

# Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

## NATIONAL EDUCATION POLICY

### DEGREE PROGRAM

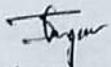
#### B.Sc. Phys. III Sem

#### Major/ Minor

Subject Code	Category	Subject Name	Teaching and Evaluation Scheme								
			Theory			Practical		Th	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment*	End Sem University Exam	Teachers Assessment*				
BSCPH301	DC	Solid State and Electronics Principles	60	20	20	00	00	4	0	0	4

<b>Course Objectives</b>	<ol style="list-style-type: none"> <li>To develop theoretical basis of semiconductors and solid state mechanics.</li> <li>To understand the Principal and Working of semiconductor devices.</li> <li>To know and design the electronic circuits.</li> <li>To be able to solve Numerical problems based on the course.</li> <li>To develop the ability to complete the tasks in time.</li> </ol>
<b>Course Outcomes</b>	<ol style="list-style-type: none"> <li>Students will have theoretical understanding of semiconductors.</li> <li>Students will be able to the understand the principal and working of semiconductor devices.</li> <li>Students will be able design of basic electronic circuits.</li> <li>Students will be able to solve Numerical problems based on the course.</li> <li>Students will be able to complete the tasks in time.</li> </ol>

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	

  
**Chairperson**  
 Board of Studies  
 Shri Vaishnav Vidyapeeth  
 Vishwavidyalaya, Indore

  
**Chairperson**  
 Faculty of Studies  
 Shri Vaishnav Vidyapeeth  
 Vishwavidyalaya, Indore

  
**Controller of Examination**  
 Shri Vaishnav Vidyapeeth  
 Vishwavidyalaya, Indore

  
**Joint Registrar**  
 Shri Vaishnav Vidyapeeth  
 Vishwavidyalaya, Indore



# Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

## NATIONAL EDUCATION POLICY

### DEGREE PROGRAM

#### B.Sc. Phys. III Sem

#### Major/ Minor

Subject Code	Category	Subject Name	Teaching and Evaluation Scheme								
			Theory			Practical		Th	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment <sup>1</sup>	End Sem University Exam	Teacher's Assessment <sup>2</sup>				
BSCPH301	DC	Solid State and Electronics Principles	60	20	20	00	00	4	0	0	4

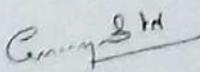
**UNIT I:** Crystal Structure and bonding: Crystalline and amorphous solids. Translational symmetry. Lattice and basis. Unit cell. Reciprocal lattice. Fundamental types of lattices (Bravais Lattice). Miller indices Lattice planes. Simple cubic. Face centered cubic. Body centered cubic lattices. Laue and Bragg's equations. Determination of crystal structure with X-rays, X-ray spectrometer. Ionic, Covalent, Metallic.

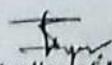
**UNIT II:** Semiconductors: Intrinsic and extrinsic semiconductors, mobility and charge density of charge carriers, Fermi Level, Temperature dependence of electron and hole concentrations, Doping: impurity states, n and p type semiconductors, conductivity, Hall Effect, Hall Coefficient. Semiconductor devices: Metal-semiconductor junction, p-n junction, majority and minority carriers.

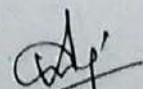
**UNIT III:** Zener and tunnel diodes, light emitting diode, Schottky diode, solar cell Diode, load line concept, rectification, Half wave and full wave rectifier, ripple factor, voltage stabilization, IC voltage regulation, Transistors, Characteristics of a transistor in CB, CE and CC mode, h-parameters.

**UNIT IV:** FETs: Field effect transistors, n-channel FET, p-channel FET, JFET, MOSFET, Amplifiers, Small signal amplifiers; General Principle of operation, classification, distortion, RC coupled amplifier, gain frequency response, input and output impedance, multistage amplifiers, Transformer coupled amplifiers, Equivalent circuits at low, Medium and high frequencies, emitter follower.

  
**Chairperson**  
 Board of Studies  
 Shri Vaishnav Vidyapeeth  
 Vishwavidyalaya, Indore

  
**Chairperson**  
 Faculty of Studies  
 Shri Vaishnav Vidyapeeth  
 Vishwavidyalaya, Indore

  
**Controller of Examination**  
 Shri Vaishnav Vidyapeeth  
 Vishwavidyalaya, Indore

  
**Joint Registrar**  
 Shri Vaishnav Vidyapeeth  
 Vishwavidyalaya, Indore



# Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

## NATIONAL EDUCATION POLICY

### DEGREE PROGRAM

#### B.Sc. Phys. III Sem

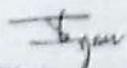
#### Major/ Minor

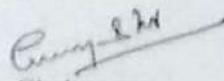
Subject Code	Category	Subject Name	Teaching and Evaluation Scheme								
			Theory			Practical		Th	I	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment*	End Sem University Exam	Teacher's Assessment*				
BSCP11301	DC	Solid State and Electronics Principles	60	20	20	00	00	4	0	0	4

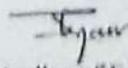
**UNIT V:** Oscillators, Feedback in amplifiers, principle, its effects on amplifiers, characteristics Principle of feedback amplifier, Barkhausen criteria, Hartley, Colpitt and Wein bridge oscillators.

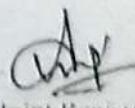
#### References:

1. Introduction to Solid State Physics, C. Kittel, VIII Edition, John Wiley and Sons, New York, 2005.
2. Intermediate Quantum theory of Crystalline Solids. A. O. E. Animalu, Prentice-Hall of India private Limited, New Delhi 1977.
3. Solid State Electronic devices. B. G. Streetman, I Edition Prentice Hall. India.
4. Microelectronics, J. Millman and A. Grabel McGraw Hill New York.
5. The Physics and Chemistry of Nanosolids: Frank J. Owens, and Charles P. Poole Jr., Wiley Inter Science, 2008.
6. Physics of Low Dimensional Semiconductors: An introduction: J.H. Davies. Cambridge University Press, U.K., 1998.

  
**Chairperson**  
 Board of Studies  
 Shri Vaishnav Vidyapeeth  
 Vishwavidyalaya, Indore

  
**Chairperson**  
 Faculty of Studies  
 Shri Vaishnav Vidyapeeth  
 Vishwavidyalaya, Indore

  
**Controller of Examination**  
 Shri Vaishnav Vidyapeeth  
 Vishwavidyalaya, Indore

  
**Joint Registrar**  
 Shri Vaishnav Vidyapeeth  
 Vishwavidyalaya, Indore



# Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

## NATIONAL EDUCATION POLICY

### DEGREE PROGRAM

#### B.Sc. Phys. III Sem

#### Major/ Minor

Subject Code	Category	Subject Name	Teaching and Evaluation Scheme								
			Theory			Practical		Th	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment*	End Sem University Exam	Teachers Assessment*				
BSCPH301 (P)	DC	Physics Laboratory III	00	00	00	30	20	0	0	4	2

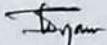
#### Course Objectives

1. To gain practical knowledge by performing various experiments of Electronics.
2. Providing a hands-on learning experience in electronics.
3. To understand the electronic circuits and to find characteristics of different devices.
4. Perform the experiments as per standard procedure and understand the applications.
5. To develop the ability to complete the tasks in time.

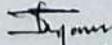
#### Course Outcomes

1. Students will gain practical knowledge by performing various experiments of Electronics.
2. They will have a hands-on learning experience in electronics.
3. They will understand the electronic circuits and characteristics of different devices.
4. Will develop the ability to complete the tasks in time.
5. They will also learn to work as a Team.

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

  
Chairperson  
Board of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

  
Chairperson  
Faculty of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

  
Controller of Examination  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

  
Joint Registrar  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore



# Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

## NATIONAL EDUCATION POLICY

### DEGREE PROGRAM

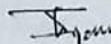
#### B.Sc. Phys. III Sem

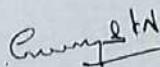
#### Major/ Minor

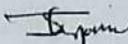
Subject Code	Category	Subject Name	Teaching and Evaluation Scheme								
			Theory			Practical		Th	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment	End Sem University Exam	Teachers Assessment				
BSCPH301 (P)	DC	Physics Laboratory III	00	00	00	30	20	0	0	4	2

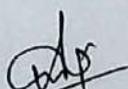
#### List of experiment

1. To find V-I characteristics of P-N junction diode.
2. To find V-I characteristics of Zener diode.
3. To find V-I characteristics of Tunnel diode.
4. To find V-I characteristics of photo diode.
5. To find input/output characteristics of common base PNP/NPN transistor.
6. To find input/output characteristics of common emitter PNP/NPN transistor.
7. To determine energy band gap using PN junction diode.
8. To study frequency of Hartley oscillator.
9. To study frequency of Wein bridge oscillator.
10. To find the characteristics of different types of LED.
11. To study of Regulated power supply using Zener.
12. To study of Regulated power supply using transistor.

  
**Chairperson**  
Board of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

  
**Chairperson**  
Faculty of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

  
**Controller of Examination**  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

  
**Joint Registrar**  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore



**Shri VaishnavVidyapeethVishwavidyalaya, Indore**  
**Shri Vaishnav Institute of Science**  
**Name of Program: B.Sc. (Major: Chemistry)**  
**(2022-2025)**

**Semester III**

COURSE CODE	CATEGORY	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*				
BSCCH301	DC	Organic Chemistry	60	20	20	30	20	4	0	4	6

**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 course Organic chemistry aims to provide the student with:

1. To understand the chemistry of saturated, unsaturated, and aromatic hydrocarbons.
2. To acquire the knowledge about Bayer's strain theory, Regioselectivity, and Thermodynamic aspects of organic reactions, and applications of Saytzeff rule.
3. To discuss the properties of Cycloalkanes, Cycloalkenes and Dienes.
4. To acquaint the students with practical knowledge and industrial applications of Organic chemistry.

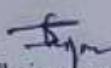
**Course Outcomes (COs):**

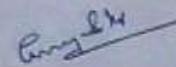
1. Students will gain the basic knowledge of IUPAC nomenclature of alkanes, alkenes, dienes, and physical, chemical properties of the commercially important molecules.
2. Students can be able to understand Aromaticity, Kekule structure, Huckel's rule, and Aromatic electrophilic substitution reactions with mechanism.
3. They can understand the chemistry of Biomolecules with structures, properties, and biological importance of Carbohydrates and Amino acids.
4. They can learn the industrial utility of Organic chemistry and practical knowledge to become good chemist.

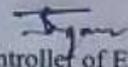
**Syllabus**

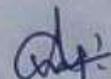
**Unit I: Alkanes and Cycloalkanes**

IUPAC nomenclature of branched and unbranched alkanes, the alkyl group, classification of carbon atom in alkanes, isomerism in alkanes, methods of preparation - Wurtz reaction, Kolbe reaction, Corey-House reaction, and decarboxylation of carboxylic acids. Physical properties and chemical reactions of alkanes. Mechanism of free radical halogenation of alkanes: orientation,

  
Chairperson  
Board of Studies  
Physical Sciences

  
Chairperson  
Faculty of Studies  
Science

  
Controller of Examinations  
SVVV, Indore

  
Joint Registrar  
SVVV, Indore



Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore  
Shri Vaishnav Institute of Science  
Name of Program: B.Sc. (Major: Chemistry)  
(2022-2025)

Semester III

COURSE CODE	CATEGORY	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*				
BSCCH301	DC	Organic Chemistry	60	20	20	30	20	4	0	4	6

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.

reactivity, and selectivity. Cycloalkanes - nomenclature, preparation methods, chemical reactions. Bayer's strain theory and its limitations. Ring strain in small rings (Cyclopropane and Cyclobutane). The case of cyclopropane ring, banana bonds.

**Unit II: Alkenes and Cycloalkenes**

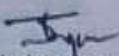
IUPAC nomenclature of alkenes, methods of formation, mechanism and regioselectivity of dehydration of alcohols and dehydrohalogenation of alkyl halides. Saytzeff rule, Hofmann elimination, physical properties, and relative stabilities of alkenes. Chemical reactions of alkenes - hydrogenation, electrophilic and free radical additions, Markownikoff's rule, hydroboration-oxidation, oxymercuration-reduction. Epoxidation, ozonolysis, hydration, hydroxylation, and oxidation with  $\text{KMnO}_4$ . Polymerization of alkenes, Industrial applications of ethylene and propene. Methods of formation, physical properties, and chemical reactions of cycloalkenes.

**UNIT III: Dienes and Alkynes**

Nomenclature and classification of dienes: isolated, conjugated, and cumulated dienes, Structure of allenes and butadiene, methods of formation, chemical reaction - 1, 2 and 1, 4 additions, Diels-Alder reaction, and polymerization. Nomenclature, structure and bonding in alkynes, methods of formation, chemical reactions of alkynes, acidity of alkynes, hydroboration-oxidation, metal-ammonia reductions, oxidation, and polymerization.

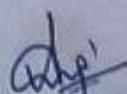
**UNIT IV: Arenes and Aromaticity**

Nomenclature of benzene derivatives, Structure of benzene - Kekule structure, stability and carbon-carbon bond lengths of benzene, resonance structure, MO picture. Aromaticity: The Huckle rule, aromatic ions. Aromatic electrophilic substitution - general pattern of the

  
Chairperson  
Board of Studies  
Physical Sciences

  
Chairperson  
Faculty of Studies  
Science

  
Controller of Examinations  
SVVV, Indore

  
Joint Registrar  
SVVV, Indore



Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore  
Shri Vaishnav Institute of Science  
Name of Program: B.Sc. (Major: Chemistry)  
(2022-2025)

Semester III

COURSE CODE	CATEGORY	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*				
BSCCH301	DC	Organic Chemistry	60	20	20	30	20	4	0	4	6

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.

mechanism, role of  $\sigma$  and  $\pi$  complexes, Mechanism of nitration, halogenation, sulphonation, mercuration and Friedel-Crafts reaction. Energy profile diagrams. Activating and deactivating substituents, orientation and ortho/para ratio, Birch reduction.

UNIT V: Biomolecules

[A] **Carbohydrates:** Introduction, classification, Osazone formation, epimerization, step-up and step-down reactions of monosaccharides, simple structures of glucose and fructose, Fischer's proof of configuration of D-glucose.

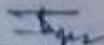
[B] **Amino acids:** Introduction of amino acid, Classification, and properties of amino acids, Zwitter ion, Isoelectric point, Strecker's and Gabriel phthalimide synthesis of amino acids.

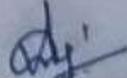
**List of Practical:** Practical: (Credits: 2, Laboratory periods: 04)

1. Thin layer chromatography – Principle and theory. Experiment of TLC of Spinach leaves
2. Column chromatography – Principle and theory. Separation of the mixture of dyes by using Column chromatography
3. Paper chromatography – Principle and theory. Separation of the mixture of dyes by using Paper chromatography
4. Systematic identification of organic compounds – Solids (Urea, Glucose, Salicylic acid, Benzoic acid, 4-amino benzene sulphonic acid) Preliminary tests (Combustion, ignition, and solubility), test for saturation and unsaturation, identification, and confirmatory tests of

  
Chairperson  
Board of Studies  
Physical Sciences

  
Chairperson  
Faculty of Studies  
Science

  
Controller of Examinations  
SVVV, Indore

  
Joint Registrar  
SVVV, Indore



Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore  
Shri Vaishnav Institute of Science  
Name of Program: B.Sc. (Major: Chemistry)  
(2022-2025)

Semester III

COURSE CODE	CATEGORY	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*				
BSCCH301	DC	Organic Chemistry	60	20	20	30	20	4	0	4	6

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.

functional groups.

5. Systematic identification of organic compounds – Liquids (Benzaldehyde, Aniline, Acetophenone, 1-Butyl alcohol, Ethyl acetate) Preliminary tests (Combustion, ignition, and solubility), test for saturation and unsaturation, identification, and confirmatory tests of functional groups.

6. Systematic organic preparation – simple, single step organic synthesis (preparation of 4-nitro acetanilide from aniline)

7. Friedel-Crafts acylation reaction on Benzene with acetyl chloride and  $AlCl_3$  catalyst

8. Claisen-Schmidt reaction: Synthesis of Benzalacetone from Benzaldehyde

9. Reimer-Tieman reaction: Synthesis of 2-hydroxy-1-naphthaldehyde from 2-naphthol

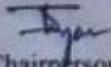
10. Rearrangement reaction: Synthesis of acetophenone oxime and its rearrangement to acetanilide

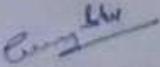
**List of Textbooks:**

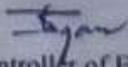
1. Robert Thorn Morrison and Robert Neilson Boyd, Textbook of Organic Chemistry, Prentice Hall of India Pvt Ltd, New Delhi, 6<sup>th</sup> Edition, 1992.

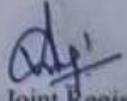
2. Bhupinder Mehta, Manju Mehta, Organic Chemistry, Prentice Hall of India Pvt. Ltd, New Delhi, 2005.

3. James B Hedrickson Donald J. Cram and George S. Hammond, Organic Chemistry, McGraw-Hill, Kogakusha, Ltd., 3<sup>rd</sup> Edition.

  
Chairperson  
Board of Studies  
Physical Sciences

  
Chairperson  
Faculty of Studies  
Science

  
Controller of Examinations  
SVVV, Indore

  
Joint Registrar  
SVVV, Indore



Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore  
Shri Vaishnav Institute of Science  
Name of Program: B.Sc. (Major: Chemistry)  
(2022-2025)

Semester III

COURSE CODE	CATEGORY	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*				
BSCCH301	DC	Organic Chemistry	60	20	20	30	20	4	0	4	6

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.

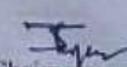
4. Arun Bahl, B. S. Bahl, Advanced Organic Chemistry, S. Chand & Company Ltd., New Delhi, 1<sup>st</sup> Edition, 2003.
5. I.L.Finar, Organic Chemistry Vol-I & Vol-II, Pearson Education Ltd, New Delhi, 5<sup>th</sup> Edition, 2016.
6. G.Marc Loudon, Organic Chemistry, Oxford University Press, 4<sup>th</sup> Indian edition, 2010.
7. P.S.Kalsi, Text book of Organic Chemistry, MacMillan, India Pvt. Ltd., 1999.

**Reference Books:**

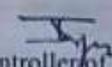
1. Pine, S., Hendrickson, J. B., Cram, D.J., Hammond, S. Organic Chemistry, 8<sup>th</sup> Edition, Mc Graw-Hill, New York. 2012
2. John McMurry, Brooks Cole, Organic Chemistry, 6<sup>th</sup> Edition, John-Wiley International Edition.
3. Graham, T.W., Solomons, S., and Craig B. Fryhle, Organic Chemistry, 8<sup>th</sup> Edition, John-Wiley International Edition.
4. Francis A. Carey and Richard J. Sundberg, Advanced Organic Chemistry Part-A & B, 7<sup>th</sup> Edition, Mc Graw-Hill, 2015.

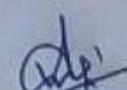
**Textbooks for practical:**

1. Vogel, A.I., Tatchell, A.R., Furnis, B.S., and Hannaford, A.J., Textbook of Practical organic chemistry, 5<sup>th</sup> Edition, Pearson, 2005.
2. Mann, F.G., and Saunders, B.C., Practical organic chemistry, 10<sup>th</sup> Edition, Longman, 2017.
3. Sethi, A., Lab Experiments in Organic Chemistry, 2<sup>nd</sup> Edition, New Age International publishers, 2018.

  
Chairperson  
Board of Studies  
Physical Sciences

  
Chairperson  
Faculty of Studies  
Science

  
Controller of Examinations  
SVVV, Indore

  
Joint Registrar  
SVVV, Indore



# Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

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

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM	MST	Q/A	END SEM	Q/A				
BSCMT 301	DC	Differential equations I	60	20	20	-	-	3	0	-	3

## Course Objective

To introduce the students with the fundamentals of the Differential Equation

## Course Outcomes

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

1. Know the basic concepts of differential equations.
2. Find the solution of the differential equations.
3. Solve the problems of linear differential equations and homogeneous linear differential equations.
4. Apply the differential equations to real world problems.

## Course Content:

### UNIT – I

Formation of differential equations, Variable separable form, Linear Differential equations, Bernoulli's equation, Exact differential equation, Equation reducible to exact differential equation.

### UNIT – II

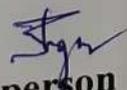
Differential equation of first order and higher degree, Solvable for  $x, y, p$ . Clairaut's equation and singular solution, Geometrical meaning of differential equation, Orthogonal trajectory.

### UNIT – III

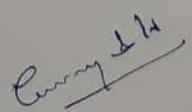
Linear differential equations with constant coefficients.

### UNIT – IV

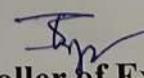
Equations reducible to linear equation with constant coefficients, Cauchy homogeneous linear equation, Legendre linear equation, Method of variation of parameter, Method of undetermined coefficients.

  
**Chairperson**

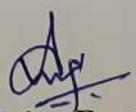
Board of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

  
**Chairperson**

Faculty of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

  
**Controller of Examinations**

Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

  
**Joint Registrar**

Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore



# Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

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

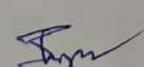
SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM	MST	Q/A	END SEM	Q/A				
BSCMT 301	DC	Differential equations I	60	20	20	-	-	3	0	-	3

## UNIT – V

Simultaneous linear differential equations with constant coefficient, Applications of linear differential equations to: Simple harmonic motion, Simple pendulum, Oscillation of a spring.

## Reference Book:

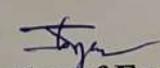
1. Differential Equations – Lester R. Ford (McGraw Hill).
2. Differential Equations – S. L. Ross (John Wiley).
3. Differential Equations – H. T. H. Piaggio.
4. A Text Book of Ordinary Differential Equations – Kiseleyev, Makarenko & Krasnov (Mir).
5. Differential Equations – H. B. Phillips (John Wiley & Sons).
6. Differential Equations with Application & Programs – S. Balachanda Rao, H. R. Anuradha (University Press).
7. Text Book of Ordinary Differential Equations (2nd Ed.) – S. G. Deo, V. Lakshmikantham & V. Raghavendra (Tata McGraw Hill).
8. An Elementary Course in Partial Differential Equation – T. Amarnath (Narosa).
9. Higher Engineering Mathematics: B.S. Grewal, Khanna Publisher.

  
**Chairperson**

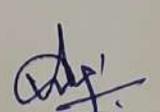
Board of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

  
**Chairperson**

Faculty of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

  
**Controller of Examinations**

Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

  
**Joint Registrar**

Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore



Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore  
Name of the Program: B. Sc. (Mathematics)

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM	MST	Q/A	END SEM	Q/A				
BSCMT 302	DC	Vector Analysis and Geometry	60	20	20	-	-	3	0	-	3

### Course Objective

To introduce the students to the fundamentals of the Algebra of Vectors and Geometry.

### Course Outcomes

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

1. Understand the algebra of vectors.
2. Interpret and apply the concept of vectors in real life.
3. Learn the basics of solid geometry.
4. Solve the problems related to cones and cylinders.

### Course Content:

#### UNIT – I

Vectors, Product of four vectors, Reciprocal vectors, Vector differentiation, Velocity and acceleration.

#### UNIT – II

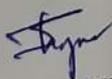
Del operator, Gradient, Divergence and Curl, Higher order derivatives, Physical interpretation of divergence and curl.

#### UNIT – III

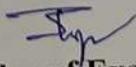
Vector Integration, Line integral, Circulation and work, Surface integral, Volume integral, flux, Theorems of Gauss, Green, Stoke (without proof) and problems based on them.

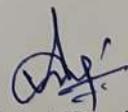
#### UNIT – IV

Equation of cone with given base, generators of cone, condition for three mutually perpendicular generators.

  
**Chairperson**  
Board of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

  
**Chairperson**  
Faculty of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

  
**Controller of Examinations**  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

  
**Joint Registrar**  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore



**Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore**  
**Name of the Program: B. Sc. (Mathematics)**

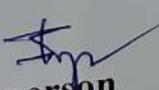
SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM	MST	Q/A	END SEM	Q/A				
BSCMT 302	DC	Vector Analysis and Geometry	60	20	20	-	-	3	0	-	3

**UNIT – V**

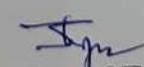
Right circular cone, equation of cylinder and its properties.

**Reference Book:**

1. Elementary Treatise on Coordinate Geometry of Three Dimension: R.J.T. Bell. MacMillan, India.
2. Theory and Problems of Advance Calculus: R. Murray, Spiegel, Schaum Publishing Co. New York.
3. Vector Analysis: R. Murray, Spiegel, Schaum Publishing Co. New York.
4. A Textbook of Vector Calculus: Shanti Narayan, S. Chand & Co. New Delhi.
5. A Textbook of Vector Algebra: Shanti Narayan, S. Chand & Co. New Delhi.
6. The Elements of Coordinate Geometry: S.L. Loney, Mac Millan & Co.
7. A Textbook of Analytical Geometry of Two Dimensions: P.K. Jain, Khalil Ahmed, Mac Millan India Ltd.
8. A Textbook of Analytical Geometry of Three Dimensions: P.K. Jain, Khalil Ahmed, Willey Eastern Ltd.

  
**Chairperson**  
Board of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

  
**Chairperson**  
Faculty of Studies  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

  
**Controller of Examinations**  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

  
**Joint Registrar**  
Shri Vaishnav Vidyapeeth  
Vishwavidyalaya, Indore

## SEMESTER IV

SUBJECT CODE	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*				
<b>BBAI501</b>	<b>Human Values and Professional Ethics</b>	60	20	20	-	-	3	1	-	4

Legends: L-Lecture; T-Tutorial/Teacher Guided Student Activity; P-Practical; C-Credit;  
\***Teacher Assessment** shall be based on following components: Quiz / Assignment / Project/ Participation in Class, given that no component shall exceed more than 10 marks.

### Course Objectives:

The objective of the course is to disseminate the theory and practice of moral code of conduct and familiarize the students with the concepts of "right" and "good" in individual, social and professional context

### Course Outcomes:

1. Help the learners to determine what action or life is best to do or live.
2. Right conduct and good life.
3. To equip students with understanding of the ethical philosophies, principles, models that directly and indirectly affect business.

### Course Content:

#### UNIT I: Human Value

1. Definition, Essence, Features and Sources
2. Sources and Classification
3. Hierarchy of Values
4. Values Across Culture

#### UNIT II: Morality

1. Definition, Moral Behaviour and Systems
2. Characteristics of Moral Standards
3. Values Vs Ethics Vs Morality
4. Impression Formation and Management

## **BBAI501 Human Values and Professional Ethics (for UG Programs)**

### **UNIT III: Leadership in Indian Ethical Perspective**

1. Leadership, Characteristics
2. Leadership in Business (Styles), Types of Leadership (Scriptural, Political, Business and Charismatic)
3. Leadership Behaviour, Leadership Transformation in Terms of Shastras (Upanishads, Smritis and Manu-smriti).

### **UNIT IV: Human Behavior – Indian Thoughts**

1. Business Ethics its meaning and definition, need.
2. Types, Objectives, Sources, Relevance in Business organizations.
3. Theories of Ethics, Codes of Ethics.

### **UNIT V: Globalization and Ethics**

1. Sources of Indian Ethos & its impact on human behavior
2. Corporate Citizenship and Social Responsibility – Concept (in Business),
3. Work Ethics and factors affecting work Ethics.

### **Suggested Readings**

1. Beteille Andre (1991), Society and Politics in India, Athlone Press.
2. Chakraborty S. K. (1999), Values and Ethics for Organizations, oxford university press.
3. Fernando, A.C.(2009), Business Ethics - An Indian Perspective, Pearson Education :India.
4. Fleddermann, Charles D. (2012), "Engineering Ethics", Pearson Education / Prentice Hall.
5. Boatright, John R (2012), "Ethics and the Conduct of Business", Pearson Education, New Delhi.
6. Crane, Andrew and Matten Dirk (2015), Business Ethics, Oxford University Press Inc.: New York.
7. Murthy, C.S.V.(2016), Business Ethics – Text and Cases, Himalaya Publishing House Pvt. Ltd.: Mumbai.
8. Naagrajan, R.R (2016), Professional Ethics and Human Values, New Age International Publications: New Delhi.