SRI VENKATESWARA UNIVERSITY:: TIRUPATI DEPARTMENT OF PHYSICS TWO YEAR M.Sc. COURSE IN PHYSICS (2021-2022) COURSE STRUCTURE AND EXAMINATION SCHEME

Semester -I								
SI.N O	Components of study	Title of the course	Title of the paper	Credit Hrs/ Week	No. of credits	IA marks	Sem End Marks	Total
1.	Mandatory	PHY 101	1.Classical Mechanics and theory of relativity.	6	4	20	80	100
2.	Core	PHY102	2.Solid state Physics	6	4	20	80	100
3.	Compulsory Foundation	PHY103 (a) PHY103(b) PHY103(c)	 1.Analog and Digital Electronics 2.Computational Methods & C Language 3.Sensors and 	6	4	20	80	100
4.	Elective	PHY104 (a)	Transducers1.Atomic andmolecular physics2.Optical	6	4	20	80	100
	1 oundation	PHY104 (c)	2.0phcal, Microwave and Satellite Communications 3.Computer	-				
			Architecture and Networking					
5.	Practical -I	PHY 105	Paper 1& 3 (General Lab)	6	4		100-	100
6.	Practical-II	PHY 106	Paper 3 &4 (Electronics Lab)	6	4		100	100
	Total			36	24	80	320	600
7.	Audit Course			0	0	100	0	0

*All core papers are Mandatory

Compulsory Foundation choose one paper.

Elective Foundation – Choose one paper.

Audit course-100 Marks(Internals) Zero Credits under self-study.

Interested students may register for MOOC with the approval of the concerned DDC but it will be considered for the award of the grade as open elective only giving extra credits.

SRI VENKATESWARA UNIVERSITY:: TIRUPATI DEPARTMENT OF PHYSICS TWO YEAR M.Sc. COURSE IN PHYS 2021-2022) COURSE STRUCTURE AND EXAMINATION SCHEME

Semester -II

SI.N	Component	Title of	Title of the paper	Credit	No. of	IA	Sem	Total
0	s of study	the		Hrs/	credits	marks	End	
	5	course		Week			Marks	
1.	Mandatory	PHY201	1.Statistical	6	4	20	80	100
	5		Mechanics					
	Core							
2.		PHY 202	2.EM Theory,	6	4	20	80	100
			Lasers & Modern					
			Optics					
3.	Compulsory	PHY	1.Nuclearl Physics	6	4	20	80	100
	Foundation	203(a)						
		PHY	2.IC fabrication					
		203(b)	Techniques					
		PHY	3.Advanced					
		203(c)	Microprocessors					
			and its					
			Applications					
		PHY	1.Mathematical	6	4	20	80	100
4.	Elective	204(a)	Physics					
	Foundation	PHY	2.Introduction to					
		204(b)	VLSI design					
		PHY	3.Materials					
		204(c)	Science and					
			Industrial					
			Applications					
5.	Practical -I	PHY 205	Paper 1& 3	6	4			100
			(General Lab)					
6.	Practical-II	PHY206	Paper 3 &4	6	4			100
			(Electronics Lab)					
	Total			36	24	80	320	600
7.	7. Audit Course			0	0	100	0	0

*All core papers are Mandatory

Compulsory Foundation choose one paper.

Elective Foundation – Choose one paper.

Audit course-100 Marks(Internals) Zero Credits under self-study.

Interested students may register for MOOC with the approval of the concerned DDC but it will be considered for the award of the grade as open elective only giving extra credits.

SRI VENKATESWARA UNIVERSITY:: TIRUPATI DEPARTMENT OF PHYSICS TWO YEAR M.Sc. COURSE IN PHYSICS (2022-2023) COURSE STRUCTURE AND EXAMINATION SCHEME

$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	SI.N	Components	Title of	Title of the paper	Credit	No. of	IA	Sem	Total
I.MandatoryPHY3011.Introductory Quantum Mechanics6420801002.CorePHY3022.Physics of Semiconductor Devices6420801003.Generic ElectivePHY 303(a)1.Applied Spectroscopy6420801004.PracticalsPHY 303(c)3.Embedded Systems6420801004.PracticalsPHY 3043.Embedded 303(c)5641005.Skill Oriented coursePHY 306(a)Advanced Spectroscopic Techniques for Industrial Applications.641090 (40+50)1006.Open ElectivePHY 306(a)1.Basic Spectroscopic Techniques642011007TotalTotalJoan Joan362490410600	0	of study	the		Hrs/	credits	marks	End	
1.MandatoryPHY3011.Introductory Quantum Mechanics6420801002.CorePHY3022.Physics of Semiconductor Devices6420801003.Generic ElectivePHY 303(a)1.Applied Spectroscopy6420801004.PracticalsPHY 3043. Embedded Systems641005.Skill Oriented coursePHY 305305641006.Open ElectivePHY 306(a)Advanced Spectroscopic Techniques for Industrial Applications.641090 (40+50)1006.Open ElectivePHY 306(a)1.Basic Spectroscopic Techniques642011007.TotalTotalI.Basic Spectroscopic6420100			course		Week			Marks	
MandatoryQuantum MechanicsQuantum Mechanics2.CorePHY 3022.Physics of Semiconductor Devices6420801003.Generic ElectivePHY 303(a)1.Applied Spectroscopy6420801004.PracticalsPHY 303(c)Systems641005.Skill Oriented coursePHY 305Advanced characterization Techniques for Industrial Applications.641006.Open ElectivePHY 306(a)Spectroscopic Techniques641090 (40+50)100 (40+50)6.Open ElectivePHY 306(a)1. Basic Spectroscopic Techniques642011007.TotalTotalI. Basic Spectroscopic Techniques6420100	1.		PHY301	1.Introductory	6	4	20	80	100
2.CorePHY3022.Physics of Semiconductor Devices6420801003.Generic ElectivePHY 303(a)1.Applied Spectroscopy6420801003.Generic ElectivePHY 303(b)1.Applied Matter Physics6420801004.PracticalsPHY 30430455641005.Skill Oriented coursePHY 305305641090 (40+50)1006.Open ElectivePHY 306(a)1.Basic Spectroscopic Techniques642011006.Open ElectivePHY 306(a)1.Basic Spectroscopic Techniques642011007TotalTotalIJonomaterials and Devices362490410600		Mandatory		Quantum					
2.CorePHY3022.Physics of Semiconductor Devices6420801003.Generic ElectivePHY 303(a)1.Applied Spectroscopy64208010072.Condensed 303(b)Matter Physics Matter Physics6420801004.PracticalsPHY 3043. Embedded 303(c)5641005.Skill Oriented coursePHY 305Special labs characterization Techniques for Industrial Applications.641090 (40+50)1006.Open ElectivePHY 306(a)1.Basic Spectroscopic Techniques642011006.Open FlectivePHY 306(a)2. Nanomaterials and Devices642011007TotalTotal5362490410600				Mechanics					
2.CoreHT 3022.1 Hystor042080100Semiconductor Devices $Devices$ $Devices$ 6420801003.Generic ElectivePHY 303(a)1.Applied Spectroscopy6420801004.PracticalsPHY 3043. Embedded 304641004.PracticalsPHY 304Special labs characterization Techniques for Industrial Applications.641005.Oriented course305characterization Techniques for Industrial Applications.641090 (40+50)1006.Open ElectivePHY 306(a)1. Basic Spectroscopic Techniques642011007TotalTotalJob AlloSpectroscopic Techniques64201100	2	Core	PHY302	2 Physics of	6	4	20	80	100
3.Generic ElectivePHY 303(a)1.Applied Spectroscopy PHY 303(b)6420801004.PracticalsPHY 3043. Embedded 303(c)Systems641005.Skill Oriented coursePHY 305Advanced characterization Techniques for Industrial Applications.641090 (40+50)1006.Open ElectivePHY 306(a)1. Basic Spectroscopic Techniques642011007.TotalTotalTotalJob Spectroscopic Techniques642011007.Open ElectivePHY 306(b)1. Basic and Devices642011007.TotalTotalJob Spectroscopic Techniques64201100	2.		1111302	Semiconductor	0		20	00	100
3.Generic ElectivePHY $303(a)$ 1.Applied Spectroscopy PHY $2.Condensed$ $303(b)$ 642080100 $303(a)$ Spectroscopy PHY $303(b)$ Matter Physics PHY $303(c)$ 641004.PracticalsPHY 304 Special labs 304 641005.Skill Oriented coursePHY 305 Advanced characterization Techniques for Industrial Applications.641090 $(40+50)$ 1006.Open ElectivePHY $306(a)$ 1. Basic Spectroscopic Techniques642011006.Open ElectivePHY $306(b)$ 1. Basic and Devices642011007TotalTotalJob362490410600				Devices					
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	3.	Generic	PHY	1.Applied	6	4	20	80	100
PHY 303(b)2.Condensed Matter Physics PHY 303(c)Natter Physics PHY SystemsImage: Condensed Systems4.PracticalsPHY 304Special labs Sode641005.Skill Oriented coursePHY 305Advanced characterization Techniques for Industrial Applications.641090 (40+50)1006.Open ElectivePHY 306(a)1. Basic Spectroscopic Techniques642011007.TotalTotalJob Spectroscopic Techniques64201100		Elective	303(a)	Spectroscopy					
$ \begin{array}{ c c c c c c } \hline \begin{tabular}{ c c c c } \hline & 303(b) & Matter Physics \\ \hline PHY & 3. Embedded \\ \hline 303(c) & Systems & & & & & & & & & & & & & & & & & & &$			PHY	2.Condensed					
PHY 303(c)3. Embedded Systems9994.PracticalsPHY 304Special labs641005.Skill Oriented coursePHY 305Advanced characterization Techniques for Industrial Applications.641090 (40+50)1006.Open ElectivePHY 306(a)1. Basic Spectroscopic Techniques642011007TotalTotalTotal362490410600			303(b)	Matter Physics					
$303(c)$ Systems \sim \sim \sim \sim \sim 4.PracticalsPHY 304 Special labs64 \sim \sim \sim 100 5.Skill Oriented coursePHY 305 Advanced characterization Techniques for Industrial Applications.64 10 90 $(40+50)$ 100 6.Open ElectivePHY $306(a)$ 1. Basic Spectroscopic Techniques64 20 1 100 7.PHY $306(b)$ 1. Basic Spectroscopic Techniques64 20 1 100 7.TotalTotalTotal 36 24 90 410 600			PHY	3. Embedded					
4.PracticalsPHY 304 Special labs641005.Skill Oriented coursePHY 305 Advanced characterization Techniques for Industrial Applications.641090 (40+50)1006.Open ElectivePHY $306(a)$ 1. Basic Spectroscopic Techniques642011007.PHY $306(b)$ 1. Basic and Devices642011007.TotalTotal362490410600			303(c)	Systems					
304 304 10 90 100 $5.$ Skill Oriented coursePHY 305Advanced characterization Techniques for Industrial Applications. 6 4 10 90 $(40+50)$ 100 $6.$ Open ElectivePHY $306(a)$ $1.$ Basic Spectroscopic Techniques 6 4 20 1 100 $6.$ Open ElectivePHY $306(a)$ $2.$ Nanomaterials and Devices 6 4 20 1 100 7 TotalTotal 36 24 90 410 600	4.	Practicals	PHY	Special labs	6	4			100
Skill Oriented coursePHY 305Advanced characterization Techniques for Industrial Applications.641090 (40+50)1006.Open ElectivePHY 306(a)1. Basic Spectroscopic Techniques642011006.Open ElectivePHY 306(a)2. Nanomaterials and Devices64201100Total			304						
5.Oriented course305characterization Techniques for Industrial Applications.(40+50)6.Open ElectivePHY 306(a)1. Basic Spectroscopic Techniques64201100PHY 306(b)1. Basic and Devices64201100TotalPHY 4101. Basic Spectroscopic Techniques64201100TotalPHY 4102. Nanomaterials and Devices362490410600		Skill	PHY	Advanced	6	4	10	90	100
courseTechniques for Industrial Applications.Industrial Applications.Industrial Applications.6.Open ElectivePHY 306(a)1. Basic Spectroscopic Techniques64201100PHY 306(b)2. Nanomaterials and Devices64201100TotalTotal000410600	5.	Oriented	305	characterization				(40+50)	
Industrial Applications.Industrial Applications.Image: Constraint of the sector of the		course		Techniques for					
6.Open ElectivePHY $306(a)$ 1. Basic Spectroscopic Techniques 6 4 20 1 100 <				Industrial					
6. Open Elective PHY 306(a) 1. Basic Spectroscopic Techniques 6 4 20 1 100 8 306(a) Spectroscopic Techniques 6 4 20 1 100 9 PHY 306(b) 2. Nanomaterials and Devices 6 4 20 1 100 7 Total 7 36 24 90 410 600				Applications.					
Elective 306(a) Spectroscopic Techniques PHY 2. Nanomaterials 306(b) and Devices Total 36 24 90 410 600	6.	Open	PHY	1. Basic	6	4	20	1	100
Techniques PHY 2. Nanomaterials 306(b) and Devices Total 36		Elective	306(a)	Spectroscopic					
PHY 2. Nanomaterials 306(b) and Devices Total 36				Techniques	-				
306(b) and Devices Image: Constraint of the second			PHY	2. Nanomaterials					
Total 36 24 90 410 600			306(b)	and Devices	-				
		Total			36	24	90	410	600

Semester -III

*All core papers are Mandatory

Generic Elective – Choose two

Core papers and Generic Electives opted paper held Practical-I

Skill Oriented Course is Mandatory. Relevant society along with practical (10marks internal 40 final theory & 50 for practicals).

Open Electives are for the students of other Departments. Minimum one paper should be opted. Extra credits may be earned by opting for more number of open electives depending on the interest of the student through self study.

Interested students may register for MOOC with the approval of the concerned DDC.

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SI.N O	Components of study	Title of the course	Title of the paper	Credit Hrs/ Week	No. of credits	IA marks	Sem End Marks	Total
1.	Mandatory	PHY 401	1.Advanced Quantum Mechanics	6	4	20	80	100
2.	Core	PHY402	2. Physics of Advanced Materials	6	4	20	80	100
3.	Generic Elective	PHY 403(a) PHY 403(b) PHY 403(c)	1.Photonics 2.Solar Energy Thermal and Photovoltaic Properties 3.Vacuum and Thin Film	6	4	20	80	100
4.	Practicals	PHY 404	Elective labs	6	4			100
5.	Multi Disciplinary Course/ Project Work	РНҮ 405	Advances in Physics	6	4			100
6.	Open Elective	PHY 406(a) PHY 406(b)	 Wireless Communications Vacuum Technology & Applications 	6	4	20	80	100
	Total			50	L4	00	520	000

Semester -IV

*All core papers are Mandatory

Generic Elective – Choose one

Core papers and Generic Electives opted paper held Practical-II.

Project Work- Collaboration with various firms/companies/societies.

Multi Disciplinary Course is Mandatory. Circle formation with other subjects/Dept. of Arts/Commerce.

Open Electives are for the students of other Departments. Minimum one paper should be opted. Extra credits may be earned by opting for more number of open electives depending on the interest of the student through self study.

M.Sc PHYSICS

III SEMESTER Skill Oriented Course (W.E.F. 2022-2023)

PHY305: Advanced Characterization Techniques for Industrial Applications (SoC)

UNIT-I: Resonance Spectrometers and Mass Spectrometer

Electron Spin Resonance(ESR)–Principle–ESR spectrometer – Working Principle with block diagram Applications of ESR. Nuclear Magnetic Resonance (NMR) – Principle – NMR spectrometer – Working Principle with block diagram, Basic concepts of NQR spectrometer: Mossbauer spectrometer – Principle ofworking – Applications of NQR and Mossbauer studies.

UNIT - II: Advanced Spectroscopic and Microscopic Techniques

Spectroscopic Techniques: Energy dispersive spectroscopy, X-ray photoelectron spectroscopy, X ray fluorescence spectroscopy, and Auger Electron Spectroscopy.

Imaging Techniques: Scanning electron microscopy, Transmission electron microscopy, Atomic force microscopy,

Books for Study:

Methods of Surface Analysis, Techniques and Applications, J.M. WallsCambridge University Press, 1990.

Instrumental Methods of Analysis, Willard Merritt, Dean Settle, CBS publishers, New Delhi, 1986

Materials Characterization Techniques" by Sam Zhang and Lin Li. CRC Press, 1976.

Advanced Techniques for Material Characterization by A.K. Tyagi, Manik Roy, Trans Tech Publishers

X-ray Photoelectron Spectroscopy by Paul Van Der Heide, Wiley Publication.

M.Sc PHYSICS

IV SEMESTER (Multi-disciplinary Course) PHY 405: Advances in Physics (W.E.F. 2022-2023)

UNIT - I: 8051 Microcontrollers

Introduction of Microprocessors and Microcontrollers, Microcontroller: 8051 Internal Architecture, Register Structure, I/O pins, Memory Organization, 8051 Addressing modes. 8051 Assembly Language Programming Tools. 8051 Instruction set: Data Transfer Instructions, Arithmetic instructions, Logical instructions, Boolean Variable Manipulation Instructions-Bit Addressability, Single-Bit instructions, Program Branching Instructions-Jump, Loop, and Call instructions, Rotate Instructions, Stack Pointer.

UNIT - II: Remote Sensing

Definition of remote sensing; introduction to concepts and systems; Electromagnetic radiation; electromagnetic spectrum; image characteristics; remote sensing systems; remote sensing platform; Sources of remote sensing information; Advantages of remote sensing. Application of Remote sensing in Environmental Management, Natural resource management – forest resources, water resources, land resources and mineral resources. Books for Study:

1. The 8051 Microcontroller and Embedded systems, by Mahammad Ali Mazidi and Janice, Gillispie Mazidi, Pearson Education Asia, Pvt. Ltd., 2000.

2. Floyd F. Sabins Jr., Remote Sensing Principles and interpretation, by W.H. Freemanand Company, 2nd Ed., New York, 1987.

3. T.M. Lillesand & R.W.Kiefer, Remote Sensing and Image Interpretation', by JohnWiley& Sons, New York, 1994.

4. An Introduction to GIS by Ian Heywood et al., Addision Wesley, Longmont Limited,
