



Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore
Shri Vaishnav Institute of Social Sciences, Humanities and Arts
Choice Based Credit System (CBCS) in Light of NEP-2020
Humanities (Common Course)
Semester II (Batch 2021-24)

COURSE CODE	CATE-GORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
HU201	AECC	Foundation English II	60	20	20	-	50	3	0	2	4

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

*Teacher Assessment shall be based 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

- CEO1 Understand the role and types of workplace communication
- CEO2 Read their texts for understanding for pleasure and business purpose.
- CEO3 Understand language, word relationships and nuances in word meanings.
- CEO4 Recall key elements of structure and style in drafting technical reports
- CEO5 Develop competency in professional communication.

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

- CO1 Discuss the role and types of workplace communication
- CO2 Practice reading based on comprehension of a text.
- CO3 Use resources to increase vocabulary and gain deeper understanding by using context of words and sentences.
- CO4 Write according to standard principles of structure, style, and English-language mechanics.
- CO5 Demonstrate different strategies for using professional communication skills.

Paper I
HU201
Foundation English II

COURSE CONTENTS

UNIT I

Communication: Objectives of Communication, Formal and Informal Channels of Communication, Advantages and Disadvantages, Extra personal 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



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Legends: L - Lecture, T - Tutor, P - Teacher Guided Student Activity, F - Practical, C - Credit.

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Suggested Readings

- Allen, R. (2005). *Effective Technical Communication*. New Delhi: McGraw Hill.
- Price, L. M. (2001) *How to Prepare for Group Discussion and Interview*. New Delhi: McGraw-Hill.
- Pease, A. (1977). *Body Language*. Delhi: Sadha Publications.
- Morgan, Dana (1998) *10 Minute Guide to Job Interviews*. New York: Macmillan.

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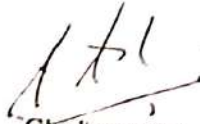
Choice Based Credit System (CBCS)


B. Sc. II Sem

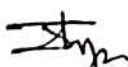
Subject Code	Category	Subject Name	Teaching and Evaluation Scheme								
			Theory			Practical		Th	T	P	CREDITS
			End Sem Univer sity Exam	Two Term Exnm	Teac hers Asses sment	End Sem Unive rsity Exam	Tea cher s Asses sment				
BSPH202	DC	Waves and Optics	60	20	20	30	20	4	0	0	4

Course Objectives	<ol style="list-style-type: none"> 1. To develop the comprehensive understanding of laws of physics related to Waves 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	<ol style="list-style-type: none"> 1. Student will be able to understand and solve the problems related to Waves and Optics. 2. Student will be able to determine physical parameter experimentally with optimal usage of resources and complete the assignments in time.

Abbreviation		Teacher Assessment (Theory) shall be based on following components: Quiz/Assignment/Project/ Participation in class (Given that no component shall be exceed 10 Marks).
Th	Theory	Teacher Assessment (Practical) shall be based on following components: Viva/ File/ Participation in Lab work (Given that no component shall be exceed 50% of Marks).
T	Tutorial	
P	Practical	


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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 pressure in a plane progressive wave, Energy, Energy density of a progressive wave and intensity 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 destructive 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, path difference, phase difference due to reflection from denser medium: Stokes law, localized fringes, Newton's rings and applications, Haidinger fringes (Fringes of equal inclination), Michelson interferometer and its application.

UNIT III: Diffraction

Fraunhofer'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: Polarization


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 elliptically polarized light, analysis of polarized light, rotation of plane of polarization, polarimeter, Laurent's half shade device.

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, CO₂ Lasers.


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BSPH 202: Waves and Optics

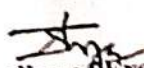
References:

1. F. A. Jenkins and H. E. White, *Fundamentals of Optics*, 4th Edition, McGraw-Hill Higher Education, 2001.
2. F. S. Crawford Jr., *Waves, Berkeley Physics Course*, Vol. 3, Mc-Graw Hill Education, 1968.
3. M. Born and E. Wolf, *Principles of Optics*, 7th Edition, Cambridge University Press, 2003.
4. K. Thyagarajan and A. Ghatak, *Lasers: Fundamentals and Applications*, 2nd Edition, Springer Science + Business Media, 2010.
5. B. K. Mathur, *Principles of Optics*, 2nd Edition, Gopal Printing Press, 1970.
6. H. D. young, R. A. Freedman, R. Bhathal and A. L. ford, *Sears and Zemansky's University Physics with Modern Physics*, 1st Australian SI Edition, Pearson Education Inc, 2011.
7. D. P. Khandelwal, *Textbook of Optics and Atomic Physics*, Himalaya Publishing House, 1989.
8. A. K. Ghatak, *Optics*, 6th Edition, McGraw Hill Education (India), 2017.


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

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***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-

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BSCS203	COMPU LSORY	Object Oriented Programmin g with C++	60	20	20	0	0	4	0	0	4

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

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BSCS203	COMPU LSORY	Object Oriented Programmin g with C++	60	20	20	0	0	4	0	0	4

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”, Addison Wesley.
- S. Parate “C++ Programming”, BPB. 8. Boggs “Mastering UML” BPB Publications.
- Mastering C++ by Venugopal TMH

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			THEORY			PRACTICAL		L	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment*	End Sem University Exam	Teachers Assessment*				
BSCL207	COMPU LSORY	Programmin g Lab in C++	0	0	0	30	20	0	0	4	2

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- To make students well versed with C++ language to solve problems efficiently.
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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

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BSCL207	COMPU LSORY	Programmin g Lab in C++	0	0	0	30	20	0	0	4	2

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.

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BSCL207	COMPUTSORY	Programmin g Lab in C++	0	0	0	30	20	0	0	4	2

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.

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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				
BSMA204	DC	Vector Algebra	60	20	20	-	-	4	0	-	4

Course Objective

To introduce the students with the Fundamentals of the Vector Algebra

Course Outcomes

This course will enable the students to:

- 1. Understand and apply the basics of the various operations in the Vector Algebra.*
- 2. Demonstrate the basic concepts of the Vectors.*
- 3. Apply the techniques of vector and scalar triple product.*
- 4. Justify the concept of Line and Plane.*
- 5. Elaborate the problems of the Volume of tetrahedron, work done, momentum.*


Course Content


UNIT – I

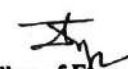
Addition of vector, Multiplication of vectors, Vectors and scalars, Algebra of vectors, Laws of addition, Relation between two compositions, Vector Equation, Linear combinations, Expression of linear combination, Linearly independent and dependent vectors.

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

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			END SEM	MST	Q/A	END SEM	Q/A				
BSMA204	DC	Vector Algebra	60	20	20	-	-	4	0	-	4

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

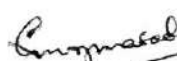
UNIT – V


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				
BSMA205	DC	Differential Calculus	60	20	20	-	-	4	0	-	4

Course Objective

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

Course Outcomes

This course will enable the students to:

1. Understand and apply the basics of the Rational Numbers & Sequences.
2. Classify the infinite series.
3. Adopt knowledge about the basic concepts of partial differentiations.
4. Decide the maxima and minima of a function.
5. Solve the problems on the functions of the several variables.

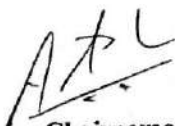
Course Content

UNIT – I

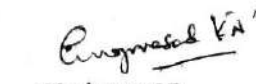
Rational Numbers & Sequence: Geometrical representation. Irrational number, Real number represented as point on a line Linear Continuum. Acquaintance with Basic properties of real number (No deduction or proof is included), Definition of bounds of a sequence and monotone sequence, Limit of a sequence. Statements of limit theorems, Concept of convergence and divergence of monotone sequences - applications of the theorems, 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: 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 n th 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


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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				
BSMA205	DC	Differential Calculus	60	20	20	-	-	4	0	-	4

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'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


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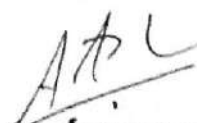
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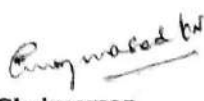
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variables –Lagrange's Method of undetermined multiplier – Problems only. Implicit function in case of function of two variables (existence assumed) and derivative.

Texts:

1. Basic Real & Abstract Analysis – Randolph J. P. (Academic Press).
2. A First Course in Real Analysis – M. H. Protter & G. B. Morrey (SpringerVerlag, NBHM).
3. A Course of Analysis – Phillips.
4. Problems in Mathematical Analysis – B. P. Demidovich (Mir).
5. Problems in Mathematical Analysis – Berman (Mir).
6. Mathematical Analysis – Shantinarayan (S. Chand & Co.).
7. T. M. Apostol: Mathematical Analysis, Addison-Wesley Publishing Co. 1957
8. W. Rudin: Principles of Mathematical Analysis, McGraw-Hill, New York, 1976
9. Differential Calculus – Shantinarayan.
10. An elementary treatise on the Differential Calculus – J. Edwards (RadhaPublishing House).
11. Advanced Calculus – David V. Widder (Prentice Hall)


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