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VEER NARMAD SOUTH GUJARAT UNIVERSITY
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વીર નર્મદ દક્ષિણ ગુજરાત યુનિવર્સિટી
યુનિવર્સિટી કેમ્પસ, ઉધના-મગદલ્લા રોડ, સુરત - ૩૯૫ ૦૦૭, ગુજરાત, ભારત.
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-: પરિપત્ર :-

વિજ્ઞાન વિદ્યાશાખા હેઠળની ભૌતિકશાસ્ત્ર વિષય ચલાવતી સંલગ્ન સ્નાતક કોલેજોના આચાર્યશ્રીઓને જણાવવાનું કે, શૈક્ષણિક વર્ષ ૨૦૧૯-૨૦ થી અમલમાં આવનાર F.Y.B.Sc.Physics Sem-I & II નાં અભ્યાસક્રમ અંગે ભૌતિકશાસ્ત્ર વિષયની અભ્યાસસમિતિની તા. ૩૦/૦૪/૨૦૧૯ની સભાનાં ઠરાવ ક્રમાંક: ૨ અન્વયે કરેલ નીચેની ભલામણ વિજ્ઞાન વિદ્યાશાખાની તા.૦૨/૦૫/૨૦૧૯ ની સભાનાં ઠરાવ ક્રમાંક : ૩૨ અન્વયે સ્વીકારી એકેડેમિક કાઉન્સિલને કરેલ ભલામણ એકેડેમિક કાઉન્સિલએ તેની તા.૦૭/૬/૨૦૧૯ની સભાના ઠરાવ ક્રમાંક: ૫૯ અન્વયે સ્વીકારી મંજૂર કરેલ છે. તેની જાણ સંબંધકર્તા શિક્ષકો અને વિદ્યાર્થીઓને કરવી, તદ્ઉપરાંત તેનો અમલ કરવો.

ભૌતિકશાસ્ત્ર વિષયની અભ્યાસસમિતિની તા. ૩૦/૦૪/૨૦૧૯ ની સભાનાં ઠરાવ ક્રમાંક: ૨

:: આથી ઠરાવવામાં આવે છે કે, પેટાસમિતિએ તૈયાર કરેલ F.Y.B.Sc.Physics Sem-I &II નો શૈક્ષણિક વર્ષ ૨૦૧૯-૨૦ થી અમલમાં આવનાર અભ્યાસક્રમ સર્વાનુમતે મંજૂર કરી તે મંજૂર કરવા વિજ્ઞાન વિદ્યાશાખાને ભલામણ કરવામાં આવે છે.

વિજ્ઞાન વિદ્યાશાખાની તા.૦૨/૦૫/૨૦૧૯ ની સભાનાં ઠરાવ ક્રમાંક : ૩૨

:: આથી ઠરાવવામાં આવે છે કે, પેટાસમિતિએ તૈયાર કરેલ F.Y.B.Sc.Physics Sem-I &II નો શૈક્ષણિક વર્ષ ૨૦૧૯-૨૦ થી અમલમાં આવનાર અભ્યાસક્રમ સ્વીકારી તે મંજૂર કરવા એકેડેમિક કાઉન્સિલને ભલામણ કરવામાં આવે છે.

એકેડેમિક કાઉન્સિલની તા.૦૭/૦૬/૨૦૧૯ ની સભાનાં ઠરાવ ક્રમાંક: ૫૯

:: આથી ઠરાવવામાં આવે છે કે, વિજ્ઞાન વિદ્યાશાખાએ તેની તા. ૦૨/૦૫/૨૦૧૯ ની સભાના ઠરાવ ક્રમાંક : ૩૨ અન્વયે ભલામણ કરેલ શૈક્ષણિક વર્ષ ૨૦૧૯-૨૦ થી અમલમાં આવનાર F.Y.B.Sc.Physics Sem-I &II નો અભ્યાસક્રમ સ્વીકારી મંજૂર કરવામાં આવે છે.

બિડાણ: ઉપર મુજબ

ક્રમાંક : એકે./પરિપત્ર/૧૦૨૯૫/૧૯
તા. ૨૦-૦૬-૨૦૧૯

ઈ.ચા. કુલસચિવ

પ્રતિ,
૧) વિજ્ઞાન વિદ્યાશાખા હેઠળની ભૌતિકશાસ્ત્ર વિષય ચલાવતી સંલગ્ન સ્નાતક કોલેજોના આચાર્યશ્રીઓ.
૨) અધ્યક્ષશ્રી, વિજ્ઞાન વિદ્યાશાખા
૩) પરીક્ષા નિયામકશ્રી, પરીક્ષા વિભાગ, વીર નર્મદ દ. ગુ. યુનિવર્સિટી, સુરત.

.....તરફ જાણ તેમજ અમલ સારૂ.

Structure for B.Sc. Syllabus

Inforce from June 2019

B. Sc. (PHYSICS)

Sr. No.	Course Code	Course Title	Credits
1	PH-101	Physics Paper I	2
2	PH-102	Physics Paper II	2
3	PH-103	Practical	2

Faculty Code: **Science** Subject Code: **PH**

Name of Program: **B.Sc.** Subject: **PHYSICS**

External Examination Time Duration: **02 Hours**

Name of Exam	Semester	PAPER No.	Course Group	Credit	Internal Marks	External Marks	Total Marks
B.Sc.	1	PH-101		02	20	50	70
		PH-102		02	20	50	70
		PH-103	Practical	02	20	40	60

In force from: June -2019

Veer Narmad South Gujarat University, Surat

Syllabus for F. Y. B. Sc. Sem I

Physics Paper I (PH – 101)

Unit 1	**Vector analysis (Vector analysis by Murray Spiegel Schaum's Outline 2nd Ed. McGraw-Hill, 2009)**
	Dot or scalar product, Cross or vector product, Triple product, reciprocal sets of vectors (Ch. 2), Ordinary derivatives of vectors, space curves, continuity and differentiability, differentiation formulae, Partial derivatives of vectors, differentials of vectors, differential geometry (Ch. 3), The vector differential operator del., the gradient, the divergence and the curl, formulae involving del, invariance(Ch. 4) Ordinary integrals of vectors, line integrals, surface integrals and volume integrals (Ch. 5), The divergence theorem of gauss, Stokes' theorem, Green's theorem in the plane, related integral theorems, integral operator form for del (Ch. 6) (Theorem statements only)
Unit 2	**Force and Newton's laws and Force and Newton's laws (Physics by Halliday, Resnick and Krane, Vol. 1, 5thEd. Wiley)**
	Classical Mechanics (3.1), Newton's first law (3.2), Force (3.3), Mass (3.4), Newton's second law (3.5), Newton's third law (3.6), Weight and mass (3.7), Applications of Newton's laws in one dimension (3.8), Motion in three dimensions with constant acceleration (4.1), Newton's laws in three dimensional vector form (4.2) Projectile motion (4.3), Drag forces and the motion of projectile (4.4), Uniform circular motion (4.5), Relative motion (4.6)
Unit 3	**Momentum and System of particles(Physics by Halliday, Resnick and Krane, Vol. 1, 5thEd.Wiley)**
	Collisions (6.1), Linear momentum (6.2), Impulse and momentum (6.3), conservation of momentum (6.4), two boy collisions (6.5), Two particle systems (7.2), many particle systems (7.3), centre of mass of solid objects (7.4), conservation of momentum in a system of particles (7.5), system of variable mass (7.6), rotational motion (8.1), The rotational variables (8.2), Rotational quantities as vectors (8.3), rotation with constant angular acceleration (8.4), relationships between linear and angular variables (8.6)
Unit 4	**Elasticity (Properties of Matter by D. S. Mathur, S Chand & Co., 2009)**
	Introduction (8.1), Load, stress and strain (8.2), Hooke's law (8.3), ductility, brittleness and plasticity (8.4), elastic behaviour of solids in general (8.5), factors affecting elasticity (8.7), three types of elasticity (8.8), equivalence of a shear to a compression and an extension at right angles to each other (8.9), deformation of a cube – bulk

	modulus (8.12), modulus of rigidity (8.13), Young's modulus (8.14), relations connecting the elastic constant (8.15), Poisson's ratio (8.16), relations for K and n in terms of Poisson's ratio (8.17), limiting values of σ (8.18)

Suggested Books:

1. Mathematical Methods for Physics and Engineering by Riley, Hobson and Bence, Cambridge University Press, 1998.
2. Mechanics (Berkley Physics Course 1 by C Kittle, W D Knight, M Alvine and A Ruderman, Tata McGraw-Hill, 1991.
3. University Physics by Young and R. Freedman, Pearson 13th Ed., 2013.

Syllabus for F. Y. B. Sc. Sem I

Physics Paper II (PH – 102)

Unit 1	**Electrostatics I (Physics by Halliday, Resnick and Krane, Vol. 2, 5th Ed. Wiley)**
	Coulomb's law (25.4), what is a field? (26.1), the electric field (26.2),), electric field of point charges (26.3),), electric field of continuous charge distributions (26.4), electric field lines (26.5), a point charge in an electric field (26.6) What is Gauss' law all about? (27.1), the flux of a vector field (27.2), the flux of the electric field (27.3), Gauss' law (27.4), applications of Gauss' law (27.5), Gauss' law and conductors (27.6), experimental tests of Gauss' law and Coulomb's law (27.7)
Unit 2	**Electrostatics II (Physics by Halliday, Resnick and Krane, Vol. 2, 5th Ed. Wiley)**
	Potential energy (28.1), electric potential energy (28.2), electric potential (28.3), calculating the potential from the field (28.4), potential due to point charges (28.5), electric potential of continuous charge distributions (28.6), calculating the field from the potential (28.7), equi-potential surfaces (28.8), Electric current (31.1), electromotive force (31.2), analysis of circuits (31.3), RC circuits (31.7)
Unit 3	**Diode circuits (Electronic principles by A. P. Malvino, 6th Ed. Tata McGraw-Hill)**
	The half-wave rectifier (4.1), the transformer (4.2), the full-wave rectifier (4.3), the bridge rectifier (4.4), the choke input filter (4.5), the capacitor input filter (4.6), peak inverse voltage and surge current (4.7), clippers and limiters (4.10), clampers (4.11)
Unit 4	**Optics (Optics by AjoyGhatak, 6th Ed. McGraw-Hill Education)**
	Introduction (3.1), laws of reflection and refraction from Fermat's principle (3.2), introduction (4.1), refraction at a single spherical surface (4.2), reflection by a single spherical surface (4.3), the thin lens (4.4), the principle foci and the focal length of a lens (4.5), the Newton's formula (4.6), lateral magnification (4.7),aplanatic points of a sphere (4.8), The matrix method (5.2), Unit planes (5.3), Nodal planes (5.4), A system of two thin lenses (5.5)

Suggested Books:

1. Elements of Electromagnetics by M N O Sadiku, Oxford University Press, 2001
2. Electricity and Magnetism by A S Mahajan and A R Rangwala 7th Ed. Tata McGraw-Hill, 2003.
3. University Physics by H. D. Young, R. A. Freedman and A. Lewis Ford, 13th Ed. Pearson Education, 2013
4. Fundamentals of Optics by F. Jenkins and H. White, 4th Ed. McGraw Hill Education, 2017

Syllabus for F. Y. B. Sc. Sem I

Practical (PH – 103)

List of experiments

	Group A
1	Error analysis and least square fit
2	To verify the parallel axes theorem of moment of inertia
3	To verify the perpendicular axes theorem of moment of inertia
4	Modulus of rigidity of a wire using torsional pendulum
5	Modulus of rigidity of a rod by Searle's apparatus
6	Poisson's ratio of rubber

	Group B
1	Low resistance by Wheatstone's bridge method of projection
2	Study of decay of current in RC circuit
3	Study of rectifiers (Half wave and full wave rectifier)
4	Resistivity of the material of a conductor using Ohm's law
5	Cardinal points of a lens system placed in air
6	To determine angle of prism using spectrometer

Suggested Books

1. D.C.Tayal ,University Practical physics,Edited by Ila Agarwal ,Himalayan Publishing House
2. B. L. Worsnop and H. T. Flint, Advanced Practical Physics, Asia Publishing House, New Delhi.
3. P. Khandelwal, A Laboratory Manual of Physics for Undergraduate Classes, Vani Publication House, New Delhi.
4. Geeta Sanon, BSc Practical Physics, 1st Edn. (2007), R. Chand & Co.

Note:

1. The duration of each experiment is of 2 hours. Two such experiments are to be performed by each student per week.
2. In the external exam, a student will have to perform two experiments, one from each group. The experiment will be of 2 hours duration.
3. It is recommended that there should not be more than 20 students per batch in the external exam.