



Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
HU201	II	Foundation English II	60	20	20	0	20	3	0	2	4

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

***Teacher's Assessment** shall be based upon following components: Quiz/Assignment/Project/Participation in Class, given that no component shall exceed more than 10 marks.

.Course Educational Objectives (CEOs): The students will be able to:

- Participation in seminars, group discussions, paper presentation and general personal interactions at the professional level.
- Have adequate mastery over communicative english, reading and writing skills, secondarily listening and speaking skills.


Course Outcomes (COs): The students should be able to:

- Improve their language skills, oral communication skills, group discussion skills, personal skills and confidence level.
- express his /her ideas and thoughts in speech or writing,
- Bridge the language gap vital to their success.
- Communicate effectively.

COURSE CONTENTS:

UNIT I

Communication: Objectives of Communication, Formal and Informal Channels of Communication, Advantages and Disadvantages, Extrapersonal communication, Interpersonal communication, Intrapersonal communication, Principles of communication.


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UNIT II

Developing Reading Skills: Reading Comprehension, Process, Active & Passive reading, Reading speed Strategies, Benefits of effective reading, SQ3R Reading technique.

UNIT III

Vocabulary Building: Using Dictionaries and Thesaurus, Synonyms, Antonyms, Homophones, One Word Substitution, Affixation: Prefixes & Suffixes, Derivation from root words, Jargon, Scientific Jargon, Word Formation.

UNIT IV

Developing Writing Skills: Planning, Drafting and Editing, Developing Logical Paragraphs, Report Writing: Importance of Report, Characteristics of Good Report, Types of Report, Various Structures of a Report.

UNIT V


Professional Skills: Negotiation Skills, Telephonic Skills, Interview Skills: Team building Skills and Time management

Practical:

- Listening
- Linguistics and Phonetics
- Telephonic Conversation
- Mock Interviews
- Group discussions
- Extempore
- Debate
- Role Plays

Suggested Readings

- Ashraf Rizvi.(2005). *Effective Technical Communication*. New Delhi:Tata Mc Graw Hill
- Prasad, H. M.(2001) *How to Prepare for Group Discussion and Interview*. New Delhi: Tata McGraw-Hill.
- Pease, Allan. (1998).*Body Language*. Delhi: Sudha Publications.
- Morgan, Dana (1998).*10 Minute Guide to Job Interviews*. New York: Macmillan.


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DEGREE PROGRAM

B.Sc. II Sem

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			THEORY			PRACTICAL		Th	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment *	End Sem University Exam	Teachers Assessment *				
BSPH 202	DC	Waves, Acoustics and Optics	60	20	20	30	20	3	1	4	6

Legends: L - Lecture; T Tutorial/Teacher Guided Student Activity; P - Practical; C - Credit; Q/A Quiz/Assignment/Attendance, MST Mid Sem Test.

*Teacher Assessment shall be based on following components: Quiz/Assignment/ Project/Participation in class (Given that no component shall be exceed 10 Marks)

Course Objectives:-

1. To develop the comprehensive understanding of laws of physics related to Waves, Acoustics and Optics and ability to apply them for laying the foundation for research and development.
2. To work ethically as member as well as leader in a diverse team.

Course Outcomes:-

1. Student will be able to understand and solve the problems related to Waves, Acoustics and Optics
2. Student will be able to determine physical parameter experimentally with optimal usage of resources and complete the assignments in time.

Suprajyoti

 Shubh Chandra

BSPH 202: Waves, Acoustics and Optics

Unit-I:

Waves in Media : Speed of transverse waves on a uniform string, speed of longitudinal waves in a fluid, energy density and energy transmission in waves, typical measurements. Waves over liquid surface : gravity waves and ripples Group velocity and phase velocity, their measurements
Superposition of waves: Linear homogeneous equation and the superposition principle, non linear superposition and consequences.
Standing waves: Standing waves as normal modes of bounded systems, examples. Harmonics and the quality of sound; Chaldni's figures and vibrations of a drum. Production and detection of ultrasonic and instrasonic waves and applications.

Unit-II:

Noise and Music ; The human ear and its responses ; limits of human audibility, intensity and loudness, bel and decibel, the musical scale, temperament and musical instrument.
Reflection, refraction and diffraction of sound. Acoustic impedance of a medium, percentage reflection and refraction at a boundary, impedance matching for transducers, diffraction of sound, principle of a sonar system ranging.

Unit-III:

Applied acoustics: Transducers and their characteristics, recording and reproduction of sounds, various systems, Measurements of frequency, waveform, intensity and velocity. The acoustics of halls, reverberation period, Sabine's formula.
Fermat's Principle of extremum path, the aplanatic points of a sphere and other applications. General theory of image formation: cardinal points of an optical system, general relationship, lens and lens combinations, Lagrange equation of magnification, telescopic combinations, telephoto lenses and eyepieces.

UNIT IV:

Introduction to Interference, Fresnel's Bi-prism, Interference in Thin films, Newton's rings experiment, Michelson's interferometer and its application, Introduction to Diffraction and its Types, Diffraction at single slit, double slit and diffraction grating

Unit V:

Rayleigh criterion, resolving power of grating, Concept of polarized light, Brewster's laws, Double refraction, Nicol prism, quarter and half wave plate, circularly & elliptically polarized light.

Supriya *(A)*
Sankar Chandra

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References:

1. Optics by Ajoy Ghatak, McGraw-Hill International Editions.
2. A text book on Optics by Subrahmanyam.
3. Optics by Brijlal and Avadhanulu, South Asian Publication.
4. Concept of Physics by H.C. Verma, Bharati Bhavan Publishers.

List of Experiments (Any Eight)

1. ✓ To determine the refractive index of the material of the prism using Na light.
2. To determine the dispersive power of the material of the prism.
3. Measurement of radius of curvature "R" of convex lens by Newton's ring experiment. ✓
4. Measurement of Resolving Power of Telescope. ✓
5. Measurement of " λ " of Na light source using Diffraction Grating. ✓
6. To determine the mass of cane sugar dissolved in water using half shade polarimeter. ✓
7. Heating efficiency of electrical Kettle with varying voltages.
8. Measurement of Resolving Power of prism.
9. Measurement of Resolving Power of grating.
10. Measurement of Frequency of A.C. mains by electrically maintained vibrating rod. ✓

Suprajit

MS

Eng. D. K.

SEMESTER – II

BSEL203 - : DIGITAL ELECTRONICS

Unit I : Number Systems, Codes and Logic Gates Decimal, Binary, Octal, Hexadecimal number systems and their interconversions, Signed and fractional binary number representation. BCD, Excess-3, Gray, ASCII & EBCDIC Codes. Basic logic gates & derived gates (AND, OR, NOT, NAND, NOR, XOR, XNOR): Symbols, Truth Tables and Circuit diagrams using switches, diodes and transistors.

Unit II: Boolean Algebra and K-map Boolean Algebra, minterms, maxterms, Boolean expression in SOP form and POS form, conversion of SOP/POS expression to its standard SOP/POS form, Demorgan's Theorem. Universal Gates, Simplification of Logic equations using laws of Boolean algebra and Karnaugh map (upto 4 variables)

Unit III: Arithmetic & Combinational Circuits Binary addition, subtraction, multiplication & division, 1's and 2's complement, Half adder and Full Adder, Half Subtractor and Full Subtractor, Binary Adder, 2's complement Adder/Subtractor circuit, Digital Comparator, Multiplexer, Demultiplexer, Encoder, Decoder and code converters.

Unit IV: Sequential Circuits RS & D Latches, RS, D, JK & T Flip Flops, Concept of racing and JK Master-Slave Flip Flops, Registers & Counters and their different types.

Unit V: A/D and D/A Converter Basic D/A Converters: R-2R, Binary Weighted Resistor type, A/D Converters: Counter, Ramp, Flash and Successive Approximation. Sample and Hold Circuits: Basic Concept and Working.

Text Books:

1. M. Morris Mano: Digital Logic Design, Pearson Education
2. S Salivahanan and S Arivazhagan: Digital Circuits and Design, Vikas Publishing House

Reference Books:

1. Anand Kumar: Fundamentals of Digital Circuits, PHI.
2. Malvino and Leach : Digital Principles and Applications
3. R. P. Jain : Modern Digital Electronics
4. Malvino and Brown : Digital Computer Electronics
5. Floyd and Jain: Digital Fundamentals, Pearson Education.

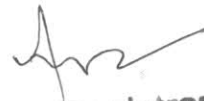
List of experiments:

1. To study and test of operation of all logic gates for various IC's (IC7400, IC7403, IC408, IC74332, IC7486).
2. Verification of DeMorgan's theorem.
3. To construct of half adder and full adder.
4. To construct of half subtractor and full subtractor circuits.
5. Verification of versatility of NAND gate.
6. Verification of versatility of NOR gate.
7. Design a BCD to excess 3 code converter.
8. Design a Multiplexer/ Demultiplexer
9. Analysis of various flip flops with Preset and Clear capability.
10. Design of synchronous and asynchronous up/down counters.



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Name of the Program: B. Sc. (Plain)

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			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM	MST	Q/A	END SEM	Q/A				
BSMA 204	DC	Vector Algebra	60	20	20	-	-	3	1	-	4

Course Objective

To introduce the students with the Fundamentals of the Vector Algebra

Course Outcomes

After the successful completion of this course students will be able to

- 1. understand and apply the basics of the various operations in the Vector Algebra.*
- 2. demonstrate the basic concepts of the Geometry with Vectors.*
- 3. apply the techniques of vector and scalar triple product.*
- 4. solve the problem Related to geometry with Cartesian co-ordinates.*
- 5. solve the problems of the Volume of tetrahedron, work done, momentum.*

Course Content:

UNIT – I

Addition of vector, Multiplication of vectors, Vectors and scalars, Algebra of vectors, Laws of addition, Relation between two compositions, Vector Equation, Linear combinations, Expression of linear combination, Linearly independent and dependent vectors.

UNIT – II

Collinear and coplanar vectors: Origin of reference, position vectors, Section formula, Application to geometry, Condition for co linearity of three points, Parametric equation of plane, Condition for co planarity of four vectors, Proof of some well known Classical theorems.

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UNIT – III

Scalar and vector product of two or three vectors: Scalar product, Orthogonal bases, Application to Cartesian geometry, Distance between points whose rectangular Cartesian co-ordinates, Direction cosine of a line, Angle between two lines, Normal from of vector equation of a plain, Vector product or Cross product, Some properties of vector product, Interpretation of vector product as vector area, Scalar Triple product, Distribution law, Some properties of Scalar triple product, Vector triple product.

UNIT – IV

Simple Application problem to geometry: Equation of planes parallel to given vectors and passing through given points, Coplanerity of two lines, Shortest distance between two lines, Normal form of lines, Shortest distance, Change of Axes, Scalar Triple products, Two Useful Decompositions, Reciprocal System of Vectors, Solution of vector equations

UNIT – V

Tetrahedron & Application problem to Mechanics: Volume of Tetrahedron, Work done and Momentum.

Texts:

1. Vector Analysis – Louis Brand.
2. Vector Analysis – Barry Spain.
3. Vector & Tensor Analysis – Spiegel (Schaum).
4. Elementary Vector Analysis – C. E. Weatherburn (Vol. I & II).

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			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM	MST	Q/A	END SEM	Q/A				
BSMA 205	DC	Differential Calculus	60	20	20	-	-	3	1	-	4

Course Objective

To introduce the students with the Fundamentals of the Differential Calculus.

Course Outcomes

After the successful completion of this course students will be able to

- 1. understand and apply the basics of the Rational Numbers & Sequences.*
- 2. solve the problems of the Limit, Continuity and differentiation.*
- 3. apply the techniques to find the various partial differentiations.*
- 4. find maxima and minima of a function.*
- 5. know the solution of the problems of the function of the several variables.*


Course Content:

UNIT – I

Rational Numbers & Sequence: Geometrical representation. Irrational number, Real number represented as point on a line Linear Continuum. Acquaintance with Basic properties of real number (No deduction or proof is included), Definition of bounds of a sequence and monotone sequence, Limit of a sequence. Statements of limit theorems, Concept of convergence and divergence of monotone sequences - applications of the theorems, in particular, definition of ϵ . Statement of Cauchy's general principle of convergence and its application.

UNIT – II

Infinite series of constant terms &. Real-valued functions defined on an interval:


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Convergence and Divergence (definitions), Cauchy's principle as applied to infinite series (application only). Series of positive terms: Statements of Comparison test, D'Alembert's Ratio test, Cauchy's nth root test and Raabe's test – Applications. Alternating series, Statement of Leibnitz test and its applications, Limit of a function (Cauchy's definition). Algebra of limits. Continuity of a function at a point and in an interval, Acquaintance (no proof) with the important properties of continuous functions on closed intervals, Statement of existence of inverse function of a strictly monotone function and its continuity.

UNIT – III

Derivative & Successive derivative:

Derivative its geometrical and physical interpretation. Sign of derivative – Monotonic increasing and decreasing functions. Relation between continuity and derivability. Differential – application in finding approximation, Leibnitz's Theorem and its application, Application of the principle of Maxima and Minima for a function of single variable in geometrical, physical and other problems.

UNIT – IV

Applications of Differential Calculus:

Tangents and Normal's, Pedal equation and Pedal of a curve, Rectilinear Asymptotes (Cartesian only), Definition and examples of singular points (viz. Node, Cusp, Isolated point), Statement of Rolle's Theorem and its geometrical interpretation. Mean Value, Theorems of Lagrange and Cauchy. Statements of Taylor's and Maclaurin's Theorems with Lagrange's and Cauchy's form of remainders. Taylor's and Maclaurin's Infinite series for functions like e^x , $\sin x$, $\cos x$, $(1+x)^n$, $\log(1+x)$ [with restrictions wherever necessary].

UNIT – V

Indeterminate Forms & Functions of two and three variables: L'Hospital's Rule: Statement and problems only, their geometrical representations, Limit and Continuity (definitions only) for functions of two variables, Partial Derivatives: Knowledge and use of Chain Rule, Exact differentials (emphasis on solving problems only). Functions of two variables, Successive partial derivatives: Statement of Schwarz's theorem on commutative property of mixed derivatives. Euler's theorem on homogeneous function of two and three variables. Maxima and minima of functions of not more than three variables – Lagrange's Method of undetermined multiplier – Problems only. Implicit function in case of function of two variables (existence assumed) and derivative.

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Texts:

1. Basic Real & Abstract Analysis – Randolph J. P. (Academic Press).
2. A First Course in Real Analysis – M. H. Protter & G. B. Morrey (Springer Verlag, NBHM).
3. A Course of Analysis – Phillips.
4. Problems in Mathematical Analysis – B. P. Demidovich (Mir).
5. Problems in Mathematical Analysis – Berman (Mir).
6. Differential & Integral Calculus (Vol. I & II) – Courant & John.
7. Calculus of One Variable – Maron (CBS Publication).
8. Introduction to Real Analysis – Bartle & Sherbert (John Wiley & Sons.)
9. Mathematical Analysis – Parzynski.
10. Introduction to Real Variable Theory – Saxena & Shah (Prentice Hall Publication).
11. Real Analysis – Ravi Prakash & Siri Wasan (Tata McGraw Hill).
12. Mathematical Analysis – Shantinakaran (S. Chand & Co.).
13. Theory & Applications of Infinite Series – Dr. K. Knopp.
14. Advanced Calculus – David Widder (Prentice Hall).
15. Charles Chapman Pugh: Real mathematical analysis; Springer; New York; 2002
16. Sterling K. Berberian: A First Course in Real Analysis; Springer; New York; 1994
17. Steven G. Krantz: Real Analysis and Foundations; Chapman and Hall/CRC; 2004
18. Stephen Abbott: Understanding Analysis; Springer; New York, 2002


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- 19 T. M. Apostol: Mathematical Analysis, Addison-Wesley Publishing Co. 1957
- 20 W. Rudin: Principles of Mathematical Analysis, McGraw-Hill, New York, 1976
- 21 J. F. Randolph: Basic Real and Abstract Analysis, Academic Press; New York, 1968
- 22 Robert G Bartle, Donald R Sherbert: Introduction to real analysis; John Wiley Singapore; 1994
- 23 Differential & Integral Calculus (Vols. I & II) – Courant & John.
- 24 Differential & Integral Calculus (Vol. I) – N. Piskunov (CBS Publishers & Distributors)
- 25 Differential Calculus – Shantinakaran.
- 26 An elementary treatise on the Differential Calculus – J. Edwards (Radha Publishing House).
- 27 Advanced Calculus – David V. Widder (Prentice Hall)


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