS0040	MAYAKUNTLAJYOSHNA	p	P	p	p	p	p	P	p	p	p	A	p	P	A	P	30	26	87%
14	20211CCS0046	CHINMAYAGP	p	p	p	p	p	p	a	a	a	p	p	p	p	p	p	30	24	80%
15	20211CCS0158	SHAUNFRANKLYN	p	P	A	p	p	p	a	p	p	p	p	p	P	A	P	30	24	80%



**Presidency University, Bengaluru**  
**Value Added Course Marksheet**  
**School of Engineering**

<b>Course Code :</b>		<b>PHY V 008</b>			<b>Academic Year :</b>		<b>2020-21</b>	
<b>Course Name :</b>		<b>NANOSTRUCTURED MATERIALS</b>			<b>Semester :</b>		<b>Odd Semester</b>	
					<b>Instructor-in-Charge Name :</b>		<b>Dr. Anindita B</b>	
					<b>Instructor-in-Charge Employee ID :</b>		<b>PUNIV01030</b>	
<b>S. No</b>	<b>UID No</b>	<b>Roll No</b>	<b>Name</b>	<b>School (e.g. SoE/SoL etc)</b>	<b>Attendance (in %)</b>	<b>Marks</b>	<b>Eligible for Certificate (Y/N)</b>	<b>Remark</b>
1		20211CAI0065	SIRIHG	SOE	93	90	Y	NIL
2		20211CAI0081	VIDHYASHREE V	SOE	93	77	Y	NIL
3		20211CAI0083	PRAKRUTHIDR	SOE	93	88	Y	NIL
4		20211CAI0094	SALAPAKSHISAGAR	SOE	80	75	Y	NIL
5		20211CAI0118	VAIBHAVGUPTA	SOE	80	80	N	NIL
6		20211CAI0134	NANDISHBS	SOE	87	73	Y	NIL
7		20211CAI0140	VIGNESH V	SOE	87	93	Y	NIL
8		20211CAI0199	RAHUL REDDY	SOE	73	86	Y	NIL
9		20211CAI0201	V DEEKSHITHA.	SOE	87	80	Y	NIL
10		20211CCS0002	KOTHAKOTA RAJKUMAR	SOE	73	70	Y	NIL
11		20211CCS0018	K RAMAKRISHNA	SOE	73	72	Y	NIL
12		20211CCS0025	INDUPURU YESWANTHREDDY	SOE	33	17	N	NIL
13		20211CCS0040	MAYAKUNTLA JYOSHNA	SOE	87	79	Y	NIL
14		20211CCS0046	CHINMAYAGP	SOE	80	80	Y	NIL
15		20211CCS0158	SHAUNFRANKLYN	SOE	80	84	Y	NIL





# PRESIDENCY UNIVERSITY

(Established under the Presidency University Act, 2013 of the Karnataka Act 41 of 2013)

**Name of the School: Engineering**

**Name of the Department: Physics**

**Area of Specialization: Advanced Amorphous Materials**

**Name of the Faculty Member(s): Dr. N Sivasankara Reddy**

**Title of the Value Added Course: Applications of Amorphous Materials for Engineers**

**Course Code: PHY V 015**

**Course Duration: 30 hours [From Oct 1 to Oct 30 2021]**

**Introduction to the Course:** Glass, method of preparation, types of glasses and their properties. Structural properties of glasses. Glasses for optical fibers communication and Fiber drawing method. Glass ceramics for missile nose which is IR transparent, extreme durability, corrosion resistant and low thermal expansion. Glasses for CD-RW, DVD-RW, bio active glass for bone implant, wound healing, Anti-bacterial glasses, strong glasses for display panels, radiation shielding material, laser material.


**Course Outcomes: On successful completion of the course the students shall be able to:**

1. Understand the basic concept of amorphous materials
2. Know the different types of preparation techniques and structural characterizations of amorphous materials.
3. Apply the knowledge of amorphous materials for engineering applications.

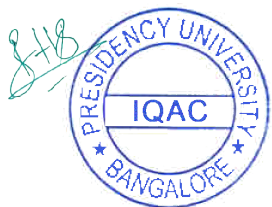


**Course Content:** Introduction to glasses, methods of preparation and their general and special properties. Structural properties of glasses in contrast to crystalline materials. Types of glasses for special engineering applications. Glass ceramics for missile nose which is IR transparent, extreme durability, corrosion resistant and low thermal expansion.

**Approval by the HOD**



Dr. M. S. Srinivas  
Department of Physics  
School of Engineering  
PRESIDENCY UNIVERSITY  
Rajarajwade, Yelahanka, Bengaluru -54



Presidency University, Bengaluru  
 Department of Physics  
 School of Engineering

VAC DETAILS  
 Total number of hours:15  
 Value added Course(VAC) Name and Code: Advanced Amorphous Materials  
 Name of the Instructor: Dr N Sivaankara Reddy

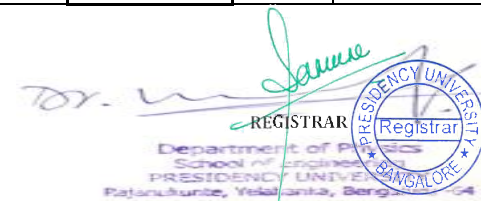
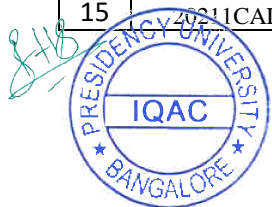
**NOTE:** 1. If 1 or more classes are engaged on same day. Then change timings by repeating date  
 2. Enter date and timings according to the VAC class engaged

S.No	STUDENT ID NO	STUDENT NAME	1/10/21	1/10/21	2/10/21	2/10/21	3/10/21	3/10/21	4/10/21	4/10/21	5/10/21	5/10/21	6/10/21	6/10/21	7/10/21	7/10/21	8/10/21	12/10/21	13/10/21	14/10/21	15/10/21	16/10/21	17/10/21	18/10/21	19/10/21	20/10/21	21/10/21	22/10/21	23/10/21	24/10/21	25/10/21	26/10/21	Total classes conducted	Total classes attended	Percentage attended
			5 to 6 PM	6 to 7 PM	5 to 6 PM	6 to 7 PM	5 to 6 PM	6 to 7 PM	5 to 6 PM	6 to 7 PM	5 to 6 PM	6 to 7 PM	5 to 6 PM	6 to 7 PM	5 to 6 PM	6 to 7 PM	5 to 6 PM	6 to 7 PM	5 to 6 PM	6 to 7 PM	5 to 6 PM	6 to 7 PM	5 to 6 PM	6 to 7 PM	5 to 6 PM	6 to 7 PM	5 to 6 PM	6 to 7 PM	5 to 6 PM	6 to 7 PM	5 to 6 PM	6 to 7 PM			
1	20211CA00008	Udayagir Manna	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	29	97
2	20211CA00025	Sanjayogolu Harshavardhan	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	30	100
3	20211CA00029	MUHAMMAD HASNAIN AKRAM KHAN	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	26	87
4	20211CA00033	ABI ROSHAN	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	25	83
5	20211CA00035	ELLURI BHAVYA SREE	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	27	90
6	20211CA00048	PABITALA VENKATA SAMBHRANA	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	26	86
7	20211CA00049	HELPTLA VENKATA KALYANSINAM	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	28	93
8	20211CA00050	DUGGEMPTI RAHEL KUMAR REDDY	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	29	97
9	20211CA00053	GRUGUNTLA SUNIL KUMAR REDDY	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	28	93
10	20211CA00055	Vedhul v	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	30	100
11	20211CA00100	Sangati Siva Anjaneyulu	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	28	93
12	20211CA00171	B R YESHWANTH	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	27	90
13	20211CA00174	Sane venkum charan	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	28	93
14	20211CA00177	SEKHAN S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	28	93
15	20211CA00181	A M CRITHAN KUMAR	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	30	29	97



**Presidency University, Bengaluru**  
**Value Added Course Marksheet**  
**School of Engineering**

<b>Course Code :</b>		<b>PHYV015</b>			<b>Academic Year :</b>		<b>2021-22</b>	
<b>Course Name :</b>		<b>Advanced Amorphous Materials</b>			<b>Semester :</b>		<b>Odd</b>	
					<b>Instructor-in-Charge Name :</b>		<b>Dr N Sivasankara Reddy</b>	
					<b>Instructor-in-Charge Employee ID :</b>		<b>PUNIV00473</b>	
<b>S. No</b>	<b>UID No</b>	<b>Roll No</b>	<b>Name</b>	<b>School (e.g. SoE/SoL etc)</b>	<b>Attendance (in %)</b>	<b>Marks</b>	<b>Eligible for Certificate (Y/N)</b>	<b>Remark</b>
1	20211CAI0008	20211CAI0008	Udayagiri Munna	SoE	97	68	Y	Nil
2	20211CAI0025	20211CAI0025	Sannapogula Harshavardhan	SoE	100	76	Y	Nil
3	20211CAI0029	20211CAI0029	MUHAMMAD HASNAIN AKRAM KHAN	SoE	87	88	Y	Nil
4	20211CAI0033	20211CAI0033	ABI ROSHAN	SoE	83	76	Y	Nil
5	20211CAI0035	20211CAI0035	ELLURI BHAVYA SREE	SoE	90	77	Y	Nil
6	20211CAI0048	20211CAI0048	PARITALA VENKATA SAI MEGHANA	SoE	93	84	Y	Nil
7	20211CAI0049	20211CAI0049	VELPULA VENKATA KASI VYSHNAVI	SoE	93	87	Y	Nil
8	20211CAI0050	20211CAI0050	DUGGEMPUDI RAHUL KUMAR REDDY	SoE	97	75	Y	Nil
9	20211CAI0053	20211CAI0053	GURUGUNTLA SUNIL KUMAR REDDY	SoE	93	86	Y	Nil
10	20211CAI0055	20211CAI0055	Vidhul v	SoE	100	88	Y	Nil
11	20211CAI0160	20211CAI0160	Sangati Siva Anjaneyulu	SoE	93	92	Y	Nil
12	20211CAI0173	20211CAI0173	B R YESHWANTH	SoE	90	88	Y	Nil
13	20211CAI0174	20211CAI0174	Sane venkata charan	SoE	93	79	Y	Nil
14	20211CAI0177	20211CAI0177	SOHAN S	SoE	93	80	Y	Nil
15	20211CAI0183	20211CAI0183	A M CHETHAN KUMAR	SoE	97	90	Y	Nil







# PRESIDENCY UNIVERSITY

(Established under the Presidency University Act, 2013 of the Karnataka Act 41 of 2013)

**Name of the School: Engineering**

**Name of the Department: Physics**

**Area of Specialization: Condensed Matter Physics**

**Name of the Faculty Member(s): Dr.T.Ranjeth Kumar Reddy**

**Title of the Value Added Course: Solid State Physics**

**Course Code: PHY V 006**

**Course Duration: 30 hours [From July 1 to July 30 2020]**

**Introduction to the Course:** This course is intended to provide an introduction to the physics of solids. We will begin by characterizing the properties of static (crystal structure) and dynamic (lattice vibrations) arrangements of atoms. Next we will study electrons in solids and will identify key features distinguishing metals, insulators and semiconductors. We will end with nearly free electron model, tight binding approximation. Topics of current interest will be covered throughout the course.

**Course Outcomes: On successful completion of the course the students shall be able to:**


1. Understand the crystal structure, electronic and vibrational properties of solid-state systems.
2. Explain the crystal systems in different materials
3. Predict the structure of solid-state systems

**Course Content:** Crystal Physics: Classification of condensed matter-crystalline and noncrystalline solids, Bonding in solids - Ionic, covalent and metallic solids, the van der Waals interaction, hydrogen bonding, crystal symmetry, point groups, space groups, lattices and basis, typical crystal structures. Unit 2: Reciprocal lattice, Bragg's law of diffraction, X-ray, neutron, and electron diffraction, Brillouin zone, structure factor. Defects in

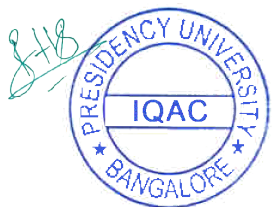


Crystals: Point defects - Frenkel and Schottky defects; Dislocations - models of screw and edge dislocations, Burgers vector; Surface imperfections – grain boundaries, tilt boundaries, twin boundaries and stacking faults; Volume defects.

**Approval by the HOD**



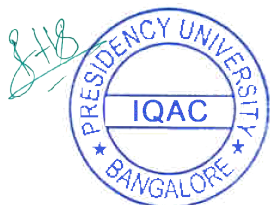
Dr. M. A.  
Department of Physics  
School of Engineering  
PRESIDENCY UNIVERSITY  
Rajarajkunte, Yelahanka, Bengaluru - 56



<b>Presidency University, Bengaluru</b>
<b>Department of Physics</b>
<b>School of Engineering</b>
<b>VAC DETAILS</b>
Total number of hours:30
Value added Course(VAC) Name and Code:PHYV006
Name of the Instructor: Dr T Ranjeth Kumar Reddy

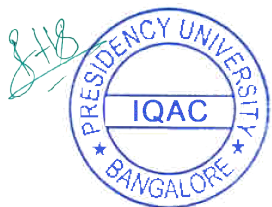
**NOTE:1.** If 1 or more classes are engaged on same day. Then change timings by repeating date  
**2.** Enter date and timings according to the VAC class engaged

S.No.	STUDENT ID NO	STUDENT NAME	3/12/22	4/12/22	5/12/22	10/12/22	12/12/22	14/12/22	16/12/22	17/12/22	18/12/22	20/12/22	21/12/22	22/12/22	24/12/22	26/12/22	27/12/22	Total classes attended	Percentage attended
			5-7 PM	5-7 PM	5-7PM	5-7 PM	5-7 PM	5-7 PM	5-7 PM	5-7 PM	5-7 PM	5-7 PM	5-7 PM	5-7 PM	5-7 PM	5-7 PM			
1	20211CEI0153	PERISETTY UDAYKIRAN	p	P	p	p	p	p	p	A	p	P	p	p	p	p	p	28	93%
2	20211CSE0775	VUTUKURU TEJA REDDY	p	P	P	p	p	p	p	P	p	P	P	p	p	A	p	28	93%
3	20211CDV0038	V D SHANMUKHANANDA REDDY	p	P	p	p	p	p	p	P	p	P	p	p	p	A	p	28	93%
4	20211CSE0039	SIDDAREDDYGARI VENU GOPAL REDDY	p	p	p	p	A	p	p	p	p	p	p	p	A	p	p	26	87%
5	20211CSE0278	ANDE VENKATA YOGENDRA REDDY	p	p	p	p	p	p	p	A	p	p	p	p	p	p	p	28	93%
6	20211CSE0142	KURLAPALLI RUDRAPPA GARI SUDARSHAN	p	p	p	p	p	p	p	p	p	p	p	p	A	p	p	28	93%
7	20211CSE0709	KOTTE DINESH	p	p	p	p	p	p	p	P	p	p	A	p	p	p	p	28	93%
8	20211CBC0010	SHAIK ARSHAD AHAMED	A	p	p	p	p	p	A	p	A	p	p	p	p	p	P	24	80%
9	20211CEI0137	PASALURU ABHINAY KUMAR	p	p	p	p	p	p	P	p	p	p	A	p	p	p	P	28	93%
10	20211CSE0483	JALADANGI ABDULLA	A	p	p	P	A	p	P	P	P	p	p	P	P	p	P	26	87%
11	20211CSE0774	SUMANT JAVOOR	p	p	p	A	p	A	p	p	p	p	p	A	p	P	p	24	80%
12	20211CEI0043	ULLI MADHU	p	A	A	P	p	p	P	P	p	A	P	P	p	p	P	24	80%
13	20211CEI0042	SHAIK ASLAM	p	P	p	p	p	p	P	p	p	P	p	A	p	p	P	28	93%



**Presidency University, Bengaluru**  
**Value Added Course Marksheet**  
**School of Engineering**

<b>Course Code :</b>		<b>PHYV006</b>			<b>Academic Year :</b>		<b>2020-2021</b>	
<b>Course Name :</b>		<b>Solid State Physics</b>			<b>Semester :</b>		<b>Odd Semester</b>	
					<b>Instructor-in-Charge Name :</b>		<b>Dr T Ranjeth Kumar Reddy</b>	
					<b>Instructor-in-Charge Employee ID :</b>		<b>PUNIV00873</b>	
<b>S. No</b>	<b>UID No</b>	<b>Roll No</b>	<b>Name</b>	<b>School (e.g. SoE/Sol etc)</b>	<b>Attendance (in %)</b>	<b>Marks</b>	<b>Eligible for Certificate (Y/N)</b>	<b>Remark</b>
1		20211CEI0153	PERISETTY UDAYKIRAN	SOE	93%	76	Y	NIL
2		20211CSE0775	VUTUKURU TEJA REDDY	SOE	93%	87	Y	NIL
3		20211CDV0038	V D SHANMUKHANANDA REDDY	SOE	93%	65	Y	NIL
4		20211CSE0039	SIDDAREDDYGARI VENU GOPAL REDDY	SOE	87%	66	Y	NIL
5		20211CSE0278	ANDE VENKATA YOGENDRA REDDY	SOE	93%	78	Y	NIL
6		20211CSE0142	KURLAPALLI RUDRAPPA GARI SUDARSHAN	SOE	93%	81	Y	NIL
7		20211CSE0709	KOTTE DINESH	SOE	93%	73	Y	NIL
8		20211CBC0010	SHAIK ARSHAD AHAMED	SOE	80%	72	y	NIL
9		20211CEI0137	PASALURU ABHINAY KUMAR	SOE	93%	79	Y	NIL
10		20211CSE0483	JALADANGI ABDULLA	SOE	87%	73	Y	NIL
11		20211CSE0774	SUMANT JAVOOR	SOE	80%	76	Y	NIL
12		20211CEI0043	ULLI MADHU	SOE	80%	67	Y	NIL
13		20211CEI0042	SHAIK ASLAM	SOE	93%	76	Y	NIL





# PRESIDENCY UNIVERSITY

(Established under the Presidency University Act, 2013 of the Karnataka Act 41 of 2013)

**Name of the School: Presidency University**

**Name of the Department: PHYSICS**

**Area of Specialization: Condensed matter Physics, Spectroscopy**

**Name of the Faculty Member/Members: Dr. Bharathi D**

**Title of the Value Added Course: Nanotechnology**

**Course Duration: [30 hours]**

**Course Code: PHYV012**

**Course Description:**

**After viewing Introduction to Nano Measurement Tools:**

Students will be able to recognize the challenge of nano scale measurement from traditional "measurement" and relate it to a practical example. Explain the difference between an optical and electron microscope. Name types of information nano-measurement tools can measure. Generally express how nano-measurement tools work

**After viewing Introduction to Nano Fabrication Tools:**

Students will be able to identify conductive materials. Recognize nanotechnology in commercial products. Discriminate length scales associated with lithography, deposition, and etching. Generally express how nano-fabrication tools work. Explain why environmental control is necessary in nanofabrication.



**Course Outcomes:** On successful completion of the course the students shall be able to:

**01: Recognize the types of information nano-measurement tools can measure and express how nano-measurement tools work.**

**02: Recognize Nanotechnology in commercial product.**

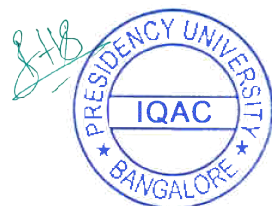
**03: Express how nano-fabrication tools work.**

**Course Content:**

SL. No.	Topic	
1	Introduction to Nanotechnology	
2	Nano Measurement and Characterization Tools	
	2.1	Scanning Electron Microscopy and Energy-Dispersive X-ray Spectroscopy
	2.2	Transmission Electron Microscopy
	2.3	X-Ray and Optical Characterization
3	Nanofabrication	
	3.1	Vacuum Pumps and Thin Film Vacuum Deposition
	3.2	Vapor Deposition
	3.3	Patterning and Self-Assembly
	3.4	Etching

**Approval by the HOD.**

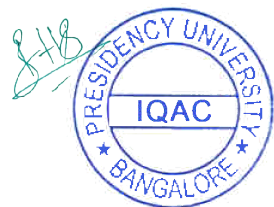
  
Department of Physics  
School of Engineering  
PRESIDENCY UNIVERSITY  
Rajarajkunte, Yelahanka, Bengaluru -54



<b>Presidency University, Bengaluru</b>
<b>Department of Physics</b>
<b>School of Engineering</b>
VAC DETAILS
Total number of hours:30
Value added Course(VAC) Name and Code: Nanotechnology PHYV012
Name of the Instructor: Dr Bharathi D

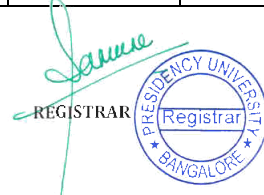
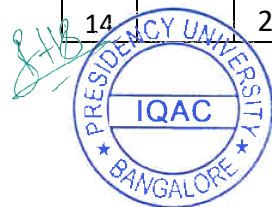
**NOTE:1.** If 1 or more classes are engaged on same day. Then change timings by repeating date  
**2.** Enter date and timings according to the VAC class engaged

S.No.	STUDENT ID NO	STUDENT NAME	3/12/22	4/12/22	5/12/22	10/12/22	12/12/22	14/12/22	16/12/22	17/12/22	18/12/22	20/12/22	21/12/22	22/12/22	24/12/22	26/12/22	27/12/22	Total classes attended	Percentage attended
			5-7 PM	5-7 PM	5-7PM	5-7 PM	5-7 PM	5-7 PM	5-7 PM	5-7 PM	5-7 PM	5-7 PM	5-7 PM	5-7 PM	5-7 PM	5-7 PM	5-7 PM		
1	20211CSE0721	JNANAVI C	p	A	A	P	p	p	P	P	p	A	P	P	p	p	P	24	80%
2	20211CSE0344	GURUPRASAD D	p	P	p	p	p	p	P	p	p	P	p	A	p	p	P	28	93%
3	20211CSE0111	YASHWANTH S	p	P	p	p	p	p	p	P	p	P	p	p	p	A	p	28	93%
4	20211CSE0107	PRUTHVI PEMMAIAH M	p	p	p	p	A	p	p	p	p	p	p	p	A	p	p	26	87%
5	20211CSE0742	THASMAY H P	p	p	p	p	p	p	p	A	p	p	p	p	p	p	p	28	93%
6	20211CSE0729	S PAVANI	p	p	p	p	p	p	p	p	p	p	p	p	A	p	p	28	93%
7	20211CSE0780	PRATHISH S	p	p	p	p	p	p	p	P	p	p	A	p	p	p	p	28	93%
8	20211CSE0786	ROHITH M	A	p	p	p	p	p	A	p	A	p	p	p	p	p	P	24	80%
9	20211CSE0283	PATAN SHAHEENA	p	p	p	p	p	p	P	p	p	p	A	p	p	p	P	28	93%
10	20211CSE0280	SIDDE HIMAJA	A	p	p	P	A	p	P	P	P	p	p	P	P	p	P	26	87%
11	20211CSE0324	HEMA DEEPIKA MIKKILI	p	p	p	A	p	A	p	p	p	p	p	A	p	P	p	24	80%
12	20211CSE0096	PUJARI SAIENDRA	p	A	A	P	p	p	P	P	p	A	P	P	p	p	P	24	80%
13	20211CSE0811	LISHITHA K ASWATH	p	P	p	p	p	p	P	p	p	P	p	A	p	p	P	28	93%
14	20211CSE0698	A S ASMITHA .	p	p	p	p	p	p	p	p	p	p	p	p	A	p	p	28	93%
15	20211CSE0697	RITU JAISWAL R	p	p	p	p	p	p	p	P	p	p	A	p	p	p	p	28	93%




**Presidency University, Bengaluru**  
**Value Added Course Marksheet**  
**School of Engineering**

<b>Course Code :</b>		<b>PHYV012</b>			<b>Academic Year :</b>		<b>2020-2021</b>	
<b>Course Name :</b>		<b>Nanotechnology</b>			<b>Semester :</b>		<b>Odd Semester</b>	
					<b>Instructor-in-Charge Name :</b>		<b>Dr Bharathi D</b>	
					<b>Instructor-in-Charge Employee ID :</b>		<b>PUNIV01370</b>	
<b>S. No</b>	<b>UID No</b>	<b>Roll No</b>	<b>Name</b>	<b>School (e.g. SoE/SoL etc)</b>	<b>Attendance (in %)</b>	<b>Marks</b>	<b>Eligible for Certificate (Y/N)</b>	<b>Remark</b>
1		20211CSE0721	JNANAVI C	SOE	80%	76	Y	NIL
2		20211CSE0344	GURUPRASAD D	SOE	80%	67	Y	NIL
3		20211CSE0111	YASHWANTH S	SOE	93%	76	Y	NIL
4		20211CSE0107	PRUTHVI PEMMAIAH M	SOE	87%	66	Y	NIL
5		20211CSE0742	THASMAY H P	SOE	93%	78	Y	NIL
6		20211CSE0729	S PAVANI	SOE	93%	81	Y	NIL
7		20211CSE0780	PRATHISH S	SOE	93%	73	Y	NIL
8		20211CSE0786	ROHITH M	SOE	80%	72	y	NIL
9		20211CSE0283	PATAN SHAHEENA	SOE	93%	79	Y	NIL
10		20211CSE0280	SIDDE HIMAJA	SOE	87%	73	Y	NIL
11		20211CSE0324	HEMA DEEPIKA MIKKILI	SOE	80%	76	Y	NIL
12		20211CSE0096	PUJARI SAIENDRA	SOE	80%	67	Y	NIL
13		20211CSE0811	LISHITHA K ASWATH	SOE	93%	76	Y	NIL
14		20211CSE0698	A S ASMITHA .	SOE	93%	78	Y	NIL

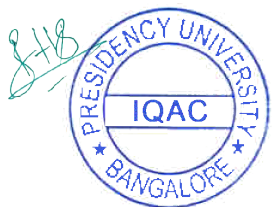




15		20211CSE0697	RITU JAISWAL R	SOE	80%	76	Y	NIL
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Department of Physics  
School of Engineering  
PRESIDENCY UNIVERSITY  
Rajarohunte, Yelahanka, Bengaluru -54

**Signature of HoD**





# PRESIDENCY UNIVERSITY

(Established under the Presidency University Act, 2013 of the Karnataka Act 41 of 2013)

**Name of the School:** SOE

**Name of the Department:** Physics

**Area of Specialization:** Physics

**Name of the Faculty Member:** Dr.G Srinivas Reddy

**Title of the Value Added Course:** Electrodynamics

**Course Duration:** [30 hours]

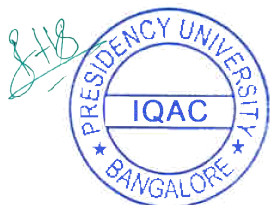
**Course Code:** PHYV017

## **Introduction to the Course:**

Electromagnetic Field Theory acquire understanding and ability to analyze static electric and magnetic fields, time-varying electric and magnetic fields, wave propagation in different types of media. This course may also be useful for the practicing engineers who want to refresh their understanding in Electromagnetics. Along with static electric and magnetic fields, time-varying electric and magnetic fields the course covers basics of electromagnetic wave and introductory concepts on application numerical techniques have also been discussed.

**Course Outcomes:** On successful completion of the course the students shall be able to :

- 1] Understand electric and magnetic fields and apply the principles of Coulomb's Law and Gauss's law to electric fields
- 2] Describe the concepts of electrodynamics & to derive and discuss the Maxwell's equations.
- 3] Explain the basic Magneto static theorems and laws and infer the magnetic properties of matter.



## Course Content (Syllabus):

**Module:1: Introduction:** Scalars and vectors, Dot and cross products, Co-ordinate systems and conversions, Coulomb's law, Concept of electric flux density, Gauss's law and its application, Concept of Gradient and Divergence, Divergence theorem and Maxwell's First Equation, Different Charge distributions.

**[10 Hrs] [Blooms level selected: Knowledge]**

**Module: 2:** Energy expended in moving a point charge in electric field, Definition of potential and potential difference, Concept of potential gradient, Dipole, Potential density in Electrostatic field, Concept of current and current density, Continuity equation, Metallic conductor and their properties, Semiconductor, Dielectric materials, Boundary conditions, Capacitance of a parallel plate capacitor, Poisson's and Laplace's equation with example, Uniqueness theorem.

**[12 Hrs] [Blooms level selected: Comprehension]**


**Module: 3:** Biot-Savart's law, Ampere's law, concept of curl, Stoke's theorem, Definition of magnetic flux and magnetic flux density, Scalar and vector magnetic potential. Force on a moving charge, force on a differential current element, Force and torque on a close circuit, Magnetization and permeability, Magnetic boundary condition, Faraday's law, Displacement current, Maxwell's equation in point and integral form.

**[08 Hrs] [Blooms level selected: Application]**

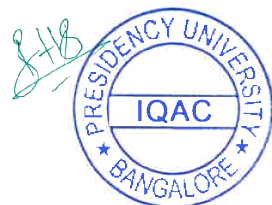
## References

- (1) V.V.Sarwate, 'Electromagnetic fields and waves', First Edition, Newage Publishers, 1993.
- (2) <https://nptel.ac.in/courses/115/104/115104088/>
- (3) J.P.Tewari, 'Engineering Electromagnetics – Theory, Problems and Applications', Second Edition, Khanna Publishers.

**Approval by the HOD.**



Department of Physics  
School of Engineering  
PRESIDENCY UNIVERSITY  
Rajajukunte, Yelahanka, Bengaluru -54

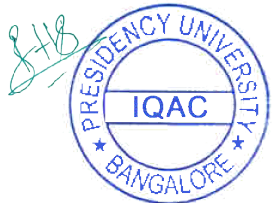


**Presidency University, Bengaluru**  
**Department of Physics**  
**School of Engineering**

VAC DETAILS  
 Total number of hours:30  
 Value added Course(VAC) Name and Code:PHYV017  
 Name of the Instructor: Dr G Srinivas Reddy

**NOTE:1.** If 1 or more classes are engaged on same day. Then change timings by repeating date  
**2.** Enter date and timings according to the VAC class engaged

S.No.	STUDENT ID NO	STUDENT NAME	6/12/21	7/12/21	9/12/21	10/12/21	13/12/21	14/12/21	15/12/21	17/12/21	21/12/21	22/12/21	22/12/21	23/12/21	24/12/22	25/12/22	30/12/22	Total classes conducted	Total classes attended	Percentage attended
			5-7 PM	5-7 PM	5-7PM	5-7 PM	5-7 PM	5-7 PM	5-7 PM	5-7 PM	5-7 PM	5-7 PM	5-7 PM	5-7 PM	5-7 PM	5-7 PM				
1	20211CSE0023	BAGINENI VENKATA SANJAY RAYAL	p	p	p	p	p	p	p	p	p	p	p	p	p	a	p	30	28	93%
2	20211CSE0024	CHAVVA ROHITH REDDY	p	a	p	a	p	a	p	A	p	a	p	p	p	p	A	30	18	60%
3	20211CSE0031	CHINTA MARY KIRANMAYE	a	P	p	p	p	p	p	p	p	p	p	p	a	p	P	30	26	87%
4	20211CSE0032	SUNKESULA MUNEERA BEGUM	p	p	p	a	p	p	p	p	p	p	p	p	p	p	p	30	28	93%
5	20211CSE0040	SHAIK BILAAL HUSSAIN	p	p	p	p	a	p	p	p	a	p	p	p	p	p	p	30	26	87%
6	20211CSE0042	THOTA YOGESH NAIDU	p	p	p	p	p	p	p	a	p	p	p	p	p	p	p	30	28	93%
7	20211CSE0046	ALLU PRAVALLIKA	p	p	a	p	a	p	p	P	p	a	p	a	p	a	p	30	20	67%
8	20211CSE0048	JATIN THAPA	p	p	p	p	p	p	A	p	p	p	p	p	p	p	p	30	28	93%
9	20211CSE0049	ARPAN MANDAL	p	p	p	p	p	p	p	p	p	p	p	p	p	p	a	30	28	93%
10	20211CSE0059	LINGUTLA RACHANA	A	p	p	A	p	p	P	a	p	p	A	p	a	p	p	30	20	67%
11	20211CSE0068	MADHULATHA T.R	p	p	p	p	p	A	p	p	p	A	p	A	p	p	p	30	24	80%
12	20211CSE0090	METLA SRINIVAS	p	A	p	P	p	p	p	a	p	P	p	p	p	p	p	30	26	87%
13	20211CSE0091	BOBBEPALLI LAKSHMAN PAVAN KU	p	P	p	p	p	p	P	p	p	p	p	p	P	p	a	30	28	93%
14	20211CSE0130	DEPATLA GANESH REDDY	A	p	p	p	p	p	a	p	a	p	p	p	p	p	A	30	22	73%
15	20211CSE0187	V V PRAVEEN	p	P	A	p	a	p	p	p	p	p	p	p	P	p	P	30	26	87%
16	20211CSE0188	MADDU AKHIL	p	p	p	p	p	p	P	p	p	p	a	p	p	A	p	30	26	87%



**Presidency University, Bengaluru**  
**Value Added Course Marksheet**  
**School of Engineering**

<b>Course Code :</b>		<b>PHYV017</b>			<b>Academic Year :</b>		<b>2021-22</b>	
<b>Course Name :</b>		<b>Electrodynamics</b>			<b>Semester :</b>		<b>odd SEM</b>	
					<b>Instructor-in-Charge Name :</b>		<b>Dr G Srinivas Reddy</b>	
					<b>Instructor-in-Charge Employee ID :</b>		<b>Dr G Srinivas Reddy</b>	
<b>S. No</b>	<b>UID No</b>	<b>Roll No</b>	<b>Name</b>	<b>School (e.g. SoE/SoL etc)</b>	<b>Attendance (in %)</b>	<b>Marks</b>	<b>Eligible for Certificate (Y/N)</b>	<b>Remark</b>
1		20211CSE0023	BAGINENI VENKATA SANJAY RAYAL	SOE	93%	70	Y	NIL
2		20211CSE0024	CHAVVA ROHITH REDDY	SOE	60%	72	Y	NIL
3		20211CSE0031	CHINTA MARY KIRANMAYE	SOE	87%	75	Y	NIL
4		20211CSE0032	SUNKESULA MUNEERA BEGUM	SOE	93%	70	Y	NIL
5		20211CSE0040	SHAIK BILAAL HUSSAIN	SOE	87%	60	Y	NIL
6		20211CSE0042	THOTA YOGESH NAIDU	SOE	93%	65	Y	NIL
7		20211CSE0046	ALLU PRAVALLIKA	SOE	67%	44	Y	NIL
8		20211CSE0048	JATIN THAPA	SOE	93%	35	Y	NIL
9		20211CSE0049	ARPAN MANDAL	SOE	93%	65	Y	NIL
10		20211CSE0059	LINGUTLA RACHANA	SOE	67%	35	Y	NIL
11		20211CSE0068	MADHULATHA T R	SOE	80%	36	Y	NIL
12		20211CSE0090	METLA SRINIVAS	SOE	87%	70	Y	NIL
13		20211CSE0091	BOBBEPALLI LAKSHMAN PAVAN KUMAR	SOE	93%	68	Y	NIL
14		20211CSE0130	DEPATLA GANESH REDDY	SOE	73%	35	Y	NIL
15		20211CSE0187	V V PRAVEEN	SOE	87%	56	Y	NIL
16		20211CSE0188	MADDU AKHIL	SOE	87%	62	Y	NIL

