Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Shri Vaishnav Institute of Computer Applications

Name of the Program: BSC (Data Science)

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment *	END SEM University Exam	Teachers Assessment *
BSCDS301	Major	Cloud Computing	2	0	2	3	60	20	20	30	20

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 Objectives:

The goal of this course is to provide students with an understanding of basic concepts of cloud computing, various features along with cloud management, its applications and cloud security.

Course Outcomes: After course completion Students will be able to understand:

1. Concept of cloud computing with broader perspectives like requirement, advantages, characteristics, Cloud Service Model and Deployment Model,
2. Cloud Management, Interoperability, Standards, Scalability and Cloud Virtualization Technology Management.
3. Cloud information security and its challenges.

UNIT- I

8Hrs

Basics of Cloud Computing: Introduction, Historical development, principles and vision, Cloud services requirements, Types of Clouds, Advantages and disadvantages of cloud computing, Characteristics of Cloud Computing.

Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Shri Vaishnav Institute of Computer Applications

Name of the Program: BSC (Data Science)

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BSCDS301	Major	Cloud Computing	2	0	2	3	60	20	20	30	20

Unit-II **8 Hrs**

Architecture for Cloud Computing: Cloud Computing Environments, Characteristics of cloud computing as per NIST, Deployment Models and Service Models.

Unit-III **8 Hrs**

Cloud Management: Resiliency, Provisioning, Asset management, Concepts of Map reduce.

Virtualization Technology: Introduction, working process of virtualization and benefits of virtualization.

Unit-IV **8 Hrs**

Types of Virtualizations- Memory Virtualization, Storage Virtualization, Data and Network Virtualization, Desktop and Application virtualization.

Technology used for virtualization, Hypervisor Virtualization Software, Concept of Virtual LAN(VLAN) and Virtual SAN(VSAN).

Unit V **8 Hrs**

Cloud Security: Introduction of cloud Information security services, Secure Cloud Software Requirements and Security Challenges.

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

Shri Vaishnav Institute of Computer Applications

Name of the Program: BSC (Data Science)

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment *	END SEM University Exam	Teachers Assessment *
BSCDS301	Major	Cloud Computing	2	0	2	3	60	20	20	30	20

Textbooks:

1. Judith S. Hurwitz, Daniel Kirsch" Cloud Computing For Dummies, 2nd Edition,John Wiley and Sons inc., New Jersey, 2000.
2. Hashmi, Tahir, Landreau, Jean-Francois" Cloud Strategy: A Decision-based Approach to cloud migration" Gregor Hohpe:An architect Elevator Guide,2019-2020.
3. Kavis, Michael J. "Architecting the Cloud: Design Decisions for Cloud Computing Service Models (SaaS, PaaS, and IaaS) John Wiley and Sons inc., Hoboken, New Jersey, 2000.
4. Mr. Ray J Rafaels "Cloud Computing: From Beginning to End" Second edition, paperback,2018.

Chairperson	Chairperson	Controller of Examination	Joint Registrar
Board of Studies	Faculty of Studies	Shri Vaishnav Vidyapeeth	Shri Vaishnav Vidyapeeth
Shri Vaishnav Vidyapeeth	Shri Vaishnav Vidyapeeth	Vishwavidyalaya, Indore	Vishwavidyalaya, Indore
Vishwavidyalaya, Indore	Vishwavidyalaya, Indore		

Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Shri Vaishnav Institute of Computer Applications

Name of the Program: BSC (Data Science)

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BSCDS302	Major	Python Programming	2	0	2	3	60	20	20	30	20

Legends: L – Lecture; T – Tutorial/Teacher Guided Student Activity; P – Practical; Q/A – Quiz/Assignment/Attendance; MST – Mid Semester Test.
***Teacher Assessment** shall be based on following components: Quiz/Assignment/Project/Participation in class activities, given that no component shall exceed more than 10 marks.

Course Education Objectives (CEOs):

The goal of this course is to provide students with an understanding of basic concepts of Python Programming Language along with its features.

Course Outcomes (COs): After completion of this syllabus students will be able to

- Apply basic concepts of python programming.
- Write clear and effective python code based on conditional and iterative statements.
- Will be having an idea about string, list, tuple and functions.
- Create an applications using python programming.

Syllabus

Unit-I

Introduction: Basic Concept of python, its characteristics, Features, Names of popular application in python, various flavours of python, limitations of python, versions of python, Python-2 and Python-3 differences. Identifiers, keywords, datatypes, use of comments in python, variables and constants, various operators used in python.

Unit-II

Conditional statements: Decision Making statements: if statement, if-else statement and nested if statement.

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BSCDS302	Major	Python Programming	2	0	2	3	60	20	20	30	20

Iterative and Transfer Statements: Iterative statements: For Loop, While loop, nested loops, Transfer statement: break and continue statement.

Unit-III

Strings Used in Python Programming: Definition, accessingcharacters or values of a String, Updating Strings,String Special Operators

Unit-IV

List, Tuples, Functions, Introductory concept of Python Lists and Python Tuples, list Vs tuples, Basic concept of python functions.

Unit-V

Introduction of Python OOPs Concepts: Introduction of Class and Object, creating class and its instance, constructor **(**Parameterized Constructor and Non-Parameterized Constructor), destructors, polymorphism, inheritance (Multilevel and multiple), definition of data abstraction.

Text Books:

1. PratiyushGuleria," Basics of Python Programming, BPB Publications, March 2020.
2. Jason Cannon" Python programming for beginners, Kindle book, 2020
3. Ryan Turner, "Python Programming: 3 Books in 1: Ultimate Beginner's, Intermediate & Advanced Guide to Learn Python Step-by-Step", Kindle Edition, 2018.
4. Martin Brown, "Python: The Complete Reference", Mc-Graw-Hill, 2018.

Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Shri Vaishnav Institute of Computer Applications

Name of the Program: BSC (Data Science)

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BSCDS302	Major	Python Programming	2	0	2	3	60	20	20	30	20

List of Practical:

1. Write python program to print Hello World.
2. Write python program to print your Bio Data.
3. Write a program to perform different Arithmetic Operations on numbers in Python.
4. Write python program to Hello World using string variable.
5. Write python program to show use of break statement.
6. Write python program to show use of continue statement.
7. Write a python program to find largest of three numbers.
8. Write a Python program to convert temperatures to and from Celsius, Fahrenheit.
   [Formula : c = (f-32)/1.8]
9. Write a python program to find Smallest of three numbers
10. Write python program to store data in list and then try to print them.
11. Write a python Program to print first five even numbers.
12. Write a python Program to print first five odd numbers.
13. Write python program to print list of numbers using for loop.
14. Write a python program to find factorial of a number using loop.
15. Write a python program to display Fibonacci series.

Chairperson	Chairperson	Controller of Examination	Joint Registrar
Board of Studies	Faculty of Studies	Shri Vaishnav Vidyapeeth	Shri Vaishnav Vidyapeeth
Shri Vaishnav Vidyapeeth	Shri Vaishnav Vidyapeeth	Vishwavidyalaya, Indore	Vishwavidyalaya, Indore
Vishwavidyalaya, Indore	Vishwavidyalaya, Indore		

Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Shri Vaishnav Institute of Computer Applications

Name of the Program: BSC (Data Science)

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BSCDSMA301	Minor	Operations Research	3	0	0	3	60	20	20	0	0

Course Education Objectives (CEOs):
To introduce the students with the optimization techniques and Operation Research

Course Outcomes (COs):
After the successful completion of this course students will be able to:

1. *understand and discuss the concept of the optimization techniques in the LPP*
2. *solve linear programming problem*
3. *analyse and adopt the techniques of Queuing theory*
4. *demonstrate and apply the advanced optimization techniques.*

UNIT – I
Introduction to the Operation Research, Models in OR, Linear Programming.

UNIT – II
Simplex Method, Computational problems, Computer solution of linear programs.

UNIT – III
Network analysis – Assignment problems, Maximal flow problem, shortest route problem, Minimal Spanning tree problem.

UNIT – IV
Queuing Models – M/M/1 model, Limited queue capacity, Multiple Servers.

UNIT – V
Reliability Models, Inventory Models – EOQ, Nonzero lead time, Dynamic Programming – Developing an optimal decision policy, multiple state variables, Curse of dimensionality.

References

1. Taha Hamdy A: Operation Research; an introduction, Sixth ed., PHI, 2001
2. Gillett Billy E: Introduction to Operation Research, Tata-Mcgraw Hill, 1979

Chairperson	Chairperson	Controller of Examination	Joint Registrar
Board of Studies	Faculty of Studies	Shri Vaishnav Vidyapeeth	Shri Vaishnav Vidyapeeth
Shri Vaishnav Vidyapeeth	Shri Vaishnav Vidyapeeth	Vishwavidyalaya, Indore	Vishwavidyalaya, Indore
Vishwavidyalaya, Indore	Vishwavidyalaya, Indore		

Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Shri Vaishnav Institute of Computer Applications

Name of the Program: BSC (Data Science)

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BSCDSMA302	Minor	Statistical Inference	3	0	0	3	60	20	20	0	0

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 Objective

To introduce the students with the Fundamentals of the Statistical Inference.

Course Outcomes

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

- *Know the contribution of a good estimator.*
- *Apply the Cramer Rao inequality.*
- *Differentiate between Type-I and Type-II error.*
- *Conduct and Interpret student's t, Snedecor's F and chi-square Distribution.*
- *Differentiate between parametric and non-parametric test.*
- *Identify, apply and interpret the different small sample and large sample tests.*

Course Content:

UNIT – I

Theory of Estimation: Definition of a random sample, Parameter and Statistic. Concepts of point and interval estimation, criterion of a good estimator; Unbiasedness, Consistency. efficiency and sufficiency; Mean square error of-an estimate, Method of maximum likelihood estimation. Cramer - Rao inequality and its applications confidence interval.

UNIT – II

Concept of Test of Significance, Null and alternative hypothesis, Simple and composite hypothesis. Type rand II errors, Critical region and level of significance. One and two tailed tests, Neymann Pearson lemma for construction of most powerful tests for simple null versus simple alternative for the parameters of Binomial, Poisson and Normal distributions. Likelihood ratio test, Likelihood ratio test for single mean.

Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Shri Vaishnav Institute of Computer Applications

Name of the Program: BSC (Data Science)

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BSCDSMA302	Minor	Statistical Inference	3	0	0	3	60	20	20	0	0

UNIT – III

Non parametric Tests: Order statistics: Definition, distributions of single, joint and marginal density functions. Advantages and disadvantages of non-parametric methods. Run test for randomness, sign tests for univariate and bivariate distribution, Wilcoxon's signed ranked test for univariate and bivariate distribution, Mann-Whitney U test, Wald-Wolfowitz run test, Median test (Applications only).

UNIT – IV

Sampling Distribution Sampling distribution of a statistic, definition of standard error and some examples. Sampling distribution of Sum of binomial and poisson variates. Sampling distribution of mean of normal distribution. Derivation of Chi-Square, Student's t, Fisher's t and F distributions with their properties, relation between Chi-Square, t and F.

UNIT – V

Large Sample Tests: Test of significance of single proportion, z-test of signific.ance for single mean and for difference of means. **Small Sample Test**: t- Test for single mean, and difference of means, paired I-test, F- test for equality of population variances. Conditions for the validity of Chi-square test for goodness of fit, test for independence of attributes: (Contingency table). Fisher's Z-transformations and their applications.

Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Shri Vaishnav Institute of Computer Applications

Name of the Program: BSC (Data Science)

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BSCDSMA302	Minor	Statistical Inference	3	0	0	3	60	20	20	0	0

SUGGESTED READINGS:

1. Goon A.M., Gupta M.K.: Das Gupta. B. (2005), Fundamentals of Statistics, Vol. I, World Press, Calcutta.
2. Rohatgi V. K. and Saleh, A.K. Md. E. (2009): An Introduction to Probability and Statistics. 2nd Edn. (Reprint) John Wiley and Sons.
3. Miller, I. and Miller, M. (2002) : John E. Freund's Mathematical Statistics (6th addition, low price edition), Prentice Hall of India.
4. Dudewicz, E. J., and Mishra, S. N. (1988): Modern Mathematical Statistics. John Wiley & Sons.
5. Mood A.M, Graybill F.A. and Boes D.C,: Introduction to the Theory of Statistics, McGraw Hill.
6. Bhat B.R, Srivenkatramana T and Rao Madhava K.S. (1997) Statistics: A Beginner's Text, Vol. I, New Age International (P) Ltd.
7. Jim Frost, Introduction to Statistics: An Intuitive Guide for Analyzing Data and Unlocking Discoveries, Jim Frost MS.

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

Shri Vaishnav Institute of Computer Applications

Name of the Program: BSC (Data Science)

COURSE CODE	CATEGORY	COURSE NAME	TEACHING&EVALUATIONSCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			ENDSEM University Exam	TwoTerm Exam	Teachers Assessment*	ENDSEM UniversityExam	Teachers Assessment*				
BBAI501	AECC	Human Values and Professional Ethics	60	20	20	-	-	4	-	-	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical:**C** - Credit; **AECC**- Ability Enhancement Compulsory Course
***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 Objective

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

Examination Scheme

The internal assessment of the students' performance will be done out of 40 Marks. The semester Examination will be worth 60 Marks. The question paper and semester exam will consist of two sections A and B. Section A will carry 36 Marks and consist of 5 questions, out of which student will be required to attempt any three questions. Section B will comprise of one or more cases / problems worth 24 marks.

Course Outcomes

1. Help the learners to determine what action or life is best to door 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.

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

Shri Vaishnav Institute of Computer Applications

Name of the Program: BSC (Data Science)

COURSE CODE	CATEGORY	COURSE NAME	TEACHING&EVALUATIONSCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	TwoTerm Exam	Teachers Assessment*	ENDSEM UniversityExam	Teachers Assessment*				
BBAI501	AECC	Human Values and Professional Ethics	60	20	20	-	-	4	-	-	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical: **C** - Credit; **AECC**- Ability Enhancement Compulsory Course

***TeacherAssessment**shallbebasedonfollowingcomponents:Quiz/Assignment/Project/Participationin Class,giventhatnocomponentshallexceedmorethan10marks.

COURSE CONTENTS

UNITI: Human Value

1. Definition, Need for Human Values, Sources of Values
2. Essence of Values
3. Classification of Values (Temporal Values, Universal Values)
4. Values Across Culture

UNIT II: Morality

1. Morality its meaning and definition
2. Values Vs Ethics Vs Morality
3. Concept of Impression Management
4. Impression Management Strategies (Intimidation, Ingratiation, Self-promotion, Supplication, Exemplification)

UNIT III: Leadership in Indian Ethical Perspective.

1. Leadership, Pre-requisites of Leadership
2. Approaches to Leadership, Leadership Styles
3. Ethical Leadership
4. Values in Leadership

Chairperson	**Chairperson**	**Controller of Examination**	**Joint Registrar**
Board of Studies	**Faculty of Studies**	**Shri Vaishnav Vidyapeeth**	**Shri Vaishnav Vidyapeeth**
Shri Vaishnav Vidyapeeth	**Shri Vaishnav Vidyapeeth**	**Vishwavidyalaya, Indore**	**Vishwavidyalaya, Indore**
Vishwavidyalaya, Indore	**Vishwavidyalaya, Indore**		

Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Shri Vaishnav Institute of Computer Applications

Name of the Program: BSC (Data Science)

COURSE CODE	CATEGORY	COURSE NAME	TEACHING&EVALUATIONSCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	TwoTerm Exam	Teachers Assessment*	ENDSEM UniversityExam	Teachers Assessment*				
BBAI501	AECC	Human Values and Professional Ethics	60	20	20	-	-	4	-	-	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical: **C** - Credit; **AECC-** Ability Enhancement Compulsory Course

*__Teacher Assessment__ shall be based on following components: Quiz/ Assignment/ Project/ Participation in Class, given that no component shall exceed more than 10 marks.

UNIT IV: Business Ethics

1. Business Ethics its meaning and definition
2. Relevance of Ethics in Business organizations.
3. Theories of Ethics(Teleological, Deontological)
4. Code of Ethics

UNIT V: Globalization and Ethics

1. Globalization and Business Changes
2. Values for Global Managers
3. Corporate Social Responsibility
4. Benefits of Managing Ethics in Work Place.

Suggested Readings:

1. Kaur,T.(2004).***Values and Ethics in Management.*** Galgotia Publishing Company: New Delhi
2. Kauhal, S.L.(2006). ***Business Ethics. Concepts, CrisisandSolutions.*** Deep & Deep Publications Pvt. Ltd.: New Delhi
3. Beteille, Andre (1991).***Society and Politicsin India***. Athlone Press: New Jersey.
4. Chakraborty, S.K.(1999).***Values and Ethics for Organizations***. Oxford University Press
5. Fernando, A.C. (2009). ***Business Ethics - An Indian Perspective*** .India: Pearson Education: India.

Chairperson	Chairperson	Controller of Examination	Joint Registrar
Board of Studies	Faculty of Studies	Shri Vaishnav Vidyapeeth	Shri Vaishnav Vidyapeeth
Shri Vaishnav Vidyapeeth	Shri Vaishnav Vidyapeeth	Vishwavidyalaya, Indore	Vishwavidyalaya, Indore
Vishwavidyalaya, Indore	Vishwavidyalaya, Indore		

Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Shri Vaishnav Institute of Computer Applications

Name of the Program: BSC (Data Science)

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