

SARDAR PATEL UNIVERSITY

STRUCTURE OF S.Y.B.SC.- MATHEMATICS

SEMESTER- 3

Course	Subject code	Subject Title	Credit	Hours
Core Courses	US03CMTH01	Advanced Calculus	03	03
	US03CMTH02	Numerical Analysis	03	03
	US03CMTH03	Mathematics Practical	03	06
	US03CPHY01	Optics	03	03
	US03CPHY02	Basic Solid state Electronics	03	03
	US03CPHY03	Physics Practical	03	06
Elective courses	US03ESTA01	Operations Research	02	02
	US03ECSC01	Digital Computer Electronics	02	02
Foundation Courses	US03FENG01	Functional English	02	02
Total credit			24	30

SARDAR PATEL UNIVERSITY ,VALLABH VIDYANAGAR
SYLLABUS FOR B.Sc.(MATHEMATICS) SEMESTER - III
US03CMTH01 (Advanced Calculus)
THREE HOURS PER WEEK (3 CREDIT)
Effective from June 2012
Marks:-100(30 internal+70 external)

UNIT-1. Line integral , Evaluation of line integrals , Double integral : Definition and Examples , Change of variables in double integral , Application of Double integral .

UNIT-2. Change of order of integration in Cartesian form , Line integral independent of path , Green's theorem and its application with Examples ,Area of plane region , Vector form of Green's theorem .

UNIT-3. Surfaces , Tangent plane and Normal line to the surface , First fundamental form , Area of a surface , Surface integrals , Moment of inertia of surface , Triple integrals : Definition and Examples , Divergence theorem of Gauss and its applications with Examples .

UNIT-4. First and Second form of Green's theorem , Application of Triple Integral (Total Mass ,Moment of Inertia , Volume) , Stoke's theorem and its applications with Examples .

Reference texts:

- (1) E.Kreyszing , Advanced Engineering Mathematics , Fifth edition , New Age International (P) Ltd., New Delhi , 1997.
- (2) Shanti Narayan , A course of Mathematical Analysis ,S.Chand & Company Ltd.
- (3) Dr.Dinesh Karia,M.L.Patel,N.Y.Patel,B.P.Patel,A Textbook of Calculus with an Introduction to Differential Equations.
- (4) B.S.Grewal,Higher Engineering Mathematics.

SARDAR PATEL UNIVERSITY ,VALLABH VIDYANAGAR
SYLLABUS FOR B.Sc.(MATHEMATICS) SEMESTER - III
US03CMTH02 (Numerical Analysis)
THREE HOURS PER WEEK (3 CREDIT)
Effective from June 2012
Marks:-100(30 internal+70 external)

UNIT-1. Solutions of algebraic and transcendental equations , Bisection Method , Iteration method, Aitken's Δ^2 process , method of false Position , Newton-Raphson method .

UNIT-2. Interpolation : Forward , central and backward differences , Symbolic relations of operators , Detection of errors by use of difference Tables , Differences of a polynomial , Newton's forward and backward formulae , Gauss forward and backward formulae , Bessel's , Stirling's and Everett's formulae .

UNIT-3. Interpolation with unequally spaced points , Lagrange's formula (Without proof) , Divided difference and their properties , Newton's General formula , Inverse interpolation , Method of successive Approximations , Numerical differentiation:- Newton's forward and Backward, Gauss's Method , Maximum and minimum values of a tabulated function .

UNIT-4. Numerical integration :- trapezoidal rule , Simpson's $(\frac{1}{3})^{rd}$ and $(\frac{3}{8})^{th}$ rules , Romberg integration , Numerical solution of ordinary differential equation by Taylor's series , Picards' method , Euler's method , Modified Euler's method , Range-kutta method up to second order.

Reference Texts:

- (1) S.S.Sastry, Introductory methods of Numerical analysis, Prentice hall of India, 1990.
- (2) G. Sankar rao , Numerical analysis.
- (3) B.S.Grawal , Numerical analysis.

SARDAR PATEL UNIVERSITY , VALLABH VIDYANAGAR
B.Sc.(MATHEMATICS) SEMESTER - III
US03CMTH03 (Mathematics Practical)
SIX HOURS PER WEEK (3 CREDIT)
Effective from June 2011
Marks:-100(30 internal+70 external)

- (1) Inherent Errors and truncated errors ; Errors in a series approximation.
- (2) Interpolation :- Newton's forward and backward, Gauss's forward and Backward, Sterling's, Bessel's, Everett's, Lagrange's , Newton's General and Lagrange's general formulae , Method of successive approximations , Numerical differentiation and integration :- differentiation of Newton's forward and backward , Stirling's , Bessel's , Newton's General and Lagrange's formulae ; Trapezoidal, Simpson's $(\frac{1}{3})^{rd}$ and $(\frac{3}{8})^{th}$ rules, Romberg method.
- (3) Solution of algebraic and transcendental equations : Bisection method, Iteration method, Aitken's Δ^2 process, method of false position, Newton Raphson's method ; Numerical solution of ordinary differential equations :- Solution by Taylor's series, Picard's method, Euler's Method, Modified Euler's method ; Runge-kutta method (fourth order only).
- (4) Boolean algebra and Switching circuits.

Recommended Texts :

- (1) S.S.Sastry, Introductory methods of Numerical analysis, Prentice Hall Of India, 1990.
- (2) Scarborough, Numerical Mathematical Analysis
- (3) Bajpai, calus and farly, Numerical Analysis for scientists and Engineers, John Wiely.
- (4) J.E.Whitesitt , Boolean Algebra .

Notes :

- (1) Use of the standard texts books may be permitted at the time of Practical Examination.
- (2) The candidate shall have to produce at the time practical Examination the record of their prescribed Laboratory work, certified by the Head of the Department.

SARDAR PATEL UNIVERSITY

Vallabh Vidyanagar-388120

B.Sc. (Semester - 3)

Subject: Physics

Course: US03CPHY01

Optics

(Three Credit Course –3 Hours per week)

(Effective from June-2012)

UNIT- I Geometrical Optics

Lens Systems: Introduction to lens systems, Cardinal points of lens systems, Construction of image using cardinal points, Newton's formula, Combination of two thin lenses, Related Numericals

Lens Aberrations: Types of monochromatic aberration and their reduction- Spherical aberration, Coma, Astigmatism, Curvature of field, Distortion, Chromatic aberration in a lens

Eyepieces: Importance of an objective lens, Huygens eyepiece, Ramsden eyepiece

UNIT - II Interference and Diffraction

Interference: Techniques for obtaining interference, Interference by division of wavefront- Fresnel's biprism, Lloyd's single mirror, Interference by division of amplitude- Newton's ring, Multiple beam interferometry- Multiple reflections from a plane parallel film, Feby-Perot interferometer and Etalon

Diffraction: Fresnel's diffraction, Diffraction due to a narrow wire, Cornu's spiral, Fraunhofer's diffraction, Fraunhofer's diffraction at double slit and its analytical treatment, Fraunhofer's diffraction at N slits, Related Numericals

UNIT - III Polarization

Introduction, Types of polarization- plane, circular, elliptical, Production of linearly polarized light, Polarizer and analyzer, Anisotropic crystals, Calcite crystal, Huygens' explanation of double refraction, Superposition of waves linearly polarized at right angles, Types of polarized light, LCDs

UNIT- IV Fiber Optics

Introduction, Optical fiber, Total internal reflection, Propagation of light through an optical fiber, Fractional refractive index change, Numerical aperture, Modes of propagation, Classification of optical fibers, The three types of fibers, Materials, Characteristics of the fibers, Merits of optical fibers

Books Recommended:

1. A Textbook of Optics
Subrahmanyam, Brij lal and Avadhnulu
S Chand Publication
2. Optics
Ajoy Ghatak, McGraw-Hill Publishing Co. Ltd.
3. Textbook of light
D N Vasudev
Atma Ram and Sons, New Delhi
4. Fundamental of Optics
F A Jenkin and H E White
Tata McGraw Hill Book Co. Ltd.

SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar-388120
B.Sc. (Semester - 3)
Subject: Physics
Course: US03CPHY02
Basic Solid State Electronics
(Three Credit Course –3 Hours per week)
(Effective from June-2012)

UNIT- I Transistor Biasing Circuits

Introduction, Need to bias a transistor, Selection of operating point, Need for bias stabilization, Requirement of a biasing circuits, Different biasing circuits, Fixed-bias circuit, Collector to base bias circuit, Voltage divider biasing circuit, Approximate analysis, Accurate analysis, Emitter-bias circuit, PNP transistor biasing circuit, Related numericals

UNIT- II Small Signal Amplifiers and h-parameters

Introduction, Single stage transistor amplifier, Amplifier performance analysis methods, Graphical method, AC and DC load lines, Calculation of gain, Input and output phase relationship, Equivalent circuit method, Development of transistor AC equivalent circuit, h-parameter equivalent circuit, Amplifier analysis, Need of multistage amplifier, Gain of multistage amplifier, Related numericals

UNIT-III Feedback in Amplifiers

Concepts of feedback in amplifiers, Types of feedback, Voltage gain of feedback amplifier, Advantages of negative feedback, Stabilization of gain, Reduction in distortion and noise, Increase in input impedance, Decrease in output impedance, Increase in bandwidth, Amplifier circuit with negative feedback, RC coupled amplifier without bypass capacitor, Emitter follower, Related Numericals

UNIT-IV Oscillators

Need of an oscillator, Classification of oscillators, Tuned circuit for generation of sine waves, Frequency of oscillation in LC circuit, Sustained oscillations, Positive feedback amplifier as an oscillator, The starting voltage, Hartley oscillator, Colpitts oscillator, Basic principles of RC oscillator, Phase shift oscillator, Wien bridge oscillator, Crystal oscillators, Crystal oscillator circuit, Related Numericals

Books Recommended:

1. Electronic Principles
A P Malvino
Tata McGraw Hill Publishing Co. Ltd., New Delhi
2. Basic Electronics (Solid State)
B L Theraja
S Chand, New Delhi
3. Basic Electronics and Linear Circuits
N N Bhargava, D C Kulshreshtha and S C Gupta
Tata McGraw Hill Publishing Co. Ltd., New Delhi

SARDAR PATEL UNIVERSITY

Vallabh Vidyanagar - 388 120

B.Sc. (Semester -3)

Subject: Physics Practicals

Course No. US03CPHY03

(Three Credit Course –6 Hours per week)

(Effective from June-2012)

List of Practicals:

1. Kater's reversible pendulum (fixed & variable distance between knife edges)
2. Cardinal points of two lens system
3. Dispersive curve and power of a prism.
4. Resolving power of a telescope
5. Biprism
6. Hybrid parameters 'h' of a BJT
7. Frequency response of a RC coupled amplifier (without feedback)
8. Thermal conductivity (K) of a rubber tube
9. Velocity of sound by resonance tube
10. Impedance by voltage drop
11. Study of L-C-R series resonance
12. RC Phase shift oscillator
13. Plank's constant "h" using photocell
14. Exponential least square fitting
15. Numerical differentiation

Note: To provide flexibility up to the maximum of 20% of total experiments can be replaced/ added to the list by the board of studies.

Books Recommended:

1. Advanced Practical Physics for students
B L Wosnop and H T Flint
Methuen and Co. Ltd., London
2. B.Sc. Practical Physics
C L Arora
S.Chand & Co. Ltd., New Delhi
3. Advanced Practical Physics
M S Chauhan and S P Singh
Pragati Prakashan, Meerut
4. Advanced Practical Physics
S L Gupta and V Kumar
Pragati Prakashan, Meerut

**SARDAR PATEL UNIVERSITY
THIRD SEMESTER
(EFFECTIVE FROM JUNE, 2011)
SUBJECT: STATISTICS
COURSE CODE: US03ESTA01
(OPERATION RESEARCH-I)**

Course credit: 2

No. of lectures per week: 2

All units carry equal Weightage

Weightage: Internal – 30%, External – 70%

Unit-I Linear Programming-I

- Introduction
- Formulation of LPP
- Solution of LPP using Graphical method

Unit-II Linear Programming-II

- Solution of LPP using Simplex method (Big M method)
- Duality

Unit-III Transportation Problems-I

- Introduction
- Mathematical formulation of Transportation problem
- Methods of finding i.b.f. solution
 - North West Corner Method (N-W Corner Method)
 - Row Minima Method
 - Column Minima method
 - Matrix Minima Method (Least Cost Entry Method)
 - Vogel's Approximation method (VAM)

Unit-IV Transportation Problems-II

- uv method of obtaining optimum solution of TP
- Unbalanced TP
- Degenerate TP

References:

- (i) Operations Research by S.D.Sharma
- (ii) Operations Research by J.K.Sharma

Course : US03ECSC01
(Digital Computer Electronics)

Credits : 2
Lectures per week : 2
University examination duration : 2 Hours
All units carry equal weightage.

Unit 1. Gates and Boolean Algebra

- Gates, Boolean algebra, Truth tables
- Circuit equivalence, De Morgan's theorems

Unit 2. Basic Digital Logic Circuits-I

- Usage of Karnaugh maps
- Encoders, decoders, comparators

Unit 3. Basic Digital Logic Circuits-II

- Half adder, full adder, binary adder-subtractor
- Multiplexers

Unit 4. Memory Elements & Counters

- D Flip flops
- Shift-left, shift-right and controlled buffer registers
- Ring counters

MAIN REFERENCE BOOKS :

1. Malvino A. P.: Digital Computer Electronics, 2nd Edition, Tata McGraw, Hill Pub. Co. Ltd., New Delhi, 1990.
2. Gothmann, William H. : Digital Electronics - An Introduction to Theory and Practice, 2nd Edition, PHI, 1982.

BOOKS FOR ADDITIONAL READING :

1. Tanenbaum A. S. : Structured Computer Organization, 3rd Edition, Prentice-Hall of India Pvt. Ltd., 1993.
2. Hall Douglas V. : Microprocessors and Interfacing - Programming and Hardware., McGraw Hill Book Company, 1986.
3. M.M. Mano : Computer System Architecture, 3rd Edition, Pearson Education, 2000.

Sardar Patel University
 Syllabus of B.Sc. (Third Semester)
 Subject: Functional English
 Course code: US03FENG01
 2 credits(Practical)

Hours per week (2 hours/batch)

Internals 30 marks + externals 70 marks

Unit 1 Introduction to Phonetics of English **Marks**
Language

1	Definition of Phoneme and phonetic keys (Match the following)	03
2	Phonetic Transcription from the specified list (Words)	03
3	Types of some of the sounds i.e. voiced and voiceless from the specified list (classify the words)	04
4	Classification of sounds (vowels, consonants, diphthongs) Ref: CDs of Cambridge Dictionary (for No. 3 and 4)	05
Total=		15

Unit 2 Writing Skills

1	Writing Emails and short messages (In general)	05
2	Writing Circulars / Notices /Memos(only for information)	---
3	Business Letters (i.e. Letter of Inquiry and Reply, Placing Order, Complaining and adjustment)	10
4	Report Writing (Individual Reports on for example, suitability of some premises, general inefficiency of staff, increasing competition from rival enterprises etc.)	05
Total=		15

Unit 3 Oral Skills

1	Preparing and Delivering Speeches (Welcome Speech, Vote of Thanks, Key note address etc.) (On specified topic)	10
2	Making presentation in seminars (just information)	---
3	Handling formal meetings (just information)	05
4	AV (Look Ahead) BBC (31 to 45)	10
Total=		20
20+05 journal=		25

Unit 4 Grammar and Vocabulary

1	Use of Verbs, Tenses, Prepositions, Modals (fill in the blank)	05
2	Degrees of Comparison (fill in the blank)	03
3	Abbreviation used in English language (Write the full form)	04
4	Homophones and Homonyms, Misused words (fill in the blank)	03
Total=		15

Topics to be covered in the journal:

1 All the topics from Unit One

- A Definition of Phoneme and phonetic keys
(Match the following)
- B Phonetic Transcription from the specified list (Words)
- C Types of some of the sounds i.e. voiced and voiceless from the specified list (classify the words)
- D Classification of sounds
(vowels, consonants, diphthongs)

2 1, 3 and 4 from Unit 2

- A Writing Emails and short messages (In general)
- B Business Letters (i.e. Letter of Inquiry and Reply, Placing Order, Complaining and adjustment)
- C Report Writing (Individual Reports on for example, suitability of some premises, general inefficiency of staff, increasing competition from rival enterprises etc.)

3 1 and 4 from Unit 3

- A Preparing and Delivering Speeches (Welcome Speech, Vote of Thanks, Key note address etc.)(On specified topic)
- B AV (Look Ahead) Cambridge University

4 All the topics from Unit 4

- A Use of Verbs, Tenses, Prepositions, Modals
(fill in the blank)
- B Degrees of Comparison (fill in the blank)
- C Abbreviation used in English language
(Write the full form)
- D Homophones and Homonyms, words Misused
(fill in the blank)