Faculty of Vocational Studies

SYLLABUS FOR

Bachelor of Vocation

(Artificial Intelligence and Data Science)

(Semester I-IV)

(Under Credit Based Continuous Evaluation Grading System)

Session: 2021-22

The Heritage Institution

KANYA MAHA VIDYALAYA JALANDHAR

(Autonomous)

PROGRAMME SPECIFIC OUTCOMES

On successful completion of 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 Weka) while working collaboratively on real-world problems.

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

Scheme and Curriculum of Examinations of Three Year Degree Programme

Bachelor of Vocation

(Artificial Intelligence and Data Science) Semester I

Session 2021-2022

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester I									
Course code	**Course Title**	**Course Type**	**L-T-P**	**Total**	**Marks**				**mination time (in Hours)**
					Total	**Ext.**		**CA**	
						L	**P**		
BVIL-1421/ BVIL-1031/ BVIL-1431	Punjabi(Compulsory)/ [1]Basic Punjabi/ [2]Punjab History and Culture	C	2-0-0	2	50	40	-	10	3
BVIL-1102	Communication Skills in English	C	4-0-0	4	50	40	-	10	3
BVIL-1113	Introduction to Computers and Information Technology	C	2-0-0	2	50	40	-	10	3
BVIL-1114	Introduction to Artificial Intelligence and Data Science	S	4-0-0	4	75	60	-	15	3
BVIL-1115	Office Fundamentals	S	2-0-0	2	50	40		10	3
BVIP-1116	Lab in Office Fundamentals	S	0-0-4	4	75		60	15	3
BVIP-1117	Field Visit and Report	S	0-0-4	4	75	-	60	15	3
BVID-1118	Minor Project -1	S	0-2-2	4	100	-	80	20	3
AECD-1161	*Drug Abuse: Problem, Management and Prevention (Compulsory)	AC	2-0-0	2	50	40	-	10	3
SECF-I492	*Foundation Course	AC	2-0-0	2	25	20	-	5	1
	Total		**30**		**525**				

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

1. Special paper on lieu of Punjabi(Compulsory)
2. Special paper in lieu of Punjabi(Compulsory) for those students who are not domicile of Punjab

*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 2021-2022

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester II									
Course code	**Course Title**	**Course Type**	**L-T-P**	**Total**	**Marks**				**Examination time (in Hours)**
					Total	**Ext.**		**CA**	
						L	**P**		
BVIL-2421/ BVIL-2031/ BVIL-2431	Punjabi(Compulsory)/ [1]Basic Punjabi/ [2]Punjab History and Culture	C	2-0-0	2	50	40	-	10	3
BVIM-2102	Communication Skills in English	C	3-0-1	4	50	25	15	10	3+3
BVIL-2113	Computational Problem Solving	S	3-0-0	3	75	60	-	15	3
BVIL-2114	Mathematical Foundation	C	2-0-0	2	50	40	-	10	3
BVIL-2115	Technical Writing	S	3-0-0	3	50	40		10	3
BVIL-2116	Data Collection and Analysis	S	4-0-0	4	50	40	-	10	3
BVIM-2117	Relational Database Management System	S	2-0-2	4	100	40	40	20	3+3
BVIP-2118	Computational Problem Solving Lab	S	0-0-2	2	50		40	10	3
BVID-2119	Minor Project-II	S	0-0-2	2	50		40	10	3
AECD-2161	* Drug Abuse: Problem, Management and Prevention (Compulsory)	AC	2-0-0	2	50	40	-	10	3
SECM-2502	*Moral Education	AC	2-0-0	2	25	20	-	05	3
	Total			**30**	**525**				

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

1. Special paper on lieu of Punjabi(Compulsory)
2. Special paper in lieu of Punjabi(Compulsory) for those students who are not domicile of Punjab

*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 2021-2022

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	75	60		15	3
BVIL-3112	Data Mining and Data Warehousing	S	4-0-0	4	75	60		15	3
BVIL-3113	Data Processing and Visualization	S	2-0-0	2	50	40		10	3
BVIL-3114	Entrepreneurship basics	C	2-0-0	2	50	40	-	10	3
BVIL-3115	Machine Learning-I	S	3-0-0	3	50	40		10	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	75		60	15	3
BVIP-3118	Lab on Machine Learning-I	S	0-0-3	3	50		40	10	3
BVID-3119	Minor Project-III	S	0-0-4	4	100		80	20	3
SECG-3532	*Gender Sensitization	AC	1-0-1	2	25	10	10	5	1
Total				30	575				

Note: C – Compulsory
S – Skill Enhancement
AC-Audit Course
* 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 2021-2022

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	50	40	-	10	3
BVIL-4112	Applied Statistical Programming	S	4-0-0	4	75	60		15	3
BVIL-4113	Non-Relational Databases	S	3-0-0	3	75	60		15	3
BVIL-4114	Workplace Management	C	2-0-0	2	75	60		15	3
BVIP-4115	Applied Statistical Programming Lab	S	0-0-4	4	100		80	20	3
BVIP-4116	Lab on Non-Relational Databases	S	0-0-3	3	100		80	20	3
BVID-4117	Minor Project-IV	S	0-0-4	4	100		80	20	3
AECE-4221	*Environmental Studies (Compulsory)	AC	3-0-1	4	100	60	20 (Project work)	20	3
SECS-4522	*Social Outreach	AC	0-0-2	2	25		20	05	1
Total				30	575				

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

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

Bachelor of Vocation (Artificial Intelligence and Data Science) - Semester I
COURSE CODE: BVIL-1421
Punjabi (Compulsory)

COURSE OUTCOMES:

CO1:ਆਤਮ ਅਨਾਤਮ' ਪੁਸਤਕ ਦੇ ਕਵਿਤਾ ਭਾਗ ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਕਵਿਤਾ ਪ੍ਰਤੀ ਦਿਲਚਸਪੀ, ਸੂਝ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ ਤਾਂ ਕਿ ਉਹ ਆਧੁਨਿਕ ਦੌਰ ਵਿਚ ਚੱਲਰਹੀਆਂ ਕਾਵਿ ਧਾਰਾਵਾਂ ਅਤੇ ਕਵੀਆਂ ਬਾਰੇ ਗਿਆਨ ਹਾਸਿਲ ਕਰ ਸਕਣ।ਇਸ ਦਾ ਹੋਰ ਮਨੋਰਥ ਕਵਿਤਾ ਦੀ ਵਿਆਖਿਆ, ਵਿਸ਼ਲੇਸ਼ਣ ਤੇ ਮੁਲੰਕਣ ਦੀ ਪ੍ਰਕਿਰਿਆ ਤੋਂਜਾਣੂ ਕਰਾਉਣਾ ਵੀ ਹੈ ਤਾਂਕਿ ਉਹ ਸਮਕਾਲੀ ਸਮਾਜਦੀਆਂ ਸਮੱਸਿਆਵਾਂ ਨੂੰ ਸਮਝ ਸਕਣ ਅਤੇ ਆਲੋਚਨਾਤਮਕ ਦ੍ਰਿਸ਼ਟੀ ਬਣਾ ਸਕਣ।

CO2:ਗਿਆਨ ਮਾਲਾ (ਵਿਗਿਆਨਕ ਤੇ ਸਮਾਜ ਵਿਗਿਆਨਕ ਲੇਖਾਂ ਦਾ ਸੰਗ੍ਰਹਿ) ਪੁਸਤਕ ਨੂੰ ਸਿਲੇਬਸ ਵਿਚ ਸ਼ਾਮਿਲ ਕਰ ਕੇ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਪੜ੍ਹਣ ਦੀ ਰੁਚੀ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ ਅਤੇ ਮੁੱਲਵਾਨ ਗਿਆਨ ਦੇਣਾ ਹੈ।

CO3:ਪੈਰ੍ਹਾ ਰਚਨਾ ਅਤੇ ਪੈਰ੍ਹਾਪੜ੍ਹ ਕੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਉਤਰ ਦੇਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਬੁੱਧੀ ਨੂੰ ਤੀਖਣ ਕਰਦਿਆਂ ਉਨਾਂ ਦੀ ਲਿਖਣ ਪ੍ਰਤਿਭਾ ਨੂੰ ਉਜਾਗਰ ਕਰਨਾ ਹੈ।

CO4:ਧੁਨੀ ਵਿਉਂਤ ਪੜ੍ਹਣ ਨਾਲ ਵਿਦਿਆਰਥੀ ਧੁਨੀਆਂ ਦੀ ਉਚਾਰਨ ਪ੍ਰਣਾਲੀ ਤੋਂਵਾਕਫ਼ ਹੋਣਗੇ।

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

COURSE CODE: BVIL-1421

Punjabi (Compulsory)

ਪਾਠ ਕ੍ਰਮ ਅਤੇ ਪਾਠ ਪੁਸਤਕਾਂ

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

ਯੂਨਿਟ-I

ਆਤਮ ਅਨਾਤਮ(ਕਵਿਤਾਭਾਗ),(ਸੰਪ. ਸੁਹਿੰਦਰ ਬੀਰ ਅਤੇ ਵਰਿਆਮਸਿੰਘ ਸੰਧੂ) ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ।

ਪ੍ਰੋ.ਪੂਰਨ ਸਿੰਘ, ਪ੍ਰੋ.ਮੋਹਨ ਸਿੰਘ,ਅੰਮ੍ਰਿਤਾ ਪ੍ਰੀਤਮ, ਜਗਤਾਰ, ਸੁਰਜੀਤ ਪਾਤਰ(ਕਵੀ ਪਾਠ ਕ੍ਰਮ ਦਾ ਹਿੱਸਾ ਹਨ**ਸਾਰ**, ਵਿਸ਼ਾ ਵਸਤੂ)**08 ਅੰਕ**

ਯੂਨਿਟ-II

ਗਿਆਨ ਮਾਲਾ (ਵਿਗਿਆਨਕ ਤੇ ਸਮਾਜ ਵਿਗਿਆਨਕ ਲੇਖਾਂ ਦਾ ਸੰਗ੍ਰਹਿ),(ਸੰਪਾ.ਡਾ. ਸਤਿੰਦਰ ਸਿੰਘ, ਪ੍ਰੋ. ਮਹਿੰਦਰ ਸਿੰਘ ਬਨਵੈਤ), ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ।

ਲੇਖ : ਭਰੂਣ ਹੱਤਿਆ ਦੇ ਦੇਸ਼ ਵਿਚ, ਵਾਤਾਵਰਣੀ ਪ੍ਰਦੂਸ਼ਣ ਅਤੇ ਮਨੁੱਖ, ਏਡਜ਼ : ਇਕ ਗੰਭੀਰ ਸੰਕਟ।
(ਸਾਰ, ਵਿਸ਼ਾਵਸਤੂ**)** **08 ਅੰਕ**

ਯੂਨਿਟ-III

(ੳ)ਪੈਰ੍ਹਾਰਚਨਾ

(ਅ) ਪੈਰ੍ਹਾ ਪੜ੍ਹ ਕੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਉਤਰ। **08 ਅੰਕ**

ਯੂਨਿਟ-IV

(ੳ) ਪੰਜਾਬੀ ਧੁਨੀ ਵਿਉਂਤ : ਪਰਿਭਾਸ਼ਾ, ਉਚਾਰਨ ਅੰਗ

(ਅ)ਸਵਰ, ਵਿਅੰਜਨ **08 ਅੰਕ**

ਅੰਕ ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਸੈਕਸ਼ਨ ਹੋਣਗੇ।ਸੈਕਸ਼ਨ A-D ਤੱਕ ਦੇ ਪ੍ਰਸ਼ਨ ਯੂਨਿਟI-IV ਵਿਚੋਂ ਪੁੱਛੇ ਜਾਣਗੇ।ਹਰ ਸੈਕਸ਼ਨ ਵਿਚ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚੋ ਂਇਕ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਸੈਕਸ਼ਨ ਵਿਚੋ ਂਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 08 ਅੰਕਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋ ਂਵੱਧ ਤੋ ਂਵੱਧ ਚਾਰ ਉਪ ਪ੍ਰਸ਼ਨਾਂ ਵਿਚਕਰ ਸਕਦਾ ਹੈ।

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester I
COURSE CODE: BVIL-1031
BASIC PUNJABI (In lieu of Compulsory Punjabi)

COURSE OUTCOMES:

CO1: ਮੁੱਢਲੀ ਪੰਜਾਬੀ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਨੂੰ ਸਿਖਾਉਣ ਦੀ ਪ੍ਰਕਿਰਿਆ ਵਿਚ ਪਾ ਕੇ ਇਕ ਹੋਰ ਭਾਸ਼ਾ ਸਿੱਖਣ ਦਾਂ ਮੌਕਾ ਪ੍ਰਦਾਨ ਕਰਨਾ ਹੈ।

CO2: ਇਸ ਵਿਚ ਵਿਦਿਆਰਥੀ ਨੂੰ ਬਾਰੀਕੀ ਨਾਲ ਭਾਸ਼ਾ ਦਾ ਅਧਿਐਨ ਕਰਵਾਇਆ ਜਾਵੇਗਾ।

CO3: ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੰਜਾਬੀ ਸ਼ਬਦ ਰਚਨਾ ਤੋ ਜਾਣੂ ਕਰਵਾਇਆ ਜਾਵੇਗਾ।

CO4: ਮੁੱਢਲੀ ਪੰਜਾਬੀ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਨਿੱਤ ਵਰਤੋਂ ਦੀ ਪੰਜਾਬੀ ਸ਼ਬਦਾਵਲੀ ਬਾਰੇ ਦੱਸਣਾ ਹੈ।

CO5: ਮੁੱਢਲੀ ਪੰਜਾਬੀ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਦਾ ਸ਼ਬਦ ਘੇਰਾ ਵਿਸ਼ਾਲ ਕਰਨਾ ਹੈ।

CO6: ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੰਜਾਬੀ ਵਿਚ ਹਫ਼ਤੇ ਦੇ ਸੱਤ ਦਿਨਾਂ ਦੇ ਨਾਂ, ਬਾਰ੍ਹਾਂ ਮਹੀਨਿਆਂ ਦੇ ਨਾਂ, ਰੁੱਤਾਂ ਦੇ ਨਾਂ, ਇਕਤੋਂ ਸੌ ਤੱਕ ਗਿਣਤੀ ਸ਼ਬਦਾਂ ਵਿਚ ਸਿਖਾਉਣਾ ਹੈ।

B.Voc. (Artificial Intelligence and Data Science) Semester I
COURSE CODE: BVIL-1031

BASIC PUNJABI

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

ਪਾਠ ਕ੍ਰਮ

ਯੂਨਿਟ-I

ਪੈਂਤੀ ਅੱਖਰੀ, ਅੱਖਰ ਕ੍ਰਮ, ਪੈਰ ਬਿੰਦੀ ਵਾਲੇ ਵਰਣ ਅਤੇ ਪੈਰ ਵਿਚ ਪੈਣ ਵਾਲੇ ਵਰਣ ਅਤੇ ਮਾਤਰਾਵਾਂ (ਮੁੱਢਲੀ ਜਾਣ ਪਛਾਣ) ਲਗਾਖ਼ਰ (ਬਿੰਦੀ, ਟਿੱਪੀ, ਅੱਧਕ) : ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ ।

ਯੂਨਿਟ-II

ਭੰਜਾਬੀ ਸ਼ਬਦ ਬਣਤਰ : ਮੁੱਢਲੀ ਜਾਣ ਪਛਾਣ (ਸਾਧਾਰਨ ਸ਼ਬਦ, ਸੰਯੁਕਤ ਸ਼ਬਦ, ਮਿਸ਼ਰਤ ਸ਼ਬਦ, ਮੂਲ ਸ਼ਬਦ, ਅਗੇਤਰ ਅਤੇ ਪਿਛੇਤਰ)

ਯੂਨਿਟ-III

ਨਿੱਤ ਵਰਤੋਂ ਦੀ ਪੰਜਾਬੀ ਸ਼ਬਦਾਵਲੀ : ਬਾਜ਼ਾਰ, ਵਪਾਰ, ਰਿਸ਼ਤੇਨਾਤੇ, ਖੇਤੀ ਅਤੇ ਹੋਰ ਧੰਦਿਆਂ ਆਦਿ ਨਾਲ ਸੰਬੰਧਤ।

ਯੂਨਿਟ-IV

ਹਫ਼ਤੇ ਦੇ ਸੱਤ ਦਿਨਾਂ ਦੇ ਨਾਂ, ਬਾਰ੍ਹਾਂ ਮਹੀਨਿਆਂ ਦੇ ਨਾਂ, ਰੁੱਤਾਂ ਦੇ ਨਾਂ, ਇੱਕਤੋਂ ਸੌ ਤੱਕ ਗਿਣਤੀ ਸ਼ਬਦਾਂ ਵਿਚ ।

ਅੰਕ ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਸੈਕਸ਼ਨ ਹੋਣਗੇ।ਸੈਕਸ਼ਨ A-D ਤੱਕ ਦੇ ਪ੍ਰਸ਼ਨ ਯੂਨਿਟI-IV ਵਿਚੋਂ ਪੁੱਛੇ ਜਾਣਗੇ।ਹਰ ਸੈਕਸ਼ਨ ਵਿਚ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚੋ ਂਇਕ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਸੈਕਸ਼ਨ ਵਿਚੋ ਂਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 08 ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗ ੋਂਵੱਧ ਤੋ ਂਵੱਧ ਚਾਰ ਉਪ ਪ੍ਰਸ਼ਨਾਂ ਵਿਚਕਰ ਸਕਦਾ ਹੈ।

B.Voc. (Artificial Intelligence and Data Science) Semester I
Course Code: BVIL-1431

Punjab History and Culture (1450-1716) (Special paper in lieu of Punjabi Compulsory)

COURSE OUTCOMES:

After the completion of Sem-I (Under Credit Based Continuous Evaluation Grading System) student will have a grasp on:

CO1: To enable them to have grasp on the physical features of Punjab, its flora & fauna, the composition of population, culture, society, religion and polity.

CO2: To make a comparison between the original philosophical & teachings of Sikh Gurus and their relevance in the present scenario.

CO3: To enable students of history to have deep insight into the origin of Sikhism, foundation of Khalsa, the conflict with Mughals and the rise of Banda Bahadur and the aftermath.

CO4: The paper has been designed specifically to have in dept peep into the past in order to have better understanding of present & apply corrective measures

B.Voc. (Artificial Intelligence and Data Science) Semester I
Course Code: BVIL-1431

Punjab History and Culture (1450-1716)
(Special paper in lieu of Punjabi Compulsory)

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

Instructions for the Paper Setter:

Question paper shall consist of four Sections. Candidates shall attempt 5 questions in all, by atleastselectingoneQuestionfromeachunitandthe5thquestionmaybeattemptedfromany of the four sections. Each question carries 8marks.

Section- A

1. Land and the People.
2. Bhakti Movement

Section- B

3. Life and Teaching of Guru Nanak Dev.
4. Contribution of Guru Angad Dev, Guru Arjun Dev, Guru Amar Das and Guru Ram Das.

Section –C

5. Guru Hargobind.
6. Martyrdom of Guru Teg Bahadur

Section- D

1. Guru Gobind Singh and the Khalsa.
2. Banda Singh Bahadur: Conquests and Execution.

References/ Textbooks

1. Kirpal Singh(ed.), *History and Culture of the Punjab, Part-ii, Punjabi University,* Patiala. 1990.
2. Fauja Singh (ed.), *History of Punjab, Vol, III Punjabi University, Patiala, 1987.*
3. J.S. Grewal, *The Sikhs of the Punjab, Cup, Cambridge, 1991.*
4. Khushwant Singh, *A History of the Sikhs,* Vol. I, OUP, New Delhi, 1990

B.Voc. (Artificial Intelligence and Data Science) Semester I

Course Code: BVIL-1102

Communication Skills in English

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: The ability to realize not only language productivity but also the pleasure of being able to articulate well

CO 3: The power to analyze, interpret and infer the ideas in the text

CO 4: The ability to have a comprehensive understanding of the ideas in the text and enhance their critical thinking

CO 5: Writing skills of students which will make them proficient enough to express ideas in clear and grammatically correct English

CO 6: Ability to plan, organise and present ideas coherently on a given topic

CO 7: The skill to use an appropriate style and format in writing letters (formal and informal)

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

Course Code: BVIL-1102

Communication Skills in English

L - T – P	**Max. Marks: 50**
4-0-0	**Theory: 40**
Time : 3 Hours	**CA: 10**

Instructions for the paper setter and distribution of marks:

The question paper will consist of four sections and distribution of marks will be as under:

Section-A: Two questions of theoretical nature will be set from Unit I of the syllabus and the candidates will have to attempt one carrying 8 marks.

Section-B: Two comprehension passages will be given to the students based on the Unit II and the candidates will have to attempt one carrying 8 marks.

Section-C: Two questions will be given based on the topics given in the Unit III and the candidates will have to attempt one carrying 8 marks.

Section-D: One out of the two questions will have to be attempted by the candidates based on the topics given in Unit IV of the syllabus. It will carry 8marks.

Important Note:

The candidate will have to attempt five questions in all selecting one from each section of the question paper and the fifth question may be attempted from any of the four sections.

(8 x 5 = 40)

The syllabus is divided in four units as mentioned below:

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.
- Organising the details in a sequential order

Unit IV

Resume, memo, notices etc.; outline and revision.

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

References:

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).
5. *English Grammar in Use: A Self Study Reference and Practice Book Intermediate Learners Book* by Raymond Murphy, Cambridge UniversityPress

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: 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).

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, 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: 75
4-0-0	Theory: 60
Time : 3 Hours	CA: 15

Instructions for the paper setter:
Eight questions of equal marks (8 marks each) are to be 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 subdivided into parts (not exceeding four).

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, modeling, 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: Have knowledge of creating, 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: 40**
Time : 3 Hours	**CA: 10**

Instructions for the Paper Setter

Eight questions of equal marks (8 marks each) are to be 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 subdivided into parts (not exceeding four).

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 ofword

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 WordArt 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. WeverkaPeter,“Office2016AllinOneforDummies”,FirstEdition,WileyIndia,2015.
4. Satish Jain, Kratika, M.Geetha, “MS–Office 2010”, First Edition, BPBPublications,2012.

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

Course Code: BVIP-1116

Lab on Office Fundamentals

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

Lab based on Office tools

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

Course Code: BVIP-1117

Field Visit and Report

COURSE OUTCOMES:

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

CO1: Understand and familiarize themselves with the work environment of companies.

CO2: Learn coordination and cooperation of various teams for the project

CO3: Develop skills necessary for structuring, managing, and carrying out projects within an organization/industry.

CO4: Describe the observations through report writing.

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

Course Code: BVIP-1117

Field Visit and Report

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

Note: The marks will be awarded to the candidate on the basis of report, presentation and seminar submitted.

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

Course Code: BVID-1118

Minor Project – I

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.

COURSE OUTCOMES:

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

CO1: Apply the tools and techniques learnt in the course to process and analyze data for problems associated with AI and Data science.

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

CO3: 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: BVID-1118

Minor Project – I

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

Instructions to the examiner:

The students will be working on a project based on the subjects studied in the course. The students need to submit the self-made project 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- I

COURSE CODE: AECD-1161

DRUG ABUSE: PROBLEM, MANAGEMENT & PREVENTION

COURSE OUTCOMES:

CO1. This information can include factual data about what substance abuse is; warning signs of addiction; information about how alcohol and specific drugs affect the mind and body;

CO2. Learn to be supportive during the detoxification and rehabilitation process.

CO3. Main focus of substance abuse education is teaching individuals about drug and alcohol abuse and how to avoid, stop, or get help for substance usedisorders.

CO4.Substance abuse education is important for students alike; there are many misconceptions about commonly used legal and illegal substances, such as alcohol and marijuana.

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

COURSE CODE: AECD-1161

DRUG ABUSE: PROBLEM, MANAGEMENT & PREVENTION

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

Instructions for the Paper Setter

Eight questions of equal marks are to be 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 subdivided 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 anySection.

UNIT-I

1) **MeaningofDrugAbuse**:Meaning,NatureandExtentofDrugAbuseinIndiaandPunjab.

UNIT-II

2) **Consequences of Drug Abuse for**: Individual:Education,Employment,Income.
Family:Violence.
Society: Crime

Nation:LawandOrderproblem.

UNIT-III

3) **Management of Drug Abuse**
Medical management: medication for treatment and to withdrawal effects.

UNIT-IV

4) **PsychiatricManagement**:Counselling,BehaviouralandCognitivetherapy.
SocialManagement:Family,GrouptherapyandEnvironmentalIntervention.

References:

1. Ahuja,Ram(2003),*SocialProblemsinIndia*,RawatPublication,Jaipur.
2. Extent,PatternandTrendofDrugUseinIndia,MinistryofSocialJusticeandEmpowerment,

Government of India,2004.
3. Inciardi,J.A.1981.*TheDrugCrimeConnection.* BeverlyHills:SagePublications.
4. Kapoor.T. (1985)*DrugepidemicamongIndianYouth*,NewDelhi:MittalPub.
5. Modi,IshwarandModi,Shalini(1997)*Drugs:AddictionandPrevention*,Jaipur:RawatPublication.
6. NationalHouseholdSurveyofAlcoholandDrugabuse.(2003)NewDelhi,ClinicalEpidemiologicalUnit,All India Institute of Medical Sciences,2004.
7. Sain,Bhim1991,*DrugAddictionAlcoholism*,SmokingobscenityNewDelhi:MittalPublications.
8. Sandhu,RanvinderSingh,2009, *DrugAddictioninPunjab*:ASociologicalStudy.Amritsar:GuruNanakDev University.
9. Singh,ChandraPaul2000.*AlcoholandDependenceamongIndustrialWorkers*:Delhi:Shipra.
10. Sussman, S and Ames, S.L. (2008). *Drug Abuse: Concepts, Prevention and Cessation,* Cambridge UniversityPress.

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

COURSE CODE: BVIL-2421

PUNJABI (COMPULSORY)

COURSE OUTCOMES:

CO1: ਆਤਮ ਅਨਾਤਮ ਪੁਸਤਕ ਦੇ ਕਹਾਣੀਭਾਗ ਨੂੰ ਸਿਲੇਬਸ ਵਿਚ ਸ਼ਾਮਿਲ ਕਰ ਕੇ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਕਹਾਣੀ ਨੂੰ ਪੜ੍ਹਣ ਦੀ ਰੁਚੀ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ ਅਤੇ ਕਹਾਣੀ ਜਗਤ ਨਾਲ ਜੋੜਣਾ ਹੈ।
CO2: ਗਿਆਨ ਮਾਲਾ ਪੁਸਤਕ ਨੂੰ ਸਿਲੇਬਸ ਵਿਚ ਸ਼ਾਮਿਲ ਕਰ ਕੇ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਪੜ੍ਹਣ ਦੀ ਰੁਚੀ ਨੂੰ ਪੈਦਾਕਰਨਾ ਹੈ ।
CO3: ਸੰਖੇਪ ਰਚਨਾ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਸਮੇਂ ਅਤੇ ਮਿਹਨਤ ਦੀ ਬੱਚਤ ਕਰਨ ਬਾਰੇ ਦੱਸਣਾ ਹੈ।
CO4: ਪੈਰ੍ਹਾ ਪੜ੍ਹ ਕੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਉੱਤਰ ਦੇਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਬੁੱਧੀ ਨੂੰ ਤੀਖਣ ਕਰਦਿਆਂ ਉਨ੍ਹਾਂ ਦੀ ਲਿਖਣ ਪ੍ਰਤਿਭਾ ਨੂੰ ਉਜਾਗਰ ਕਰਨਾ ਹੈ।
CO5: ਸ਼ਬਦ ਬਣਤਰ ਅਤੇ ਸ਼ਬਦ ਰਚਨਾ ਪੜ੍ਹਣ ਨਾਲ ਵਿਦਿਆਰਥੀ ਇਸਦੇ ਮੁੱਢਲੇ ਸੰਕਲਪਾਂ ਨੂੰ ਆਧਾਰ ਬਣਾ ਕੇ ਇਹਨਾਂ ਸੰਕਲਪਾਂ ਤੋਂ ਜਾਣੂ ਹੋਣਗੇ ।
CO6:ਸ਼ਬਦ ਸ਼੍ਰੇਣੀਆਂ ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੀ ਅਮੀਰੀ ਦਾ ਅਤੇ ਬਾਰੀਕੀਆਂ ਨੂੰ ਸਮਝਣ ਲਈ ਵੱਖਰੇ -ਵੱਖਰੇ ਸਿਧਾਂਤਾਂ ਦਾ ਵਿਕਾਸ ਕਰਨਾ ਹੈ।
CO7: ਮੁਹਾਵਰਿਆਂ ਦੀ ਵਰਤੋਂਨਾਲ ਗੱਲਬਾਤ ਵਿਚ ਪਰਪੱਕਤਾ ਆਉਂਦੀ ਹੈ। ਇਹ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਗੱਲਬਾਤ ਵਿਚ ਨਿਖਾਰ ਲਿਆਉਣ ਦਾ ਕੰਮ ਕਰਨਗੇ।

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

COURSE CODE: BVIL-2421

PUNJABI (COMPULSORY)

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

ਪਾਠ ਕ੍ਰਮ ਅਤੇ ਪਾਠ ਪੁਸਤਕਾਂ

ਯੂਨਿਟ-I

ਆਤਮ ਅਨਾਤਮ (ਕਵਿਤਾ ਭਾਗ),(ਸੰਪ. ਸੁਹਿੰਦਰ ਬੀਰ ਅਤੇ ਵਰਿਆਮ ਸਿੰਘ ਸੰਧੂ) ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ।

ਪ੍ਰੋ.ਪੂਰਨ ਸਿੰਘ, ਪ੍ਰੋ. ਮੋਹਨ ਸਿੰਘ,ਅੰਮ੍ਰਿਤਾ ਪ੍ਰੀਤਮ, ਜਗਤਾਰ, ਸੁਰਜੀਤ ਪਾਤਰ (ਕਵੀ ਪਾਠ ਕ੍ਰਮ ਦਾ ਹਿੱਸਾ ਹਨ)

(ਸਾਰ, ਵਿਸ਼ਾ ਵਸਤੂ**)**

ਯੂਨਿਟ-II

ਗਿਆਨ ਮਾਲਾ (ਵਿਗਿਆਨਕ ਤੇ ਸਮਾਜ ਵਿਗਿਆਨਕ ਲੇਖਾਂ ਦਾ ਸੰਗ੍ਰਹਿ), (ਸੰਪਾ.ਡਾ. ਸਤਿੰਦਰ ਸਿੰਘ, ਪ੍ਰੋ. ਮਹਿੰਦਰ ਸਿੰਘ ਬਨਵੈਤ), ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ।

ਲੇਖ : ਭਰੂਣ ਹੱਤਿਆ ਦੇ ਦੇਸ਼ ਵਿਚ, ਵਾਤਾਵਰਣੀ ਪ੍ਰਦੂਸ਼ਣ ਅਤੇ ਮਨੁੱਖ, ਏਡਜ਼ : ਇਕ ਗੰਭੀਰ ਸੰਕਟ। **(ਸਾਰ**, ਵਿਸ਼ਾਵਸਤੂ**)**

ਯੂਨਿਟ-III

(ਓ)ਪੈਰ੍ਹਾ ਰਚਨਾ

(ਅ) ਪੈਰ੍ਹਾ ਪੜ੍ਹ ਕੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਉਤਰ।

ਯੂਨਿਟ-IV

(ਓ)ਪੰਜਾਬੀ ਧੁਨੀ ਵਿਉਂਤ: ਪਰਿਭਾਸ਼ਾ,ਉਚਾਰਨ ਅੰਗ

(ਅ)ਸਵਰ, ਵਿਅੰਜਨ

ਅੰਕ ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਸੈਕਸ਼ਨ ਹੋਣਗੇ।ਸੈਕਸ਼ਨ A-D ਤੱਕ ਦੇ ਪ੍ਰਸ਼ਨ ਯੂਨਿਟI-IV ਵਿਚੋਂ ਪੁੱਛੇ ਜਾਣਗੇ।ਹਰ ਸੈਕਸ਼ਨ ਵਿਚ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।

2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਇੱਕ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।

3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 08 ਅੰਕ ਹਨ।

4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋ ਵੱਧ ਚਾਰ ਉਪ ਪ੍ਰਸ਼ਨਾਂ ਵਿਚਕਰ ਸਕਦਾ ਹੈ।

B.Voc (Artificial Intelligence and Data Science) Semester- II

Course Code: BVIL-2031

BASIC PUNJABI

COURSE OUTCOMES:

CO1:ਆਤਮ ਅਨਾਤਮ ਪੁਸਤਕ ਦੇ ਕਹਾਣੀ ਭਾਗ ਨੂੰ ਸਿਲੇਬਸ ਵਿਚ ਸ਼ਾਮਿਲਕਰ ਕੇ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਕਹਾਣੀ ਨੂੰ ਪੜ੍ਹਣ ਦੀ ਰੁਚੀ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ ਅਤੇ ਕਹਾਣੀ ਜਗਤ ਨਾਲ ਜੋੜਣਾ ਹੈ।

CO2:ਗਿਆਨ ਮਾਲਾ ਪੁਸਤਕ ਨੂੰ ਸਿਲੇਬਸ ਵਿਚ ਸ਼ਾਮਿਲ ਕਰ ਕੇ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਪੜ੍ਹਣ ਦੀ ਰੁਚੀ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ ।

CO3:ਸੰਖੇਪ ਰਚਨਾ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਸਮੇਂ ਅਤੇ ਮਿਹਨਤ ਦੀ ਬੱਚਤ ਕਰਨ ਬਾਰੇ ਦੱਸਣਾ ਹੈ।

CO4:ਪੈਰ੍ਹਾ ਪੜ੍ਹ ਕੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਉੱਤਰ ਦੇਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਬੁੱਧੀ ਨੂੰ ਤੀਖਣ ਕਰਦਿਆਂ ਉਨ੍ਹਾਂ ਦੀ ਲਿਖਣ ਪ੍ਰਤਿਭਾ ਨੂੰ ਉਜਾਗ ਰਕਰਨਾ ਹੈ।

CO5:ਸ਼ਬਦ ਬਣਤਰ ਅਤੇ ਸ਼ਬਦ ਰਚਨਾ ਪੜ੍ਹਣ ਨਾਲ ਵਿਦਿਆਰਥੀ ਇਸਦੇ ਮੁੱਢਲੇ ਸੰਕਲਪਾਂ ਨੂੰ ਆਧਾਰ ਬਣਾ ਕੇ ਇਹਨਾਂ ਸੰਕਲਪਾਂ ਤੋਂਜਾਣੂ ਹੋਣਗੇ ।

CO6:ਸ਼ਬਦ ਸ਼੍ਰੇਣੀਆਂ ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੀ ਅਮੀਰੀ ਦਾ ਅਤੇ ਬਾਰੀਕੀਆਂ ਨੂੰ ਸਮਝਣ ਲਈ ਵੱਖਰੇ -ਵੱਖਰੇ ਸਿਧਾਂਤਾਂ ਦਾ ਵਿਕਾਸ ਕਰਨਾ ਹੈ।

CO7:ਮੁਹਾਵਰਿਆਂ ਦੀ ਵਰਤੋ ਂਨਾਲ ਗੱਲਬਾਤ ਵਿਚ ਪਰਪੱਕਤਾ ਆਉਂਦੀ ਹੈ।ਇਹ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਗੱਲਬਾਤ ਵਿਚ ਨਿਖਾਰ ਲਿਆਉਣ ਦਾ ਕੰਮ ਕਰਨਗੇ।

Bachelor of Vocation (Artificial Intelligence and Data Science) Semester- II
Course Code: BVIL-2031

BASIC PUNJABI

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

ਪਾਠ ਕ੍ਰਮ

ਯੂਨਿਟ-I

ਸ਼ਬਦ ਸ਼੍ਰੇਣੀਆਂ: ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ (ਨਾਂਵ, ਪੜਨਾਂਵ, ਕਿਰਿਆ, ਵਿਸ਼ੇਸ਼ਣ, ਕਿਰਿਆ ਵਿਸ਼ੇਸ਼ਣ, ਸਬੰਧਕ, ਯੋਜਕ ਅਤੇ ਵਿਸਮਿਕ)

ਯੂਨਿਟ-II

ਪੰਜਾਬੀ ਵਾਕ ਬਣਤਰ: ਮੁੱਢਲੀ ਜਾਣ ਪਛਾਣ

(ੳ) ਸਾਧਾਰਨ ਵਾਕ, ਸੰਯੁਕਤਵਾਕ ਅਤੇ ਮਿਸ਼ਰਤਵਾਕ (ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ)

(ਅ) ਬਿਆਨੀਆ ਵਾਕ, ਪ੍ਰਸ਼ਨਵਾਚਕ ਵਾਕ ਅਤੇ ਹੁਕਮੀ ਵਾਕ (ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ)

ਯੂਨਿਟ-III

ਪੈਰ੍ਹਾ ਰਚਨਾ

ਸੰਖੇਪ ਰਚਨਾ

ਯੂਨਿਟ-IV

ਚਿੱਠੀ ਪੱਤਰ (ਘਰੇਲੂ ਅਤੇ ਦਫ਼ਤਰੀ)

ਮੁਹਾਵਰੇ

ਅੰਕ ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਸੈਕਸ਼ਨ ਹੋਣਗੇ।ਸੈਕਸ਼ਨ A-D ਤੱਕ ਦੇ ਪ੍ਰਸ਼ਨ ਯੂਨਿਟI-IV ਵਿਚੋਂ ਪੁੱਛੇ ਜਾਣਗੇ।ਹਰ ਸੈਕਸ਼ਨ ਵਿਚ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਸੈਕਸ਼ਨ ਵਿਚੋਂਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 08 ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋ ਵੱਧ ਤੋਂਵੱਧ ਚਾਰ ਉਪ ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

B.Voc (Artificial Intelligence and Data Science) Semester- II

COURSE CODE: BVIL-2431

Punjab History and Culture (C. 320 to 1000 B.C.)

(Special paper in lieu of Punjabi Compulsory)

COURSE OUTCOMES:

After completing Semester II and course on Ancient History of Punjab, students of History will be able to identify and have a complete grasp on the sources & writings of Ancient History of Punjab

CO 1: Analyse the emergence of Mauryan, Gupta empires during the classical age in India

CO 2: To understand the various factors leading to rise and fall of empires and emergence of new dynasties and their Culture, society, administration, polity and religion specifically of Kushans and Vardhanas in the Punjab

CO 3: Students will be adept in constructing original historical argument based on primary source material research

CO 4: To have an insight on the existing Literature of this period and understand the past developments in the light of present scenario.

CO 5: To enable students to have thorough insight into the various forms/styles of Architecture and synthesis of Indo - Muslim Art and Architecture in Punjab

B.Voc (Artificial Intelligence and Data Science) Semester- II

COURSE CODE: BVIL-2431

Punjab History and Culture (C. 320 to 1000 B.C.)

(Special paper in lieu of Punjabi Compulsory)

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

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 600 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 8 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 (Science , Art and Literature)

Unit-III

5. The Punjab under the 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

References/ Textbooks

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

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

Course Code: BVIM-2102

COMMUNICATION SKILLS IN ENGLISH

COURSE OUTCOMES:

After passing this course the student will develop the following Skills:

CO1: Enhancement of listening skills with the help of listening exercises based on conversation, news and TV reports.

CO2: Improvement of speaking skills enabling them to converse in a specific situation.

CO3: Acquisition of knowledge of phonetics which will help them in learning about correct pronunciation as well as effective speaking.

CO4: The capability to present themselves well in a job interview.

CO5: 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.

CO6: Speaking skills of the students enabling them to take active part in group discussion and present their own ideas.

CO7: The capability of narrating events and incidents in a logical sequence.

B.Voc. (Artificial Intelligence and Data Science) Semester- II

Course Code: BVIM-2102

COMMUNICATION SKILLS IN ENGLISH

L - T – P	**Max. Marks: 50**
3-0-1	**Theory: 25 Practical:15**
Time : 3 Hours	**CA: 10**

Instructions for the paper setters and distribution of marks:

The question paper will consist of four sections and distribution of marks will be as under:

Section-A: Two questions of theoretical nature will be set from Unit I of the syllabus and the candidates will have to attempt one carrying 5 marks.

Section-B: Two questions will be set from Unit II of the syllabus. One will be theoretical and these cond will be practical in nature. Candidates will have to attempt one carrying 5marks.

Section-C: Two questions will be given based on the topics given in the Unit III and the candidates will have to attempt one carrying 5 marks.

Section-D: Two questions will be set from Unit IV of the syllabus. One question will be theoretical in nature and the other will be practical in nature (based on phonetic transcription and stress). Candidates will have to attempt one carrying 5 marks.

Important Note:

Thecandidatewillhavetoattemptfivequestionsinallselectingonefromeachsection of the question paper and the fifth question may be attempted from any of the four sections. (5 x 5 =25)

Course Contents:

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

References/ Textbooks:

1. *Oxford Guide to Effective Writing and Speaking* by JohnSeely.
2. *Business Communication* by Sethi, A and Adhikari, B., McGraw Hill Education2009.
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, PhiLearning.

PRACTICAL / ORAL TESTING

Time:3hours **Marks: 15**

Course Contents:

1. Oral Presentation with/without audio visual aids.
2. Group Discussion.
3. Listening to any recorded or live material and asking oral questions for listening comprehension.

Questions:

1. Oral Presentation will be of 5to7 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 20minutes.

Note: Oral test will be conducted by external examiner with the help of internal examiner.

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

Course Code: BVIL-2113

Computational Problem Solving

COURSE OUTCOMES:

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

CO1: Comprehend the concepts of computation problem, data and expressions

CO2: Demonstrate the usage of algorithms under several categories like list, string, dictionary and control structures

CO3: Implement various problems associated with functions and file handling using related languages

CO4: Comprehend the concepts of Object Oriented Programming and Database using related programming language

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

Course Code: BVIL-2113

Computational Problem Solving

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).

UNIT-I

Introduction to Python: Process of Computational Problem Solving, Python Programming Language

Data and Expressions: Literals, Variables and Identifiers, Operators, Expressions, Statements and Data Types

Control Structures: Boolean Expressions (Conditions), Logical Operators, Selection Control, Nested conditions,Debugging

UNIT-II

Lists: List Structures, Lists (Sequences) in Python, Iterating Over Lists (Sequences) in Python

Dictionaries: Dictionaries and Files, Looping and dictionaries, Advanced text parsing

Iteration: While statement, Definite loops using for, Loop Patterns, Recursive Functions, Recursive Problem Solving, Iteration vs. Recursion

UNIT-III

Functions: Fundamental Concepts, Program Routines, Flow of Execution, Parameters & Arguments

Files: Opening Files, Using Text Files, String Processing, Exception Handling

UNIT-IV

Introduction to Data Scraping with Python: Scrapy Library

Objects and Their Use: Introduction to Object Oriented Programming

Modular Design: Modules, Top-Down Design, Python Modules

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

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. GUTTAG JOHN V, “Introduction to Computation and Programming Using Python”, Second Edition, PHI,2014.
4. Jeeva Jose, Sojan P.Lal, “Introduction to Computing & Problem Solving Through Python”, First Edition, Khanna Publishers,2015.
5. Mark J. Guzdial, Barbara Ericson, “Introduction to Computing and Programming in Python”, First Edition, Pearson Education,2015.
6. Kenneth Lambert, “Fundamentals of Python”, First Edition, Cengage Learning,2015.
7. Mark Lutz, “Learning Python", Fifth Edition, O'Reilly Media,2013.

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

Course Code: BVIL-2114

Mathematical Foundation

COURSE OUTCOMES:

After passing 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

B.Voc (Artificial Intelligence and Data Science) Semester- II

Course Code: BVIL-2114

Mathematical Foundation

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

Instructions for the paper setter:
Eight questions of equal marks (8 marks each) are to be 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 subdivided into parts (not exceeding four).

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: 50
3-0-0	Theory: 40
Time : 3 Hours	CA: 10

Instructions for the paper setter:
Eight questions of equal marks (8 marks each) are to be 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 subdivided into parts (not exceeding four).

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.

B.Voc. (Artificial Intelligence and Data Science) Semester- II

COURSE CODE: BVIL-2116

Data Collection and Analysis

L - T – P	**Max. Marks: 50**
4-0-0	**Theory: 40**
Time : 3 Hours	**CA: 10**

Instructions for the paper setter:
Eight questions of equal marks (8 marks each) are to be 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 subdivided into parts (not exceeding four).

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: Analyze, 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.

B.Voc. (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: Demonstrate the use of SQL to create basic to intermediate level of databases

CO5: Comprehend the concept of Cursors and Triggers

B.Voc (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: 40, Practical:40**
Time : 3 Hours	**CA: 20**

Instructions for the paper setter:

Eight questions of equal marks (8 marks each) are to be 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 subdivided into parts (not exceeding four).

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.

B.Voc (Artificial Intelligence and Data Science) Semester- II

Course Code: BVIP-2118

Computational Problem Solving Lab

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

Lab based on Computational Problem solving

B.Voc (Artificial Intelligence and Data Science) Semester- II

Course Code: BVID-2119

Minor Project-II

Course Outcomes:

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

CO1: Apply the tools and techniques learnt in the course to process and analyze data for problems associated with AI and Data science.

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

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

CO4: Describe the observations through project report submission.

B.Voc (Artificial Intelligence and Data Science) Semester- II

Course Code: BVIP-2118

Minor Project-II

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

Note: The students need to submit the self-made project at the end of the Semester. The marks will be awarded to the student on the basis of quality showcased in the project to build AI/ Data Science based Model.

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

Course Code: AECD-2161

DRUG ABUSE

COURSE OUTCOMES:

CO1: This information can include factual data about what substance abuse is; warning signs of addiction; information about how alcohol and specific drugs affect the mind and body

CO2. Learn to be supportive during the detoxification and rehabilitation process.

CO3: Main focus of substance abuse education is teaching individuals about drug and alcohol abuse and how to avoid, stop, or get help for substance use disorders.

CO4: Substance abuse education is important for students alike; there are many misconceptions about commonly used legal and illegal substances, such as alcohol and marijuana.

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

Course Code: AECD-2161

DRUG ABUSE: PROBLEM, MANAGEMENT & PREVENTION

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

Instructions for the Paper Setter

Eight questions of equal marks are to be set two in each of the fourSections(A-D).Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided 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 anySection.

UNIT-I

Prevention of Drug abuse: Role of family: Parent child relationship, Family support, Supervision, Shaping values, Active Scrutiny.

UNIT-II

School: Counselling, Teacher as role-model. Parent-teacher-Health Professional Coordination, Random testing on students.

UNIT-III

Controlling Drug Abuse: Media: Restraint on advertisements of drugs, advertisements on bad effects of drugs, Publicity and media, Campaigns against drug abuse, Educational and awareness program

UNIT-IV

Legislation: NDPs act, Statutory warnings, Policing of Borders, Checking Supply/ Smuggling of Drugs, Strict enforcement of laws, Time bound trials.

References/ Textbooks:

1. Ahuja, Ram (2003), *Social Problems in India*, Rawat Publication,Jaipur.
2. Extent, Pattern and Trend of Drug Use in India, Ministry of Social Justice and Empowerment, Government of India, 2004.
3. Inciardi, J.A. 1981. *The Drug Crime Connection.* Beverly Hills: SagePublications.
4. Kapoor. T. (1985) *Drug epidemic among Indian Youth*, New Delhi: MittalPub.
5. Modi, Ishwar and Modi, Shalini (1997) *Drugs: Addiction and Prevention*, Jaipur:

RawatPublication.
6. National Household Survey of Alcohol and Drug abuse. (2003) New Delhi, Clinical Epidemiological Unit, All India Institute of Medical Sciences,2004.
7. Sain, Bhim 1991, *Drug Addiction Alcoholism*, Smoking obscenity New Delhi:Mitta Publications.
8. Sandhu, Ranvinder Singh, 2009, *Drug Addiction in Punjab*: A Sociological Study. Amritsar: Guru Nanak DevUniversity.
9. Singh, Chandra Paul 2000. *Alcohol and Dependence among Industrial Workers*: Delhi: Shipra.
10. Sussman, S and Ames, S.L. (2008). *Drug Abuse: Concepts, Prevention and Cessation,* Cambridge UniversityPress.

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 Laplace theorem.

CO3: 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: 75**
4-0-0	**Theory:60**
Time:3Hours	**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).

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: 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).

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: 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).

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. T F Fry, “Data Processing”, Elsevier, First Edition, 1983
3. E. Tufte, “The Visual Display of Quantitative Information”, Graphics Press, 2nd Edition, 2001.

4. Andy Kirk, “Data Visualization: A Handbook for Data Driven Design” SAGE Publications Ltd, First edition, 2016
5. Kieran Healy, “Data Visualization: A Practical Introduction” Kindle Edition, Princeton University Press, First edition, 2018.
6. 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

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- III
Course Code: BVIL-3114

Entrepreneurship basics

L-T-P	**Max. Marks:50**
2-0-0	**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).

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- 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:3Hours	**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).

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 in trend.

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: Identify various graphs and plots.

CO3: 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
- Vital components of Data Storytelling
- Differentiate between data exploration and data storytelling

Activity 2:

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

Activity 3:

- 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**

Lab based on Machine Learning tools (SCIKIT)

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

Minor Project-III

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 project.

CO3: 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: BVID-3119

Minor Project-III

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 a project based on Machine learning concepts. The students need to submit the self-made project 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: Comprehend 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: 50**
4-0-0	**Practical:40**
Time:3Hours	**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).

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 Pearsom 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 passing 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: 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).

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, Help functions in 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 DataFrames, 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 MapReduce framework.

CO3: Comprehend various types of databases in NoSQL.

CO4: Execute CRUD: Create, Update, Delete and Query operation on database

CO5: Implement 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: 75**
3-0-0	**Theory:60**
Time:3Hours	**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).

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. Tom White, " Hadoop: The Definitive Guide", Third Edition, O'reily Media, 2012.
2. Seema Acharya, SubhasiniChellappan, "Big Data Analytics" Wiley, Second Edition, 2015.
3. Y. Lakshmi Prasad, "Big Data Analytics Made Easy", Notion Press, First Edition, 2016.
4. Vignesh Prajapati, "Big Data Analytics with R and Hadoop",PacktPublishing, First Edition, 2013.
5. Gaurav Vaish, "Getting Started with NoSQL", Packt Publishing, First Edition, 2013.
6. Adam Fowler, "NoSQL For Dummies", Wiley, First Edition, 2015.
7. Dan McCreary, Ann Kelly, "Making Sense of NoSQL: A guide for managers and the rest of us",Manning Publications, First edition, 2013.
8. Shashank Tiwari, "Professional NoSQL", Wrox, First edition, 2011.
9. Gerardus Blokdyk, "NoSQL A Complete Guide", 5STARCooks, Second Edition, 2021.
10. Shannon Bradshaw, Eoin Brazil, Kristina Chodorow, "MongoDB: The Definitive Guide: Powerful and Scalable Data Storage", O'Reilly Media; Third edition, 2019.

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

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.

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

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).

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- IV
Course Code: BVIP- 4115

Applied Statistical Programming Lab

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

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**
0-0-4	**Theory:80**
Time:3Hours	**CA: 20**

Lab based on NoSQL

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

Minor Project-IV

Course Outcomes:

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

CO1: Apply CRUD: Create, Update, Delete and Query operation operations on Database.

CO2: Apply their knowledge to work on small/medium scale database related project.

CO3: 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: BVIP-4117

Minor Project-IV

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

Instructions to the examiner:

The students will be working on a database related project. The students need to submit the self-made project 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: AECE-4221

Environmental Studies (Compulsory)

COURSE OUTCOMES:

CO1. Reflect upon the concept and need of environmental education.

CO2. Define major eco-systems and their conservation.

CO3. Understand the role of different agencies in the protection of environment.

CO4. Develop desirable attitude, values and respect for protection of environment.

B.Voc (Artificial Intelligence and Data Science) Semester- IV

Course Code: AECE-4221

Environmental Studies (Compulsory)

(Theory)

L-T-P	**Max. Marks: 100**
3-0-1	**Theory:60, Project Report:20**
Time: 3 Hours	**CA:20**

Time: 3 Hrs **Credit: Theory: 60**

Instructions for the Paper Setter

The question paper should carry 60 marks.

The structure of the question paper being:

Part-A, Short answer pattern – 20 marks

Attempt any five questions out of seven. Each question carries 4 marks. Answer to each question should not exceed 2 pages

Part-B, Essay type with inbuilt choice – 40 marks

Attempt any five questions out of eight. Each question carries 8 marks. Answer to each question should not exceed 5 pages.

Unit 1

The multidisciplinary nature of environmental studies

Definition, scope and importance, Need for public awareness

Unit 2

Natural Resources: Renewable and non-renewable resources:

Natural resources and associated problems.

(a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.

(b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.

(c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.

(d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.

(e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies.

(f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

• Role of an individual in conservation of natural resources.

• Equitable use of resources for sustainable lifestyles.

Unit 3

Ecosystems

• Concept of an ecosystem

• Structure and function of an ecosystem

• Producers, consumers and decomposers

• Energy flow in the ecosystem

• Ecological succession

• Food chains, food webs and ecological pyramids

• Introduction, types, characteristic features, structure and function of the following ecosystem: Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, ocean estuaries)

Unit 4

Biodiversity and its conservation

• Introduction – Definition: genetic, species and ecosystem diversity

• Bio-geographical classification of India

• Value of biodiversity: consumptive use, productive use, social, ethical aesthetic and option values

• Biodiversity at global, national and local levels

• India as a mega-diversity nation

• Hot-spots of biodiversity

• Threats to biodiversity: habitat loss, poaching of wildlife, man wildlife conflicts

• Endangered and endemic species of India

• Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity

Unit 5

Environmental Pollution

Definition

• Causes, effects and control measures of Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear pollution

• Solid waste management: Causes, effects and control measures of urban and industrial wastes.

• Role of an individual in prevention of pollution

• Pollution case studies

• Disaster management: floods, earthquake, cyclone and landslides

Unit 6

Social Issues and the Environment

• From unsustainable to sustainable development

• Urban problems and related to energy

• Water conservation, rain water harvesting, watershed management

• Resettlement and rehabilitation of people; its problems and concerns. Case studies.

• Environmental ethics: Issues and possible solutions

• Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.

• Wasteland reclamation

• Consumerism and waste products

• Environmental Protection Act, 1986

• Air (Prevention and Control of Pollution) Act, 1981

• Water (Prevention and control of Pollution) Act, 1974

• Wildlife Protection Act

• Forest Conservation Act

Issues involved in enforcement of environmental legislation

Public awareness

Unit 7

Human Population and the Environment

• Population growth, variation among nations

• Population explosion – Family Welfare Programmes

• Environment and human health

• Human Rights

• Value Education

• HIV / AIDS

• Women and Child Welfare

• Role of Information Technology in Environment and Human Health

• Case Studies

Unit 8

Field Work

• Visit to a local area to document environmental assets river/forest/grassland/hill/mountain

• Visit to a local polluted site – Urban / Rural / Industrial / Agricultural

• Study of common plants, insects, birds

• Study of simple ecosystems-pond, river, hill slopes, etc

References/Textbooks:

1. Bharucha, E. 2005. Textbook of Environmental Studies, Universities Press, Hyderabad.

2. Down to Earth, Centre for Science and Environment, New Delhi.

3. Heywood, V.H. &Waston, R.T. 1995. Global Biodiversity Assessment, Cambridge House, Delhi.

4. Joseph, K. & Nagendran, R. 2004. Essentials of Environmental Studies, Pearson Education (Singapore) Pte. Ltd., Delhi.

5. Kaushik, A. & Kaushik, C.P. 2004. Perspective in Environmental Studies, New Age International (P) Ltd, New Delhi.

6. Rajagopalan, R. 2011. Environmental Studies from Crisis to Cure. Oxford University Press, New Delhi.

7. Sharma, J. P., Sharma. N.K. & Yadav, N.S. 2005. Comprehensive Environmental Studies, Laxmi Publications, New Delhi.

8. Sharma, P. D. 2009. Ecology and Environment, Rastogi Publications, Meerut.

9. State of India's Environment 2018 by Centre for Sciences and Environment, New Delhi

10. Subramanian, V. 2002. A Text Book in Environmental Sciences, Narosa Publishing House, New Delhi