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

Semester -I

SI.NO	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)	1.Analog and Digital Electronics	6	4	20	80	100
		PHY103(b)	2.Computational Methods & C Language					
		PHY103(c)	3.Sensors and Transducers					
4.	Elective Foundation	PHY104 (a)	1.Atomic and molecular physics	6	4	20	80	100
		PHY104 (b)	2.Optical, Microwave and Satellite Communications					
		PHY104 (c)	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.

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Semester -II

SI.NO	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 Core	PHY201	1.Statistical Mechanics	6	4	20	80	100
2.		PHY 202	2.EM Theory, Lasers & Modern Optics	6	4	20	80	100
3.	Compulsory Foundation	PHY 203(a)	1.Nuclearl Physics	6	4	20	80	100
		PHY 203(b)	2.IC fabrication Techniques					
		PHY 203(c)	3.Advanced Microprocessors and its Applications					
4.	Elective Foundation	PHY 204(a)	1.Mathematical Physics	6	4	20	80	100
		PHY 204(b)	2.Introduction to VLSI design					
		PHY 204(c)	3.Materials Science and Industrial Applications					
5.	Practical -I	PHY 205	Paper 1& 3 (General Lab)	6	4	--	- -	100
6.	Practical-II	PHY206	Paper 3 &4 (Electronics Lab)	6	4	--	- -	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.

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Semester -III

SI.NO	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	PHY301	1.Introductory Quantum Mechanics	6	4	20	80	100
2.	Core	PHY302	2.Physics of Semiconductor Devices	6	4	20	80	100
3.	Generic Elective	PHY 303(a)	1.Applied Spectroscopy	6	4	20	80	100
		PHY 303(b)	2.Condensed Matter Physics					
		PHY 303(c)	3. Embedded Systems					
4.	Practicals	PHY 304	Special labs	6	4	--	- -	100
5.	Skill Oriented course	PHY 305	Advanced characterization Techniques for Industrial Applications.	6	4	10	90 (40+50)	100
6.	Open Elective	PHY 306(a)	1. Basic Spectroscopic Techniques	6	4	20	1	100
		PHY 306(b)	2. Nanomaterials and Devices					
	Total			36	24	90	410	600

*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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COURSE STRUCTURE AND EXAMINATION SCHEME
Semester -IV

SI.NO	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 Core	PHY 401	1.Advanced Quantum Mechanics	6	4	20	80	100
2.		PHY402	2. Physics of Advanced Materials	6	4	20	80	100
3.	Generic Elective	PHY 403(a)	1.Photonics	6	4	20	80	100
		PHY 403(b)	2.Solar Energy Thermal and Photovoltaic Properties					
		PHY 403(c)	3.Vacuum and Thin Film Technology					
4.	Practicals	PHY 404	Elective labs	6	4	--	- -	100
5.	Multi Disciplinary Course/ Project Work	PHY 405	Advances in Physics	6	4	--	- -	100
6.	Open Elective	PHY 406(a)	1.Wireless Communications	6	4	20	80	100
		PHY 406(b)	2. Vacuum Technology & Applications					
	Total			36	24	80	320	600

*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,

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