



Re-Accredited 'B++' 2.86 CGPA by NAAC

VEER NARMAD SOUTH GUJARAT UNIVERSITY

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વીર નર્મદ દક્ષિણ ગુજરાત યુનિવર્સિટી

યુનિવર્સિટી કેમ્પસ, ઉધના-મગદલા રોડ, સુરત - ૩૯૫ ૦૦૭, ગુજરાત, ભારત.

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-: પરિપત્ર :-

વિજ્ઞાન વિદ્યાશાખા હેઠળની સંલગ્ન તમામ કોલેજોનાં આચાર્યશ્રીઓને જણાવવાનું કે, NEP-2020 અંતર્ગત શૈક્ષણિક વર્ષ ૨૦૨૩-૨૪ થી અમલમાં આવનાર B.Sc.Physics Sem.-2 MDC અને SEC ના અભ્યાસક્રમ સંદર્ભે ચર્ચા કરતાં ભૌતિકશાસ્ત્ર વિષયની અભ્યાસ સમિતિની તા.૧૪/૧૨/૨૦૨૩ ની સભાના ઠરાવ ક્રમાંક:૪ અન્વયે કરેલ ભલામણ વિજ્ઞાન વિદ્યાશાખાના અધ્યક્ષશ્રીએ વિદ્યાશાખાની મંજૂરીની અપેક્ષાએ વિદ્યાશાખા વતી મંજૂર કરી એકેડેમિક કાઉન્સિલને કરેલ ભલામણ એકેડેમિક કાઉન્સિલની તા.૦૭/૦૮/૨૦૨૩ની સભાના ઠરાવ ક્રમાંક: ૯૯ અન્વયે માન.કુલપતિશ્રીને આપેલ સત્તા અંતર્ગત માનનીય કુલપતિશ્રી દ્વારા મંજૂર કરેલ છે. જેનો અમલ કરવા આથી જાણ કરવામાં આવે છે.

ભૌતિકશાસ્ત્ર વિષયની અભ્યાસ સમિતિની તા.૧૪/૧૨/૨૦૨૩ ની સભાના ઠરાવ ક્રમાંક:૪

:: આથી ઠરાવવામાં આવે છે કે, NEP-2020 અંતર્ગત B.Sc.Physics Sem.-2 નો MDC અને SEC નો અભ્યાસક્રમ મંજૂર કરી વિજ્ઞાન વિદ્યાશાખાને ભલામણ કરવામાં આવે છે.

(બિડાણ: ઉપર મુજબ)

ક્રમાંક : એસ./સાયન્સ/પરિપત્ર/૬૯૮/૨૦૨૪
તા.૦૫-૦૧-૨૦૨૪

Witesh
કુલસચિવ

પ્રતિ,

- ૧) વિજ્ઞાન વિદ્યાશાખા હેઠળની સંલગ્ન તમામ કોલેજોનાં આચાર્યશ્રીઓ.
..... આપશ્રીની કોલેજના સંબંધિત શિક્ષકોને જાણ કરી અમલ કરવા સારું.
- ૨) અધ્યક્ષશ્રી, વિજ્ઞાન વિદ્યાશાખા.
- ૩) પરીક્ષા નિયામકશ્રી, પરીક્ષા વિભાગ, વીર નર્મદ દ. ગુ. યુનિવર્સિટી, સુરત.
.....તરફ જાણ તેમજ અમલ સારું.

B.Sc. Semester-II
Course code: PH-MDC-1

Total Credits: 04 (Theory: 2, Practical; 2)

Total Hrs: Theory: 30, Practical: 60

Course Title: Motion and Force

PH-MDC-1 (Theory)

Unit 1	Rest and Motion: Kinematics, Rest and Motion, Average Speed and Instantaneous Speed, Average Velocity and Instantaneous Velocity, Average Acceleration and Instantaneous Acceleration, Motion in a Plane, Projectile Motion, Examples
Unit 2	The Forces: Introduction, Gravitational Force, Electromagnetic (EM) Force, Nuclear Forces, Weak Forces, Scope of Classical Physics Newton's Laws of Motion: First Law of Motion, Second Law of Motion, Working with Newton's First and Second Law, Newton's Third Law of Motion, Pseudo Forces 5.6 The Horse and the Cart 5.7 Inertia ,Examples

Reference books:

1. Concepts of Physics part 1 by H.C.Verma (second reprint addition 2020)
2. Physics by Halliday, Resnick and Krane volume 1 (Fifth addition)

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B. Sc. Sem.II
Practical FOR Physics Multidisciplinary (PH-MDC-1(P))

No	Experiment
1	To determine gravitational acceleration (g) using simple pendulum.
2	To determine height of ceiling using simple pendulum.
3	To determine gravitational acceleration (g) with the help of free fall of a body.
4	To determine height with the help of free fall of a body.
5	To determine force of static friction and coefficient of static friction.
6	To determine force of rolling friction and coefficient of rolling friction.
7	To verify the law of conservation of linear momentum.
8	To verify the law of conservation of kinetic energy.
9	To study projectile motion.
10	Project work regarding Newton's laws of motion.

Reference books:

1. Concepts of Physics part 1 by H.C.Verma (second reprint addition 2020)
2. Physics by Halliday, Resnick and Krane volume 1 (Fifth addition)

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B.Sc. Semester- II
Course code: PH-MDC-2
Total Credits: 04 (Theory: 2, Practical; 2)
Total Hrs: Theory: 30, Practical: 60
Course Title: Space Science - Theory

UNIT 1	<p>Stellar Evolution: 1. Why do stars evolve? 2. How do stars evolve? 3. Stars < (less than) 8 Solar mass 4. Stars > (greater than) 8 Solar Mass, Supernovae 5. Where do we come from? 6. Hertzsprung–Russell diagram 7. Main sequence stars.</p> <p>Stellar Remnants: 1. Degenerate Gas Pressure 2. White dwarfs 3. Neutron Stars 4. Chandrashekhar’s Limit, Schwarzschild radius and Black holes .</p>
UNIT 2	<p>Galaxies and Clusters: 1. The Milky Way 2. Normal Galaxies 3. Active Galaxies and Quasars.</p> <p>Cosmology: 1. Hubble’s Law 2. Hubble’s Law and expansion of the universe 3. Hubble’s Law and age of the universe 4. Hubble’s Law and size of the universe. 5. The Big bang 6. Life in the universe.</p>

Reference Books:

- 1) Schaum's Outline of Astronomy: Stacy E. Palen, McGraw-Hill Publishing Company Limited, 2020
- 2) An Introduction to Astrophysics: Baidyanath Basu, Tanuka Cattopadhyay and Sudhindra Nath Biswas, Prentice Hall India Learning Private Limited (2010)
- 3) An Introduction to Astronomy and Astrophysics: Pankaj Jain, CRC Press Publishing Company (2015)

B.Sc. (Semester – II)
Practical: PH – MDC – 2

Sr.No.	Experiment
1	Resolving power of a telescope.
2	Demonstration of a Newtonian telescope.
3	To verify Stefan-Boltzmann’s law
4	To find out the divergence angle of a laser beam.
5	Measurement of horizontal component of Earth’s magnetic field.
6	Demonstration of Hertz’s experiment.

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B.Sc. Semester-II
Course Code : PH-MDC-3
Total Credits : 04 (Theory – 02 ; Practical – 02)
Total Hours: Theory : 30 Hrs; Practical : 60 Hrs.
Course Title : LASERS

Unit – 1	Introduction, Attenuation of light in an optical medium, Thermal equilibrium, Interaction of light with matter, Absorption, Spontaneous emission, Einstein's prediction, Stimulated emission, Light amplification, Population inversion, Active medium, Pumping, Metastable states, Principal pumping schemes: Three level pumping scheme, Four level pumping scheme, Comparison of four level laser with three level laser
UNIT-2	Types of lasers, Ruby lasers, Nd:YAG laser, He-Ne laser, Carbon dioxide laser, Semiconductor laser, Achieving population inversion in a semiconductor, PN junction laser, Laser beam characteristics, Applications of lasers.

Reference books: (1) Optics by Ajoy Ghatak (McGraw Hill Publication) (2) A Textbook of Optics, N. Subrahmanyam, Brij Lal, M. N. Avadhanulu.(S. Chand & Co.)

B.Sc. (Semester – II)
Practical: PH – MDC – 3

Sr.No.	Experiment
1	Measurement of angle of diffraction of laser using a diffraction grating.
2	Study of variation in diffraction angle with wavelength for lasers.
3	Measurement of wavelength of laser.
4	Study the divergence of laser beam
5	Study the dependence of divergence on wavelength of laser.
6	Determination of grating element using laser.
7	Measurement of angle of refraction for different angle of incidence using laser.
8	Determination of refractive index of a glass slab using laser.
9	Determination of refractive index of a glass slab using Brewster's law
10	Determination of particle size of a sample powder using laser.

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Skill Enhancement Course: PH-SEC

B.Sc. Semester-II

Course code: PH-SEC-1

Total Credits: 02 (Theory: 1, Practical: 1)

Total Hrs: Theory: 15, Practical:30

Course Title: Electrical Circuits and Network Skills

PH-SEC-1

Electrical Circuits and Network Skills (Theory)

Ideal constant voltage source (2.15), Ideal constant current source (2.16) Superposition theorem (2.17) , Delta/ star transformation (2.22) Star/ Delta transformation (2.23), Maximum power transfer theorem (2.30), current voltage relationship in a capacitor (5.17), current voltage relationship in a capacitor (5.17), changing of a capacitor (5.18), Time constant (5.19), Discharging of a capacitor (5.20), A.C. through resistance, Inductance and capacitor (11.28)
A.C. through pure ohmic Resistance alone (11.29), A.C. through pure capacitor alone (11.30), A.C. through pure inductance alone (11.32), A.C. through Resistance and inductance (13.1), A.C. through Resistance and Capacitance (13.7), Resistance, Inductance and capacitor in series (13.9)

A Textbook of Electrical Technology Volume – I
B.L. Theraja and A.K. Theraja, S. Chand Publication

Oscilloscope,

Introduction (7.1), Basic Principle (7.2), CRT Feature (7.3), Basic Principle of signal display (function of the sweep generator) 7.3.1 Block diagram of oscilloscope (7.4)

Electronic Instrumentation (Technical education series)

By Tata HcGraw Hill, By H.S. Kalsi.

PH-SEC-1

Electrical Circuits and Network Skills (Practical)

Sr.No.	Experiment
1	Study of I-V Characteristic of zener diode (forward bias, reverse bias)
2	To determine the impedance of an A.C. circuit
3	Design built and test of bridge rectifier
4	D.B.T. of Rectifier with filter
5	Study of CRO function
6	Measurement of frequency of given source by CRO
7	Use of transistor as a switch in circuit
8	Tress out of waveform of bridge rectifier on CRO

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B.Sc. Semester-II
Course code: PH-SEC-2
Total Credits: 02 (Theory: 1, Practical; 1)
Total Hrs: Theory: 15, Practical: 30
Course Title: Digital Electronics
PH-SEC-2
Digital Electronics (Theory)

Unit-1	Analog and Digital Signals (26.1), Digital Circuits (26.2), Binary Number System (26.3), Place Value (26.4), Decimal to Binary Conversion (26.5), Binary to Decimal Conversion (26.6), Octal Number System (26.7), Hexadecimal Number System (26.8), Binary Coded Decimal Code (26.9)
Unit-2	Logic Gates (26.10), Three Basic Logic Gates (26.11), OR Gate (26.12), AND Gate (26.13), Not Gate or Inverter (26.14), Combination of Basic Logic Gates (26.15), NAND Gate (26.15.1), NOR Gate (26.15.2)

Reference Book:

- 1) Principles of Electronics by V K Maheta&RohitMahta
- 2) A Textbook Of Electrical Technology - by A.K.Theraja B.L. Theraja
- 3) Digital Principles & Applications by Albert Paul Malvino and Donald P. Leach

Digital Electronics(Practical)

Experiments:

1	Conversion of Binary to Decimal Number System
2	Conversion of Binary to Octal Number System
3	Conversion of Binary to Hexadecimal Number System
4	Verify AND, OR and NOT Gate
5	Verify NAND Gate
6	Verify NOR Gate

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B.Sc. Semester-II
Course code: PH-SEC-3
Total Credits: 02 (Theory: 1, Practical; 1)
Total Hrs: Theory: 15, Practical: 30
Course Title: Programming in "C" Language
(Theory)

Unit-1	Arrays: 7.1 Introduction, 7.2 One dimensional arrays, 7.3 Declaration of One Dimensional Arrays, 7.4 Initialization of One Dimensional Arrays, 7.5 Two dimensional arrays 7.6 Initializing two Dimensional Arrays 7.7 Multi-Dimensional Arrays Character Strings and Arrays: 8.1 Introduction, 8.2 Declaring and Initializing String
Unit-2	Variables, 8.3 Reading Strings from Terminal 8.4 Writing Strings to screen, 8.5 Arithmetic Operations on Characters, 8.6 Putting Strings Together, 8.7 Comparison of Two strings, 8.8 Strings Handling Functions, 8.9 Table of Strings, 8.10 Other features of strings

Programming in "C" Language (Practical)

Experiments:

Development of algorithm, flow chart and program for the following

1	To find Largest/Smallest of a set of integers using Array
2	Print Multiplication Table for numbers 1 to 5
3	Reading and Printing an n x n matrix
4	Addition/Subtraction of two 3x3 matrices
5	Find median of a set of data
6	Check whether the given word is a palindrome or not.
7	Write a program, which reads your name from keyboard and outputs a list of ASCII codes, which represent your name.
8	Define 3 string variables and write a program to read two string constants into two string variables, compare whether they are equal or not; if not join them together; copy the contents to the third variable and print all the three variables along with their lengths.

Text Book:

1. ANSI C by E Balaguruswamy, TATA McGraw-Hill Publication

