



SRI VENKATESWARA UNIVERSITY
II Year Syllabus for 4-Year UG Honours in BCA. (Artificial Intelligence & Data Science) as Major
in consonance with the Curriculum framework w.e.f. AY 2026-27
II Year III Semester

Sl. No.	Category	Course No.	Course Name	No. of Hours		Total No. of Hours	No. of Credits		Total No. of Credits
				Theory	Practical		Theory	Practical	
1	Major-Core	5	Mathematical and Statistical Foundation	5	0	5	4	0	4
2	Major-Core	6	OOPS Through JAVA	3	2	5	3	1	4
3	Major-Core	7	Introduction to AI & DS	3	2	5	3	1	4
4	Minor	1		4	0	4	4	0	4
5	AECC	1	English	4	0	4	3	0	3
6	AECC	1	MIL (Telugu/Hindi/Sanskrit)	4	0	4	3	0	3
7	MDC	2	-	2	0	2	2	0	2
8	SEC	3	SEC: Design Thinking/Problem solving/ others	2	0	2	2	0	2
				27	4	31	24	2	26

Note:

The number of instructional hours shall be five (5) for courses involving problem-solving, and four (4) for courses comprising only theory.


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Year	Semester	Course	Title of the Course	No. of Hrs /Week	No. of Credits
II	III	5	Mathematical and Statistical Foundation	5	4
		6	OOPS Through JAVA	3	3
			OOPS Through JAVA – Practical	2	1
		7	Introduction to AI & DS	3	3
			Introduction to AI & DS – Practical	2	1


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BCA. (Artificial Intelligence & Data Science)

II Year III Semester

COURSE 7 : Introduction to Artificial Intelligence and Data Science

Theory

Credits: 3

3 hrs/week

Learning Outcomes: Upon successful completion of the course, a student will be able to:

1. Understand the evolutions of AI.
2. Explain how data is collected, managed and stored for data science.
3. Understand the key concepts in data science, including their real-world applications and the toolkit used by data scientists.
4. Understand the R language constructs.
5. Using R language constructs to solve problems.

UNIT-I

Introduction to AI: Definition of AI, Features, Advantages and Disadvantages of AI, The AI Problems, The Underlying Assumption, what is an AI Technique, The Level of the Model, and Criteria for Success. Problems, Problem spaces: Defining the problem as a state space search, production systems, problem characteristics, and issues in the design of search programs.

UNIT-II

Expert System: What is Expert system, When to use an Expert system, advantages and disadvantages of using Expert system, Components of Expert System, Representing and using Domain Knowledge, Reasoning with knowledge, Expert System Shells, Knowledge acquisition and knowledge base construction.

UNIT-III

Data Science: Data Science in big data world Definition, facets of data, the data science process: Overview, defining research goals and creating a project, retrieving data, cleansing, integrating, and transforming data, exploratory data analysis, building the models, presenting findings and building applications.

UNIT-IV

Machine Learning: Definition, Applications of machine learning in data science, Types of Machine Learning (Degree) - supervised learning, semi supervised learning, unsupervised learning, Linear regression, Decision Tree classifier – constructing decision Tree, Bayes Theorem

UNIT-V

R-Programming: History and Overview of R, R Nuts and Bolts, Getting Data In and Out of R, Subsetting R Objects, Control Structures.

Text Books:

1. Elaine Rich, Kevin Knight, & Shiva shankar B Nair, Artificial Intelligence, McGraw Hill, 3rd ed., 2009
2. Introducing Data Science by Davy Cielen, Arno D.B. Meysman and Mohamed Ali, Published by Manning
3. Roger D. Peng, "R Programming for Data Science" Lean Publishing, 2015

Reference Books:

1. Cathy O'Neil and Rachel Schutt, Doing Data Science, Straight Talk from The Frontline O'Reilly.
2. Jure Leskovek, Anand Rajaraman and Jeffrey D.Ullman, Mining of Massive Datasets.v2.1, Cambridge University Press.

V. Co-Curricular Activities:

a) Suggested Co-Curricular Activities: (Co-curricular activities shall not promote

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copying from textbook or from others work and shall encourage self/independent and group learning)

A. Measurable

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)
2. Student seminars (on topics of the syllabus and related aspects (individual activity))
3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams))
4. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity))

B. General

1. Group Discussion

2. Others

RECOMMENDED CONTINUOUS ASSESSMENT METHODS: Some of the following suggested assessment methodologies could be adopted:

1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Programming exercises,
4. Practical assignments and laboratory reports,
5. Observation of practical skills,
6. Individual and group project reports.
7. Efficient delivery using seminar presentations,
8. Viva voce interviews.
9. Computerized adaptive testing, literature surveys and evaluations,
10. Peers and self-assessment, outputs form individual and collaborative work


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SEMESTER-III

COURSE 7: Introduction to Artificial Intelligence and Data Science		
Practical	Credits: 1	2hrs/week

List of Experiments:

1. Write and implement algorithms for search techniques
2. Write and implement algorithm for Decision Tree classification.
3. Write and implement algorithm for Navie Bayes.
4. Write Steps to Installation of R language
5. Getting data into R, Basic data manipulation, Loading Data into R
6. Write program in R to import the data from outside of the sources.
7. Write a program in R. To compute the Mean and Variance.
8. write a program in R. compute the add two values.
9. write a program in R. Compute the Arithmetic operations.
10. write a program in R. Find area of rectangle and also find perimeter.


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BCA. (Artificial Intelligence & Data Science)

II Year III Semester

COURSE 7 : Introduction to Artificial Intelligence and Data Science

Time : 3 Hrs

Max Marks : 75

SECTION - A

Answer any FIVE of the following

5 X 3= 15 Marks

1. Short answer question from unit-I
2. Short answer question from unit-I
3. Short answer question from unit-II
4. Short answer question from unit-II
5. Short answer question from unit-III
6. Short answer question from unit-III
7. Short answer question from unit-IV
8. Short answer question from unit-IV
9. Short answer question from unit-V
10. Short answer question from unit-V

SECTION-B

Answer FIVE of the following.

5 X 12=60 Marks

11. a) Essay question from Unit-I
OR
b) Essay question from Unit-I
12. a) Essay question from Unit-II
OR
b) Essay question from Unit-II
13. a) Essay question from Unit-III
OR
b) Essay question from Unit-III
14. a) Essay question from Unit-IV
OR
b) Essay question from Unit-IV
15. a) Essay question from Unit-V
OR
b) Essay question from Unit-V

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