Faculty of Vocational Studies

SYLLABUS FOR

Bachelor of Vocation

(Artificial Intelligence and Data Science)

(Semester I-VI)

(Under Credit Based Continuous Evaluation Grading System)

Session: 2025-26

The Heritage Institution

KANYA MAHA VIDYALAYA JALANDHAR

(Autonomous)

PROGRAMME SPECIFIC OUTCOMES

On successful completion of the B.Voc. Programme (Artificial Intelligence and Data Science) students will be able to:

PS 01: Get knowledge about various practical and professional tools required for data entry.

PS 02: Get knowledge about document writing and technical writing concepts

PS 03: Professional development in the field of AI and Data Science

PS 04: Get knowledge about basic and advanced data science tools (e.g, Python, R and Tableau) while working collaboratively on real-world problems.

PS 05: Get knowledge about methods to collect, organize, manage, examine, prepare, analyze, cleaning, transformation, modelling and visualize data on student-driven data analysis projects.

PS 06: Learn about the working of Neural Networks, advanced AI and Machine Learning Algorithms, Natural Language Processing etc.

PS 07: Learn about managing a Project, steps to perform effective research and make a major project on the basis of their learnings.

Scheme and Curriculum of Examinations of Three-Year Degree Programme

Bachelor of Vocation

(Artificial Intelligence and Data Science) Semester I

Session 2025-2026

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester I									
Course Code	**Course Title**	**Course Type**	**Credits**		**Marks**				**Examination time (in hours)**
					Total	**Ext.**		**CA**	
			L-T-P	**Total**		**L**	**P**		
BVIL-1421/ BVIL-1031/ BVIL-1431	Punjabi (Compulsory)/ [1]Basic Punjabi/ [2]Punjab History and Culture	C	4-0-0	4	100	70	-	30	3
BVIM-1102	Communication Skills in English-I	AEC	3-0-1	4	100	50	20	30	3
BVIL-1113	Introduction to Computers and Information Technology	S	2-0-0	2	50	35	-	15	3
BVIL-1114	Introduction to Artificial Intelligence and Data Science	S	3-0-0	3	100	70	-	30	3
BVIL-1115	Office Fundamentals	S	2-0-0	2	50	35	-	15	3
BVIM-1116	Computational Problem Solving-I	S	2-0-2	4	100	35	35	30	3+3
BVIP-1117	Lab in Office Fundamentals	S	0-0-3	3	100	-	70	30	3
BVII-1118	Assignment based on Spreadsheet	S	0-2-2	4	100	-	70	30	3
USEP-0001	Entrepreneurship Mindset Level-I	S	0-0-2	2	50	-	50	-	
VACF-I491	*Foundation Course	VAC	2-0-0	2	50	35	-	15	1
Total				30					

Note: C – Compulsory S – Skill Enhancement VAC-Audit Course

*Credits/Grade points or grades of these courses will not be included in SGPA/CGPA of the Semester/Programme

Scheme and Curriculum of Examinations of Three-Year Degree Programme

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester II

Session 2025-2026

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester II									
Course Code	**Course Title**	**Course Type**	**Credits**		**Marks**				**Examination time (in hours)**
					Total	**Ext.**		**CA**	
			L-T-P	**Total**		**L**	**P**		
BVIL-2421/ BVIL-2031/ BVIL-2431	Punjabi (Compulsory)/ [1]Basic Punjabi/ [2]Punjab History and Culture	C	4-0-0	4	100	70	-	30	3
BVIM-2102	Communication Skills in English-II	AEC	3-0-1	4	100	50	20	30	3+3
BVIL-2113	Computational Problem Solving-II	S	3-0-0	3	100	70	-	30	3
BVIL-2114	Mathematical Foundation	C	2-0-0	2	50	35	-	15	3
BVIL-2115	Technical Writing	S	3-0-0	3	100	70		30	3
BVIL-2116	Data Collection and Analysis	S	2-0-0	2	50	35	-	15	3
BVIM-2117	Relational Database Management System	S	2-0-2	4	100	35	35	30	3+3
BVIP-2118	Computational Problem-Solving Lab	S	0-0-4	4	100	-	70	30	3
BVII-2119	Assignment based on Skill Development	S	0-0-2	2	50	-	35	15	3
USEP-0002	Entrepreneurship Mindset Level-II	SEC	0-0-2	2	50	-	50	-	-
VACD-2161	*Drug Abuse and Ethical Education	VAC	4-0-0	4	100	70	-	30	3
Total				34	900				

Note: C – Compulsory S – Skill Enhancement VAC-Audit Course

*Credits/Grade points or grades of these courses will not be included in SGPA/CGPA of the Semester/Programme

Scheme and Curriculum of Examinations of Three-Year Degree Programme

Bachelor of Vocation(Artificial Intelligence and Data Science) Semester III
Session 2025-2026

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester III									
Course Code	**Course Title**	**Course Type**	**Credits**		**Marks**				**Examination time (in hours)**
					Total	**Ext.**		**CA**	
			L-T-P	**Total**		**L**	**P**		
BVIL-3111	Statistical Inference-I	C	4-0-0	4	100	80		20	3
BVIL-3112	Data Mining and Data Warehousing	S	4-0-0	4	100	80		20	3
BVIL-3113	Data Processing and Visualization	S	2-0-0	2	50	40		10	3
BVIL-3114	Workplace Management	C	2-0-0	2	50	40		10	3
BVIL-3115	Machine Learning-I	S	3-0-0	3	75	60		15	3
BVIP-3116	Lab on Data Processing and Visualization	S	0-0-2	2	50		40	10	3
BVIP-3117	Data Storytelling and Presentation	C	0-0-4	4	100		80	20	3
BVIP-3118	Lab on Machine Learning-I	S	0-0-3	3	75		60	15	3
BVII-3119	Assignment based on Visual Insights	S	0-0-4	4	100		80	20	3
SECP-3512	*Personality Development	AC	2-0-0	2	25	20		5	1
Total				30					

Note: C – Compulsory S – Skill Enhancement VAC-Audit Course

*Credits/Grade points or grades of these courses will not be included in SGPA/CGPA of the Semester/Programme

Scheme and Curriculum of Examinations of Three-Year Degree Programme

Bachelor of Vocation(Artificial Intelligence and Data Science) Semester IV
Session 2025-2026

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester IV									
Course Code	**Course Title**	**Course Type**	**Credits**		**Marks**				**Examination time (in hours)**
					Total	**Ext.**		**CA**	
			L-T-P	**Total**		**L**	**P**		
BVIL-4111	Statistical Inference-II	C	4-0-0	4	100	70	-	30	3
BVIL-4112	Applied Statistical Programming	S	4-0-0	4	100	70	-	30	3
BVIL-4113	Non-Relational Databases	S	3-0-0	3	100	70	-	30	3
BVIL-4114	Entrepreneurship Basics	C	2-0-0	2	50	35	-	15	3
BVIP-4115	Applied Statistical Programming Lab	S	0-0-4	4	100	-	70	30	3
BVIP-4116	Lab on Non-Relational Databases	S	0-0-3	3	100	-	70	30	3
BVII-4117	Assignment based on Unstructured Data Analysis using MongoDB and Python	S	0-0-4	4	100	-	70	30	3
VACE-4221	*Environmental Studies (Compulsory)	VAC	2-0-0	2	50	35	-	15	3
VACM-4502	Moral Education	VAC	0-0-2	2	50	35	-	15	1
Total				28					

Note: C – Compulsory S – Skill Enhancement VAC-Audit Course

*Credits/Grade points or grades of these courses will not be included in SGPA/CGPA of the Semester/Programme

Scheme and Curriculum of Examinations of Three-Year Degree Programme

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester V

Session 2025-2026

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester V									
Course Code	**Course Title**	**Course Type**	**Credits**		**Marks**				**Examination time (in hours)**
					Total	**Ext.**		**CA**	
			L-T-P	**Total**		**L**	**P**		
BVIL-5111	Research Methodology	C	3-0-0	3	75	60	-	15	3
BVIL-5112	Principles of Artificial Intelligence	C	4-0-0	4	75	60		15	3
BVIL-5113	Machine Learning-II	S	4-0-0	4	75	60		15	3
BVIL-5114	Soft Computing	S	4-0-0	4	75	60		15	3
BVIL-5115	Project Management	C	3-0-0	3	50	40		10	3
BVIP-5116	Lab on Machine Learning-II	S	0-0-4	4	75		60	15	3
BVII-5117	Assignment based on Predictive Analysis	S	0-0-6	6	100		80	20	3
SECI-5541	Innovation, Entrepreneurship and Creative Thinking	AC	2-0-0	2	25	20	-	5	1
Total				30					

Note: C – Compulsory S – Skill Enhancement AC-Audit Course

*Credits/Grade points or grades of these courses will not be included in SGPA/CGPA of the Semester/Programme

Scheme and Curriculum of Examinations of Three-Year Degree Programme

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester VI

Session 2025-2026

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester VI									
Course Code	**Course Title**	**Course Type**	**Credits**		**Marks**				**Examination time (in hours)**
					Total	**Ext.**		**CA**	
			L-T-P	**Total**		**L**	**P**		
BVIL-6111	Introduction to Blockchain Technology	C	4-0-0	4	100	80	-	20	3
BVIL-6112	Deep Learning	C	4-0-0	4	100	80		20	3
BVIL-6113	Business Intelligence	C	4-0-0	4	100	80		20	3
BVIP-6114	Lab on Deep Learning	S	0-0-4	4	100	-	80	20	3
BVID-6115	Major Project	S	0-0-8	8	200	-	200	-	3
Total				24					

Note: C – Compulsory S – Skill Enhancement AC-Audit Course

*Credits/Grade points or grades of these courses will not be included in SGPA/CGPA of the Semester/Programme

Session-2025-26

BACHELOR OF VOCATION (RETAIL MANAGEMENT)/ BACHELOR OF VOCATION (MANAGEMENT AND SECRETARIAL PRACTICES)/ BACHELOR OF VOCATION (ANIMATION)/ BACHELOR OF VOCATION (NUTRITION EXERCISE AND HEALTH))/ BACHELOR OF VOCATION (BEAUTY AND WELLNESS)/BACHELOR OF VOCATION(HOSPITALITY AND TOURISM)/ BACHELOR OF VOCATION(ARTIFICIAL INTELLIGENCE AND DATA SCIENCE) Semester I

Punjabi (Compulsory)

COURSE CODE-BVRL/BVML/BVAL/ BVNL/BVBL/BVHL/BVIL-1421

COURSE OUTCOMES

CO1: **nksw nBksw' g[[[;se d/ eftsk Gkr Bz{ gVQkT[D dk wB'oE ftfdnkoEhnK nzdo eftsk gqsh fdbu;gh, ;{M Bz{ g?dk eoBk j? sK fe T[j nkX[fBe d"o ftu uZb ojhnK ekft XkoktK ns/ ethnK pko/ frnkB jkf;b eo ;eD.fJ; dk j'o wB'oE eftsk dh ftnkfynk, ftPb/PD s/ w[bzeD dh gqfefonk s'A ikD{ eokT[Dk th j? sK fe T[j ;wekbh ;wki dhnK ;wZf;nktK Bz{ ;wM ;eD ns/ nkb'uBkswe fdqPNh pDk ;eD.**

CO2: wzu xo g[[[;se B{z f;b/p; ftu Pkfwb eo e/ ftfdnkoEhnK nzdo gVQD dh o[uh Bz{ g?dk eoBk j? ns/ w[ZbtkB frnkB d/Dk j?.

CO3: g?oQk ouBk ns/ g?oQk gVQ e/ gqPBK d/ T[so d/D dk wB'oE ftfdnkoEhnK dh p[ZXh Bz{ shyD eofdnK T[BK dh fbyD gqfsGk B{z T[ikro eoBk j?.

CO4: GkPk tzBrhnKLGkPk dk Ne;kbh o{g, GkPk ns/ T[gGkPk ftubk nzso, gzikph T[gGkPktK d/ gSkD fuzBQ, gzikph GkPk fBek; s/ ftek; gVQD Bkb ftfdnkoEh X[BhnK dh T[ukoB gqDkbh s'A tke| j'Dr/.

Session-2025-26

BACHELOR OF VOCATION (RETAIL MANAGEMENT)/ BACHELOR OF VOCATION (MANAGEMENT AND SECRETARIAL PRACTICES)/ BACHELOR OF VOCATION (ANIMATION)/ BACHELOR OF VOCATION (NUTRITION EXERCISE AND HEALTH))/ BACHELOR OF VOCATION (BEAUTY AND WELLNESS)/BACHELOR OF VOCATION(HOSPITALITY AND TOURISM)/ BACHELOR OF VOCATION(ARTIFICIAL INTELLIGENCE AND DATA SCIENCE) Semester I

Punjabi (Compulsory)

COURSE CODE-BVRL/BVML/BVAL/BVNL/BVBL/BVHL/BVIL-1421

;wK L 3 xzN/ **Maximum Marks :100**

L-T-P **Theory : 80**

4-0-0 **CA : 20**

nze tzv ns/ gohfyne bJh jdkfJsK

1H gqPB gZso d/ uko ;?ePB j'Dr/.;?ePB A-D sZe d/ gqPB :{fBN I-IV ftu'A g[ZS/ ikDr/. jo ;?ePB ftu d' gqPB g[ZS/ ikDr/.

2H ftfdnkoEh B/ eZ[b gzi gqPB eoB/ jB. jo ;?ePB ftu'A fJe gqPB eoBk bkIwh j?. gzitK gqPB fe;/ th ;?ePB ftu'A ehsk ik ;edk j?.

3H jo/e gqPB d/ 16 nze jB.

4H g/go ;?ZN eoB tkbk i/eo ukj/ sK gqPBK dh tzv nZr'A tZX s'A tZX uko T[g gqPBK ftu eo ;edk j?.

gkmeqw ns/ gkm g[;seK

:{fBN-I

nksw nBksw (eftsk Gkr),(;zgH ;[fjzdo pho ns/ tfonkw f;zx ;zX{) r[o{ BkBe d/t :{Bhtof;Nh, nzfwqs;o.

gq'Hg{oB fz;zx,gq'Hw'jB f;zx,nzfwqsk gqhsw,irsko,;[oihs gkso(eth gkm eqw dk fjZ;k jB)

(ਪ੍ਰਸੰਗ ਸਹਿਤ ਹਿਆਹਿਆ/ ਸਾਰ/ftPk t;s{) **16 nze**

:{fBN-II

wzu xo

vkH e[bdhg f;zx Xho, vkH fjod/ihs f;zx G'rb (;zgkH), r[o{ BkBe d/t :{Bhtof;Nh,nzfwqs;o.

(ftPk t;s{, ਸਾਰ ,gkso fusoB)

16 nze

:{fBN-III

(ઉ) g?oQk ouBk

(ઋ) g?oQk gVQ e/ gqPBK d/ T[so. 16 nze

:{fBN-IV

GkPk tzBrhnKL

GkPk dk Ne;kbh o{g, GkPk ns/ T[gGkPk ftubk nzso, gzikph T[gGkPktK d/ gSkD fuzBQ, gzikph GkPk fBek; s/ ftek;

16 nze

BACHELOR OF VOCATION (RETAIL MANAGEMENT)/ BACHELOR OF VOCATION (MANAGEMENT AND SECRETARIAL PRACTICES)/ BACHELOR OF VOCATION (ANIMATION)/ BACHELOR OF VOCATION (NUTRITION EXERCISE AND HEALTH))/ BACHELOR OF VOCATION (BEAUTY AND WELLNESS)/BACHELOR OF VOCATION(HOSPITALITY AND TOURISM)/ BACHELOR OF VOCATION(ARTIFICIAL INTELLIGENCE AND DATA SCIENCE) Semester I

BASIC PUNJABI

COURSE CODE-BVRL/BVML/BVAL /BVNL/BVBL /BVHL/BVIL-1031

Course outcomes

Course outcomes

CO1:w[ZYbh gzikph gVQkT[D dk wB'oE ftfdnkoEhnK B{z gzikph GkPk B{z f;ykT[D dh gqfefonk ftu gk e/ fJe j'o GkPk f;ZyD dk w"ek gqdkB eoBk j?. ftfdnkoEhnK B{z g?Ash nZyoh, nZyo eqw, g?o fpzdh tkb/ toD ns/ g?o ftu g?D tkb/ toD ns/ wksoktK (wZ[Ybh ikD gSkD) brk\o (fpzdh, fNZgh, nZXe) dh gSkD ns/ tos'A s'A ikD{ eotkfJnk ikt/rk.

CO2: ftfdnkoEhnK B{z gzikph Ppd pDso dh wZ[Ybh ikD gSkD (;kXkoB Ppd, ;z:[es Ppd, fwPos Ppd,w{b Ppd,nr/so ns/ fgS/so) s'A ikD{ eotkfJnk ikt/rk.

CO3: ftfdnkoEhnK B{z fBZs tos'A dh gzikph Ppdktbh L pkIko, tgko, foPs/ Bks/, y/sh ns/ j'o XzfdnK nkfd s'A ikD{ eotkfJnk ikt/rk.

CO4: ftfdnkoEhnK B{z gzikph ftu j|s/ d/ ;Zs fdBK d/ BK, pkoQK wjhfBnK d/ BK, oZ[sK d/ BK, fJe s'A ;" sZe frDsh PpdK ftu f;ykT[Dk j?.

Session-2025-26

BACHELOR OF VOCATION (RETAIL MANAGEMENT)/ BACHELOR OF VOCATION (MANAGEMENT AND SECRETARIAL PRACTICES)/ BACHELOR OF VOCATION (ANIMATION)/ BACHELOR OF VOCATION (NUTRITION EXERCISE AND HEALTH))/ BACHELOR OF VOCATION (BEAUTY AND WELLNESS)/BACHELOR OF VOCATION(HOSPITALITY AND TOURISM)/ BACHELOR OF VOCATION(ARTIFICIAL INTELLIGENCE AND DATA SCIENCE) Semester I

BASIC PUNJABI

COURSE CODE-BVRL/BVML/BVAL/ BVNL/BVBL/ /BVHL/BVIL-1031

smW: 3 GMty **Maximum Marks : 100**

L-T-P **Theory : 70**

4-0-0 **CA : 30**

nze tzv ns/ gohfyne bJh jdkfJsK

1H gqPB gZso d/ uko ;?ePB j'Dr/.;?ePB A-D sZe d/ gqPB :{fBN I-IV ftu'A g[ZS/ ikDr/. jo ;?ePB ftu d' gqPB g[ZS/ ikDr/.

2H ftfdnkoEh B/ eZ[b gzi gqPB eoB/ jB. jo ;?ePB ftu'A fJe gqPB bkIwh j?. gzitK gqPB fe;/ th ;?ePB ftu'A ehsk ik ;edk j?.

3H jo/e gqPB d/ 14 nze jB.

4H g/go ;?ZN eoB tkbk i/eo ukj/ sK gqPBK dh tzv nZr'A tZX s'A tZX uko T[g gqPBK ftu eo ;edk j?.

gkmeqw

:{fBN-I

g?Ash nZyoh, nZyo eqw, g?o fpzdh tkb/ toD ns/ g?o ftu g?D tkb/ toD ns/ wksoktK (wZ[Ybh ikD gSkD) brkyo (fpzdh, fNZgh, nZXe) L gSkD ns/ tos'A .

14 nze

:{fBN-II

gzikph Ppd pDso L wZ[Ybh ikD gSkD (;kXkoB Ppd, ;z:[es Ppd, fwPos Ppd, w{b Ppd, nr/so ns/ fgS/so) **14 nze**

:{fBN-III

fBZs tos'A dh gzikph Ppdktbh L pkIko, tgko, foPs/ Bks/, y/sh ns/ j'o XzfdnK nkfd Bkb ;zpzXs. **14 nze**

:{fBN-IV

j|s/ d/ ;Zs fdBK d/ BK, pkoQK wjhfBnK d/ BK, oZ[sK d/ BK, fJe s'A ;" se frDsh PpdK ftu .

14 nze

Course Title: Punjab History and Culture (From Earliest Times to C. 320)
(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)

Course Code: BVRL-1431/ BVAL-1431/BVNL-1431/BVBL-1431/BVIL -1431/ BVHL-1431

COURSE OUTCOMES:

After completing Semester-I and course on Punjab History and Culture students of History will be able to identify and have a complete grasp on the sources & writings of Ancient Indian History of Punjab.

CO1: Identify and understand the sources and physical features of Punjab

CO 2: To study the earliest civilisation (Indus Valley Civilization) and original home of Aryans

CO 3:To examine the Social, Religious and Economic life during Early and Later Vedic Age

CO 4: To comprehend the Buddhist, Jain and Hindu faith and their relevance in the modern times

Course Title: Punjab History and Culture (From Earliest Times to C. 320)

(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)

Course Code: BVRL-1431/BVAL-1431/BVNL-1431/BVBL-1431/BVIL - 1431/BVHL-1431

Examination Time: 3 Hours
Credits L-T-P: 4-0-0
Contact Hours: 4 Hrs/Week

Max. Marks: 100
Theory: 70
CA: 30

Instructions for the Paper Setter:

1. Question paper shall consist of four Units
2. Examiner shall set 8 questions in all by selecting Two Questions of equal marks from each Unit.
3. Candidates shall attempt 5 questions in 1000 words, by at least selecting One Question from each Unit and the 5th question may be attempted from any of the four Units.
4. Each question will carry 14 marks

Unit-I

1. Physical features of the Punjab

2. Sources of the ancient history of Punjab

Unit-II

3. Harappan Civilization: social, economic and religious life of the Indus Valley People.

4. The Indo-Aryans: Original home

Unit-III

5. Social, Religious and Economic life during Early Vedic Age.

6. Social, Religious and Economic life during Later Vedic Age.

UNIT-IV

7. Teachings of Buddhism

8. Teachings of Jainism

Suggested Readings

- B.N. Sharma, *Life in Northern India*, Delhi. 1966
- BudhaParkash, *Glimpses of Ancient Punjab*, Patiala, 1983.
- Chopra, P.N., Puri, B.N., & Das, M.N.(1974). *A Social, Cultural & Economic History*
- L. M Joshi (ed.), *History and Culture of the Punjab*, Art-I, Patiala, 1989 (3rd edition)
- L.M. Joshi and Fauja Singh (ed.), *History of Punjab*, Vol.I, Patiala 1977.
  of India, Vol. I, New Delhi: Macmillan India.

BACHELOR OF VOCATION (RETAIL MANAGEMENT) / BACHELOR OF VOCATION
(ANIMATION)/ BACHELOR OF VOCATION (NUTRITION EXERCISE & HEALTH)/ BACHELOR
OF VOCATION (BEAUTY & WELLNESS) /BACHELOR OF VOCATION (ARTIFICIAL
INTELLIGENCE AND DATA SCIENCE)/ BACHELOR OF VOCATION (HOSPITALITY AND

TOURISM)

(Semester I)

Session 2025-26

COMMUNICATION SKILLS IN ENGLISH- I

(Theory)

Course Code: BVRL/BVML/BVAL/BVTL/BVNL/BVBL/BVAI/BVHL -1102

COURSE OUTCOMES

At the end of this course, the students will develop the following Skills:

CO 1: Reading skills that will facilitate them to become an efficient reader

CO 2: Through reading skills, the students will have an ability to have a comprehensive understanding of the ideas in the text and enhance their critical thinking

CO 3: Writing skills of students which will make them proficient enough to express ideas in clear and grammatically correct English

CO 4: The skill to use an appropriate style and format in writing letters (formal and informal) and resume, memo, notices, agenda, minutes

BACHELOR OF VOCATION (RETAIL MANAGEMENT) / BACHELOR OF VOCATION
(ANIMATION)/ BACHELOR OF VOCATION (NUTRITION EXERCISE & HEALTH)/ BACHELOR

OF VOCATION (BEAUTY & WELLNESS) /BACHELOR OF VOCATION (ARTIFICIAL INTELLIGENCE AND DATA SCIENCE)/ BACHELOR OF VOCATION (HOSPITALITY AND

TOURISM)

(Semester I)

Session 2025-26

COMMUNICATION SKILLS IN ENGLISH - I

(Theory)

Course Code: BVRM/BVMM/BVAM/BVTM/BVNM/BVBM/BVAM/BVHM -1102

Examination Time: 3 Hrs **Total Marks: 100**

L-T-P (Credits): 3-0-1

Theory: 50

Practical: 20

CA: 30

Instructions for the paper setter and distribution of marks:

The question paper will consist of four sections. The candidate will have to attempt five questions in all selecting one from each section and the fifth question from any of the four sections. Each question will carry 10 marks. Each question can be sub divided into two parts.
(10 x 5 = 50)

Section-A: Two questions of theoretical nature will be set from Unit I.
Section-B: Two comprehension passages will be given to the students from Unit II.
Section-C: Two questions will be given from Unit III.
Section-D: Two questions will be set from Unit IV.

BACHELOR OF VOCATION (RETAIL MANAGEMENT) / BACHELOR OF VOCATION (ANIMATION)/ BACHELOR OF VOCATION (NUTRITION EXERCISE & HEALTH)/ BACHELOR OF VOCATION (BEAUTY & WELLNESS) /BACHELOR OF VOCATION (ARTIFICIAL INTELLIGENCE AND DATA SCIENCE)/ BACHELOR OF VOCATION (HOSPITALITY AND TOURISM)

Course Code: BVRM/ /BVAM/ /BVNM/BVBM/BVAM/BVHM -1102

(Semester I)
Session 2025-26

Unit I

Reading Skills: Reading Tactics and strategies; Reading purposes–kinds of purposes and associated comprehension; Reading for direct meanings.

Unit II

Reading for understanding concepts, details, coherence, logical progression and meanings of phrases/ expressions.

Activities:

- Comprehension questions in multiple choice format
- Short comprehension questions based on content and development of ideas

Unit III

Writing Skills: Guidelines for effective writing; writing styles for application, personal letter, official/ business letter.

Activities:

- **Formatting personal and business letters.**
- **Organizing the details in a sequential order**

Unit IV

Resume, memo, notices, agenda, minutes, Tips for effective blog writing

Activities:

- Converting a biographical note into a sequenced resume or vice-versa
- Ordering and sub-dividing the contents while making notes.
- Writing notices for circulation/boards
- Writing blogs

Recommended Books:

1) Oxford Guide to Effective Writing and Speaking by JohnSeely.
2) Business Communication, by Sinha, K.K. Galgotia Publishers, 2003.
3) Business Communication by Sethi, A and Adhikari, B., McGraw Hill Education2009.
4) Communication Skills by Raman, M. & S. Sharma, OUP, New Delhi, India (2011).

(2/2)

BACHELOR OF VOCATION (RETAIL MANAGEMENT) / BACHELOR OF VOCATION (ANIMATION)/ BACHELOR OF VOCATION (NUTRITION EXERCISE & HEALTH)/ BACHELOR OF VOCATION (BEAUTY & WELLNESS) /BACHELOR OF VOCATION (ARTIFICIAL INTELLIGENCE AND DATA SCIENCE)/ BACHELOR OF VOCATION (HOSPITALITY AND TOURISM)

Course Code: BVRM/ /BVAM/ /BVNM/BVBM/BVAM/BVHM -1102

(Semester I)

Session 2025-26

PRACTICAL / ORAL TESTING

Time: 3 hours
Marks: 20

Course Contents:

1. Oral Presentation with/without audio visual aids (10 Marks)
2. Group Discussion
(05 Marks)
3. Practical File
(05 Marks)

Questions:

1. Oral Presentation will be of 5 to 7 minutes duration. (Topic can be given in advance or it can be of student's own choice). Use of audio-visual aids is desirable.
2. Group discussion comprising 8 to 10 students on a familiar topic. Time for each group will be 15 to 20 minutes.

Bachelor of Vocation (Artificial Intelligence and Data Science) - Semester I

Course Code: BVIL-1113

Introduction to Computers and Information Technology

COURSE OUTCOMES:

After completing this course, the students will be able to:

CO1: Comprehend fundamentals of Computer and Software

CO2: Describe Information Technology and its Applications

CO3: Comprehend the concepts of I/O devices and memory.

CO4: Demonstrate the Introduction to Emerging Technologies: Big Data, IoT and Cloud

Bachelor of Vocation (Artificial Intelligence and Data Science) - Semester I

Course Code: BVIL-1113

Introduction to Computers and Information Technology

L - T – P	**Max. Marks: 50**
2-0-0	**Theory: 35**
Time: 3 Hours	**CA: 15**

Instructions for Paper Setter -

Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section. Each Question Carries 7 Marks.

Unit-I

Introduction to Information Technology: Basic concepts of IT, Data Processing: Data and Information.

Introduction to Computers and its Applications:

- Computer as a system, basic concepts, functional units and their interrelation.
- Milestones in Hardware and Software.
- Batch oriented / on–line / real time applications.
- Application of computers.

Unit-II

Software: System and Application Software, Utility packages, Configuration of Computer System.

Applications of Information Technology: Wide range of Applications in: Home, Education and Training, Entertainment, Science, medicine, engineering etc

Unit-III

Input Devices: Keyboard, mouse, pens, touch screens, Bar Code reader, joystick, source data automation, (MICR, OMR, OCR), screen assisted data entry: portable / handheld terminals for data collection, vision input systems.

Output Devices: Monitor, Serial line page printers, plotters, voice response units.

Data Storage Devices and Media: Primary storage (Storage addresses and capacity, type of memory), Secondary storage, Magnetic storage devices and Optical Storage Devices.

Unit-IV

Introduction to Emerging Technologies: Big Data: Characteristics, Architecture, Technologies and Applications, Edge Computing

Cloud: Predecessors technologies, characteristics, service models, Deployment models, benefits and challenges, Third Party Cloud Providers: GCP, AWSS, Introduction to MICROSOFT AZURE

IoT: History, characteristics, applications and Adoption barriers.

References/ Textbooks:

1. P.K.Sinha, "Computer Fundamentals", Sixth Edition, BPB Publications,2004.
2. N. Subramanian, "Introduction to Computers", First Edition, McGraw Hill Education India,2001.
3. Peter Norton, "Introduction to Computers", First Edition, McgrawHill Education,2017.
4. Gurvinder Singh, Rachpal Singh,"Windows Based Computer Courses", Third Edition, Kalyani Publishers,2017

Bachelor of Vocation (Artificial Intelligence and Data Science) - Semester I

Course Code: BVIL-1114

Introduction to Artificial Intelligence and Data Science

COURSE OUTCOMES:

After completing this course, the student will be able to:

CO1: Comprehend the concepts of Artificial Intelligence.

CO2: Demonstrate various concepts of Data Science domain and its difference with Business Intelligence.

CO3: Comprehend Data Science methodologies and steps involved in data analysis.

CO4: Apply learned techniques to solve problem associated with basic statistical operations on Real/Dummy data.

Bachelor of Vocation (Artificial Intelligence and Data Science) - Semester I

Course Code: BVIL-1114

Introduction to Artificial Intelligence and Data Science

L - T – P	**Max. Marks: 100**
3-0-0	**Theory: 70**
Time: 3 Hours	**CA: 30**

Instructions for the paper setter:

Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section. Each Question Carries 14 Marks.

UNIT I

What is AI, How does it works, History of AI, AI- Intelligent Systems, benefits and Risk of AI, Challenges, Opportunities and Applications.AI its applications in data science, Problem Framing

UNIT II

Introduction to Data Science, Evolution of Data science, Need of Data Science, Components of data Science, Data Science Process. Difference between Data Science and Business Intelligence. Application Areas and Challenges in Data Science, Job Roles in Data Science domain

UNIT III

Data Science Methodologies, Steps Involved in Data Analysis (data collection, integration, management, modelling, analysis, visualization, prediction and informed decision making)

UNIT IV

Statistical description of data: Mean, Median and Mode, Measures of Dispersion: Range, Quartile Deviation, Mean Deviation, Standard Deviation

References/ Textbooks:

1. J. Han, M. Kamber and J. Pei , “Data Mining: Concepts and Techniques”, Third Edition, Morgan Kaufmann Publishers,2011.
2. Nong Ye, “Handbook of Data Mining”, First Edition,2003.
3. Anshuman Sharma, “Fundamentals of Numerical Methods and Statistical Techniques”, Second Edition, Lakhanpal Publishers,2014.

Bachelor of Vocation (Artificial Intelligence and Data Science) - Semester I

Course Code: BVIL-1115

Office Fundamentals

COURSE OUTCOMES:

After completing this course, the students will be able to:

CO1: Comprehend basics and formatting concepts of word document.

CO2: Create, customize Tables and working with Graphics in word.

CO3: Comprehend basics of presentation involved in text formatting, graphs and animation.

CO4: Comprehend basics of spreadsheet involved in creation, editing of graphs, sorting, querying and filtering of data.

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Bachelor of Vocation (Artificial Intelligence and Data Science) - Semester I

Course Code: BVIL-1115

Office Fundamentals

L - T – P	**Max. Marks: 50**
2-0-0	**Theory: 35**
Time: 3 Hours	**CA: 15**

Instructions for the Paper Setter

Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section. Each Question Carries 7 Marks.

Unit I

Basics of Word Document: Creating a New Document, Inserting and Deleting Text, Saving a Document, Opening a Document, Selecting and Replacing Text Using Undo, Redo and Repeat Navigating through a Document, Viewing a Document, Working with the Document, Window Viewing Multiple Document, and Windows Previewing and Printing a Document, Closing a Document

Formatting of a Word Document: Drop Caps, Add Shading to Draw Reader's Attention, Steps to Add Borders to a Document, work with Word Styles, Adjust the Horizontal Size of Characters, Insert and Prevent certain types of Page Breaks, Using the Word, Themes To Make a Professional Document look. Steps to Create, Modify or Attach a Template. Add, Edit or Delete Headers and Footers, Toolbars of word.

Unit II

Creating and Customizing Tables: Methods to Create a Table, Steps to Create a Table that has Specific Column Widths. Deleting Column, Row or Entire Table in Word, Creating Table of Contents in word

Working with Graphics: Add, Crop, Change Pictures File Size and Wrap Picture with Text, Discover the Proper Steps to Add and Organize Clip Arts, Manipulating Word Art Effects to the Text

Unit III

Presentation: Introduction to PowerPoint, exploring menus, starting a new slide, saving presentation, moving/rearranging slides, printing slides. Applying theme to presentation, Views (slide View, slide sorter, notes view, outline view), Formatting & enhancing text formatting. Creating a graph, displaying slide show, adding multimedia. Slide transitions, applying Animation, Timing slide display, adding movies & sounds. Using a pick look Wizards to change format.

Unit IV

Spreadsheet: Introduction to Worksheet/Spreads, Features of excel, Describe the excel Window, Creating a new workbook, different functions on different data in excel, creation of graphs, editing it and formatting, changing chart type to 2d chart or 3d chart, pivot table, creation of worksheet, adding, deleting, moving the text in worksheet, linking different sheets, sorting the data, querying the data, filtering the data (auto and advance filters), What-if analysis, To open an already existing workbook, Saving workbook, printing a worksheet, Closing the workbook &exiting.

References/ Textbooks:

1. Joyce Cox, Joan Lambert and Curtis Frye, "Microsoft office Professional 2010 Step by Step", First Edition, Microsoft Press,2010.
2. Bucki Lisa A, "Office 2016 Bible", First Edition, Wiley,2013.
3. Weverka Peter,"Office2016AllinOneforDummies",FirstEdition,WileyIndia,2015.
4. Satish Jain, Kratika, M.Geetha, "MS–Office 2010", First Edition, BPB Publications, 2012.

Bachelor of Vocation (Artificial Intelligence and Data Science) - Semester I

Course Code: BVIM-1116

Computational Problem Solving-I

COURSE OUTCOMES:

After completing this course, the students will be able to:

CO1: Understand the basic concepts and terminology of programming languages.

CO2: Comprehend the concepts of computation problem, data and expressions.

CO3: Demonstrate the usage of algorithms under several categories like list, string, dictionary and control structures.

CO4: Comprehend the concepts of functions and Recursive problem solving.

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester I

Course Code: BVIM-1116

Computational Problem Solving-I

L - T – P	**Max. Marks: 100**
2-0-2	**Theory: 35 Practical:35**
Time: 3 Hours	**CA: 30**

Instructions for Paper Setter –
Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT-I

Basic Programming concepts: Generations of programming languages, Machine language, Assembly language, High level language, Compiler, Interpreter, Assembler, Programming environment**,** Text Editor

UNIT-II

Introduction to Python: Applications and features of Python, Process of Computational Problem

Data and Expressions: Literals, Variables, Identifiers, Keywords, Expressions, Statements and Data Types, Python Operators, Data Types: Numbers, String, List, Tuple, Array, Set, Tuples, Dictionaries

UNIT-III

Control Structures: Selection control, Iterative statements, Jumping statements

UNIT-IV

Functions: Fundamental Concepts, Program Routines, Flow of Execution, Parameters & Arguments, Recursive Functions, Recursive Problem Solving, Iteration vs. Recursion, Basic OOPs concept

References/ Textbooks:

1. Charles Dierbach, "Introduction to Computer Science Using Python: A Computational Problem-Solving Focus", First Edition, John Wiley & Sons, 2013.
2. GUTTAG JOHN V, "Introduction to Computation and Programming Using Python", Second Edition, PHI,2014.
3. Jeeva Jose, Sojan P.Lal, "Introduction to Computing & Problem Solving Through Python", First Edition, Khanna Publishers,2015.
4. Mark J. Guzdial, Barbara Ericson, "Introduction to Computing and Programming in Python", First Edition, Pearson Education,2015.
5. Kenneth Lambert, "Fundamentals of Python", First Edition, Cengage Learning,2015.

6. Mark Lutz, “Learning Python", Fifth Edition, O'Reilly Media,2013.

Bachelor of Vocation (Artificial Intelligence and Data Science) - Semester I

Course Code: BVIP-1117

Lab on Office Fundamentals

COURSE OUTCOMES:

After completing this course, the students will be able to:

CO1: Learn to build and format formal word documents.

CO2: Create and customize Tables and Graphics in word.

CO3: Learn to build professional PowerPoint presentation by using animations and Transitions.

CO4: Understand spreadsheet basics, create graphs, query, filter and analyse data using pivot tables of data.

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Bachelor of Vocation (Artificial Intelligence and Data Science) - Semester I

Course Code: BVIP-1117

Lab on Office Fundamentals

L - T – P	**Max. Marks: 75**
0-0-3	**Practical: 60**
Time: 3 Hours	**CA: 15**

MS WORD

- Text Basics
- Text Formatting and saving file
- Working with Tabs and Indents
- Working with Objects
- Headers and Footers
- Working with bullets and numbered lists
- Working with Tables
- Adding a Footnote and Endnote
- Sharing and Maintaining Document
- Restricting Document Access
- Using Protected View
- Proofing the document
- Printing the document

MS POWERPOINT

- Setting Up PowerPoint Environment
- Creating slides and applying themes
- Working with bullets and numbering
- Working with Shapes, Clipart and Pictures, Word Art, Smart Art
- Hyperlinks and Action Buttons
- Working With Movies and Sounds
- Animation and Slide Transition
- Using slide Master
- Slide Show

MS EXCEL

- Introduction to Excel
- Formatting excel work book
- Perform Calculations with Functions
- Sort and Filter Data with Excel
- Create Effective Charts to Present Data Visually
- Analyse Data Using PivotTables and Pivot Charts
- Protecting and sharing the work book

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- I

Course Code: BVII-1118

Assignment based on MS-Excel

COURSE OUTCOMES:

After completing this course, the students will be able to:

CO1: Collect and study data from reliable data sources

CO2 Apply the tools and techniques learnt in the course to process and analyze data for problems associated with AI and Data science.

CO3: Apply their knowledge to work on assigned/self-identified assignment.

CO4: Work within defined time and resource constraints while working with real world applications.

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- I

Course Code: BVII-1118

Assignment based on MS-Excel

L - T – P	**Max. Marks: 100**
0-2-2	**Practical: 80**
Time : 3 Hours	**CA: 20**

Instructions to the examiner:

The primary objective of the course is to encourage students to learn various tools and to build AI/ Data Science based Model: This module is delivered using a combination of introductory lectures and participation activities by the students.

The students will be working on a practical based on the subjects studied in the course. The students need to submit the self-made report at the end of the semester. The marks will be awarded to the student on the basis of technical knowledge, reports and performance in viva-voce.

Session-2025-26

BACHELOR OF VOCATION (RETAIL MANAGEMENT)/ BACHELOR OF VOCATION (MANAGEMENT AND SECRETARIAL PRACTICES)/ BACHELOR OF VOCATION (ANIMATION)/BACHELOR OF VOCATION (NUTRITION EXERCISE AND HEALTH))/ BACHELOR OF VOCATION (BEAUTY AND WELLNESS)/BACHELOR OF VOCATION(HOSPITALITY AND TOURISM)/ BACHELOR OF VOCATION(ARTIFICIAL INTELLIGENCE AND DATA SCIENCE) Semester II

Punjabi (Compulsory)

COURSE CODE-BVRL/BVML/BVAL/BVNL/BVBL /BVHL/BVIL -2421

COURSE OUTCOMES

CO1: ‘nksw nBksw’ g[[[;se d/ ejkDh Gkr B{z f;b/p; ftu Pkfwb eo e/ ftfdnkoEhnK nzdo ejkDh Bz{ gVQD dh o[uh Bz{ g?dk eoBk j? ns/ ejkDh irs Bkb i'VDk j?.

CO2: rZd gqtkj g[[[;se B{z f;b/p; ftu Pkfwb eo e/ ftfdnkoEhnK nzdo gVQD dh o[uh Bz{ g?dk eoBk j? ns/ w[ZbtkB frnkB d/Dk j?.

CO3: Ppd pDso ns/ Ppd ouBk, gfoGkPk, w[ZYb/ ;zebg, Ppd Pq/DhnK Bz{ gVQkT[D dk wB'oE ftfdnkoEhnK nzdo gzikph GkPk dh nwhoh dk ns/ pkohehnK Bz{ ;wMD bJh tZyo/ -tZyo/ f;XKsK dk ftek; eoBk j?.

CO4: d|soh fuZmh gZso dk wB'oE ftfdnkoEhnK B{z ;w/A ns/ fwjBs dh pZus eoB pko/ dZ;Dk j?. w[jkto/ / nykD dh tos'A Bkb rZbpks ftu gogZesk nkT[Adh j?.fJj ftfdnkoEhnK dh rZbpks ftu fByko fbnkT[D dk ezw eoBr/.

Session-2025-26

BACHELOR OF VOCATION (RETAIL MANAGEMENT)/ BACHELOR OF VOCATION (MANAGEMENT AND SECRETARIAL PRACTICES)/ BACHELOR OF VOCATION (ANIMATION)/ BACHELOR OF VOCATION (NUTRITION EXERCISE AND HEALTH))/ BACHELOR OF VOCATION (BEAUTY AND WELLNESS)/BACHELOR OF VOCATION(HOSPITALITY AND TOURISM)/ BACHELOR OF VOCATION(ARTIFICIAL INTELLIGENCE AND DATA SCIENCE) Semester II

Punjabi (Compulsory)

COURSE CODE-BVRL/BVML/BVAL/BVNL/BVBL /BVHL/BVIL -2421

;wK L 3 xzN/ **Maximum Marks :100**

L-T-P **Theory:70**

4-0-0 **CA: 30**

nze tzv ns/ gohfyne bJh jdkfJsK

1H gqPB gZso d/ uko ;?ePB j'Dr/.;?ePB A-D sZe d/ gqPB :{fBN I-IV ftu'A g[ZS/ ikDr/. jo ;?ePB ftu d' gqPB g[ZS/ ikDr/.

2H ftfdnkoEh B/ eZ[b gzi gqPB eoB/ jB. jo ;?ePB ftu'A fJe gqPB eoBk bkIwh j?. gzitK gqPB fe;/ th ;?ePB ftu'A ehsk ik ;edk j?.

3H jo/e gqPB d/ 16 nze jB.

4H g/go ;?ZN eoB tkbk i/eo ukj/ sK gqPBK dh tzv nZr'A tZX s'A tZX uko T[g gqPBK ftu eo ;edk j?.

gkmeqw ns/ gkm g[;seK

:{fBN-I

nksw nBksw (ejkDh Gkr),(;zgH ;[fjzdo pho ns/ tfonkw f;zx ;zX{) r[o{ BkBe d/t

:{Bhtof;Nh, nzfwqs;o.

gmkD dh Xh,T[ikV,wkVk pzdk,x'NDk,dbdb(ejkDhnK gkmeqw dk fjZ;k jB)

(;ko, gkso fusoB, ftPk t;s{) **14 nze**

:{fBN-II

rZd gqtkj (o/yk fuso s/ jbe/ b/y)

(;zgkH vkH fpeow f;zx x[zwD ns/ i;gkb f;zx),

r[o{ BkBe d/t :{Bhtof;Nh, nzfwqs;o.

(ftPk t;s{$;ko)

14 nze

:{fBN-III

(T) Ppd pDso ns/ Ppd ouBk, gfoGkPk, w[ZYb/ ;zebg
(n) Ppd P/qDhnK **14 nze**

:{fBN-IV

d|soh fuZmh gZso

w[jkto/ ns/ nykD **14 nze**

Session-2025-26

BACHELOR OF VOCATION (RETAIL MANAGEMENT)/ BACHELOR OF VOCATION (MANAGEMENT AND SECRETARIAL PRACTICES)/ BACHELOR OF VOCATION (ANIMATION)/ BACHELOR OF VOCATION (NUTRITION EXERCISE AND HEALTH))/ BACHELOR OF VOCATION (BEAUTY AND WELLNESS)/BACHELOR OF VOCATION(HOSPITALITY AND TOURISM)/ BACHELOR OF VOCATION(ARTIFICIAL INTELLIGENCE AND DATA SCIENCE) Semester II

BASIC PUNJABI

COURSE CODE-BVRL/BVML/BVAL/ /BVNL/BVBL/BVHL/BVIL-2031

Course outcomes

CO1: Ppd P/qDhnK L gSkD ns/ tos'A (BKt, gVBKt, fefonk, ftP/PD, fefonk ftP/PD, ;pzXe, :'ie ns/ ft;fwe) Bz{ gVQkT[D dk wB'oE ftfdnkoEhnK nzdo gzikph GkPk dh nwhoh dk ns/ pkohehnK Bz{ ;wMD bJh tZyo/ -tZyo/ f;XKsK dk ftek; eoBk j?/.

CO2: ftfdnkoEh gzikph tke pDso (;kXkoB tke, ;z:[es tke, fwPos tke, fpnkBhnk tke, gqPB tkue tke ns/ j[ewh tke) dh gfoGkPk ns/ fJ; dh pDso s'A ikD{ j'Dr/ ns/ T[BQK dh GkPk s/ geV wip{s j't/rh.

CO3: g?oQk ouBk ns/ ;zy/g ouBk dk wB'oE ftfdnkoEhnK dh p[ZXh B{z shyD eofdnK T[BK dh fbyD gqfsGk B{z T[ikro eoBk j?.

CO4: xo/b{ ns/ d|soh fuZmh gZso fbyD dk wB'oE ftfdnkoEhnK B{z fJ; ebk ftu fBg[zB eoBk j? I nykD ns/ w[jkto/ dh tos'A Bkb rZbpks ftu gogZesk nkT[Adh j?.fJj ftfdnkoEhnK dh rZbpks ftu fByko fbnkT[D dk ezw eoBr/.

Session-2025-26

BACHELOR OF VOCATION (RETAIL MANAGEMENT)/ BACHELOR OF VOCATION (MANAGEMENT AND SECRETARIAL PRACTICES)/ BACHELOR OF VOCATION (ANIMATION)/ BACHELOR OF VOCATION (NUTRITION EXERCISE AND HEALTH))/ BACHELOR OF VOCATION (BEAUTY AND WELLNESS)/BACHELOR OF VOCATION(HOSPITALITY AND TOURISM)/ BACHELOR OF VOCATION(ARTIFICIAL INTELLIGENCE AND DATA SCIENCE) Semester II

BASIC PUNJABI(In lieu of Compulsory Punjabi)

COURSE CODE-BVRL/BVML/BVAL/ BVNL/BVBL /BVHL/BVIL -2031

smW: 3 GMty **Maximum Marks : 100**

L-T-P **Theory : 70**

4-0-0 **CA : 30**

nze tzv ns/ gohfyne bJh jdkfJsK

1H gqPB gZso d/ uko ;?ePB j'Dr/.;?ePB A-D sZe d/ gqPB :{fBN I-IV ftu'A g[ZS/ ikDr/. jo ;?ePB ftu d' gqPB g[ZS/ ikDr/.

2H ftfdnkoEh B/ eZ[b gzi gqPB eoB/ jB. jo ;?ePB ftu'A fJe gqPB bkIwh j?. gzitK gqPB fe;/ th ;?ePB ftu'A ehsk ik ;edk j?.

3H jo/e gqPB d/ 14 nze jB.

4H g/go ;?ZN eoB tkbk i/eo ukj/ sK gqPBK dh tzv nZr'A tZX s'A tZX uko T[g gqPBK ftu eo ;edk j?.

gkmeqw

:{fBN-I

Ppd P/qDhnK L gSkD ns/ tos'A (BKt, gVBKt, fefonk, ftP/PD, fefonk ftP/PD, ;pzXe, :'ie ns/ ft;fwe) 14 nze

:{fBN-II

gzikph tke pDso L w[ZYbh ikD gSkD

(T) ;kXkoB tke, ;z:[es tke ns/ fwPos tke (gSkD ns/ tos'A)

(n) fpnkBhnk tke, gqPB tkue tke ns/ j[ewh tke (gSkD ns/ tos'A) 14 nze

:{[fBN-III

g?oQk ouBk

;zy/g ouBk 14 nze

:{fBN-IV

fuZmh gZso (xo/b{ ns/ d|soh)

nykD ns/ w[jkto/ (fb;N Bkb BZEh j?) **14 nze**

nykD

T[m/ sk T[Zm BjhA o/s/ dh w[Zm ,ਉੱਦਮ ਅੱਗੇ ਲੱਛਮੀ ਪ੍ਰਾਪਤੀ ਅੱਗੇ ਪ੍ਰਣਾਮ ,ਉਹ ਹਦਨ ਡੱ_ਬਾ ਜਦੋਂ ਘੋੜੀ ਚਹੜਿਆ ਕੱ_ਬਾ ,ਉੱਚੀ ਦ_ਕਾਨ ਾ ੱਕਾ ਪ੍ਰਕਿਾਨ ,ਉਲਟੀ ਿਾੜ ਿੇਤ ਨੰ ਿਾਏ ,ਉੱਚਾ ਲੰਮਾ ਗੱਭਰ ਪ੍ਰੇਮੀ ਠੀਕਰੀਆਂ , nPo|hnK dh b[ZN s/ e'fbnK s/ w[joK, nZr/ ;Zg fgZS/ PhAj, nkdo s/oh ukdo B{z pfjDk s/o/ rfjD/ B{z, nkg/ ckEVhJ/ s?B{z e"D S[vkJ/, nkgD/ jZEhA nkgDk nkg/ jh eki ;tkohn?, nkoh B{z fJZe gk;/ dzd/ ijkB B{z d'jhA gk;hA,ਅੱਿੀ ਿੇਿ ਕੇ ਮੱਿੀ ਨਿੀ ਹਨਗਲੀ ਜਾਂਦੀ ,ਅੰਦਰ ਿੇਾਿੇ ਸੱਚ ਤਾਂ ਕੋਠੇ ਚੜ੍ਹ ਕੇ ਨੱਚ ,ਆਪ੍ੇ ਮੈਂ ਰੱਜੀ ਪ੍ੱਜੀ ਆਪ੍ੇ ਮੇਰੇ ਬੱਚੇ ਹਜਉਣ ,ਆਪ੍ ਕ੍ਚੱਜੀ ਹਿੜੇ ਨੰ ਦੋਹ ,ਅੰਨਿਾ ਿੰਡੇ ਹਰਉੜੀਆਂ ਮ੍ੜ ਮ੍ੜ ਆਪ੍ਣਆਂ ਨੰ ,ਅਕਲ

ਿੱਡੀ ਕੇ ਮੱਝ ,ਅੰਹਨਿਆਂ ਹਿੱਚ ਕਾਣਾ ਰਾਜਾ ,ਆਪ੍ਣੀ ਪ੍ੀੜ੍ਹੀ ਿੇਠ ਸੋਟਾ ੇਰਨਾ ,ਇਕ ਅਨਾਰ ਸੌ ਹਬਮਾਰ ,ਇਕ ਿੱਬ ਨਾਲ ਤਾੜੀ ਨਿੀ ਿੱਜਦੀ ,ਇੱਕ ਚੱ_ਪ੍ ਸੌ ਸੱ_ਿ ਝੱਟ ਮੰਗਣੀ ਪ੍ੱਟ ਹਿਆ ,ਸਹਿਜ ਪ੍ੱਕੇ ਸੋ ਮੀਠਾ ਿੇਾਿੇ ,ਦਾਲ ਹਿੱਚ ਕਾਲਾ ਿੋਣਾ ,

;zr sko/ e[;zr v'p, ਸੱਦੀ ਨਾ ਬ_ਲਾਈ ਮੈਂ ਲਾੜੇ ਦੀ ਤਾਈ ,ਸੈ ਭਰੋਸਾ ਿੱਡਾ ਤੋਸਾ,ਸੌ ਹਦਨ ਚੋਰ ਦੇ ਇਕ ਹਦਨ ਸਾਧ ਦਾ ,ਸੱਪ੍ ਦਾ ਬੱਚਾ ਸਪ੍ੋਲੀਆ ,ਸੱਪ੍ ਮਰ ਜਾਿੇ ਲਾਠੀ ਿੀ ਨਾ ਟੱ_ਟੇ ,ਸਾਈਆਂ ਹਕਤੇ ਿਧਾਈਆਂ ਹਕਤੇ ,ਿੰਕਾਹਰਆ ਸੋ ਮਾਹਰਆ , jZE B{z jZE X'Adk j?, ਿਾਥੀ ਲੰਘ ਹਗਆ ਪ੍ ਛ ਰਹਿ ਗਈ, e'j Bk uZbh pkpk fsjkJh,ਕੱ_ਛV ਕ_Vh ਹ'ਹਿਰ ਢੰਡੋਰਾ ,ਕੋਹਲਆਂ ਦੀ ਦਲਾਲੀ ਹਿੱਚ ਮ ੰਿ ਕਾਲਾ ,ਕਰੇ ਕੋਈ ਭਰੇ ਕੋਈ , fyZd' |o'fbnK bhoK jh fBebdhnK jB, □ਿਾਜੇ ਦਾ ਰਿਾਿ ਡੱਡ ,ਿੇਤੀ ਿਸਮਾਂ ਸੇਤੀ , yop{I/ B{z d/y e/ yop{Ik ozr pdbdk j?,ਿ ਿ ਪ੍ੱਟਦੇ ਨੰ ਿਾਤਾ ਹਤਆਰ , xV/ B{z jZE bkfJnk ;kok NZpo fsjkfJnk,ਘਰ ਦਾ ਭੇਤੀ ਲੰਕਾ ਢਾਿੇ ,ਘਰ ਦੀ ਕੱ_ਕੜੀ ਦਾਲ ਬਰਾਬਰ ,ਹਚੰਤਾ ਹਚਿਾ ਬਰਾਬਰ , ਛੱਜ ਤਾਂ ਬੋਲੇ ਛਾਣਨੀ ਿੀ ਬੋਲੇ,ਛੋਟੀ ਮ ੰਿ ਿੱਡੀ ਗੱਲ , i' okshA ikrD ekbhnK ;' jh ykD ;[ykbhnK ,ਜਾਂਦੇ ਚੋਰ ਦੀ ਲੰਗੋਟੀ ਿੀ ਸਿੀ ,ਹਜਸ ਦੀ ਕੋਠੀ ਦਾਣੇ ਉਿਦੇ ਕਮਲੇ ਿੀ ਹਸਆਣੇ ,ਹਜਿੜੇ ਗੱਜਦੇ ਨੇ ਉਿ ਿਰਿਦੇ ਨਿੀ , ਝੱਟ ਮੰਗਣੀ ਪ੍ੱਟ ਹਿਆ , BtK B" fdB g[okDk ;" fdB, gkDh ftZu ;'Nk wkfonK gkDh d' BjhA j' iKd/, ftZfdnk ftukoh sK goT[Zgekoh, t/b/ dh BwkI e[t/b/ dhnK NZeoK, fJe do pzd ;" do yZ[bQk, fpZbh d/ f;oQkD/ d[ZX BjhA izwdk,ਰੱਸੀ ਸੜ ਗਈ ਿੱਟ ਨਿੀ ਹਗਆ

w[jkto/

ਉਸਤਾਦੀ ਕਰਨੀ, ਉਂਗਲ ਕਰਨੀ, ਉੱਲ ਬਣਾਉਣਾ ,ਉੱਚਾ ਸਾਿ ਨਾ ਕੱਢਣਾ, ਉੱਡਦੇ ਹ ਰਨਾ ,ਉੱਘ ਸੱ_ਘ ਹਮਲਣੀ,ਅੱਿਾਂ ਹਿਚ ਰੜਕਣਾ

, T[ArbK s/ BukT[Dk, T[XV^Xz[wh wukT[Dk, T{m d/ w{zj ftZu Ihok d/Dk, ਅੱਗ ਲਾਉਣਾ ,ਅਿਆ ਊਤ

ਜਾਣਾ ,ਅਸਮਾਨ ਨੰ ਟਾਕੀਆਂ ਲਾਉਣਾ, ਅੱਿਾਂ ਹਿੱਚ ਲਾਲੀ ਉਤਰਨੀ ,ਅਕਲ ਤੇ ਪ੍ਦਾ ਪ੍ੈਣਾ, nZyK nZr/ y'g/ ukV d/D/, nZyK T[Zs/ fpmkT[Dk, nZb/ cZNK s/ b{D fSVeDk, nkgD/ nZr/ ezv/ phiDk, nkgD/ soeP ftZu sho j'Dk, f;o uVQBk, ਈਨ ਮੰਨਣੀ, ਈਦ ਦਾ ਚੰਨ ਿੋਣਾ, ਇੱਟ ਨਾਲ ਇੱਟ ਿੜਕਾਉਣk,ਹਸਰ ਾ ਰਨਾ, ਹਸਰ ਤੇ ਚੜਿਨਾ ,ਸਬਰ ਦਾ ਘੱ_ਟ ਭਰਨਾ, ਹਸਰ ਪ੍ੈਰ ਨਾ ਿੋਣਾ, f;o y[oeD dh t/jb Bk j'Dk, ;Zmh d/ u"b y[nkD/, ਿੱਥ ਧੋ ਕੇ ਹਪ੍ੱਛੇ ਪ੍ੈਣਾ, ਿੱਥੀ ਛਾਂਿਾਂ ਕਰਨੀਆਂ, ਿੱਡ ਭੰਨਣੇ, ਿੱਥ ਤੰਗ ਿੋਣਾ ,ਿੱਥ ਮਲਣਾ,ਿੱਥ ਪ੍ੈਰ ਮਾਰਨਾ, jZE T[Zs/ jZE Xo e/ p?mDk, jZE tNkT[Dk, jtk d/ x'V/ ;tko j'Dk, ਕੰਨੀ ਕਤਰਾਉਣਾ, ਕੰਨ ਤੇ ਜ ਨਾ ਸਰਕਣਾ, ਕੰਨ ਘੇਸਲ ਮਾਰਨੀ, eDe Bkb x[D th fg;Dk, eZy GzB e/ d{joK Bk eoBk, ebw d/ XBh j'Dk, feskph ehVk j'Dk, ਾਨਾ ੋਬ ਿੋਣਾ, ਿਾਹਨਓ ਜਾਣਾ, y{j fBy[ZN ikDk, ਗੱ_ਡੀ ਚੜਿਨੀ, ਗਲ ਪ੍ੈਣਾ ,ਗੰਗਾ ਨਿਾਉਣਾ ,ਚੜਿ ਮੱਚਣੀ, ਚੰਦ ਚਾੜਿਨਾ, ਚਾਦਰ ਿੇਿ ਕੇ ਪ੍ੈਰ ਪ੍ਸਾਰਨਾ ,ਚਕਮਾ ਦੇਣਾ ,ਛੱਕੇ ਛੜਾਉਣਾ ,ਛਾਪ੍ਾ ਮਾਰਨਾ, ਹਛੱਲ ਲਾਉਣੀ ,ਹਛੱਕੇ ਟੰਗਣਾ

Bachelor of Vocation (Retail Management)/ Bachelor of Vocation (Animation)/ Bachelor of Vocation (Nutrition and Dietetics) /Bachelor of Vocation (Beauty and Wellness)/ Bachelor of Vocation (Artificial Intelligence and Data Science)/ Bachelor of Vocation (Hospitality and Tourism)

(Semester-II)
Session 2025-26
Course Title: Punjab History and Culture (C. 320 to 1000 A.D.)
(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)

Course Code: BVRL-2431/ BVAL-2431/BVNL-2431/BVBL-2431/BVIL-2431/BVHL-2431

COURSE OUTCOMES:

After completing Semester II and course on Ancient History of Punjab students will be able to understand:

CO 1: The reasons and impact of Alexander's invasions and to comprehend various factors leading to rise and fall of empires and emergence of new dynasties and their administration specifically of Maurya rule in general and Ashok in particular

CO 2: art and architecture of Gupta period and the Indo-Greek style of architecture under Gandhara School

CO 3: To have an insight into the socio-cultural history under Harshvardhan and Punjab under the stated period

CO 4: To enable students to have thorough insight into the various forms/styles of Architecture and synthesis of Indo - Greek Art and Architecture in Punjab

(Semester-II)
Session 2025-26
Course Title: Punjab History and Culture (C. 320 to 1000 A.D.)
(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)

Course Code: BVRL-2431/BVAL-2431/BVNL-2431/BVBL-2431/BVIL-2431/BVHL-2431

Examination Time: 3 Hours
Credits L-T-P: 4-0-0
Contact Hours: 4 Hrs/Week

Max. Marks: 100
Theory: 70
CA: 30

Instructions for the Paper Setter:

1. Question paper shall consist of four Units
2. Examiner shall set 8 questions in all by selecting Two Questions of equal marks from each Unit.
3. Candidates shall attempt 5 questions in 1000 words, by at least selecting One Question from each Unit and the 5th question may be attempted from any of the four Units.
4. Each question will carry 14 marks

Unit-I

1. Alexander's Invasion's and Impact

2. Administration of Chandragupta Maurya and Ashoka.

Unit-II

3. The Kushans: Gandhar School of Art

4. Gupta Empire: Golden Period-Social and cultural life, Art and Architecture

Unit-III

5. The Punjab under the Harshvardhana--Society and Religion during the time of Harshvardhana

6. Socio-cultural History of Punjab from 7th to 1000 A.D.

UNIT IV

7. Development of Languages and Education with Special reference to Taxila

8. Development to Art and Architecture

Suggested Readings

- B.N. Sharma: *Life in Northern India*, Delhi. 1966.
- Budha Parkash, *Glimpses of Ancient Punjab*, Patiala, 1983
- L. M Joshi (ed), *History and Culture of the Punjab*, Art-I, Punjabi University, Patiala, 1989 (3rd edition)
- L.M. Joshi and Fauja Singh (ed.), *History of Punjab*, Vol.I, Punjabi University, Patiala, 1977.

BACHELOR OF VOCATION (RETAIL MANAGEMENT) / BACHELOR OF VOCATION (ANIMATION)/ BACHELOR OF VOCATION (NUTRITION EXERCISE & HEALTH)/ BACHELOR OF VOCATION (BEAUTY & WELLNESS)/BACHELOR OF VOCATION (ARTIFICIAL INTELLIGENCE AND DATA SCIENCE)/ BACHELOR OF VOCATION (HOSPITALITY AND TOURISM)/ DIPLOMA IN GERIATRIC CARE(OLD AGE CARE AND NUTRITION)

(Semester II)

Session 2025-26

COMMUNICATION SKILLS IN ENGLISH- II

Course Code: BVRM/ BVAM/ BVNM/BVBM / BVIM/BVHM/ DGCM-2102

COURSE OUTCOMES

At the end of this course, the students will develop the following skills:

CO 1: Enhancement of listening skills with the help of listening exercises based on conversation, news and TV reports

CO 2: The ability of Note-Taking to be able to distinguish the main points from the supporting details and the irrelevant information from the relevant one

CO 3: Improvement of speaking skills enabling them to converse in a specific situation

CO 4: Acquisition of knowledge of phonetics which will help them in learning about correct pronunciation as well as effective speaking

BACHELOR OF VOCATION (RETAIL MANAGEMENT) / BACHELOR OF VOCATION (ANIMATION)/ BACHELOR OF VOCATION (NUTRITION EXERCISE & HEALTH)/ BACHELOR OF VOCATION (BEAUTY & WELLNESS)/BACHELOR OF VOCATION (ARTIFICIAL INTELLIGENCE AND DATA SCIENCE)/ BACHELOR OF VOCATION (HOSPITALITY AND TOURISM) / DIPLOMA IN GERIATRIC CARE(OLD AGE CARE AND NUTRITION)

(Semester II)

Session 2025-26

COMMUNICATION SKILLS IN ENGLISH- II

Course Code: BVRM/ /BVAM/ /BVNM/BVBM/BVIM/BVHM/DGCM-2102

Time: 3 hours (Theory) **Max. Marks: 100**

3 hours (Practical) **Theory: 50**

Practical: 20

CA: 30

Instructions for the paper setter and distribution of marks:

The question paper will consist of four sections. The candidate will have to attempt five questions in all selecting one from each section and the fifth question from any of the four sections. Each question will carry 10 marks. Each question can be sub divided into two parts. (10 x 5 = 50)

Section-A: Two questions of theoretical nature will be set from Unit I.

Section-B: Two questions will be given to the students from Unit II.

Section-C: Two questions will be given from Unit III.

Section-D: Two questions will be set from Unit IV

BACHELOR OF VOCATION (RETAIL MANAGEMENT) / BACHELOR OF VOCATION (ANIMATION)/ BACHELOR OF VOCATION (NUTRITION EXERCISE & HEALTH)/ BACHELOR OF VOCATION (BEAUTY & WELLNESS)/BACHELOR OF VOCATION (ARTIFICIAL INTELLIGENCE AND DATA SCIENCE)/ BACHELOR OF VOCATION (HOSPITALITY AND TOURISM) / DIPLOMA IN GERIATRIC CARE(OLD AGE CARE AND NUTRITION)

(Semester II)

Session 2025-26

COMMUNICATION SKILLS IN ENGLISH- II

Course Code: BVRM/ BVAM/ BVNM/BVBM / BVIM/BVHM/ DGCM-2102

Unit I

Listening Skills: Barriers to listening; effective listening skills; feedback skills.

Activities: Listening exercises – Listening to conversation, News and TV reports

Unit II

Attending telephone calls; note taking and note making

Activities: Taking notes on a speech/lecture

Unit III

Speaking and Conversational Skills: Components of a meaningful and easy conversation, understanding the cue and making appropriate responses, forms of polite speech, asking and providing information on general topics

Activities: 1) Making conversation and taking turns

2) Oral description or explanation of a common object, situation or concept

Unit IV

The study of sounds of English, stress Situation based

Conversation in English Essentials of Spoken English

Activities: Giving Interviews

Recommended Books:

1. *Oxford Guide to Effective Writing and Speaking* by John Seely.
2. *Business Communication* by Sethi, A and Adhikari, B., McGraw Hill Education 2009.
3. *Communication Skills* by Raman, M. & S. Sharma, OUP, New Delhi, India (2011).
4. *A Course in Phonetics and Spoken English* by J. Sethi and P.V. Dhamija, Phi Learning.

BACHELOR OF VOCATION (RETAIL MANAGEMENT) / BACHELOR OF VOCATION (MANAGEMENT & SECRETARIAL PRACTICES)/ BACHELOR OF VOCATION (ANIMATION)/ BACHELOR OF VOCATION (TEXTILE DESIGN & APPAREL TECHNOLOGY)/ BACHELOR OF VOCATION (NUTRITION EXERCISE & HEALTH)/ BACHELOR OF VOCATION (BEAUTY & WELLNESS)/BACHELOR OF VOCATION (ARTIFICIAL INTELLIGENCE AND DATA SCIENCE)/ BACHELOR OF VOCATION (HOSPITALITY AND TOURISM) / DIPLOMA IN GERIATRIC CARE(OLD AGE CARE AND NUTRITION)

(Semester II)

Session 2025-26

COMMUNICATION SKILLS IN ENGLISH- II

Course Code: BVRM/ BVAM/ BVNM/BVBM / BVIM/BVHM/ DGCM-2102

PRACTICAL / ORAL TESTING

Time: 3 hours **Marks: 20**

Course Contents:

1. Oral Presentation with/without audio visual aids (10 Marks)
2. Mock Interview (05 Marks)
3. Listening to any recorded or live material and asking oral questions for listening Comprehension (05 Marks)

Questions:

1. Oral Presentation will be of 5 to 7 minutes duration. (Topic can be given in advance or it can be of student's own choice). Use of audio-visual aids is desirable.
2. Mock Interview will be conducted

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester II

Course Code: BVIL-2113

Computational Problem Solving-II

COURSE OUTCOMES:

After completing this course, the students will be able to:

CO1: Comprehend the concepts of Object-Oriented Programming and file handling.

CO2: Implement Database programming in Python.

CO3: Develop Graphical user interface using Tkinter programming.

CO4: Understand the uses of various Python Libraries.

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester II

Course Code: BVIL-2113

Computational Problem Solving-II

L - T – P	Max. Marks: 100
3-0-0	Theory: 70
Time: 3 Hours	CA: 30

Instructions for Paper Setter -

Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section. Each Question Carries 14 Marks.

UNIT-I

Object Oriented Programming, Modular Design: Modules, Top-Down Design, Python Modules, **Files:** Opening Files, Using Text Files, String Processing, Exception Handling

UNIT-II

Using Databases and SQL: Database Concepts, SQLite Manager Firefox Add-on, SQL basics summary, basic Data Modelling, Programming with multiple tables.

UNIT-III

Python GUI Programming: Tkinter, Widgets: Label, Button, Entry, Text, Frame, Adjusting Frame Appearance With Reliefs, Controlling Layout With Geometry Manager

UNIT-IV

Introduction to Python Libraries: Introduction to Data Scraping with Python: Scrapy Library, TensorFlow, Scikit-Learn, Numpy, Keras, PyTorch, LightGBM, Eli5, SciPy, Theano, Pandas

References/ Textbooks:

1. Charles Severance, “Python for Informatics: version0.0.8-d2”, Amazon Digital Services, Second Edition, 2013.
2. Charles Dierbach, “Introduction to Computer Science Using Python: A Computational Problem-Solving Focus”, First Edition, John Wiley & Sons, 2013.
3. Mark J. Guzdial, Barbara Ericson, “Introduction to Computing and Programming in Python”, First Edition, Pearson Education,2015.

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- II

Course Code: BVIL-2114

Mathematical Foundation

COURSE OUTCOMES:

After completing this course the student will be able to reflect on

CO1: Set and operations on sets

CO2: Relation, Representation of Relation, Types of Relation and their Properties

CO3: To encode information in form of logical sentences through propositional and predicate logic

CO4: Concept of Duality law, Algebra of propositions, Propositional Functions, Predicates, Quantifiers, Negation of Quantified Statements

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- II
Course Code: BVIL-2114

Mathematical Foundation

L - T – P	**Max. Marks: 50**
2-0-0	**Theory: 35**
Time :3 Hours	**CA: 15**

Instructions for the paper setter:
Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section. Each Question Carries 7 Marks.

UNIT-I

Definition of Set, Representation of Sets, Types of Sets,
Operations on Sets – Intersection, Union, Complement, Set Difference, Symmetric Difference.
Problems on Cardinality of Sets, Venn diagram, Laws of Set theory, Countable and Uncountable sets, Cartesian product, Partition of Set, Minset, Maxset, Normal Forms.

UNIT-II

Definition of Relation, Representation of Relation, Types of Relation, Properties of Relation – Reflexive, Symmetric, Anti-Symmetric, Asymmetric, Transitive, Equivalence, Irreflexive, POSET,
Representation of relation: Digraph, Matrix and ordering diagram

UNIT-III

Proposition and Compound Propositions, basic Logical Operations, Propositions and Truth Tables, Tautologies and Contradictions, Logical Implication, Logical Equivalence,

UNIT IV

Duality law, Algebra of propositions, Arguments, Propositional Functions, Predicates and Quantifiers, Negation of Quantified Statements.

References/ Textbooks:
1. Lipschutz S., Lipson M., “Discrete Mathematics”, Revised Third Edition, Schaum’s outlines Series, 2017.
2. Kolman, Busby “Discrete Mathematical structures for Computer Sciences”, Second Edition, PHI, 1987.
3. Alan Doerr, “Applied Discrete Structures for Computer Science”, First Edition, Galgotia Publications, 1991.
4. Trambley J.P., “Manohar R., Discrete Mathematical Structures with Applications to Computer Science”, First Edition, O’Reilly, 2002.

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- II

Course Code: BVIL-2115

Technical Writing

COURSE OUTCOMES:

After completing this course, the students will be able to:

CO1: Write effective reports, proposals and papers.

CO2: Correspond effectively through different modes of written communication.

CO3: Present himself/ herself professionally through effective resumes and interviews.

CO4: Understand different technical writing style and concept of editing.

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- II
Course Code: BVIL-2115

Technical Writing

L - T – P	**Max. Marks: 100**
3-0-0	**Theory: 70**
Time : 3 Hours	**CA: 30**

Instructions for the paper setter:
Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section. Each Question Carries 14 Marks.

UNIT-I

Technical Communication Overview: Meaning of Technical Writer, Role of Technical Writer, Evolution of Technical Communication Characteristics of Technical Communication, Essential Skills of Technical Communication.

UNIT-II

Goals of Technical Writing, Process of Technical Writing – Prewriting, wiring and Re-writing.
Audience Analysis: Basic Classification of Readers, Types of Audiences, Audience Analysis.

UNIT-III

Research Interviews: Research Tools, Conducting Interviews: Pre-Interview, During Interview, After the Interview, Validation.
Technical Writing Style: Concise Communication, Common Errors while constructing sentences.
Clarity and Precision: Guidelines to clear and specific writing.

UNIT-IV

Technical Communication Editing: Meaning, Types of Editing, Role of a Technical Editor. Proof Reading: Proof reading symbols, Abbreviations.
Technical Communication Ethics: What is Legal & Ethical? Ethical Issues in Technical Communication.

References/Textbooks:

1. Elizabeth Tebeaux, Sam Dragga, "The Essentials of Technical Communication", First Edition, OUP USA, 2012.
2. Alan S. Pringle, Sarah S. O'Keefe, "Technical Writing 101",First Edition, Scriptorium Publishing Services, Inc., 2009.
3. Mike Markel, "Technical Communication", First Edition, Bedford Publishers, 2009.
4. Sheryl Lindsell-Roberts, "Technical Writing For Dummies", First Edition, Wiley Publishers, 2011.
5. Kieran Morgan, SanjaSpajic, "Technical Writing Process",First Edition, Better On Paper Publications, 2015.
6. Phillip A. Laplante, "Technical Writing: A Practical Guide for Engineers and Scientists", Second Edition, CRC Press, 2014.

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- II

COURSE CODE: BVIL-2116

Data Collection and Analysis

COURSE OUTCOMES:

After completing this course, the students will be able to:

CO1: Comprehend the term Data Collection and Analytics and Data Collection methods

CO2: Describe the application of basic Data Analysis Tools.

CO3: Understand the process of Data Analysis along with its applications.

CO4: Comprehend Data Analysis using spreadsheet software and Data Analysis tools.

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- II

COURSE CODE: BVIL-2116

Data Collection and Analysis

L - T – P	**Max. Marks: 50**
2-0-0	**Theory: 35**
Time : 3 Hours	**CA: 15**

Instructions for the paper setter:
Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section. Each Question Carries 14 Marks.

UNIT I

Introduction to the terms: Data Collection and Data Analytics.

Data Collection sources, Data collection methods – Primary data collection methods and Secondary data collection methods.

UNIT II

Data Collection Tools – online and offline.

Understanding Data Analytics: Why Data analytics Matter, Characteristics of Data Analysis, Types- Descriptive. Predictive, Diagnostic, Prescriptive.

UNIT III

Process of Data Analysis, Applications of Data Analysis. Technical Skills of a data Analyst. Exploratory and Confirmatory Data Analysis

UNIT IV

Data Analysis using spreadsheet. Creating Complex Formulas, Working with Basic Functions - to find values for a range of cells. Data Analysis tools: Analyse, Detect, Fill from, Forecast, Scenario tool, Google tools: Google sheet, forms, collaborations

References/ Textbooks:

1. Patricia Pulliam Phillips, Cathy A. Stawarski, “Data Collection: Planning for and Collecting All Types of Data”, Wiley Publisher, First Edition, 2008.
2. Roger Sapsford, Victor Jupp, “Data Collection -and Analysis”, Second Edition, Sage Publishing, 2006.
3. Uwe Flick, “The SAGE Handbook of Qualitative Data Collection”, First Edition, Sage Publishing, 2018.
4. A. Maheshwari, “Data Analytics Made Accessible”,Third Edition, McGraw Hill India, 2020.
5. John Walkenbach, “Excel 2010 Bible” First Edition, Wiley, 2010.
6. Wayne L. Winston, “Microsoft Excel Data Analysis and Business Modeling” First Edition, Microsoft Press, 2017.

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- II
Course Code: BVIM-2117

Relational Database Management System

COURSE OUTCOMES:

After completing this course, the students will be able to:

CO1: Understand the various terms like database, database models and ER diagrams.

CO2: Comprehend Relational Algebra and Relational Calculus

CO3: Explain the concept of database normalization and its various forms

CO4: Understand querying using SQL and PL/SQL

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- II

Course Code: BVIM-2117

Relational Database Management System

L - T – P	**Max. Marks: 100**
2-0-2	**Theory: 35, Practical:35**
Time: 3 Hours	**CA: 30**

Instructions for the paper setter:
Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section. Each Question Carries 7 Marks.

UNIT-I

Introduction to Data, Field, Record, File, Database, Database Management System. Structure of database system, Advantages and Disadvantages, levels of database system, Relational model, Hierarchical model, Network model, comparison of models, E-R diagram, different keys used in a relational system, DBA, responsibilities of DBA.

UNIT-II

Codd's Rules, Relational Algebra, Relational Calculus - Domain and Tuple relational calculus

UNIT-III

Introduction to normalization – need and advantages of normalization, INF, 2NF, 3NF, BCNF, 4NF and 5NF, Introduction to transaction management – ACID Properties, concurrency control and its management, protection, security, recovery of database

UNIT-IV

SQL: Introduction to SQL–DDL, DML, DCL, Join methods & sub query, Union Intersection, Minus, Built in Functions, Views, Security amongst users, sequences, Indexing

Introduction to PL/SQL: Cursors – Implicit and Explicit, Procedures, Functions, Introduction to Triggers

Practical to be implemented:

1. Introduction to SQL.
2. Data Types, Creating Tables, Retrieval of Rows using Select Statement, Conditional Retrieval of Rows, Alter and Drop Statements.
3. Ordering the Result of a Query, Aggregate Functions, Grouping the Result of a Query, Update and Delete Statements.
4. Set Operators, Nested Queries, Joins, Sequences.

5. Views, Indexes, Database Security and Privileges: Grant and Revoke Commands, Commit and Rollback Commands.
6. PL/SQL Architecture, Assignments and Expressions, Writing PL/SQL Code, Referencing Non-SQL parameters.
7. Stored Procedures
8. Triggers and Cursor Management in PL/SQL.

Note for the Practical Examiner:

a) Practical Exam is based on the syllabus covered in the subject.

b) The question paper will be set on the spot by the examiner.

References / Textbooks:

1. Parteek Bhatia, Gurvinder Singh, "Simplified Approach to DBMS", Eighth Edition, Kalyani Publisher, 2016.
2. C.J. Date, "An Introduction to Database System", Eighth Edition,Pearson, 2015.
3. B.C. Desai, "Database Management System", Revised First Edition, Galgotia Publication, 2012.
4. Silberschatz, Henry F. Korth, S. Sudarshan, "Database Concepts", Seventh Edition,Mcgraw Hills, 2016.
5. IvanBayross, "Oracle – Developer – 2000", Third Edition, BPB Publishers,2010.

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- II

Course Code: BVIP-2118

Computational Problem Solving Lab

COURSE OUTCOMES:

After completing this course, the students will be able to:

CO1: Perform file handing using Python

CO2: Implement MySQL and Python connectivity

CO3: Build Graphical user interface applications using tkinter

CO4: Implement Python libraries

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- II

Course Code: BVIP-2118

Computational Problem Solving Lab

L - T – P	**Max. Marks: 100**
0-0-4	**Practical:70**
Time : 3 Hours	**CA: 30**

Lab based on Computational Problem solving

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- II

Course Code: BVII-2119

Assignment based on Skill Development

Course Outcomes:

After completing this course, the students will be able to:

CO1: Apply the Python tools and techniques to develop GUI application using DBMS

CO2: Apply their knowledge to work on assigned/self-identified assignment.

CO3: Demonstrate an ability to work in teams and manage the conduct of the research study.

CO4: Describe their work with report and PPT submission.

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- II

Course Code: BVII-2119

Assignment based on Skill Development

L - T – P	**Max. Marks: 50**
0-0-2	**Practical:35**
Time: 3 Hours	**CA: 15**

Note: The students need to submit the self-made report at the end of the Semester. The marks will be awarded to the student on the basis of quality showcased in the report. The performance of the students is to be marked on the basis of their technical knowledge, innovation and presentation.

SEMESTER II
USE-0012: ENTREPRENEURSHIP MINDSET-II
(Mandatory Skill Enhancement Course)

Credits: 0+0+2
Total Marks: 50

Semester Snapshot - Semester 2
Entrepreneurship 102/201 (Marketing Basics)

Introduction
This semester helps learners understand marketing as a practical life skill - not just "advertising." It teaches them how to communicate value, attract the right customers, and grow something small into something sustainable. Learners explore the basics of customer psychology, messaging, content creation, and simple sales strategies. Through hands-on activities, they will practice real marketing techniques for their micro-hustle or a simulated business idea, learning how to get attention, build trust, and generate sales.

Learners Objective
→ Understand the core concepts of marketing using simple, relatable real-world examples.
→ Learn how customers think, choose, and buy—and how businesses influence decisions ethically.
→ Identify and define a target customer clearly instead of "selling to everyone."
→ Create clear messaging: what they sell, who it helps, and why it matters.
→ Use basic marketing channels (offline + online) to attract customers.
→ Run a simple marketing campaign and measure what worked.
→ Build confidence in selling, promoting, and talking about their product/service.

Outcome
By the end of this semester, learners will be able to market a product/service using basic strategies, attract real customers, and improve their results through feedback and experimentation.

Guiding Principles/Approach
This syllabus is built on action-based learning, clarity-first communication, and customer-first thinking. Learners don't just *study* marketing - they *practice* it in real situations through small experiments and repeated improvement. The course is designed to feel approachable and practical: learners create simple content, test messaging, talk to real people, and observe what influences decisions.
Instead of heavy theory, students build marketing skills through doing: customer discovery, storytelling, channel experiments, and reflection. The curriculum emphasizes confidence-building, ethical marketing, and communication as a leadership skill. By helping learners see results quickly (even small wins like one customer or one inquiry), the program builds motivation, creativity, and real-world business readiness.

SEMESTER II

Semester 2 Curriculum

Recap Milestone
The recap milestone focuses on revising all the 12 milestones of semester 1 and also helps students understand the upcoming 12 milestones journey of semester 2.

Milestone #	Milestone Name	Milestone Description	Task #	Task Title	Activity title
Recap	**Recap and Introduction**	Revise what you learned in Semester 1 and plan what you will do in Semester 2	**1**	**Revise first 12 milestones of Semester 1**	Watch a video on "Semester 1 summary"
					Download 12 summary cards of Semester 1 milestones
					Write 3 key learnings of Semester 1
					Write 3 things you will improve in semester 2
					Attempt Semester 1 Recap Quiz
			2	**Set your goals for Semester 2**	Learn how to 4X your revenue in Semester 02 using Marketing
					Read how famous brands use marketing to increase revenue
					Set your marketing goals
					Attempt Semester 2 Readiness Quiz

SEMESTER II

Milestone 13: Marketing Fundamentals

Marketing Fundamentals milestone focuses on helping students understand the basics of marketing and how they can use marketing to scale their businesses and generate revenue.

Milestone #	Milestone Name	Milestone Description	Task #	Task Title	Activity title
13	**Learn marketing fundamentals to scale your business**	Learn how you can use multiple types of marketing to scale your business and grow your revenue	1	**Understand what is marketing**	Watch a video on marketing fundamentals
					Read examples of famous marketing campaigns in India
					Explain what you learned about marketing
					Attempt task 01 quiz
			2	**Learn different types of digital marketing**	Watch a video on what is digital marketing
					Read a document on types of digital marketing
					Write what what kind of digital marketing works best for your business and why
					Attempt task 02 quiz
			3	**Write 3 marketing ideas for your business**	Read a document on how businesses like yours are using marketing to generate revenue
					Write 3 marketing ideas to scale your business
					Validate your ideas with 3-5 people
					Shortlist the best idea and explain how it will generate revenue
					Share your experience of doing this milestone
					Attempt task 03 quiz

SEMESTER II

Milestone 14: WhatsApp Community Marketing

WhatsApp Community Marketing milestone focuses on helping students learn how to build a WhatsApp community for their users and use it to generate trust, engagement, and sales.

Milestone #	Milestone Name	Milestone Description	Task #	Task Title	Activity title
14	Build and activate your WhatsApp community	Build a WhatsApp community for your users and use it to generate trust, engagement, and sales	1	Create your WhatsApp community	Watch a video on why you should build a WhatsApp Community
					Read a document on how to create a WhatsApp community
					Enter the name of your community
					Upload your WhatsApp community link
					Attempt task 01 quiz
			2	Invite people to join your WhatsApp community	Read a few sample invite and welcome messages
					Draft an invite message to invite 50 people to join your community
					Draft a welcome message for your community members
					Upload a screenshot of your welcome message
					Attempt task 02 quiz
			3	Engage your community users and start building trust	Learn 'how to engage people in your community'
					Read top 10 community engagement ideas for your business
					Write 5 types of content to post weekly in your community
					Create and upload your weekly calendar
					Attempt task 03 quiz
			4	Get 3 sales from your WhatsApp Community	Learn how to do soft-selling on community
					Create a community-only offer
					Learn how to convert interested people into paid customers
					Write a simple plan to generate 3 sales per month from the community
					Share your experience of doing this milestone
					Attempt task 04 quiz

SEMESTER II

Milestone 15: Generating Content for Marketing using AI

AI-led Content creation and marketing milestone focuses on helping students learn how to use AI tools to generate creative ideas and create professional videos, posters, and blogs.

Milestone #	Milestone Name	Milestone Description	Task #	Task Title	Activity title
15	**Use AI to generate content for marketing**	Learn how to use AI tools to generate creative ideas and create professional videos, posters, and blogs	**1**	**Learn what is content marketing**	Watch a video on 'what is content marketing'
					Learn which content works for brand awareness or revenue generation
					Write 3 types of content you believe your customers like
					Attempt task 01 quiz
			2	**Generate content ideas to attract customers**	Learn how to use AI to generate content marketing ideas for your business
					Generate 10 small content ideas to attract your customers
					Discuss the ideas with your users and take feedback
					Shortlist top 3 content ideas to attract customers
					Attempt task 02 quiz
			3	**Create your first brand video using AI**	Watch a video on "How to use AI tools to create simple short videos"
					Read this guide on how to ask AI to write a video script
					Generate 5 ideas for your AI videos and write them here
					Upload your AI generated video link
					Attempt task 03 quiz
			4	**Create a brand poster using AI**	Learn how to create a poster using AI
					Write a prompt for the poster will you create using AI
					Upload the AI poster you have created
					Post this poster in your WhatsApp community
					Attempt task 04 quiz
			5	**Write a blog using AI**	Learn how to use prompt engineering to write content for your business
					Read list of topics on which you can write a blog
					Write the topic on which you will write a short blog
					Write the first version of your blog
					Share your blog with your friends and faculty
					Share your experience of doing this milestone
					Attempt task 05 quiz

SEMESTER II

Milestone 16: Social Media Marketing

Social Media Marketing milestone focuses on helping students learn what social media marketing is and how to create a social media weekly plan that engages users and improves brand visibility.

Milestone #	Milestone Name	Milestone Description	Task #	Task Title	Activity title
16	**Plan your social media marketing strategy**	Learn what is social media marketing and how can you execute it to scale your business	**1**	**Learn what is social media marketing**	Watch a video on "Introduction to Social media marketing"
					Learn different types of social media marketing
					Read a document on how to use social media marketing to generate revenue
					Write your understanding of social media marketing
					Write one social media marketing idea for your business
					Attempt Task 01 Quiz
			2	**Research your competitors**	Learn how to research your competitors
					Find your competitors
					Write top 3 things your competitors are posting
					Find one unique gap that you can capture
					Attempt task 02 quiz
			3	**Finalize your content pillars**	Watch a video on 'what are content pillars'
					Read examples of 'content pillars'
					Write 5 content pillars for your social media strategy
					Attempt task 03 quiz
			4	**Create your weekly social media plan**	Watch a video on 'how to create a weekly social media plan'
					Look at examples of 'social media calendar'
					Create and upload your weekly calendar
					Upload the link of your Instagram Channel
					Share your experience of doing this milestone
					Attempt task 04 quiz

SEMESTER II

Milestone 17: Trust-led Marketing

Trust-led Marketing milestone focuses on helping students build trust through social media proofs, testimonials, or basic engagement and later converting them into leads and sales.

Milestone #	Milestone Name	Milestone Description	Task #	Task Title	Activity title
17	**Generate leads and turn them into sales**	Use testimonials, conversations, and daily posts to generate leads and close sales.	**1**	**Use social proof to build trust**	Identify 2 happy customers
					Create a testimonial post with CTA
					Post testimonial on social media
					Post testimonial on the community
					Attempt task 01 quiz
			2	**Make people share their problems**	Learn how to ask open-ended questions
					List 5 customer problems
					Post these problems in community and social media
					Evaluate top 2 problems customers face
					Encourage people to share their problems
					Attempt task 02 quiz
			3	**Help your users with 3-5 days content sprint and generate leads**	Brainstorm or use AI to create a solution document for each problem
					Post solution to 1 problem on a daily basis
					DM people to check if your solution is helping them
					Write how many leads did you generate
					Attempt task 03 quiz
			4	**Convert leads into sales**	Learn how to convert leads into sales
					Soft sell your offering in community and social media
					DM people how can your product help them better
					Follow up after 24 to 48 hours
					Write how many leads you converted into sales
					Share your experience of doing this milestone
					Attempt task 04 quiz

SEMESTER II

Milestone 18: Viral/Trend Marketing

Viral Marketing milestone focuses on helping students learn how to launch viral campaigns for their businesses using the latest trends and make their brand go viral without spending any money.

Milestone #	Milestone Name	Milestone Description	Task #	Task Title	Activity title
18	**Make your brand go viral**	Design viral marketing campaigns to reach 5X users without spending any money	**1**	**Learn viral marketing**	Understand what is virality and how it works
					Read about top 10 viral marketing campaigns in India
					Write 3 reasons why people share content
					Attempt task 01 quiz
			2	**Design 2 viral campaigns for your business**	Learn 5 types of common viral marketing strategies
					Read 10 viral marketing ideas for your business
					Design 2 viral campaigns for your business
					Take feedback from people and finalize one campaign
					Set your campaign targets
					Attempt task 02 quiz
			3	**Launch one viral campaign to increase customer reach**	Create your campaign launch video or poster
					Create your campaign launch message
					Launch your campaign on your social media platform
					Launch your campaign in your WhatsApp community
					Attempt task 03 quiz
			4	**Promote your campaign to make it viral**	Share your campaign in other groups and forums
					Measure your campaign performance
					Learn how to improve your campaign
					Analyze your campaign and record final metrics
					Enter the summary of your campaign
					Share your experience of doing this milestone
					Attempt task 04 quiz

SEMESTER II

Milestone 19: BTL/Offline Marketing

BTL/Offline Marketing milestone focuses on helping users learn about BTL (below the line) or offline marketing and use it to reach out to local customers and generate revenue.

Milestone #	Milestone Name	Milestone Description	Task #	Task Title	Activity title
19	**Drive revenue through offline/BTL marketing**	Use offline activities to reach local customers and generate sales	**1**	**Understand offline or BTL marketing**	Watch a video on what is BTL marketing
					Read about famous BTL marketing campaigns
					Write how you can use BTL marketing for your business
					Attempt task 01 quiz
			2	**Pick your offline marketing idea**	Learn about common offline tactics for your business
					Write 1 offline marketing idea you can execute
					Design your brand poster for offline marketing
					Create your offline marketing offer or pitch
					Practice your pitch with friends and take feedback
					Attempt task 02 quiz
			3	**Execute offline marketing in local market**	Identify people or locations in local for offline marketing
					Pitch to at least 10 real customers
					Collect contact details for WhatsApp Community invite
					Close at least one sale
					Write your offline marketing metrics
					Share your experience of doing this milestone
					Attempt task 03 quiz

SEMESTER II

Milestone 20: Collaboration and Affiliate Marketing

Collaboration and Affiliate Marketing milestone focuses on helping users learn about affiliate marketing and how to collaborate with individuals/businesses to reach more customers and generate revenue.

Milestone #	Milestone Name	Milestone Description	Task #	Task Title	Activity title
20	**Grow through collaboration and affiliation marketing**	Use partners and affiliates to reach new audiences and generate sales	**1**	**Understand affiliate marketing and collaboration**	Watch a video on what is affiliate marketing
					Read about top collaboration or affiliate marketing campaigns
					Learn 10 common types of collaboration or affiliate marketing for your business
					Pick 3 types that can work for your business
					Attempt task 01 quiz
			2	**Design your affiliation model**	Learn how to start an affiliation program
					Decide your commission structure
					Write a pitch for partnership
					Attempt task 03 quiz
			3	**Finalize one person or business for collaboration**	Learn how to find a right partner for collaboration
					Create a list of 5 to 10 people or businesses for collaboration
					Send your partnership pitch to potential partners
					Write the name of one final partner
					Attempt task 03 quiz
			4	**Execute the collaboration**	Explain how will the partner market your brand
					Post the link or screenshot of successful collaboration
					Respond to new leads within 24 hours
					Close at least one sale
					Attempt task 04 quiz
			5	**Measure your collaboration**	Write number of leads generated
					Write number of sales closed and revenue generated
					Write what worked and how to improve collaboration
					Share your experience of doing this milestone
					Attempt task 05 quiz

SEMESTER II

Milestone 21: Advertising Marketing (Meta)

Advertising Marketing milestone focuses on helping users learn how to post a paid ad on Meta (Instagram and Facebook) promoting their business and reach to more users or generate revenue.

Milestone #	Milestone Name	Milestone Description	Task #	Task Title	Activity title
21	Run your first ad on Instagram	Learn how to boost posts or run simple video ads to reach new viewers	1	Setup your Meta Business Suite	Watch a video on why to run ads on Meta
					Learn different types of ads
					Read the guide on Meta Ad account setup
					Setup your Meta Ad account
					Attempt task 01 quiz
			2	Design your first paid ad	Watch samples of good ad designs for your business
					Finalize your ad objective
					Upload the final draft of your ad with final copy and creatives
					Attempt task 02 quiz
			3	Define your target audience and budget	Watch a video on 'how to target the right people for ad'
					Define your target audience
					Learn how to decide the right budget for your ad
					Decide your final budget
					Attempt task 03 quiz
			4	Launch your ad	Learn how to create and launch your ad
					Create your ad and review ad preview
					Upload the screenshot of launched ad
					Attempt task 04 quiz
			5	Manage incoming leads from ad	Draft a message for incoming leads
					Send draft message to leads within 24 hours
					Pitch your offer to leads and follow
					up
					Close at least one sale
					Attempt task 05 quiz
			6	Measure your ad performance	Learn metrics to measure ad performance
					Write money spent and leads or impressions
					Mention CPL or CPM
					Write revenue generated and number of sales closed
					Write what worked and how to improve ads in future
					Share your experience of doing this milestone
					Attempt task 06 quiz

SEMESTER II

Milestone 22: Psychological Marketing

Psychological Marketing milestone focuses on helping users identify psychological triggers like urgency, pricing, and offers, and use them to increase conversions and revenue.

Milestone #	Milestone Name	Milestone Description	Task #	Task Title	Activity title
22	Use Psychological Triggers to Increase Sales	Learn how to use urgency, pricing, and offers to increase conversions and revenue	1	Understand the psychological triggers	Learn why people buy products
					Share a story of one product you purchased because of a trigger
					Identify buying triggers for your business
					Attempt task 01 quiz
			2	Execute FOMO or urgency marketing	Learn how to create a FOMO or urgency marketing campaign
					Write how will you create FOMO or urgency for your customers
					Create one FOMO/urgency marketing campaign
					Launch your campaign on social media and community
					Attempt task 02 quiz
			3	Execute one offer or discount marketing campaign	Learn how to create offer or discounting marketing campaigns
					Write how will you create an offer/discount campaign
					Create one offer/discount campaign for your customers
					Launch your campaign on social media and community
					Share your experience of doing this milestone
					Attempt task 03 quiz

SEMESTER II

Milestone 23: Data-Driven Marketing

Data-Driven Marketing milestone focuses on helping users analyze the data of the last 10 milestones and run specific campaigns or ideas that resulted in lead generation or revenue.

Milestone #	Milestone Name	Milestone Description	Task #	Task Title	Activity title
23	**Use Data-Driven Marketing to Grow Faster**	Analyze data of the last 10 milestones to identify top campaigns or ideas and decide what to continue, improve, or stop.	**1**	**Analyze your marketing data**	Learn how businesses make decisions using data
					List 3 things that worked well and why
					List 3 things that didn't work well and why
					Attempt task 01 quiz
			2	**Re-execute top performing campaign**	Re-execute top 1-2 campaigns for 1 week
					Write how it helped generate leads or revenue
					Attempt task 02 quiz
			3	**Improve one low performing campaign and relaunch it**	Pick one low performing campaign and write how to improve it
					Improve the campaign and relaunch it
					Measure its performance and see if it was better
					Share your experience of doing this milestone
					Attempt task 03 quiz

SEMESTER II

Milestone 24: Closure and Next Step

The final milestone focuses on helping users reflect on their learnings and also create an action plan for the next few months to continue to scale and grow their business.

Milestone #	Milestone Name	Milestone Description	Task #	Task Title	Activity title
24	Plan your next growth phase	Document your 12 weeks of learning and create a 1 month plan to scale and grow your business	1	Review your progress	List all the ideas you executed
					Write which milestone helped you the most and how
					Write which milestone helped you the least and why
					Write your key learnings from this semester
					Create a not-to-do list for your business
					Attempt task 01 quiz
			2	Create your 1 month marketing plan	Learn how to create a 1 month marketing plan
					Set your marketing goal
					Create and upload your 1 month plan to achieve this goal
					Share your experience of doing this milestone
					Attempt final semester quiz

SEMESTER II

Evaluation Criteria
The evaluation will be conducted by a committee consisting of the class mentor, nodal officer and the principal HOD or his/her nominee.

Evaluation Component	Description	Weightage
Weekly Task Completion	Timely submission of weekly tasks, including activities, reflection prompts, graded quizzes etc	60%
Target Completion	Performance-based evaluation on hitting revenue or Profit targets (e.g., generating ₹10,000 revenue)	20%
Final Project	A comprehensive project depending the theme of the Semester	20%

Evaluation Mechanism: The score generated by the app will be final.
Weekly Component:

Each week of the course follows a structured format designed to guide students from learning to doing, using simple, mobile-accessible components:

Component	Duration	Description
Action Lab	~4hrs	- Hands-on task on the weekly concept - Includes step-by-step guidance, templates, and worksheets - Ends with a submission (e.g., video, reflection, or proof of action)
Learning Resources	Self-paced	- Videos, short readings, real-life stories, and tools to deepen understanding at their own pace
Check-in	Self-paced	- Quizzes & Reflection prompts

SEMESTER II

Syllabus Overview for Semester 1-5

Semester	Learning Focus	Learner's demonstration	Revenue Target
1	Setup & Launch	Understand. Create. Start.	₹ 10,000/-
2	Marketing Basics	Engage. Share. Grow.	₹ 40,000/-
3	Operations &Scale	Earn. Deliver. Expand.	₹ 80,000/-
4	Organic Growth	Attract. Retain. Build.	₹ 160,000/-
5	AI Automation & Finance mastery	Simplify. Track. Sustain	₹ 400,000/-

Semester 1: Setup & Launch

In Term 1, students will explore what entrepreneurship means and how it connects to their daily lives. They will earn to identify problems, shape simple business ideas, and test the mineral settings. This semester builds the foundation—mindset, observation, value creation, and action.

Semester 2: Marketing Basics
In Term 2, students will learn how to attract customers and grow their visibility using digital platforms and community-based marketing strategies. Students will also begin to run paid advertising campaigns and learn how to optimize their marketing efforts.

Semester 3: Operations & Scale
This semester focuses on the day-to-day operations of running a business, including order fulfillment, customer service, and logistics. Students will also focus on scaling operations as demand grows, with an emphasis on managing resources effectively.

Semester 4: Organic Growth
Students will learn how to grow their businesses organically, using referrals, partnerships, and community engagement. This semester focuses on building a loyal customer base and using word-of-mouth marketing to increase reach and credibility.

SEMESTER II

Semester 5: AI Automation & Financial Mastery

The final semester prepares students for long-term sustainability. Students integrate AI to improve productivity, automate routine tasks, and enhance decision-making. They also dive deep into financial planning, learning to set income goals, track expenses, understand profit margins, and create simple financial forecasts. This semester helps students solidify their entrepreneurial identity design systems for financial stability and scalability.

Course Outcomes:-

After studying this course, students will be able to:

- Launch and manage a business within their chosen track.
- Identify profitable opportunities and develop innovative solutions.
- Implement marketing and sales strategies using both digital and traditional methods.
- Use financial metrics to track performance and make informed business decisions.
- Scale a businesss using operational systems and automation tools.

Suggested Readings:-

- Simon Sinek, *Start with Why: How Great Leaders Inspire Everyone to Take Action*, Portfolio/Penguin
- Eric Ries, *The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*, Crown Business
- Jonah Berger, *Contagious: How to Build Word of Mouth in the Digital Age*, Simon & Schuster
- Phil Knight, *Shoe Dog: A Memoir by the Creator of Nike*, Scribner
- Jason Fried and David Heinemeier Hansson, *Rework: Change the Way You Work Forever*, Crown Business
- Héctor García and Francesc Miralles, *Ikigai: The Japanese Secret to a Long and Happy Life*, Penguin Books
- Tim Ferriss, *Tools of Titans (Selected Chapters)*, Houghton Mifflin Harcourt
- Peter Thiel and Blake Masters, *Zero to One: Notes on Startups, or How to Build the Future*, Crown Business
- Anil Lamba, *Romancing the Balance Sheet*, Anil Lamba Publications
- The Better India/Your Story, *Young Entrepreneurs Series* (Collection of Articles) Real Indian stories Of youth starting businesses, snack able reads that show what's possible.

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- III
Course Code: BVIL-3111

Statistical Inference-I

COURSE OUTCOMES:

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

CO1: Comprehend the concepts of random variables.

CO2: Implement the Laplace theorem.

CO3: Understand various types of Probability distributions

CO4: Identify various probability distributions and sampling distributions.

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- III

Course Code: BVIL-3111

Statistical Inference-I

L-T-P	**Max. Marks: 100**
4-0-0	**Theory:70**
Time: 3 Hours	**CA: 30**

Instructions for Paper Setter -

Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section. Each Question Carries 14 Marks.

UNIT-I

Cumulative distribution function, Two dimensional random variables, joint distribution, marginal and conditional distributions, Stochastic independence, Introduction to function of random variables.

UNIT-II

Mathematical expectations and moments, moment generating function and its properties, Chebyshev's inequality and its application, central limit theorem (Laplace Theorem)

UNIT-III

Discrete Probability Distributions: Binomial, Poisson, Geometric, Continuous probability distributions: Uniform, Exponential, Gamma, Beta, Normal distributions.

UNIT-IV

Sampling Distributions: Chi-square, t and F-distributions with their properties, distribution of sample mean and variance. Introduction to Estimators, Types of Estimators

References/Textbooks:

1. Hogg R.V., Mckean, J.W. and Craig A.T. : Introduction to Mathematical Statistics
2. Gupta S.C. and Kapoor V.K. : Fundamentals of mathematical statistics
3. Goon,A.M.,Gupta M.K. & Dasgupta B. : Fundamental of statistic, Vol. I
4. Goon,A.M.,Gupta M.K. & Dasgupta B. : An outline of statistical theory, Vol. I

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- III
Course Code: BVIL-3112

Data Mining and Data Warehousing

COURSE OUTCOMES:

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

CO1: Comprehend Data Mining, Data Warehousing concepts and techniques.

CO2: Comprehend various classification and clustering algorithms.

CO3: Study basic concepts of OLAP.

CO4: Describe frequent pattern mining and its applications.

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- III
Course Code: BVIL-3112

Data Mining and Data Warehousing

L-T-P	**Max. Marks: 100**
4-0-0	**Theory:70**
Time:3 Hours	**CA: 30**

Instructions for Paper Setter -
Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section. Each Question Carries 14 Marks.

UNIT-I
Introduction to Data Mining Systems, Knowledge Discovery Process, Data Mining Techniques, Issues, Applications, Information Retrieval, Web search engines, Frequent pattern mining.

UNIT-II
Data Mining Techniques-association, classification, clustering, prediction, sequential patterns and decision tree. Classification- Distance based algorithms, K-nearest neighbours, Euclidean distance, city block distance, Tangent distance, Clustering Algorithms, Cluster analysis, Partitioning Methods, Hierarchical Methods, Density Based Methods, Grid Based Methods.

UNIT-III
Introduction to Data Warehousing: Evolution of Data Warehousing, Data Warehousing concepts, Benefits of Data Warehousing, Problems of Data Warehousing, Data Warehousing Architecture, OLAP

UNIT-IV
Types of Data Warehouses- Host based, single stage, LAN based, Multistage, stationary distributed & virtual data-warehouses, Data warehouse tools and technologies

References/ Textbooks:

1. Alex Berson and Stephen J.Smith, “Data Warehousing, Data Mining and OLAP”, Tata McGraw – Hill, Thirteenth Edition, Reprint 2008.
2. Jiawei Han and Micheline Kamber, “Data Mining Concepts and Techniques”, Third Edition, Elsevier, 2012.
3. Parteek Bhatia, “Data Mining and Data Warehousing: Principals and Practical Techniques”, Cambridge University Press,First Edition, 2019.

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- III
Course Code: BVIL-3113

Data Processing and Visualization

Course Outcomes:

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

CO1: Comprehend various types of data processing methods.

CO2: Identify different data formats and their conversion involved in a dataset.

CO3: Comprehend human perception in visualization of data.

CO4: Apply various visualization tools such as Histograms, Bar Charts, Pie Charts, Box Plots, Scatter Plots, etc.

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- III
Course Code: BVIL-3113

Data Processing and Visualization

L-T-P	**Max. Marks:50**
2-0-0	**Theory: 35**
Time: 3 Hours	**CA: 15**

Instructions for Paper Setter -
Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section. . Each Question Carries 7 Marks.

UNIT-I

Introduction: Data, Characteristics of Data, Prerequisite for Data Processing, Problems associated with raw data, Data cleansing methods, Principles of Data Processing, Data Processing Systems, Data Processing Cycle, Role of Data Processing.

UNIT-II

Types of Data Processing (Batch Processing, Real-time Processing, Online Processing, Distributed Processing, Multiprocessing and Time-sharing). Methods of Data Processing (Manual Data Processing, Mechanical Data Processing, Electronic Data Processing), Applications of Data Processing, Different data formats, Conversion and Aggregation.

UNIT-III

Data Visualization: Introduction of Data Visualization, Importance of Data Visualization, Data Visualization project, User psychology of Visualization, UX in Data Visualization, Introduction to DIKW hierarchy, Goals of Data Visualization. User interface design principles based on Human perception.

UNIT-IV

Basic Visualization tools - Area Plots, Histograms, Bar Charts, Specialized Visualization tools - Pie Charts, Box Plots, Scatter Plots, Bubble Plots. Charts and their applicability for different data types. Advanced Visualization tools - Waffle Charts, Word Clouds.

References/ Textbooks:

1. Satish Jain, “Computer Fundamental & Data Processing”, BPB Publications, First Edition, 2010.
2. Andy Kirk, “Data Visualization: A Handbook for Data Driven Design” SAGE Publications Ltd, First edition, 2016
3. Kieran Healy, “Data Visualization: A Practical Introduction” Kindle Edition, Princeton University Press, First edition, 2018.
4. Claus O. Wilke, “Fundamentals of Data Visualization”, Oreilly Publishers, First Edition, 2019

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- III
Course Code: BVIL-3114

Workplace Management

Course Outcomes:

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

CO1: Comprehend Formal and Informal Communication.

CO2: Identify Skills required to be an efficient employee

CO3: Apply workplace etiquettes and learn to handle difficult situations.

CO4: Develop their personality and good body language.

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- III
Course Code: BVIL-3114

Workplace Management

L-T-P	**Max.Marks: 75**
2-0-0	**Theory:60**
Time:3 Hours	**CA: 15**

Instructions for Paper Setter -
Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT I

Formal Communication: Etiquettes of Public speaking, Business meetings, Telephonic communication, Email etiquettes.
Informal Communication: Introduction, expressing gratitude, expressing regret, Apologize, Resolving conflicts.

UNIT II

Presentation Skills: Preparing presentation, making presentation meaningful and engaging, making effective use of the visual aid, interacting with audiences, dealing with queries from the audiences. **Preparing for Interviews:** Key factors for being successful in an interview, body language, confidence, subject expertise. Resume Writing.

UNIT III

Maintaining Relationships at workplace, Maintaining Client Satisfaction, Identify Skills required for the job, Work effectively with colleagues.

UNIT IV

Personality Development, Self-Esteem & Confidence Building, Power Dressing: Wardrobe Etiquette, Grooming for Success, Body Language, Poise, and Eye Contact, Pronunciation, Voice Modulation, Assertive Behaviour, Leadership Qualities, Handling difficult situations with grace, Style and Professionalism

References/ Textbooks:

1. Chaturvedi P.D. ,“ Business Communication”, Pearson Education India, Third Edition, 2013.
2. Robin Ryan, “60 Seconds and You're Hired!”, Fourth Edition, Penguin Books, 2016
3. Joan van Emden, Lucinda Becker, “Presentation Skills for Students”, Palgrave, Third Edition, 2016
4. David Barron, “Resume: The Definitive Guide on Writing a Professional Resume to Land You Your Dream Job”, CreateSpace Independent Publishing Platform, First Edition, 2017

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- III
Course Code: BVIL- 3115

Machine Learning-I

Course Outcomes:

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

CO1: Comprehend the Machine Learning Techniques.

CO2: Describe Linear Regression and Multiple Linear Regressions.

CO3: Identify Clustering and Classification Techniques.

CO4: Comprehend various machine learning models.

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- III
Course Code: BVIL- 3115

Machine Learning-I

L-T-P	**Max. Marks: 50**
3-0-0	**Theory:40**
Time: 3 Hours	**CA: 10**

Instructions for Paper Setter -
Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

Unit I

Introduction: Foundations for ML, ML Techniques, Validation Techniques, Basic definitions, types of learning, hypothesis space and inductive bias, Boolean Functions: Boolean Algebra

Unit II

Linear Regression: Regression basics: Relationship between attributes using Covariance and Correlation, Relationship between multiple variables: Regression (Linear, Multivariate) in prediction. **Multiple Linear Regressions** Polynomial Regression, Regularization methods, Categorical Variables in Regression.

Unit III

Clustering: Distance measures, Different clustering methods (Distance, Density, Hierarchical), Iterative distance-based clustering.

Classification: Naïve Bayes Classifier, Model Assumptions, Probability estimation, Required data processing

Unit IV

Latest Machine Learning models: Decision Trees, Random Forest, Principal Component analysis, Support Vector Machine, Markov decision process, Stochastic Gradient Descent.

References/ Textbooks:

1. EthemAlpaydin, "Introduction to Machine Learning", MIT Press, Second Edition, 2010
2. Judith Hurwitz, Daniel Kirsch"Machine learning for dummies", Wiley, First Edition, 2018
3. Parteek Bhatia, "Data Mining and Data Warehousing: Principals and Practical Techniques", Cambridge University Press, First Edition, 2019
4. Miroslav Kubat, "An Introduction to Machine Learning", Springer, First Edition, 2015

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- III
Course Code: BVIP-3116

Lab on Data Processing and Visualization

L-T-P	**Max. Marks:50**
0-0-2	**Practical: 40**
Time: 3 Hours	**CA: 10**

Lab based on Data Visualization Tool.

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- III
Data Storytelling and Presentation

Course Code: BVIP-3117

COURSE OUTCOMES:

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

CO1: Understand importance of Data Storytelling.

CO2: Recognise the process of preparing a Data story

CO3: Identify and work with various graphs and plots.

CO4: Present a data story.

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- III
Data Storytelling and Presentation

Course Code: BVIP-3117

L-T-P	**Max. Marks: 75**
0-2-2	**Practical:60**
Time:3 Hours	**CA: 15**

Activity 1:

Group discussion on following topics:

- What is Data Storytelling
- Importance of Data Storytelling

Activity 2:

- Vital components of Data Storytelling
- Differentiate between data exploration and data storytelling

Activity 3:

- Discuss various graphs and plots used in data visualization and storytelling.
- Discuss the anatomy of a data story.

Activity 4:

- Craft your own data story.

References/Textbooks:

1. Cole NussbaumerKnaflic "Storytelling with Data: Let's Practice",Kindle edition,Wiley,2019
2. John Truby, "The Anatomy of Story: 22 Steps to Becoming a Master Storyteller", First Edition,Faber & Faber, 2007
3. Will Storr, "The Science of Storytelling: Why Stories Make Us Human and How to Tell Them Better", First Edition,Abrams Press,2019.
4. Cole NussbaumerKnaflic, "Storytelling with Data- A Data Visualization Guide for Business Professionals", First Edition, Wiley,2015

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- III
Course Code: BVIP-3118

Lab on Machine Learning-I

L-T-P	**Max. Marks: 50**
0-0-3	**Practical:40**
Time:3Hours	**CA: 10**

Students will implement ML based Regression, Classification, Clustering algorithms using various Python Libraries such as Panda, Numpy, Matplotlib, Scikit Learn

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- III

Course Code: BVII-3119

Assignment based on Visual Insights

Course Outcomes:

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

CO1: Apply machine learning techniques on various datasets.

CO2: Apply their knowledge to work on Machine Learning related assignment.

CO3: Implement Regression , Classification or Clustering in your work.

CO4: Work within defined time and resource constraints while working with real world applications.

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- III
Course Code: BVII-3119

Assignment based on Visual Insights

L-T-P	**Max. Marks: 100**
0-0-4	**Practical:80**
Time: 3 Hours	**CA: 20**

Instructions to the examiner:

The students will be working on Machine learning and Data Visualization tools concepts. The students need to submit the self-made assignment at the end of the semester. The marks will be awarded to the student on the basis of Technical knowledge, Project reports and performance in viva-voce.

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- IV
Course Code: BVIL-4111

Statistical Inference-II

Course Outcomes:

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

CO1: Discuss various Basic Estimators.

CO2: Apply various sampling distributions.

CO3: Comprehend basic hypothesis techniques.

CO4: Solve problems based on One way and Two-way ANOVA

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- IV
Course Code: BVIL-4111

Statistical Inference-II

L-T-P	**Max. Marks: 100**
4-0-0	**Theory:70**
Time:3Hours	**CA: 30**

Instructions for Paper Setter -

Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

Unit-I

Basics of Estimators: Properties of unbiasedness, consistency, sufficiency, efficiency, completeness, uniqueness (Without Proofs)

Unit-II

Applications of Sampling Distributions: Test of mean and variance in the normal distribution, Tests of single proportion and equality of two proportions, Chi-square test, t-test, F-test.

Unit-III

Statistical Hypothesis: Null hypothesis, Alternate hypothesis, Level of Significance, simple and composite hypothesis Steps in solving Testing of hypothesis problem, Neyman Pearson Lemma.

Unit-IV

Introduction to ANOVA (Analysis of variance), One way Analysis of variance, Two way Analysis of variance. Problem based on ANOVA.

References/Textbooks:

1. Hogg R.V., Mckean, J.W. and Craig A.T.: Introduction to Mathematical Statistics
2. Gupta S.C. and Kapoor V.K.: Fundamentals of mathematical statistics
3. Goon,A.M.,Gupta M.K. & Dasgupta B. : Fundamental of statistic, Vol. I
4. Goon,A.M.,Gupta M.K. & Dasgupta B. : An outline of statistical theory, Vol. I

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- IV
Course Code: BVIL- 4112

Applied Statistical Programming

COURSE OUTCOMES:

After completing this course, the student will be able to:

CO1: Comprehend basics of Statistical Computing and role of constructs like control statements, string functions, array, list, etc in programming language.

CO2: Create, operate and manage data frames.

CO3: Simulate various descriptive and analytical algorithms using programming language.

CO4: Apply programming on statistical concepts.

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- IV
Course Code: BVIL- 4112

Applied Statistical Programming

L-T-P	**Max.Marks: 100**
4-0-0	**Theory:70**
Time:3 Hours	**CA:30**

Instructions for Paper Setter -
Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT I

Statistical Computing: Introduction, Role of Programming and Statistical Software. Data, Statistics: Sampling, Cumulative statistics, Statistics for Data frames, matrix objects and lists, Introduction to R, Vectors, Common Vector Operations, using all and any function, subletting of vector, Creating matrices, Matrix operations, Applying Functions to Matrix Rows and Columns, Adding and deleting rows and columns.

UNIT II

Lists, Creating lists, general list operations, Accessing list components and values, applying functions to lists, recursive lists Creating Data Frames – Matrix-like operations in frames, Merging Data Frames, Applying functions to Data frames, Factors and Tables, factors and levels, Common functions used with factors, string operations.

UNIT III

Input/ Ouput: scan() , readline() Function, Printing to the Screen, Reading and writing CSV and text file. Control statements: Loops, Looping Over Non vector, Sets, if-else, writing user defined function, scope of the variable, R script file.

UNIT IV

Descriptive Statistics, Data exploration (histograms, bar chart, box plot, line graph, scatter plot), Qualitative and Quantitative Data, Measure of Central Tendency (Mean, Median and Mode), Measure of Positions (Quartiles, Deciles, Percentiles and Quantiles), Measure of Dispersion (Range, Median, Absolute deviation about median, Variance and Standard deviation), Measures:

Quartile and Percentile, Inter-quartile Range, Relationship between attributes: Covariance, Correlation Coefficient.

References/ Textbooks:

1. Andrie de Vries and JorisMeys, “R Programming for Dummies”, Wiley, 2nd Edition, 2016

2. Sandip Rakshit, “Statistics with R Programming”, McGraw Hill Education, 1st Edition, 2018

3. Garrett Grolemund, “Hands on Programming with R”, O’Reilly, 1st Edition, 2014

4. Mark Gardener, “Beginning R: The Statistical Programming Language”, Wiley,Ist Edition, (2013)

5. Tilman M. Davies, “The Book of R: A first Course in Programming and Statistics”, No Strach Press, 1st Edition. 2016

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- IV
Course Code: BVIL-4113

Non-Relational Databases

Course Outcomes:

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

CO1: Comprehend fundamental concepts of Big Data and learn about various components of Hadoop ecosystems

CO2: Comprehend concepts of Hadoop Ecosystem.

CO3: Comprehend various types of databases in NoSQL and CRUD: Create, Update, Delete and Query operation on database

CO4: Understand indexing, projection, aggregation, etc on existing database.

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- IV

Course Code: BVIL-4113

Non-Relational Databases

L-T-P	**Max.Marks: 100**
3-0-0	**Theory:70**
Time: 3Hours	**CA: 30**

Instructions for Paper Setter

Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT I

Introduction to Big Data: History of Big data, Career prospects, Advantages, Disadvantages, Applications, Types of Digital Data, Characteristics of Data, Evolution of Big Data, Challenges with Big Data - 3Vs of Big Data.

UNIT II

Introduction to Hadoop: Features, Advantages, Versions, Overview of Hadoop Eco systems and its components, Hadoop1 vs. Hadoop2, Hadoop vs. SQL, RDBMS vs. Hadoop, Hadoop Components, Architecture: HDFS, YARN, Hive, Pig, Mahout, Avro, Sqoop, Oozie, Zookeeper, Chukwa, Flume.

UNIT III

NoSQL Overview, Need of NoSQL, Structured Data Vs. Unstructured Data, Types of Database in NoSQL, Brief History of NoSQL Databases, Features of NoSQL, Advantages of NoSQL, CAP Theorem, Eventual Consistency, ACID vs BASE Properties. MongoDB: Overview, Install MongoDB server, Environment, Create Database, Data Model, Collection (Creation and Deletion), Data types in MongoDB, CRUD: Create, Update, Delete And Query Database.

UNIT IV

SQL to MongoDB Mapping, Projection. Sorting, Limiting and Counting records.

Indexes in MongoDB: Creation of Index, Options, Dropping and fetching of Index. Analyze Query performance, Plan and Profiler. MongoDB Aggregation Query: Aggregate Framework (sum, avg, min, max, push, first, etc). Replication and Sharding, MapReduce Function. Creating database backup.

Reference/ Textbooks:

1. Seema Acharya, Subhasini Chellappan, "Big Data Analytics" Wiley, Second Edition, 2015.
2. Y. Lakshmi Prasad, “Big Data Analytics Made Easy”, Notion Press, First Edition, 2016.
3. Adam Fowler, “NoSQL For Dummies”, Wiley, First Edition, 2015.
4. Gerardus Blokdyk, “NoSQL A Complete Guide”, 5STARCooks, Second Edition, 2021.

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- IV
Course Code: BVIL-4114

Entrepreneurship basics

Course Outcomes:

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

CO1: Examine the challenges associated with defining the concepts of entrepreneur and entrepreneurship.

CO2: Comprehend the concepts of entrepreneurial uniqueness, entrepreneurial personality traits.

CO3: Understand the process of building a Start-Up.

CO4: Comprehend the concepts of Business Intelligence and its importance.

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- IV
Course Code: BVIL-4114

Entrepreneurship basics

L-T-P	**Max. Marks:50**
2-0-0	**Theory: 35**
Time: 3 Hours	**CA: 15**

Instructions for Paper Setter -
Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT-I

Introductory terms: Entrepreneurs and Entrepreneurship, Entrepreneurship and innovation, Profit making, Growth, Risk and uncertainty, market demand, Understanding customers.

UNIT-II

Entrepreneurship Uniqueness: Personality Traits, Behavioural traits, Skills required to be a successful Entrepreneur. Forms of Entrepreneurship: Social, Business and Techno Entrepreneurship

UNIT-III

General Venturing Script: Searching, Idea Screening, Planning and Financing, Set-Up, Start-Up, Ongoing Operations, Harvest, Artificial Intelligence as an Entrepreneurship Enabler.

UNIT-IV

Introduction to Business Intelligence, Importance of Business Intelligence, Process of Business Intelligence, Business Intelligence tools and applications.

References/ Textbooks:

1. Tom Fawcett, “Data Science for Business: What You Need to Know about Data Mining and Data-Analytic Thinking”, O’Reilly , First Edition, 2013
2. Swain Scheps, “Business Intelligence for Dummies”, Wiley, First Edition, 2008
3. Jeremy M. Kolb, “Business Intelligence in Plain Language: A Practical Guide to Data Mining and Business Analytics”CreateSpace Independent Publishing Platform, First Edition, 2013.
4. Eric Ries “The Lean Startup” Crown Publishing Group, First Edition, 2011

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- IV
Course Code: BVIP- 4115

Applied Statistical Programming Lab

L-T-P	**Max.Marks: 100**
0-0-4	**Theory:70**
Time:3 Hours	**CA:30**

Lab based on applied statistics.

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- IV
Course Code: BVIP-4116

Lab on Non-Relational Databases

L-T-P	**Max. Marks: 100**
0-0-3	**Practical:70**
Time:3Hours	**CA: 30**

Lab based on NoSQL

Course Outcomes:

After completing this course, the students will be able to:

CO1: Collect data to perform Statistical Techniques using R Language.

CO2: Apply CRUD: Create, Update, Delete and Query operation operations on Database.

CO3: Apply their knowledge to work on small/medium scale NoSQL database or R language.

CO4: Work within defined time and resource constraints while working with real world applications.

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- IV Course Code: BVII-4117

Assignment based on Unstructured Data Analysis using MongoDB and Python

L-T-P	**Max. Marks: 100**
0-0-4	**Practical:70**
Time: 3 Hours	**CA: 30**

Instructions to the examiner:

The students will be working on a database related assignment. The students need to submit the self-made work at the end of the semester. The marks will be awarded to the student on the basis of Technical knowledge, Reports and performance in viva-voce

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- V
Course Code: BVIL-5111

Research Methodology

L-T-P	**Max.Marks: 75**
4-0-0	**Theory:60**
Time:3 Hours	**CA: 15**

Course Outcomes:

After completing this course, the student will be able to**:**

CO1: Significance of ethical conduct, Classification of Research

CO2: Understand the various research methods and data sources in research

CO3: Interpretation of Data and Paper Writing

CO4: Research ethics, IPR and Scholarly publishing

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- V
Course Code: BVIL-5111

Research Methodology

L-T-P	**Max.Marks: 75**
3-0-0	**Theory:60**
Time:3 Hours	**CA: 15**

Instructions for Paper Setter -

Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT I

Overview of Research: Meaning, purpose, significance of ethical conduct in research, Classification of Research based on its purpose (Basic, Applied, Evaluation and Action Research)

UNIT II

Method: Types of approaches – Narrative, phenomenological, grounded theory, ethnographic, case study, Data Sources: Interviews, Focus groups, observations, approaches to analysis of qualitative data –coding, content analysis

UNIT III

Interpretation of Data and Paper Writing – Layout of a Research Paper, Journals in Computer Science, Impact factor of Journals, When and where to publish? Ethical issues related to publishing, Plagiarism and Self-Plagiarism. Oral Presentation

UNIT IV

RESEARCH ETHICS, IPR AND SCHOLARY PUBLISHING:

Ethics-ethical issues, ethical committees (human & animal); IPR- intellectual property rights and patent law, commercialization, copy right, royalty, trade related aspects of intellectual property rights (TRIPS); scholarly publishing- IMRAD concept and design of research paper, citation and acknowledgement

References/Textbooks:

1. Research Methodology (Kindle Edition) by R. Panneerselvam
2. Research Methodology: A Step-by-Step Guide for Beginners (Paperback) by Ranjit Kumar
3. Case Study Research: Design and Methods (Applied Social Research Methods) by Robert K.

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- V
Course Code: BVIL-5112

Principles of Artificial Intelligence

L-T-P	**Max.Marks: 75**
4-0-0	**Theory:60**
Time:3 Hours	**CA: 15**

COURSE OUTCOMES:

After completing this course, the student will be able to:

CO1: Apply knowledge of agent architecture, searching and reasoning techniques for different applications.

CO2: Analyse Searching and Inferencing Techniques.

CO3: Develop knowledge base sentences using propositional logic and first order logic

CO4: Demonstrating agents, searching, inferencing and illustrate the application of probability in uncertain reasoning.

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- V
Course Code: BVIL-5112

Principles of Artificial Intelligence

L-T-P	**Max.Marks: 75**
4-0-0	**Theory:60**
Time:3 Hours	**CA: 15**

Instructions for Paper Setter -
Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

Unit-I

Introduction: What is AI? Foundations and History of AI Intelligent Agents: Agents and environment, Concept of Rationality, The nature of environment, The structure of agents. Problem-solving: Problem-solving agents, Example problems, Searching for Solutions

Unit-II

Uninformed Search Strategies: Breadth First search, Depth First Search, Iterative deepening depth first search. Informed Search Strategies: Heuristic functions, Greedy best first search, A*search. Heuristic Functions Logical Agents: Knowledge–based agents, The Wumpus world, Logic, Propositional logic, Reasoning patterns in Propositional Logic

Unit-III

First Order Logic: Representation Revisited, Syntax and Semantics of First Order logic, Using First Order logic. Inference in First Order Logic: Propositional Versus First Order Inference, Unification, Forward Chaining, Backward Chaining, Resolution

Unit-IV

Uncertain Knowledge and Reasoning: Quantifying Uncertainty: Acting under Uncertainty, Basic Probability Notation, Inference using Full Joint Distributions, Independence, Baye's Rule and its use. Wumpus World Revisited

References/Textbooks:

1. Stuart J. Russell and Peter Norvig, Artificial Intelligence, 3rd Edition, Pearson,2015
2. Elaine Rich, Kevin Knight, Artificial Intelligence, 3rd edition,Tata McGraw Hill,2013
3. George F Lugar, Artificial Intelligence Structure and strategies for complex, Pearson Education, 5th Edition, 2011

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- V
Course Code: BVIL-5113

Machine Learning II

L-T-P	**Max.Marks: 75**
4-0-0	**Theory:60**
Time:3 Hours	**CA: 15**

Course Outcomes:

After completing this course, the student will be able to**:**

CO1: Understand the concepts of Reinforcement Learning

CO2: Learn about various machine learning methods

CO3: Overview of Independent Component

CO4: Basis introduction to Natural Language Processing

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- V
Course Code: BVIL-5113

Machine Learning II

L-T-P	**Max.Marks: 75**
4-0-0	**Theory:60**
Time:3 Hours	**CA: 15**

Instructions for Paper Setter -
Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

Unit-I

Reinforcement learning, Reinforcement Learning Algorithm : Python Implementation using Q-learning, Introduction to Thompson Sampling, Genetic Algorithm for Reinforcement Learning, SARSA Reinforcement Learning, Q-Learning in Python

Unit-II

Introduction to Dimensionality Reduction, Introduction to Kernel PCA, Principal Component Analysis(PCA), Principal Component Analysis with Python, Low-Rank Approximations, Overview of Linear Discriminant Analysis (LDA), Mathematical Explanation of Linear Discriminant Analysis (LDA), Generalized Discriminant Analysis (GDA)

Unit-III

Independent Component Analysis, Feature Mapping, Extra Tree Classifier for Feature Selection, Parameters for Feature Selection, Underfitting and Overfitting in Machine Learning

Unit-IV

Introduction to Natural Language Processing , Overview and language modeling: Overview: Origins and challenges of NLP-Language and Grammar,Processing Indian Languages- NLP Applications-Information Retrieval. Language Modeling: Various Grammar- based Language Models-Statistical Language Model, Text Preprocessing, Tokenize text , sentence, words ,Introduction to Stemming, Stemming words with NLTK, Lemmatization with NLTK, Lemmatization with Text Blob

References/Textbooks

1. The Hundred-Page Machine Learning Book,Andriy Burkov, First Edition
2. Fundamentals of Machine Learning for Predictive Data Analytics: Algorithms, Worked Examples, and Case Studies by John D. Kelleher, Brian Mac Namee, and Aoife D'Arcy
3. Machine Learning in Action by Peter Harrington
4. Machine Learning: A Probabilistic Perspective by Kevin P. Murphy

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- V
Course Code: BVIL-5114

Soft Computing

L-T-P	**Max.Marks: 75**
3-0-0	**Theory:60**
Time:3 Hours	**CA: 15**

COURSE OUTCOMES:

After completing this course, the student will be able to**:**

CO1: Learn about major areas of soft computing.

CO2: Develop the skills to gain a basic understanding of neural network theory and fuzzy logic theory.

CO3: Apply artificial neural networks and fuzzy logic theory for various problems

CO4: Determine the use of Genetic algorithm to obtain optimized solutions to problems.

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- V
Course Code: BVIL-5114

Soft Computing

L-T-P	**Max.Marks: 75**
3-0-0	**Theory:60**
Time:3 Hours	**CA: 15**

Instructions for Paper Setter -
Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

Unit-I

Soft Computing: What is Soft Computing? Difference between Hard and Soft computing, Requirement of Soft computing, Major Areas of Soft Computing, Techniques, Applications of Soft Computing.

Unit-II

Fuzzy Logic: Introduction, Architecture of a Fuzzy Logic System, characteristics, fuzzy sets and relation, applications, advantages and disadvantages. Fuzzy versus crisp, crisp set, crisp relation, Crisp logic, predicate logic, fuzzy logic, defuzzification and fuzzification.

Unit-III

Neural Networks: Biological vs Artificial neurons, Difference between ANN and BNN, architecture, working/training of ANN, ADALINE and MADALINE Networks, Backpropagation networks-architecture, advantages, disadvantages, learning rules (Hebbian, perceptron, delta, correlation, out star).

Unit-IV

Genetic Algorithm: History of Genetic Algorithms (GA), Working Principle, Various Encoding methods, Fitness function, GA Operators, Convergence of GA, Bitwise operation in GA, Multi-level Optimization.

References/Textbooks

1. Principles of Soft Computing, S.N. Sivanandam, S.N. Deepa, Wiley India
2. Neuro - Fuzzy & Soft Computing - C. T. Sun, E. Mizutani, J. S. R. Jang, Pearson
3. Neural Networks, Fuzzy Logic and Genetic Algorithms: Synthesis & Applications, S.Rajasekaran, G. A. Vijayalakshami, PHI.

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- V
Course Code: BVIL-5115

Project management

COURSE OUTCOMES

After completing this course, the student will be able to**:**

CO1: Understand and practice the process of project management

CO2: Develop the scope of work, provide accurate cost estimates and to plan the various activities.

CO3: Understand objectives of Activity Planning

CO4: Learn techniques to enhance software quality

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- V
Course Code: BVIL-5115
Project Management

L-T-P	Max.Marks: 50
3-0-0	Theory:40
Time:3 Hours	CA: 10

Instructions for Paper Setter -
Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

Unit-I

Introduction to Project Management: Introduction, Project and Importance of Project Management, Contract Management, Activities Covered by Software Project Management Software engineering, A Process Framework, Process Models: Prescriptive models, Waterfall model, Incremental process models, Evolutionary process models, Specialized process models, Software development life cycle, Software Effort Estimation, Resource Allocation, Software testing methods

Unit II

Methods and Methodologies, categories of Software Projects, Stakeholders, Setting Objectives, Business Case, Project Success and Failure, Management and Management Control, Project Management life cycle, Traditional versus Modern Project Management Practices.

Unit III

Activity Planning: Objectives of Activity Planning, When to Plan, Project Schedules, Sequencing and Scheduling Activities, Network Planning Models, Forward Pass– Backward Pass, critical path, Activity Float, Shortening Project Duration, Activity on Arrow Networks.

Unit IV

Software Quality: Introduction to software quality in project planning, Importance of software quality, software quality models, ISO 9126, quality management systems, process capability models, techniques to enhance software quality, quality plans.

References/Textbooks:

1. Roger S. Pressman: Software Engineering-A Practitioners approach, 7th Edition, Tata McGraw Hill.

2. Michael Blaha, James Rumbaugh: Object Oriented Modelling and Design with UML, 2nd Edition, Pearson Education, 2005.

3. Bob Hughes, Mike Cotterell, Rajib Mall: Software Project Management, 6th Edition, McGraw Hill Education, 2018.

4. Deepak Gaikwad, Viral Thakkar, DevOps Tools From Practitioner's Viewpoint, Wiley.

5. Ian Sommerville: Software Engineering, 9th Edition, Pearson Education, 2012.

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- V
Course Code: BVIP-5116

Lab on Machine Learning-II

COURSE OUTCOMES

After completing this course, the student will be able to**:**

CO1: Understand and practice latest Machine Learning Algorithms.

CO2: Develop their coding skills using various python toolkits and libraries

CO3: Understand and implement feature selection, extraction ad mapping

CO4: Learn and implement NLTK

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- V
Course Code: BVIP-5116

Lab on Machine Learning-II

L-T-P	**Max.Marks: 75**
0-0-4	**Practical :60**
Time:3 Hours	**CA: 15**

Students will implement Machine Learning Techniques taught in the theory paper using Python toolkits and Tensor flow.

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- V
Course Code: BVII-5117

Assignment based on Predictive Analysis

COURSE OUTCOMES

After completing this course, the student will be able to**:**

CO1: Build project based on Machine Learning Techniques.

CO2: Learn the importance of project management and delivering time-bound quality work.

CO3: Implement Neural Networks on real world problems.

CO4: Work thoroughly on their technical and management skills.

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- V
Course Code: BVII-5117

Assignment based on Predictive Analysis

L-T-P	**Max.Marks: 100**
0-0-6	**Practical:80**
Time:3 Hours	**CA: 20**

The students will be working on a Machine Learning or Neural Network using Weka tool. The students need to submit the self-made work at the end of the semester. The marks will be awarded to the student on the basis of Technical knowledge, Reports and performance in viva-voce

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- VI
Course Code: BVIL-6111

Introduction to Blockchain Technology

L-T-P	**Max.Marks: 100**
4-0-0	**Theory:80**
Time:3 Hours	**CA: 20**

Course Outcomes: After completing this course, the student will be able to**:**

CO1: Understanding about the basis of blockchain

CO2: Significance of Cryptography & Cryptocurrencies

CO3: How to Store and Use Bitcoins

CO4: Bitcoin and Anonymity Basics, How to De-anonymize Bitcoin

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- VI
Course Code: BVIL-6111

Introduction to Blockchain Technology

L-T-P	**Max.Marks: 100**
4-0-0	**Theory:80**
Time:3 Hours	**CA: 20**

Instructions for Paper Setter -
Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

Unit I

Blockchain: Distributed systems, History of blockchain, Introduction to blockchain, Types of blockchain, CAP theorem and blockchain, Benefits and limitations of blockchain. Decentralization and Cryptography: Decentralization using blockchain, Methods of decentralization, Routes to decentralization, Decentralized organizations.

Unit II

Introduction to Cryptography & Cryptocurrencies: Cryptographic Hash Functions, Hash Pointers and Data Structures, Digital Signatures, Public Keys as Identities, A Simple Cryptocurrency, How Bitcoin Achieves Decentralization: Distributed consensus, Consensus without identity using a block chain, Incentives and proof of work, Putting it all together

Unit III

Mechanics of Bitcoin: Bitcoin transactions, Bitcoin Scripts, Applications of Bitcoin scripts, Bitcoin blocks, The Bitcoin network, Limitations and improvements How to Store and Use Bitcoins: Simple Local Storage, Hot and Cold Storage, Splitting and Sharing Keys, Online Wallets and Exchanges, Payment Services, Transaction Fees, Currency Exchange Markets

UNIT IV

Bitcoin Mining: The task of Bitcoin miners, Mining Hardware, Energy consumption and ecology, Mining pools, Mining incentives and strategies, Bitcoin and Anonymity: Anonymity Basics, How to De-anonymize Bitcoin, Mixing, Decentralized Mixing, Zerocoin and Zerocash

References/Textbooks:

1. Blockchain Technology: Exploring Opportunities, Challenges, and Applications, CRC Press, Authors: Sonali Vyas, Vinod Kumar Shukla, Shaurya Gupta, Ajay Prasad
2. Blockchain and Web3: Building the Cryptocurrency, Privacy, and Security Foundations of the Metaverse, Wiley, Author: Winston Ma and Ken Huang
3. The Basics of Bitcoins and Blockchains by Antony Lewis

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- VI
Course Code: BVIL-6112

Deep learning

L-T-P	**Max.Marks: 100**
4-0-0	**Theory:80**
Time:3 Hours	**CA: 20**

COURSE OUTCOMES:

After completing this course, the student will be able to**:**

CO1: Understand Basic Concepts of Deep Learning

CO2: Comprehend Various Deep Learning Algorithms

CO3: Learn about Convolutional Neural Networks

CO4: Understand Recurrent and Recursive Neural Networks

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- VI
Course Code: BVIL-6112

Deep learning

L-T-P	**Max.Marks: 100**
4-0-0	**Theory:80**
Time:3 Hours	**CA: 20**

Instructions for Paper Setter -
Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

Unit-I

Deep learning: Introduction to Deep Learning: Introduction, Deep learning Model, Historical Trends in Deep Learning.

Unit-II

Deep learning algorithms: Feedforward Networks: Introduction to feedforward neural networks, Gradient-Based Learning, Back Propagation and Other Differentiation Algorithms. Regularization for Deep Learning CNN, long short-term memory networks, recurrent NN, Multi-layer perceptron, self-organizing maps, deep belief network, restricted Boltzmann machines, auto encoders.

Unit-III

Convolutional Networks: The Convolution Operation, Pooling, Convolution and Pooling as an Infinitely Strong Prior, Variants of the Basic Convolution Function, Structured Outputs, Data Types, Efficient Convolution Algorithms, Random or Unsupervised Features- LeNet, AlexNet.

Unit-IV

Recurrent and Recursive Neural Networks: Unfolding Computational Graphs, Recurrent Neural Network, Bidirectional RNNs, Deep Recurrent Networks, Recursive Neural Networks, The Long Short Term Memory and Other Gated RNNs. Applications: Large-Scale Deep Learning, Computer, Speech Recognition, Natural Language Processing and Other Applications.

References/Textbooks:

1. Neural Networks and Deep Learning: A Textbook by Charu C. Aggarwal
2. Fundamentals of Deep Learning: Designing Next-Generation Machine Learning Algorithms by Nithin Buduma, Nikhil Buduma and Joe Papa
3. Deep Learning: A Practitioners Approach by Josh Patterson and Adam Gibson
4. Dr. Rajkumar Tekchandani, Dr. Neeraj Kumar, “Applied Deep Learning”, BPB Publications,2023.

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- VI
Course Code: BVIL-6113

Business Intelligence

COURSE OUTCOMES:

After completing this course, the student will be able to**:**

CO1: Understand the concepts of Business Intelligence and Decision Making

CO2: Learn Implementation Phase

CO3: Comprehend Mathematical Models for Decision Support

CO4: Learn Activities and Approaches to Knowledge Management

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- VI
Course Code: BVIL-6113

Business Intelligence

L-T-P	**Max.Marks: 100**
4-0-0	**Theory: 80**
Time:3 Hours	**CA: 20**

Instructions for Paper Setter -
Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

Unit-I

Decision Support and Business Intelligence: Opening Vignette, Changing Business Environments and Computerized Decision Support, Managerial Decision Making, Computerized Support for Decision Making, An Early Framework for Computerized Decision Support, The Concept of Decision Support Systems (DSS), A framework for Business Intelligence (BI), A Work System View of Decision Support.

Unit-II

Computerized Decision Support: Decision Making, Models, Phases of the Decision-Making Process, The Intelligence Phase, The Design Phase, The Choice Phase, The Implementation Phase, How Decisions Are Supported.

Unit-III

Modelling and Analysis: Structure of Mathematical Models for Decision Support, Certainty, Uncertainty, and Risk, Management Support Systems, Multiple Goals, Sensitivity Analysis, What-If Analysis, and Goal Seeking.

Unit IV

Knowledge Management: Introduction to Knowledge Management, Organizational Learning and Transformation, Knowledge Management Activities, Approaches to Knowledge Management, Information Technology (IT) In Knowledge Management, Knowledge Management Systems Implementation.

References/Textbooks:

1. Data Strategy: How To Profit From A World Of Big Data, Analytics And The Internet Of Things" by Bernard Marr
2. A Practitioner's Guide to Business Analytics by Randy Bartlett
3. Successful Business Intelligence: Unlock the Value of BI & Big Data by Cindi Howson