Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

SUBJECT CODE	Category	SUBJECT NAME	TEACHING &EVALUATION SCHEME								
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*	Th	T	P	CREDITS
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.

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.(200**5).** *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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BSPH 202: Waves and Optics

UNIT I: Waves

Wave motion, One dimensional wave equation and solution, speed of transverse waves in a uniform stretched string, speed of longitudinal waves in a fluid and gases, speed of longitudinal waves in a solid, variation in velocity and presure in a plane progressive wave, Energy, Energy density of a progressive wave and intenisty of a wave; waves on liquid surface, gravity waves and ripples, phase velocity and group velocity.

UNIT II: Interference of light

Condition of constructive and distructive interference, necessary condition of interference, Interference of light by division of wave front: Fresnel's Bi-Prism, shape of biprism fringes, Interference by division of amplitude, interference in thin films, pathdifference , phase difference due to reflection from denser medium: Stokes law, localised fringes, Newton's rings and applications. Haidinger fringes (Fringes of equal inclination), Michelson interferometer and its application.
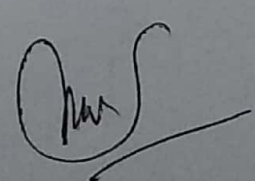
UNIT III: Diffraction

Fraunhoffer's diffraction at a single slit, double slit, plane transmission grating, n-slit diffraction, formation of spectra by the grating, determination of wavelength of light by with a grating, resolving power of an optical instruments, Rayleigh criterion of resolution of images. Resolving power of plane transmission grating.
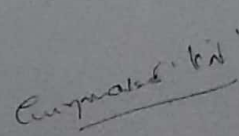
UNIT IV: Polarisation

Polarization of light, production of plane polarized light by reflection; Brewster law, Production of plane polarized light by double refraction: double refraction in uniaxial crystal, Huygens explanation of double refraction, calcite crystal, Nicol prism, quarter and half wave plates, circularly and eliptically polarized light, analysis of polarized light, rotation of plane of polarizaton, polarimeter, laurent'z half shade device.

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Indore

Dr. UTTAM SHARMA
Professor & Head
Department of Physics
Shri Vaishnav Institute of Science

Chairperson
Board of Studies
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

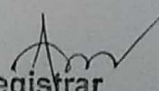# Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

UNIT V: Laser

Stimulated and Spontaneous Emission, Einstein's A & B Coefficients, Population Inversion, Pumping, Techniques of Pumping, Two three and four level lasers. Optical Resonator, Properties and Applications of Laser, Ruby Laser, Nd:YAG Laser, He-Ne Laser, CO_2 Lasers.
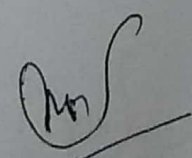
References

1. Fundamentals of Optics: F.A. Jenkins and H. E. White, 1976, McGraw-Hill.
2. Principles of Optics: B. K. Mathur, 1995, Gopal Printing. . University Physics: F.W. Sears, M.W. Zemansky and H.D. Young, 13/e, 1986.
3. Optics: A. K. Ghatak, McGraw Hill Publications. . Principles of Optics: Max Born and Wolf. Pregmon Press. . Optics and Atomic Physics, D. P. Khandelwal. Himalaya Publication.
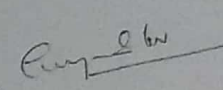4. Lasers: Theory and Applications: K. Thyagrajan and A. K. Ghatak.

List of experiment

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 wavelength 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 AC mains by electrically maintained vibrating rod.

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SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL					
			End Sem University Exam	Two Term Exam	Teachers Assessment*	End Sem University Exam	Teachers Assessment*	L	T	P	CREDITS
BSCS203	COMPULSORY	Object Oriented Programming with C++	60	20	20			3	1	0	4

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 Educational Objectives(CEOs):

- To familiarize the students with programming and to encourage them to develop their logic.
- To make students well versed with C++ language to solve problems efficiently.
- Using simple and well drawn illustrations develop their programming skills using modular programming.

Course Outcomes (COs): Student will be able to:
- Develop algorithms for problems.
- To understand the object Oriented paradigm
- Apply the programming concepts to solve the given problems.
- Write the programs using modular programming.
- Understand and write programs using various data structures very efficiently.
- Write the programs using pointers and to manage memory.
- To apply the knowledge of Object Oriented Methodology to write reusable code.
- Implement programs of file handling.

UNIT I
Object-Oriented Programming Concepts: Introduction, comparison between procedural programming paradigm and object-oriented programming paradigm, basic concepts of object-oriented programming — concepts of an object and a class, interface and implementation of a class, operations on objects, relationship among objects, abstraction, encapsulation, data hiding, inheritance, overloading, polymorphism, messaging.

UNIT II

Standard Input/output: Concept of streams, hierarchy of console stream classes, input/output using overloaded operators >> and << and member functions of i/o stream classes, formatting output, formatting using ios class functions and flags, formatting using manipulators.

UNIT III

Classes and Objects: Specifying a class, creating class objects, accessing class members, access specifiers, and static members, use of const keyword, friends of a class, empty classes, nested classes, local classes, abstract classes, container classes, bit fields and classes.

UNIT IV

Pointers and Dynamic Memory Management: Declaring and initializing pointers, accessing data through pointers, pointer arithmetic, memory allocation (static and dynamic), dynamic memory management using new and delete operators, pointer to an object, this pointer, pointer related problems - dangling/wild pointers, null pointer assignment, memory leak and allocation failures.

UNIT V

Constructors and Destructors: Need for constructors and destructors, copy constructor, dynamic constructors, explicit constructors, destructors, constructors and destructors with static members, Overloading operators, rules for overloading operators, overloading of various operators, type conversion - basic type to class type, class type to basic type, class type to another class type

Text Books

- Lafore R. "Object Oriented Programming in C++", Galgotia Pub.
- Lee "UML & C++ a practical guide to Object Oriented Development 2 ed, Pearson.
- Scheildt "C++ the complete reference 4ed, 2003.
- Hans Erit Eriksson, "UML 2 toolkit" Wiley.
- Balagurusawmy , "Object Orienter Programming with C++".

References

- B.G., Boach "Object Oriented Analysis & Design with Applications", Addision Wesly.
- S. Parate "C++ Programming", BPB. 8. Boggs "Mastering UML" BPB Publications.
- Mastering C++ by Venugopal TMH

Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

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

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			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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SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			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 *e*. 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:

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 Taylors and Maclaurin'sTheorems 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 – Shantinarayan (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

19   T. M. Apostol: Mathematical Analysis, Addison-Wesley Publishing Co. 1957

20   W. Ruddin: Principles of Mathematical Analysis, McGraw-Hill, New York, 1976

21   J. F. Randolhp: 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 – Shantinarayan.

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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BSCL207	COMPULSORY	Programming Lab in C++				30	20			4	2

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- To understand the object Oriented paradigm
- Apply the programming concepts to solve the given problems.
- Write the programs using modular programming.
- Understand and write programs using various data structures very efficiently.
- Write the programs using pointers and to manage memory.
- To apply the knowledge of Object Oriented Methodology to write reusable code.
- Implement programs of file handling.

Practical's List

1. Write a program in C++ using (i) if-then-else (ii) loops

2. Write a program illustrate Function in C++

3. Write a program for Operator overloading in C++

4. Write a program for nested function call.

5. Write a program of call by value using C++

6. Write a program of call by reference using C++

7. Write a program for Inline Function.

8. Write a program for Friend Function.

9. Write a program of dynamic memory management using new and delete.

10. Write a program on file handling using C++

11. Write a program to demonstrate the use of zero argument and parameterized constructors.

12. Write a program to demonstrate the use of dynamic constructor.

13. Write a program to demonstrate the use of explicit constructor.

14. Write a program to demonstrate the overloading of increment and decrement operators.

15. Write a program to demonstrate the overloading of binary arithmetic operators.

16. Write a program to demonstrate the typecasting of basic type to class type.

17. Write a program to demonstrate the typecasting of class type to basic type.

18. Write a program to demonstrate the multilevel inheritance.

19. Write a program to demonstrate the multiple inheritance.

20. Write a program to demonstrate the virtual derivation of a class.

21. Write a program to demonstrate the runtime polymorphism.

Text Books

1. Fundamentals of Computers : E Balagurusamy, TMH
2. Fundamentals of Computers : V Rajaraman, PHI
3. Yashavant P. Kanetkar. "Let Us C", BPB Publications, 2011.
4. Robert Lafore, "Object Oriented Programming in C++", SAMS Publication.

References

1. Fundamentals of Computers : E Balagurusamy, TMH
2. Basic Computer Engineering: Silakari and Shukla, Wiley India
3. Fundamentals of Computers : V Rajaraman, PHI
4. Information Technology Principles and Application: Ajoy Kumar Ray & Tinku Acharya PHI.