FACULTY OF SCIENCES

SYLLABUS

Master of Science (Mathematics) (FYIP)

(Semester: I -IV)

(Under Credit Based Continuous Evaluation Grading System) (CBCEGS)

Session: 2024-25

The Heritage Institution

KANYA MAHA VIDYALAYA JALANDHAR

(Autonomous)

Master of Science (Mathematics)(FYIP)

Session: 2024-25

Programme Specific Outcomes

Upon successful completion of this course, students will be able to:

PSO1: Solve complex Mathematical problems by critical understanding, analysis and synthesis. Students will also be able to provide a systematic understanding of the concepts and theorem of Mathematics and their applications in the real world to an advanced level, enhance career prospects in a huge array of field suitable to succeed at an entry level position in Mathematics post graduate program.

PSO2: Demonstrate proficiency in Mathematics and the Mathematical concepts needed for a proper understanding of Physics, Chemistry, Electronics, Computer Science and Economics.

PSO3: Create and develop Mathematical software application using a systematic approach & apply discrete Mathematical concept to practical application.

PSO4: Demonstrate knowledge of Calculus I & II, Matrices and Theory of Equations, Analytical and Solid Geometry, Statics & Tensor Calculus and able to apply this knowledge to analyze a variety of Mathematical Phenomena.

PSO5: Demonstrate knowledge of physical chemistry & apply this knowledge to analyze a variety of chemical phenomena & will be able to interpret and analyze quantitative data.

PSO6: Understand and demonstrate the knowledge of Mechanics, area, volume and displacement with differential equation of the orbit.

PSO7: Understand the basic concepts and basic principles of Demand and Supply, Measurement of Price Elasticity of Demand and apply Economic theories to derive cost function from Production Function.

PSO8: Learn implications of Revenue curves and their mutual relationships.

PSO9: Develop statistical approach and mathematical thinking among students to problem solving on a diverse variety of disciplines.

PSO10: Have knowledge of computer fundamentals, able to handle practical programming problems using C and analyze large volume of data using various statistical techniques

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

Scheme and Curriculum of Examinations of Five Years Integrated Programme

(Under Credit Based Continuous Evaluation Grading System) (CBCEGS)

Master of Science (Mathematics) (FYIP)

Semester-I

Session- 2024-25

Master of Science (Mathematics) (FYIP) Semester-I										
Course Code	Course type	Course Title	Hours Per Week L-T-P	Credits L-T-P	Total Credits	Max. Marks				Examination time in hours
						Total	Th	P	CA	
FMAL-1421/ FMAL-1031/ FMAL-1431	C	[1]Punjabi (Compulsory)/ [2]Basic Punjabi/ [3]Punjab History and Culture	2-0-0	2-0-0	2	50	35	-	15	3
FMAL -1102	AEC	Communicative English-I	2-0-0	2-0-0	2	50	35	-	15	3
FMAL-1333	DSC	Calculus	4-0-0	4-0-0	4	100	70	-	30	3
FMAL -1334	DSC	Theory of Equations	4-0-0	4-0-0	4	100	70	-	30	3
FMAL-1335 OR FMAM-1395	C	[4]Dynamics OR [5]Mechanics - I	4-0-0 3-0-2	4-0-0 3-0-1	4 4	100 100	70 40	- 30	30 30	3 3+3
FMAP-1336	DSC	Calculus Laboratory	0-0-4	0-0-2	2	50	-	35	15	3

FMAM-1130	SEC	Programming Language - I	3-0-2	3-0-1	4	100	40	30	30	3+3
VACF-1491	VAC	*Foundation Course	2-0-0	2-0-0	2	50	35	-	15	1
		Total			24					

C-Compulsory

AEC-Ability Enhancement Course

DSC-Discipline Specific Course

SEC-Skill Enhancement Course

VAC-Value Added Course

Note:

[1]Domicle / Non Domicile of Punjab students who have studied Punjabi till 8th/ 10th class will study Punjabi (compulsory)

[2,3]The Non-Domicile of Punjab Students who have not studied Punjabi till 8th/10th class can choose either Basic Punjabi or Punjab History and Culture (PHC)

[2]Domicile of Punjab students who studied out of Punjab and did not study Punjabi till 8th / 10th class will have to study Basic Punjabi

[2]Domicile of Punjab students who have studied in Kendriya Vidyalaya of Punjab or any other school and due to any reason did not study Punjabi till 8th/10th class will have to study Basic Punjabi

[4] Only those students can opt this course who have not studied Physics, Chemistry at +2 level.

[5]Only those students can opt this course who have studied Physics, Chemistry and Mathematics at +2 level.

* Marks of this paper will not be added in total marks. Grades will be provided.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

Scheme and Curriculum of Examinations of Five Years Integrated Programme

(Under Credit Based Continuous Evaluation Grading System) (CBCEGS)

Master of Science (Mathematics) (FYIP)

Semester-II

Session- 2024-25

Master of Science (Mathematics) (FYIP) Semester-II										
Course Code	Course type	Course Title	Hours Per Week L-T-P	Credits L-T-P	Total Credits	Max. Marks				Examination time in hours
						Total	Th	P	CA	
FMAL-2421/ FMAL-2031/ FMAL-2431	C	[1]Punjabi (Compulsory)/ [2] Basic Punjabi/ [3] Punjab History and Culture	2-0-0	2-0-0	2	50	35	-	15	3
FMAL-2102	MDC	Communicative English-II	2-0-0	2-0-0	2	50	35	-	15	3
FMAL-2333	DSC	Sequences and Series	4-0-0	4-0-0	4	100	70	-	30	3
FMAL -2334	DSC	Algebra	4-0-0	4-0-0	4	100	70	-	30	3
FMAM-2135	C	Object Oriented Programming C++	3-0-2	3-0-1	4	100	40	30	30	3+3
FMAL-2330	SEC	Statistical Analysis Using Excel	1-0-0	1-0-0	1	50	35	-	15	3
FMAP-2330	SEC	Statistical Analysis Using Excel Laboratory	0-0-4	0-0-2	2	50	-	35	15	3

VACD-2161	VAC	*Drug Abuse: Problem, Management and Prevention (Compulsory)	2-0-0	2-0-0	2	50	35	-	15	3
Total					21					

C-Compulsory

AEC-Ability Enhancement Course

DSC-Discipline Specific Course

SEC-Skill Enhancement Course

VAC-Value Added Course

Note:

[1]Domicle / Non Domicile of Punjab students who have studied Punjabi till 8th/ 10th class will study Punjabi (compulsory)

[2,3]The Non-Domicile of Punjab Students who have not studied Punjabi till 8th/10th class can choose either Basic Punjabi or Punjab History and Culture (PHC)

[2]Domicile of Punjab students who studied out of Punjab and did not study Punjabi till 8th / 10th class will have to study Basic Punjabi

[2]Domicile of Punjab students who have studied in Kendriya Vidyalaya of Punjab or any other school and due to any reason did not study Punjabi till 8th/10th class will have to study Basic Punjabi

* Marks of these papers will not be added in total marks. Grades will be provided.

Master of Science (Mathematics)(FYIP)
Semester–I

Session- 2024-25
Course Title: Basic Punjabi
Course Code: FMAL-1031
Course Outcomes

CO1:ਮੁੱਢਲੀਪੰਜਾਬੀਪੜ੍ਹਾਉਣ ਦਾਮਨੋਰਥਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੰਜਾਬੀਭਾਸ਼ਾ ਨੂੰ ਸਿਖਾਉਣ ਦੀ ਪ੍ਰਕਿਰਿਆ ਵਿਚ ਪਾ ਕੇ ਇਕ ਹੋਰ ਭਾਸ਼ਾ ਸਿੱਖਣ ਦਾ ਮੌਕਾ ਪ੍ਰਦਾਨਕਰਨਾ ਹੈ।ਵਿਦਿਆਰਥੀਆਂ ਨੂੰਪੈਂਤੀਅੱਖਰੀ, ਅੱਖਰਕ੍ਰਮ, ਪੈਰਬਿੰਦੀਵਾਲੇ ਵਰਣ ਅਤੇ ਪੈਰ ਵਿਚ ਪੈਣ ਵਾਲੇ ਵਰਣ ਅਤੇ ਮਾਤਰਾਵਾਂ (ਮੁੱਢਲੀਜਾਣਪਛਾਣ) ਲਗਾਖ਼ਰ (ਬਿੰਦੀ, ਟਿੱਪੀ, ਅੱਧਕ) ਦੀ ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ ਤੋਂਜਾਣੂ ਕਰਵਾਇਆਜਾਵੇਗਾ।

CO2:ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੰਜਾਬੀਸ਼ਬਦਬਣਤਰ ਦੀ ਮੁੱਢਲੀਜਾਣਪਛਾਣ (ਸਾਧਾਰਨਸ਼ਬਦ, ਸੰਯੁਕਤ ਸ਼ਬਦ, ਮਿਸ਼ਰਤ ਸ਼ਬਦ,ਮੂਲ ਸ਼ਬਦ,ਅਗੇਤਰ ਅਤੇ ਪਿਛੇਤਰ) ਤੋਂਜਾਣੂ ਕਰਵਾਇਆਜਾਵੇਗਾ।

CO3:ਵਿਦਿਆਰਥੀਆਂ ਨੂੰਨਿੱਤਵਰਤੋਂ ਦੀ ਪੰਜਾਬੀਸ਼ਬਦਾਵਲੀ : ਬਾਜ਼ਾਰ, ਵਪਾਰ, ਰਿਸ਼ਤੇਨਾਤੇ, ਖੇਤੀ ਅਤੇ ਹੋਰਧੰਦਿਆਂਆਦਿ ਨਾਲ ਸੰਬੰਧਤ ਤੋਂਜਾਣੂ ਕਰਵਾਇਆਜਾਵੇਗਾ।

CO4:ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੰਜਾਬੀਵਿਚਹਫ਼ਤੇ ਦੇ ਸੱਤਦਿਨਾਂ ਦੇ ਨਾਂ, ਬਾਰ੍ਹਾਂਮਹੀਨਿਆਂ ਦੇ ਨਾਂ, ਰੁੱਤਾਂ ਦੇ ਨਾਂ, ਇਕਤੋਂ ਸੌ ਤੱਕਗਿਣਤੀਸ਼ਬਦਾਂਵਿਚਸਿਖਾਉਣਾ ਹੈ।

Session- 2024-25
Course Title: Basic Punjabi
Course Code: FMAL-1031

ਸਮਾਂ : 3 ਘੰਟੇ   **Maximum Marks: 50**

L-T-P   **Theory   : 35**

2-0-0   **CA   : 15**

ਅੰਕ ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

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

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

3.   ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 7 ਅੰਕ ਹਨ।

4.   ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

ਪਾਠਕ੍ਰਮ

ਯੂਨਿਟ-I

ਪੈਂਤੀਅੱਖਰੀ, ਅੱਖਰਕ੍ਰਮ, ਪੈਰਬਿੰਦੀਵਾਲੇ ਵਰਣ ਅਤੇ ਪੈਰਵਿਚਪੈਣਵਾਲੇ ਵਰਣ ਅਤੇ ਮਾਤ੍ਰਾਵਾਂ (ਮੁੱਢਲੀ ਜਾਣਪਛਾਣ) ਲਗਾਖ਼ਰ (ਬਿੰਦੀ, ਟਿੱਪੀ, ਅੱਧਕ) : ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ ।

ਯੂਨਿਟ-II

ਪੰਜਾਬੀਸ਼ਬਦਬਣਤਰ : ਮੁੱਢਲੀਜਾਣਪਛਾਣ (ਸਾਧਾਰਨਸ਼ਬਦ, ਸੰਯੁਕਤਸ਼ਬਦ, ਮਿਸ਼ਰਤਸ਼ਬਦ, ਮੂਲ ਸ਼ਬਦ, ਅਗੇਤਰ ਅਤੇ ਪਿਛੇਤਰ)

ਯੂਨਿਟ-III

ਨਿੱਤਵਰਤੋਂ ਦੀ ਪੰਜਾਬੀਸ਼ਬਦਾਵਲੀ : ਬਾਜ਼ਾਰ, ਵਪਾਰ, ਰਿਸ਼ਤੇਨਾਤੇ, ਖੇਤੀ ਅਤੇ ਹੋਰਧੰਦਿਆਂ੍ਆਆਦਿਨਾਲ ਸੰਬੰਧਤ।

ਯੂਨਿਟ-IV

ਹਫ਼ਤੇ ਦੇ ਸੱਤਦਿਨਾਂ ਦੇ ਨਾਂ, ਬਾਰ੍ਹਾਂਮਹੀਨਿਆਂ ਦੇ ਨਾਂ, ਰੁੱਤਾਂ ਦੇ ਨਾਂ, ਇਕਤੋਂ ਸੌ ਤਕ ਗਿਣਤੀਸ਼ਬਦਾਂਵਿਚ ।

Course Title: Punjabi Compulsory
Course Code: FMAL-1421
Course Outcomes

CO1:'ਸਾਹਿਤ ਦੇ ਰੰਗ' ਪੁਸਤਕ ਦੇ ਕਵਿਤਾਭਾਗਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾਮਨੋਰਥਵਿਦਿਆਰਥੀਆਂਅੰਦਰਕਵਿਤਾਪ੍ਰਤੀਦਿਲਚਸਪੀ, ਸੂਝ ਨੂੰ ਪੈਦਾਕਰਨਾ ਹੈ ਤਾਂਕਿ ਉਹ ਆਧੁਨਿਕਦੌਰਵਿਚਚਲਰਹੀਆਂਕਾਵਿਧਾਰਾਵਾਂ ਅਤੇ ਕਵੀਆਂਬਾਰੇ ਗਿਆਨਹਾਸਲਕਰ ਸਕਣ।ਇਸ ਦਾਹੋਰਮਨੋਰਥਕਵਿਤਾ ਦੀ ਵਿਆਖਿਆ, ਵਿਸ਼ਲੇਸ਼ਣ ਤੇ ਮੁਲੰਕਣ ਦੀ ਪ੍ਰਕਿਰਿਆਤੋਂਜਾਣੂ ਕਰਾਉਣਾਵੀ ਹੈ ਤਾਂਕਿ ਉਹ ਸਮਕਾਲੀ ਸਮਾਜਦੀਆਂ ਸਮੱਸਿਆਵਾਂਨੂੰ ਸਮਝ ਸਕਣ ਅਤੇ ਆਲੋਚਨਾਤਮਕਦ੍ਰਿਸ਼ਟੀਬਣਾ ਸਕਣ।

CO2:'ਸਾਹਿਤ ਦੇ ਰੰਗ' ਪੁਸਤਕ ਦੇ ਕਹਾਣੀਭਾਗ ਨੂੰ ਸਿਲੇਬਸ ਵਿਚਸ਼ਾਮਿਲਕਰ ਕੇ ਵਿਦਿਆਰਥੀਆਂਅੰਦਰਕਹਾਣੀਪੜ੍ਹਨ ਦੀ ਰੁਚੀ ਨੂੰ ਪੈਦਾਕਰਨਾ ਹੈ ਅਤੇ ਕਹਾਣੀਜਗਤਨਾਲਜੋੜਨਾ ਹੈ।

CO3:ਪੈਰ੍ਹਾ ਰਚਨਾ ਅਤੇ ਪੈਰ੍ਹਾਪੜ੍ਹ ਕੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਉਤਰ ਦੇਣ ਦਾਮਨਰੋਥਵਿਦਿਆਰਥੀਆਂ ਦੀ ਬੁੱਧੀ ਨੂੰ ਤੀਖਣਕਰਦਿਆਂ ਉਨਾਂ ਦੀ ਲਿਖਣਪ੍ਰਤਿਭਾ ਨੂੰ ਉਜਾਗਰਕਰਨਾ ਹੈ।

CO4:ਧੁਨੀਵਿਉਂਤ ਪੜ੍ਹਨਨਾਲਵਿਦਿਆਰਥੀ ਧੁਨੀਆਂ ਦੀ ਉਚਾਰਨਪ੍ਰਣਾਲੀਤੋਂਵਾਕਫ਼ ਹੋਣਗੇ।

Master of Science (Mathematics)(FYIP)

Semester–I

Session- 2024-25

Course Title: Punjabi Compulsory
Course Code: FMAL-1421

ਸਮਾਂ : 3 ਘੰਟੇ

Maximum Marks: 50
Theory   : 35
CA   :15

L-T-P   2-0-0

ਅੰਕ ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1.   ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਸੈਕਸ਼ਨ ਹੋਣਗੇ।ਸੈਕਸ਼ਨA-D�ੱਕ ਦੇ ਪ੍ਰਸ਼ਨ ਯੂਨਿਟI-IV ਵਿੱਚੋਂ ਪੁੱਛੇ ਜਾਣਗੇ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।

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

3.   ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 7 ਅੰਕ ਹਨ।

4.   ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ ਪ੍ਰਸ਼ਨਾਂਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

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ਪਾਠਕ੍ਰਮ ਅਤੇ ਪਾਠ ਪੁਸਤਕਾਂ
ਯੂਨਿਟ-I

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ਸਾਹਿਤ ਦੇ ਰੰਗ (ਸੰਪਾ.ਡਾਮਹਿਲਸਿੰਘ),ਭਾਗਪਹਿਲਾ(ਕਵਿਤਾ),
ਰਵੀ ਸਾਹਿਤਪ੍ਰਕਾਸ਼ਨ,ਅੰਮ੍ਰਿਤਸਰ।
(ਪ੍ਰਸੰਗ ਸਹਿਤ ਵਿਆਖਿਆ,ਸਾਰ)
(ਡਾ.ਹਰਿਭਜਨਸਿੰਘ,ਪਾਸ਼,ਸੁਰਜੀਤਪਾਤਰ ਕਵੀ ਪਾਠਕ੍ਰਮਦਾਹਿੱਸਾਨਹੀਂਹਨ)8ਅੰਕ

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ਯੂਨਿਟ-II

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ਸਾਹਿਤ ਦੇ ਰੰਗ (ਸੰਪਾ.ਡਾਮਹਿਲਸਿੰਘ),ਭਾਗਪਹਿਲਾ(ਕਹਾਣੀ),
ਰਵੀ ਸਾਹਿਤਪ੍ਰਕਾਸ਼ਨ,ਅੰਮ੍ਰਿਤਸਰ।
(ਸਾਰ,ਵਿਸ਼ਾਵਸਤੂ)
(ਕੋਈਇਕ ਸਵਾਰ,ਘੋਟਣਾ, ਆਪਣਾਆਪਣਾਹਿੱਸਾਕਹਾਣੀਆਂਪਾਠਕ੍ਰਮਦਾਹਿੱਸਾਨਹੀਂਹਨ)8 ਅੰਕ

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ਯੂਨਿਟ-III

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ਪੈਰ੍ਹਾਰਚਨਾ

ਪੈਰ੍ਹਾਪੜ੍ਹ ਕੇ ਪਸ਼ਨਾਂ ਦੇ ਉਤਰ।8 ਅੰਕ

ਯੂਨਿਟ-IV

(ੳ)   ਪੰਜਾਬੀ ਧੁਨੀਵਿਉਂਤ :ਪਰਿਭਾਸ਼ਾ ਤੇਉਚਾਰਨਅੰਗ

(ਅ)   ਸਵਰ, ਵਿਅੰਜਨ8 ਅੰਕ

Course Title: Punjab History and Culture
Course Code: FMAL-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
Course Code: FMAL-1431

Examination Time: 3 Hours   **Max. Marks: 50**
Credits L-T-P: 2-0-0   **Theory: 35**
Contact Hours: 2 Hrs/Week   **CA: 15**

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 7 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.
- Budha Parkash, Glimpses of Ancient Punjab, Patiala, 1983.
- Chopra, P.N., Puri, B.N., & Das,M.N.(1974). A Social, Cultural & Economic History of India, Vol. I, New Delhi: Macmillan India.
- 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.

Master of Science (Mathematics)(FYIP)

Semester–I

Session- 2024-25
Course Title: Communicative English-I
Course Code: FMAL-1102
Course Outcomes

The students will be:

CO 1: able to enhance their vocabulary through vocabulary building exercises

CO2: able to improve their writing skills by writing letters and reports

CO3: able to enhance their reading and analyzing power of texts through guided reading by the study of "Making Connections" by Kenneth J. Pakenham

CO4: acquainted to the techniques of effective essay writing

Master of Science (Mathematics)(FYIP)

Semester–I
Session- 2024-25
Course Title: Communicative English-I
Course Code: FMAL-1102

Examination Time: 3 Hours   Max.Marks: 50
                                                                   Theory: 35
L T P   CA:15
2 0 0
Instructions for Paper Setters:

Eight questions of equal marks (07 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).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

"Word List", "Correct Usage of Commonly used words and Phrases" from the chapter "Vocabulary" given in The Written Word by Vandana R. Singh

Unit-I

Letter- writing as prescribed in The Written Word by Vandana R. Singh
Report writing as prescribed in The Written Word by Vandana R. Singh

Unit-III

Unit-I from Making Connections: A Strategic Approach to Academic Reading by Kenneth J. Pakenham, Second Edition

Unit-IV

Unit-II from Making Connections: A Strategic Approach to Academic Reading by Kenneth J. Pakenham, Second Edition

Text books:

The Written Word by Vandana R. Singh, Oxford University Press, New Delhi.
Making Connections: A Strategic Approach to Academic Reading by Kenneth J.Pakenham, Second Edition

Semester–I
Session- 2024-25
Course Title: Calculus
Course Code: FMAL-1333

Course Outcomes

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

CO 1:   Understand real number system, limit of a function, basic properties of limit, continuity, and classification of discontinuities & to apply it in real world problem.

CO 2:   To Classify the difference between increasing and decreasing functions and understand the concept of Differentiability of functions and maxima & minima.

CO 3: Demonstrate Asymptotes, points of inflexion, multiple points on a curve & also to differentiate between concavity and convexity.

CO 4: To understand the concepts of Riemann sum, definite integrals and their properties, the fundamental theorem of calculus, applications to length of arc and area bounded between curves, Reduction Formulae & to apply in a wide variety of disciplines like Bio, Eco, Physics & Engineering.

Semester–I
Session-2024-25
Course Title: Calculus
Course Code: FMAL-1333

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

Instructions for Paper Setters:

Eight questions of equal marks (14 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).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

Review of limit and continuity of a function of real variable, indeterminate forms, higher order derivatives, Leibnitz theorem and applications to problems of the type

$$e^{ax}\sin(bx+c)\,, e^{ax}\cos(bx+c)\,, (a+bx)^n \sin x, (a+bx)^n \cos x.$$

Unit II

Differentiability of functions of real variable, increasing and decreasing functions, maxima and minima, Taylor's and Maclaurin's theorem with various forms of remainders.

Unit III

Concave upward, Concave downward, Point of inflexion, Asymptotes, Horizontal and Verti+cal Asymptotes, asymptotes of the algebraic curves represented by homogeneous equation in two variables,

Unit IV

Anti derivative of function of real variable, Riemann sums, definite integrals and their properties, the fundamental theorem of calculus, applications to length of arc and area bounded between Cartesian curves, Reduction Formulae, illustration of Reduction Formulae of type $\int \mathrm{Sin}^n x\, dx, \int \cos^n x\, dx, \int \tan^n x\, dx, \int \mathrm{Sec}^n x\, dx, \int \mathrm{Sin}^n x \mathrm{Sin}^m x\, dx$

Text Book:
       1.Thomas, G.B., and Finney, L.R., Calculus and Analytic Geometry, 9th Edition, Addison Wesley, 1998, (Scope as in Ch.1-7, 9, 11).

Reference Books:
1. Apostol, T.M., Calculus, An Indian Adaptation, Wiley, 2022.
2. Anton, H., Bivens, I., and Davis, S., Calculus, 12th Ed. John Wiley and Sons (Asia)P. Ltd, Singa- pore, 2002. (Scope as in ch.0-3, 6, 10,12)
3. R. Courant and F. John. Introduction to Calculus and Analysis (Vol. 1), Springer, 1999. (Scope as in Ch.4)

Semester–I
Session-2024-25
Course Title: Theory of Equations
Course Code: FMAL- 1334
Course Outcomes

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

CO 1: Understand the concept of Greatest Common Divisor, Unique Factorization of Polynomial over a field F

CO 2: To find the relations between the roots and coefficients of general equation in one variable, distinguish between solution of cubic equations and Bi-quadratic equations.

CO 3: Classify Symmetric functions, Solutions of reciprocal and binomial equations, and Algebraic solutions of the cubic and biquadratic Equations using Cardan's Method, Descarte's Method, Ferrari Method.

CO 4: Obtain homogeneous products, limits of the roots of equations and Separation of the roots of equations.

Master of Science (Mathematics) (FYIP)

Semester: I
Session: 2024-25
Course Title: Theory of Equations
Course Code: FMAL- 1334

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

Instructions for Paper Setters:

Eight questions of equal marks (14 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). 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

General properties of polynomials, Graphical representation of a polynomial, maximum and minimum values of a polynomials, Euclid's Algorithm, Greatest Common Divisor, Unique Factorization of Polynomial over a field F of numbers (Statement Only), Fundamental Theorem of Algebra (Statement only), Roots and their Multiplicity.

Unit II

General properties of equations, Relationship between the roots and the coefficients, Fundamental theorem of symmetric polynomials (without proof), Evaluation of symmetric functions of roots, Rational roots of polynomials with integral coefficients, Descarte's rule of signs positive and negative rule.

Unit III

Symmetric functions, Applications of symmetric function of the roots, Transformation of equations, Solutions of reciprocal and binomial equations, Algebraic solutions of the cubic and biquadratic Equations using Cardan's Method, Descarte's Method, Ferrari Method.

Unit IV

Symmetric functions of the roots, Newton's theorem on the sums of powers of roots, homogeneous products, limits of the roots of equations, Separation of the roots of equations

Text Books:
1. Burnside, W.S. and Panton, A.W., The Theory of Equations, Dublin University Press, 1954.
2. MacDuffee, C.C., Theory of Equations, John Wiley & Sons Inc., 1954.

Reference Book:
1. Kishan, H., Theory of Equations, Atlantic Publications, 2022.

Master of Science (Mathematics)(FYIP)

Semester–I
Session-2024-25
Course Title: Dynamics
Course Code: FMAL -1335

Course Outcomes

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

CO 1: Demonstrate the basic relations between distance, time, velocity and acceleration, manage to solve the problems of Newton's Laws of Motion and the motion of particles connected by a string.

CO 2: Illustrate motion along a smooth inclined plane. Solve different types of problems with Variable Acceleration. Discuss Simple Harmonic Motion.

CO 3: Understand the concept of projectile, oscillating system.

CO 4: Define Work, Power and Energy and explain their relationship. Use measurement tools to apply the concepts of Work and power to solve real life problems. Identify the different types of energy.

Semester–I
Session-2024-25
Course Title: Dynamics
Course Code: FMAL -1335

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

Instructions for the Paper Setter: Eight questions of equal marks (14 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). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section. The question paper must contain 30% of the article/theory from the syllabus.

Unit-I

Rectilinear motion in a straight line with uniform acceleration, Newton's laws of motion. Motion of two particles connected by a string.

Unit-II

Motion along a smooth inclined plane. Variable acceleration. Simple Harmonic Motion.

Unit-III

Curvilinear motion of particle in a plane, Definition of velocity and acceleration, projectiles. Oscillations: Free Vibrations, Simple Pendulum, Conical Pendulum.

Unit-IV

Work, Power and Energy: Kinetic and Potential energy, Conservative forces. Theorem of conservation of energy. Work done against gravity.

Text Book:
R. Kumar, Fundamentals of Dynamics, Pardeep Publications, Jalandhar city, second edition, 2004

Reference Books:
    1.F. Chorlton, Text Book of Dynamics, CBS Publishers, New Delhi, second edition, 2004 (Scope in chapters 3,8).
    2. S.R. Gupta, Elementary Analytical Dynamics, Sultan Chand and Company, New Delhi, Fourteen Edition, 1983(Scope in chapters 1,2,3)

Master of Science (Mathematics)(FYIP)

Semester–I
Session-2024-25
Course Title: Mechanics - I
Course Code: FMAM-1395

COURSE OUTCOMES:

After passing this course, students will be able to:

CO1: Understand the various coordinate systems and their applications. Students will learn the applications of Newton's laws of motion in various situations such as variable mass systems.

CO2:They will understand the elastic scattering in lab and centre of mass systems. They will learn the rotational motion of a body in general by studying Euler's equations and the Moment of inertia tensor.

CO3: Know the fundamental forces of nature, the concept of centre mass, central forces and the motion of particles under central force and to determine the turning points oforbit.They will be able to understand planetary motion by solving differential equations of orbits and studying Kepler's laws.

CO4: They will learn Galilean transformations and understand the origin of fictitious forces in non-inertial frames. They will understand the consequences fictitious forces on acceleration due to gravity, motion of a particle on earth, and Foucault's pendulum.

Master of Science (Mathematics) (FYIP)

Semester–I
Session-2024-25
Course Title: Mechanics - I
Course Code: FMAM-1395

Examination Time: (3+3) Hours   Max. Marks: 100
                                                                           Practical-30
                                                                           Theory: 40
 L T P   CA: 30
3 0 1

Instructions for Paper Setters:

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). 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

Reference frames, Inertial frames,Displacement, velocity& acceleration in Cartesian, Plane polar, and Sphericalpolar coordinate systems,Area and volume in these coordinate systems. solidangle.Review of Newton's Laws of Motion, Momentum of variable-mass system: motion of the rocket.

Unit II

Elastic and inelastic collisions in laboratory and centre ofmass systems; velocities, angles, energies in these systems and their relationships. Rotational motion of the rigid body, Torques due to internalforces, angular momentum about the centre of mass, Principal axes and inertia tensor, Kinetic energy of rotation, Euler's equations,

Unit III

Forces in nature (Qualitative). Conservative forces. Central Forces.Motion of a particle under a central force field, Two-body problem and its reduction to one-body problem and its solution, Reduced mass, Equation of motion of a reduced mass under central force and energy. Differential equation of the orbit, Equation of orbit under inverse square force field, turning points, Kepler's Laws.

Unit IV

Galilean transformations; Galilean invariance of space &time intervals, Newton's laws of motion and conservation laws. Non-inertial frames, Fictitious forces. Effect of rotation of the earth on'g'. Effects of centrifugal and Coriolis forces produced as a result of earth's rotation. Foucault's pendulumandits equationofmotion.

BooksRecommended:
1. Knight,W.D.,Ruderman,M.A.,Helmholtz,C.A.andMoyer,R.J.,BerkeleyPhysicsCourse,Vol.IMechanics
2. Halliday, D., Resnick, R., and Walker, J., Fundamentals of Physics, 6Edition, Wiley India Pvt.Ltd,NewDelhi, 2004.
3. Gupta,S.K.,Analytical Mechanics,ModernPublishers.AnIntroductiontoMechanics,DanielKleppner &Robert Kolenkow, TataMcGrawHillPublishingCompanyLtd., NewDelhi.
4. Feynman, R.P., Leighton, R. and Sands, M., The Feynman Lectures in Physics, The New MillenniumEdition,Basic Books, Vol.I, Mechanics,

Practical's:-

1. To determine the value of acceleration due to gravity at a place with Kater's pendulum.

2. To find the moment of inertia of a fly wheel.

3. To find the moment of inertia of an irregular body about an axis through its centre of gravity with a torsion pendulum.

4. To study the dependence of moment of inertia on distribution of mass (by noting time periods of oscillations using objects of various geometrical shapes but of same mass)

5. Study of bending of beams and determination of Young's modulus.

6. Determination of Poisson's ratio for rubber.

Semester–I
Session-2024-25
Course Title: Calculus Laboratory
Course Code: FMAP-1336

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

Practical (Using any Software)

1. Plotting the graphs of elementary functions: $e^{ax+b}\sin(bx+c)$, $\log(ax+b)$, $1/(ax+b)$, $\sin(ax+b)$, $\cos(ax+b)$, $|ax+b|$ and to illustrate the effect of a and b on the graph.
2. Plotting the graphs of the polynomial of degree 4 and 5
3. Obtaining surfaces of revolution of curves and their area.
4. Sketching ellipsoid, hyperboloid of one and two sheets, elliptic cone, elliptic paraboloid, hyperbolic paraboloid using Cartesian coordinates.
5. Matrix operations (addition, multiplication, inverse, transpose), eigenvalues and eigenvectors.

Text Book:

1. Thomas, G.B. and Finney, R.L., Calculus and Analytic Geometry, 9th Edition, Addison Wesley, 1998. (Scope as in Ch.1-7,9,11)

Reference Books:

1. Anton, H., Bivens, I., and Davis, S., Calculus, 12th Ed. John Wiley and Sons (Asia) P. Ltd, Singapore, 2002. (Scope as in Ch.0-3,6,10,12)
2. Courant, R.and John, F., Introduction to Calculus and Analysis (Vol I), Springer,1999.(Scopes in Ch.4)

Master of Science (Mathematics)(FYIP)

Semester–I
Session-2024-25
Course Title: Programming Language - I
Course Code: FMAM- 1130
Course Outcomes

After passing course the student will be able to:

CO1: Articulate various kind of software and hardware used in computers.

CO2: Work with different set of operations in C programming.

CO3: Apply various control statements of C Programming Language for designing solutions to different real world problems.

CO4: Implement single and multidimensional arrays for representing complex data collections.

Master of Science (Mathematics)(FYIP)

Semester–I
Session-2024-25
Course Title: Programming Language - I
Course Code: FMAM- 1130

Examination Time: (3+3) Hours   Max. Marks: 100

Practical-30
Theory: 40
L T P   CA: 30
3 0 1

Instructions for the Paper Setters: Eight questions of equal marks (8 Marks each) are to be set, two in each of the four Sections (A-D). 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 any Section.

UNIT-I

Introduction to Computer Programming, Program Development life cycle, algorithms, flow chart, decision table & pseudo code.

UNIT-II

Introduction to C language, data types, Operators and Expression, Input/output Functions, Structured programming elements, Control statements: Branching, Jumping, Looping Arrays.

UNIT-III

Pointers, Functions: Inbuilt Functions, User defined Functions, Recursion, Storage Classes in C, dynamic memory management.

UNIT-IV

Strings, Structure and union, Reference variables, basics of searching and sorting techniques, file handling in C

References / Textbooks:

1. E. Balagurusamy, Programming in ANSI C, Tata McGraw-Hill (2002), 5th edition.
2. Stephen G. Kochan, Programming in C, Pearson Education (2015), 4th edition.
3. R.S. Salari, Application Programming in C, Khanna Book Publishing (2012), 4th edition.
4. Anshuman Sharma, Learn programming in C, Lakhanpal Publishers (2016), 7th edition.

Practical's:-

Development of Computer Programs using C language for:

- Separation of odd and even numbers
- Summation of N Natural numbers
- Generating Fibonacci series
- Roots of quadratic and Cubic equations
- Evaluating various mathematical functions: exp(x), log(x), sin(x), cos(x) etc using Taylor series expansion
- Arranging numbers in ascending and descending orders
- Finding maximum/minimum of numbers, for matrix operations, determinants, and inverse of 3x3 matrix, elementary numerical methods and statistical methods.

FOUNDATION COURSE

Course Title: Foundation Course

Nature of Course: Audit Course (Value

Added)

Course Duration: 30hours

Course intended for: Semester I students of undergraduate degree programs
of all 25 streams.

Course Credits:2

Course Code:

VACF-1492

PURPOSE&AIM

This course has been designed to strengthen the intellectual foundation of all the new entrants in the college. One of the most common factors found in the students seeking admission in college after high school is the lack of an overall view of human history, knowledge of global issues,peaksofhumanintellect,social/politicalthinkersandinventors&discovererswhohaveimpacted human life. For a student, the process of transition from school to college is full of apprehension and skepticism regarding adapting themselves to new system. The Foundation Programme intends to bridge the gap between high school and college education and develop an intellectual readiness and base for acquiring higher education.

INSTRUCTIONALOBJECTIVES

- To enable the students to realize their position in the wholesaga of time and space
- to inculcate in them an appreciation of life, cultures and people across the globe
- to promote, in the students, an awareness of human intellectual history
- tomakethemresponsibleandhumaneworldcitizenssothattheycancarryforwardtherichlegacy of humanity

LEARNINGOUTCOMES

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

- ➢ learn how past societies, systems, ideologies,governments,culturesandtechnologieswerebuilt, how they operated, and how they have changed
- ➢ understandhowtherichhistoryoftheworldhelpsustopaintadetailedpictureofwherewest

andtoday

- understand the Vedic theism, UpanishadsPhilosophyanddoctrinesofJainism, BuddhismandSikhism
- acquireknowledgeofwomenrights andcouragetofacedaytodaychallenges
- acknowledge the changes in society, religion and literature in the renaissance period and theimportanceofempathy andcompassionforhumanity
- learn about the prominent Indians (Men and Women) who contributed significantly infreedom struggle,education, economic development and in the formationand evolutionofour nation
- understand meaning of race and how that concept has been used to justify exclusion,inequality, and violence throughout history and the origin of civil right movements tofightforequality, libertyand fraternity
- criticallyevaluatethesocio-politicalandeconomicissuesatgloballevelanditsimplications in thepresent
- upgradeandenhancelearningtechnologicalskillsandstrikingabalancebetweentechnology andtheirwell being
- takepridein learningthe sagaof IndianPast CultureandHeritage
- understandtherich legacy ofKMVandits progressiveendeavours

MODULE	TITLE	CONTACT HOURS
I	**Introduction and Initial Assessment**	2
II	**The Human Story**	3
III	***The Vedas** and the Indian Philosophy*	2.5
IV	**The Journey of Woman** **The Story and the Dream**	2.5
V	**Changing Paradigms in Society, Religion &Literature**	2.5
VI	**Makers of Modern India**	2.5
VII	**Racism:Storyof theWest**	2.5
VIII	**Modern Worldata Glance:Political &Economic Perspective**	2.5
IX	**TechnologyVisa VisHuman Life**	2.5
X	**My Nation My Pride**	2.5
XI	**The KMV Experience**	2.5
XII	**Final Assessment, Feedback andClosure**	2.5

EXAMINATION

- **TotalMarks: 50(FinalExam:35;Internal Assessment:15)**
- Final Exam:multiplechoicequiz**.** Marks–20; Time: 1hour
- InternalAssessment:10(Assessment:6;Attendance: 4)
  Comparative assessment questions (medium length) in the beginning and close of the programme.Marks:3;Time:0.5 hour eachatthe beginningand end.

- Totalmarks: 50convertedtogradeforfinal result

- Gradingsystem:90%marks&above: Agrade

 80% - 89% marks: B
 grade70% - 79%
 marks: C grade60% -
 69% marks: D
 grade50% -
 59%marks:Egrade

 Below50%marks:F grade(Fail-mustgivethe examagain)

SYLLABUS

ModuleIBeingaHuman: Introduction&Initial Assessment

- Introductiontotheprogramme
- InitialAssessmentofthe studentsthroughwrittenanswers toa coupleofquestions

Module2TheHumanStory

- Comprehensiveoverviewofhumanintellectualgrowthrightfromthebirthofhumanhistory
- Thewisdom of theAncients
- DarkMiddleAges
- RevolutionaryRenaissance
- Progressivemoderntimes
- Mostmomentousturningpoints,inventionsanddiscoveries

Module3*TheVedas*and theIndian Philosophy

- Origin,teachingsandsignificanceof *TheVedas*
- UpnishadsandPuranas
- KarmaTheory of *TheBhagwad Gita*
- Maintenetsof Buddhism&Jainism
- Teachingsof GuruGranthSahib

Module4ChangingParadigmsinSociety,Religion &Literature

- Renaissance:TheAgeof Rebirth
- Transformationinhuman thought
- Importanceofhumanism
- Geocentricismtoheliocentricism
- Copernicus,Galileo,Columbus,DarwinandSaint Joan
- EmpathyandCompassion

Module5Woman:AJourneythroughtheAges

- Statusofwomen inpre-vedictimes
- WomeninancientGreekandRomancivilizations
- WomeninvedicandancientIndia
- Statusof women inthe Muslim world

- Womenin themodern world
- Crimesagainstwomen
- Womenlabourworkforceparticipation
- Womeninpolitics
- Statusof women-our dream

Module6MakersofModernIndia

- Earlyengagementofforeignerswith India
- Education:Thefirststeptomodernization
- Railways:Thelifelineof India
- RajaRamMohanRoy,Gandhi,Nehru,Vivekanand,SardarPatel etc.
- IndiraGandhi,MotherTeresa,HomaiVyarawala etc.
- TheWayAhead

Module7Racism:StoryoftheWest

- Europeanbeginningsofracism
- RacismintheUSA -JimCrowLaws
- MartinLutherKingJr.and thebattleagainstracism
- Apartheidand NelsonMandela
- Changingfaceofracisminthemodernworld

Module8ModernWorldataGlance:Political&EconomicPerspective

- Changingworldorder
- WorldWarI&II
- UNOandTheCommonwealth
- NuclearPowers;Terrorism
- EconomicScenario:IMF,WorldBank
- InternationalRegionalEconomicIntegration

Module9TechnologyVisa VisHumanLife

- Impactoftechnologyonmodern life
- Technologicalgadgetsand theirrolein ourlives
- Technologyandenvironment
- Consumerismandmaterialism
- Psychologicalandemotionalconsequencesoftechnology
- Harmonizingtechnologywiththeethicsandhumaneness

Module10MyNation MyPride

- IndianPastCultureand Heritage
- MajorDiscoveries(MedicinalandScientific)
- VedicAge
- ProminentAchievements
- Art,ArchitectureandLiterature

Module11TheKMVExperience

- RichLegacyof KMV
- Pioneeringroleinwomenemancipationand empowerment
- KMVContributionintheIndian FreedomStruggle
- Moral,culturalandintellectualheritageofKMV
- Landmarkachievements
- Innovativeinitiatives;internationalendeavours
- Vision,missionand focus
- Conductguidelinesforstudents

Module12FinalAssessment,Feedback&Closure

- Finalmultiple choicequiz
- Assessmentthroughthesamequestions askedinthebeginning
- Feedback abouttheprogrammefromthestudents
- Closureof theprogramme

PRESCRIBEDREADING

- *TheHuman Story*publishedbyDawnPublications

SEMESTER-II

Semester–II
Session- 2024-25
Course Title: Basic Punjabi
Course Code: FMAL-2031
Course Outcomes

CO1: ਸ਼ਬਦ ਸ੍ਰੇਣੀਆਂ : ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ (ਨਾਂਵ, ਪੜਨਾਂਵ, ਕਿਰਿਆ, ਵਿਸ਼ੇਸ਼ਣ, ਕਿਰਿਆ ਵਿਸ਼ੇਸ਼ਣ, ਸਬੰਧਕ, ਯੋਜਕ ਅਤੇ ਵਿਸਮਿਕ)ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੀ ਅਮੀਰੀ ਦਾ ਅਤੇ ਬਾਰੀਕੀਆਂ ਨੂੰ ਸਮਝਣ ਲਈ ਵੱਖਰੇ -ਵੱਖਰੇ ਸਿਧਾਂਤਾਂ ਦਾ ਵਿਕਾਸ ਕਰਨਾ ਹੈ।

CO2: ਵਿਦਿਆਰਥੀ ਪੰਜਾਬੀ ਵਾਕ ਬਣਤਰ (ਸਾਧਾਰਨ ਵਾਕ, ਸੰਯੁਕਤ ਵਾਕ, ਮਿਸ਼ਰਤ ਵਾਕ, ਬਿਆਨੀਆ ਵਾਕ, ਪ੍ਰਸ਼ਨ ਵਾਚਕ ਵਾਕ ਅਤੇ ਹੁਕਮੀ ਵਾਕ) ਦੀ ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਇਸ ਦੀ ਬਣਤਰ ਤੋਂ ਜਾਣੂ ਹੋਣਗੇ ਅਤੇ ਉਨ੍ਹਾਂ ਦੀ ਭਾਸ਼ਾ ਤੇ ਪਕੜ ਮਜਬੂਤ ਹੋਵੇਗੀ।

CO3: ਪੈਰ੍ਹਾ ਰਚਨਾ ਅਤੇ ਸੰਖੇਪ ਰਚਨਾ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਬੁੱਧੀ ਨੂੰ ਤੀਖਣ ਕਰਦਿਆਂ ਉਨਾਂ ਦੀ ਲਿਖਣ ਪ੍ਰਤਿਭਾ ਨੂੰ ਉਜਾਗਰ ਕਰਨਾ ਹੈ।

CO4: ਘਰੇਲੂ ਅਤੇ ਦਫ਼ਤਰੀ ਚਿੱਠੀ ਪੱਤਰ ਲਿਖਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਇਸ ਕਲਾ ਵਿਚ ਨਿਪੁੰਨ ਕਰਨਾ ਹੈ ।ਅਖਾਣ ਅਤੇ ਮੁਹਾਵਰੇ ਦੀ ਵਰਤੋਂ ਨਾਲ ਗੱਲਬਾਤ ਵਿਚ ਪਰਪੱਕਤਾ ਆਉਂਦੀ ਹੈ।ਇਹ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਗੱਲਬਾਤ ਵਿਚ ਨਿਖਾਰ ਲਿਆਉਣ ਦਾ ਕੰਮ ਕਰਨਗੇ।

ਸਮਾਂ: 3 ਘੰਟੇ   **Maximum Marks : 50**

Theory : 35

CA : 15

ਅੰਕ ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

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

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

3.   ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 7 ਅੰਕ ਹਨ।

4.   ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

<div align="center">ਪਾਠਕ੍ਰਮ</div>

<div align="center">ਯੂਨਿਟ-I</div>

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

<div align="center">ਯੂਨਿਟ-II</div>

ਪੰਜਾਬੀਵਾਕਬਣਤਰ : ਮੁੱਢਲੀਜਾਣਪਛਾਣ

(ੳ) ਸਾਧਾਰਨਵਾਕ, ਸੰਯੁਕਤਵਾਕ ਅਤੇ ਮਿਸ਼ਰਤਵਾਕ (ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ)

(ਅ) ਬਿਆਨੀਆਵਾਕ, ਪ੍ਰਸ਼ਨਵਾਚਕਵਾਕ ਅਤੇ ਹੁਕਮੀਵਾਕ (ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ)

<div align="center">ਯੂਨਿਟ-III</div>

ਪੈਰ੍ਹਾਰਚਨਾ

ਸੰਖੇਪ ਰਚਨਾ

<div align="center">ਯੂਨਿਟ-IV</div>

ਚਿੱਠੀਪੱਤਰ (ਘਰੇਲੂ ਅਤੇ ਦਫ਼ਤਰੀ)

ਅਖਾਣ ਅਤੇ ਮੁਹਾਵਰੇ (ਲਿਸਟ ਨਾਲ ਨੱਥੀ ਹੈ)

COURSE OUTCOMES

CO1:ਆਧੁਨਿਕ ਇਕਾਂਗੀਪੁਸਤਕ ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾਮਨੋਰਥਵਿਦਿਆਰਥੀਆਂਅੰਦਰਇਕਾਂਗੀਪ੍ਰਤੀਦਿਲਚਸਪੀ, ਸੂਝ ਨੂੰ ਪੈਦਾਕਰਨਾ ਹੈ।

CO2ਆਧੁਨਿਕ ਇਕਾਂਗੀ ਪੁਸਤਕ ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਇਕਾਂਗੀ ਪ੍ਰਤੀ ਦਿਲਚਸਪੀ, ਸੂਝ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ।

CO3:ਮੁਹਾਵਰੇ / ਅਖਾਣਦੀ ਵਰਤੋਂ ਨਾਲ ਗੱਲਬਾਤ ਵਿਚ ਪਰਪੱਕਤਾ ਆਉਂਦੀ ਹੈ।ਇਹ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਗੱਲਬਾਤ ਵਿਚ ਨਿਖਾਰ ਲਿਆਉਣ ਦਾ ਕੰਮ ਕਰਨਗੇ।

CO4:ਸ਼ਬਦ ਸ਼੍ਰੇਣੀਆਂਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾਮਨੋਰਥਵਿਦਿਆਰਥੀਆਂਅੰਦਰਪੰਜਾਬੀਭਾਸ਼ਾ ਦੀ ਅਮੀਰੀਦਾ ਅਤੇ ਬਾਰੀਕੀਆਂਨੂੰ ਸਮਝਣਲਈਵੱਖਰੇ -ਵੱਖਰੇ ਸਿਧਾਂਤਾਂਦਾਵਿਕਾਸ ਕਰਨਾ ਹੈ।

Semester–II
Session- 2024-25
Course Title: Punjabi Compulsory
Course Code: FMAL-2421

ਸਮਾਂ : 3 ਘੰਟੇ   **Maximum Marks: 50**
L-T-P   **Theory : 35**
 2-0-0   **CA :15**

ਅੰਕ ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਸੈਕਸ਼ਨ ਹੋਣਗੇ।ਸੈਕਸ਼ਨA-Dਤੱਕ 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 ਕਰਨਾ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।

3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 7 ਅੰਕ ਹਨ।

4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ ਪ੍ਰਸ਼ਨਾਂਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

ਪਾਠਕ੍ਰਮ ਅਤੇ ਪਾਠ ਪੁਸਤਕਾਂ

ਯੂਨਿਟ-I
ਆਧੁਨਿਕ ਇਕਾਂਗੀ, ਸੰਪਾਦਕ ਰੌਸ਼ਨ ਲਾਲ ਅਹੁਜਾ, ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ

ਸੁਹਾਗ, ਜ਼ਫ਼ਰਨਾਮਾ, ਇੱਕ ਐਤਵਾਰ ਇਕਾਂਗੀਆਂ ਪੜ੍ਹਾਈਆਂ ਜਾਣਗੀਆਂ।

(ਸਾਰ,ਵਿਸ਼ਾਵਸਤੂ)

                                                                                  8 ਅੰਕ

ਯੂਨਿਟ-II
ਆਧੁਨਿਕ ਇਕਾਂਗੀ, ਸੰਪਾਦਕ ਰੌਸ਼ਨ ਲਾਲ ਅਹੁਜਾ, ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ
ਬੰਬ ਕੇਸ, ਜੁੱਤੀਆਂ ਦਾ ਜੋੜਾ, ਕੱਚ ਦਾ ਗਜਰਾ ਇਕਾਂਗੀਆਂ ਪੜ੍ਹਾਈਆਂ ਜਾਣਗੀਆਂ।
(ਸਾਰ,ਵਿਸ਼ਾ ਵਸਤੂ)

                                                                                  8 ਅੰਕ

ਯੂਨਿਟ-III

(ੳ) ਮੁਹਾਵਰੇ / ਅਖਾਣ
(ਅ) ਘਰੇਲੂ ਚਿੱਠੀ ਪੱਤਰ4ਅੰਕ

ਯੂਨਿਟ-IV

(ੳ) ਸ਼ਬਦਸ਼੍ਰੇਣੀਆਂ : ਨਾਂਵ,ਪੜਨਾਂਵ,ਕਿਰਿਆ,ਵਿਸ਼ੇਸ਼ਣ
(ਅ) ਸ਼ਬਦਸ਼੍ਰੇਣੀਆਂ: ਕਿਰਿਆਵਿਸ਼ੇਸ਼ਣ,ਸੰਬੰਧਕ,ਯੋਜਕ,ਵਿਸਮਿਕ8 ਅੰਕ

Master of Science (Mathematics)(FYIP)

Semester–II

Session- 2024-25

Course Title: Punjab History and Culture

Course Code: FMAL-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

Master of Science (Mathematics)(FYIP)

Semester–II

Session- 2024-25

Course Title: Punjab History and Culture

Course Code: FMAL-2431

Examination Time: 3 Hours   **Max. Marks: 50**
Credits L-T-P: 2-0-0   **Theory: 35**
Contact Hours: 2 Hrs/Week   **CA: 15**

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 7 marks

Unit-I

1. Alexander's Invasion's and Impact
2. Administration of Chandragupta Maurya with special reference to reforms introduced by Ashok

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 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.

Master of Science (Mathematics)(FYIP)

Semester–II
Session- 2024-25
Course Title: Communicative English-II
Course Code: FMAL-2102

Course Outcomes

At the end of this course, students will be able to:

CO1: distinguish the main points from the supporting details and the irrelevant information from the relevant one through Note-Taking

CO2: learn the skills and strategies of effective writing by paragraph writing

CO3: enhance their reading and analyzing power of texts through guided reading through the study of "Making Connections" by Kenneth J. Pakenham

CO4: be acquainted to the techniques of effective essay writing

Semester–II
Session- 2024-25
Course Title: Communicative English-II
Course Code: FMAL-2102

Examination Time: 3 Hours   Max. Marks: 50
                                                                                    Theory: 35
 L T P   CA:15
2 0 0
Instructions for Paper Setters:

Eight questions of equal marks (07 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).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

Practical question on Note Making, Summarizing and Abstracting as given in The Written Word by Vandana R. Singh

Unit-II

Practical question on Paragraph writing as prescribed in The Written Word by Vandana R. Singh

Unit-III

Theoretical questions based on ABC of Good Notes as prescribed in The Written Word by Vandana R. Singh, Unit-III from Making Connections: A Strategic Approach to Academic Reading by Kenneth J. Pakenham, Second Edition

Unit-IV

Practical question on Essay writing from The Written Word by Vandana R. Singh,
Unit - IV from Making Connections: A Strategic Approach to Academic Reading by Kenneth J. Pakenham, Second Edition.

Text books:

 • The Written Word by Vandana R. Singh, Oxford University Press, New Delhi
 • Making Connections: A Strategic Approach to Academic Reading by Kenneth J. Pakenham, second edition.

Master of Science (Mathematics)(FYIP)

Semester–II
Session-2024-25
Course Title: Sequences and series
Course Code: FMAL-2333

Course Outcomes

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

CO 1: Demonstrate an understanding of sequences and series and their convergence, Cauchy criterion, sub sequence and algebra of limit of sequences.

CO 2: Know and describe the behaviour of Infinite series using various tests like comparison test, Cauchy Integral test. Ratio test, Raabe's test.

CO 3: Distinguish between the absolute convergence and conditional convergence.

CO 4: Manage to solve the problem related to Fourier series expansion, Fourier series for even and odd functions and half range series.

Semester–II
Session-2024-25
Course Title: Sequences and series
Course Code: FMAL-2333

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

Instructions for Paper Setters:

Eight questions of equal marks (14 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). Candidates are required to attempt five questions.

Unit-I

Sequence, sub sequence, bounded sequences, monotone sequences, convergence, Cauchy criterion, algebra of limit of sequences (proofs with ε-N rigor), Sandwich Theorem.

Unit-II

Infinite series, Sequences of partial sums, convergence and divergence of series, series of non-negative terms, comparison test, Limit Comparison test, Cauchy's nth root test, Cauchy's Condensation test, Cauchy's Integral test. Ratio test, Raabe's test (all tests with proofs).

Unit-III

Logarithmic test and Gauss test, Alternating series, Leibnitz Test, absolute and conditional convergence, Convergence of Power Series, Taylor Series.

Unit-IV

Periodic functions, trigonometric series, Fourier series expansion, Fourier series for even and odd functions, half range series.

Text Book:
George B. Thomas and Ross L. Finney, Calculus and Analytic Geometry, Pearson publication, 9th Edition, 1998.
Reference Books:

1. S. C. Malik and S. Arora, Mathematical Analysis, New Age International Publishers, New Delhi, 2nd Edition, 2005.

2. Sudhir R. Ghorpade and B.V. Limaye, A course in calculus and real analysis, Springer, 2006.

Master of Science (Mathematics)(FYIP)

Semester–II
Session-2024-25
Course Title: Algebra
Course Code: FMAL-2334

Course Outcomes

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

CO 1: Understand the concept of De Moivre's theorem & its applications. Identify One to one correspondence and cardinality of a set.

CO2: Understand the concepts of basis and dimension of vector space.

CO3: Understand matrix representation of a linear transformation

CO 4: Obtain Eigen values, Eigen vectors, minimal and characteristic equation of a matrix and to apply it in advanced dynamics and electric current.

Master of Science (Mathematics)(FYIP)

Semester–II
Session-2024-25
Course Title: Algebra
Course Code: FMAL-2334

Examination Time: 3 Hours

Max. Marks: 100
Theory: 70

 L T P
4 0 0

CA: 30

Instructions for Paper Setters:

Eight questions of equal marks (14 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). Candidates are required to attempt five questions.

Unit-I
Polar representation of complex numbers, nth roots of unity, de Moivre's theorem, Invertible functions, One to one correspondence and cardinality of a set, Principles of Mathematical Induction.

Unit-II
Vector spaces, subspaces, sums of subspaces, linearly independent and dependent vectors, linear span, subspace generated by a subset, basis and dimension.

Unit-III
Linear transformations, null space and range space of a linear transformation, rank and nullity of a linear transformation, matrix representation of a linear transformation.

Unit-IV
Elementary matrix operations and Elementary matrices, Row rank and Column rank of a matrix and their equality, System of linear equations over a field, Characteristic polynomial of a matrix, Cayley-Hamilton Theorem, Eigen values and Eigen vectors.

Text Book:

 S. Axler, Linear Algebra Done Right, Springer, Second edition, 1997.

Reference Books:

1. S. H. Friedberg, A.J. Insel and L.E. Spence., Linear Algebra, PHI Learning Pvt. Ltd, New Jersey, 1979

2. V. Sahai and V. Bist., Linear Algebra, Narosa Publishing House Pvt. Ltd, Delhi, 2013

3. Andreescu, T. and Andrica, D. ,Complex Numbers from A to Z, Birkhauser,2006.

Master of Science (Mathematics)(FYIP)

Semester–II
Session-2024-25
Course Title: Object Oriented Programming C++
Course Code: FMAL-2135

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

CO1: Comprehend the concepts of Object-Oriented Programming Paradigm.

CO2: Identify the use of access specifiers and different types of constructors in class.

CO3: Apply function and operator overloading.

CO4: Comprehend different types of inheritance and polymorphism.

Master of Science (Mathematics)(FYIP)

Semester–II
Session-2024-25
Course Title: Object Oriented Programming C++
Course Code: FMAL-2135

Examination Time: 3 Hours   Max. Marks: 100
                                                             Practical-30
                                                             Theory: 40
 L T P   CA: 30
3 0 1

Instructions for the Paper Setters:

Eight questions of equal marks (8 Marks each) are to be set, two in each of the four Sections (A-D). 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 any Section.

UNIT–I

GettingStarted: Introduction.AbriefhistoryofC++,Variable,Constant,Expression,Statements, Comments and keywordsofC++.

Operator: Arithmetic, Relational, Logical, Assignment, Increment/Decrement, Conditional, Precedence ofOperators.Datatype, Typeconversion,libraryfunction.

Input/OutputStatements:Inputtingusingcinandoutputtingusingcoutstatements,Preprocessord irectives.

Basic Program construction: A complete C++ program: invoking Turbo C++, naming your program, usingthe editor, saving your program, compiling and linking, running the program Errors: Compiler, linker andruntime.

Other IDE features: Compiling and linking, shortcut exiting from IDE, examining files, opening an existingfile, DOSshell.

UNIT–II

Programming Paradigms: Introduction to the object oriented approach towards programming by discussing Traditional, Structured Programming methodology.

Objects & Classes: Object Definition, Instance, Encapsulation, Data Hiding, Abstraction, Inheritance, Messages, Method, Polymorphism, Classes.

Object Oriented Programming using C++: Characteristics of OOP, Overview of C++, Objects and Classes, Member functions and data, private & public, constructor & destructor, Constructor Overloading, Types of Constructors.

UNIT-III

Operator Overloading: Overloading unary operators, Overloading binary operators, Data conversion, Pit-fallsoperator overloadingandconversion.

Function Overloading: Function Overloading, Default Arguments, Ambiguity in Function Overloading.

UNIT–IV

Inheritance: Concept of inheritance, Base & derived classes, Access Specifiers, Class Hierarchies, Types of Inheritance with examples.

Polymorphism: Virtual functions, friend functions, static function, this pointer, polymorphism, Types of Polymorphism with examples, Templates

References / Textbooks:

1. Herbertt Schildt, C++: The Complete Reference, Tata McGraw-Hill Education India, 4th Edition.
2. Bjarne Stroustrup, The C++ Programming Language, Addison – Wesley Professional (2013), 4th Edition
3. G.S. Baluja, C++ Program Design (w/CD), Khanna Book Publishing Company (2015), 2nd edition.
4. Stanley Lippman, Josee Lajoie, Barbara Moo, C++ Primer, Addison-Wesley Professional (2012), 5th edition.
5. Richard Johnsonbaugh and Martin Kalin, Object Oriented Programming in C++, Pearson Education (1999), 2nd Edition

Semester–II
Session-2024-25
Course Title: Statistical Analysis using Excel
Course Code: FMAL-2330
Course outcomes:
After the completion of this course, the student will be able to:

CO:1 introduce the meaning of statistics, Collection, presentation and interpretation of data with the help of excel.

 CO:2 To Enhance the knowledge of Measures of dispersion, Skewness and Bowley's co-efficient of skewness and Kurtosis.

 CO:3 To comprehend the concept of Correlation and its methods with rank correlation coefficient.

  CO:4 To understand the concept of Linear Regression, regression Yon X, regression X on Y, Regression Coefficient, Difference between regression and Correlation, and calculation of these using MS excel.

Master of Science (Mathematics)(FYIP)

Semester–II
Session-2024-25
Course Title: Statistical Analysis using Excel
Course Code: FMAL-2330

Examination Time: 3 Hours   Max. Marks: 50
                                                                        Theory: 35
L T P   CA: 15
1 0 0

Instructions for Paper Setters:

Eight questions of equal marks (7 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). Candidates are required to attempt five questions.

Unit-I

Introduction to statistics, functions of statistics, collection of data, presentation of data, tabulation of data, charting of data, introduction to excel/spss, graphs in excel, measures of central tendency-, mean, median - meaning and computation, mode- meaning and computation, weighted average mean, geometric mean and harmonic mean.

Unit-II

Measures of dispersion, types of dispersion- range, quartile deviation, mean deviation, standard deviation, co-efficient of variation. Skewness- Karl Pearson co-efficient of skewness, Bowley's co-efficient of skewness and Kurtosis.

Unit-III

Correlation, Types of correlation, positive, negative, linear. methods of correlations – Karl Pearson's Co-efficient of correlation, rank correlation coefficient.

Unit-IV

Regression analysis- Linear Regression, regression Yon X, regression X on Y, Regression Coefficient, Relations between regression coefficients and correlation coefficients, Difference between regression and Correlation, Calculation of these using MS excel.

Reference Books:-

1. SC Gupta, Fundamentals of Mathematical Statistics, Himalaya Publication.
2. Data Analysis with Microsoft Excel by K. Berk, Partrick Carey.

Semester–II
Session-2024-25
Course Title: Statistical Analysis Using Excel Laboratory
Course Code: FMAP-2330

Examination Time: 3 Hours   Max. Marks: 50

Practical: 35

L T P   CA: 15

0 0 2

List of Practicals (using excel)

1. Introduction of basics of excel and functions such as 'sum', 'count', 'countif', 'max', 'min','sort' etc.
2. To prepare result from the data on marks and number of credits in a given number of courses of a class based on total marks, marks obtained, percentage of marks obtained, grades, and determine SGPA for each student.
3. Create frequency distribution table; plot histogram, bar chart, pie chart, etc.
4. Plotting two dimensional graphs.
5. To find measures of central tendency for a given data.
6. To find measures of dispersion for a given data.
7. To find measures of skewness and kurtosis for a given data.
8. To find Karl Pearson Coefficient of correlation and rank correlation coefficient for a givendata.
9. To find regression coefficient for bivariate data and plotting regression lines.

Reference Books:-

1. S. C. Gupta, Fundamentals of Mathematical Statistics, Himalaya Publication.
2. K. Berk, Partrick Carey, Data Analysis with Microsoft Excel.

Master of Science (Mathematics) (FYIP)

Semester–II
Session-2024-25
Course Title: Drug Abuse: Problem, Management and Prevention

Course Code: VACD-2161
Course Outcomes

After completing the course the students will be able to:

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

CO 2. Focus on substance abuse education- is teaching individuals about drug and alcohol abuse and how to avoid, stop, or get help for substance use disorders.

CO3. Learn how to be supportive during the detoxification and rehabilitation process

CO 4. Understand that substance abuse education is important for students alike; there are many misconceptions about commonly used legal and illegal substances, such as alcohol and marijuana

Master of Science (Mathematics)(FYIP)

Semester–II
Session-2024-25
Course Title: Drug Abuse: Problem, Management and Prevention

Course Code: VACD-2161

Examination Time: 3 Hours   Max. Marks: 50
                                                             Theory: 35
 L T P   CA: 15
2 0 0
  Contact Hours: 2 Hrs/ Week

Instructions for the Paper Setter:

Eight questions of equal marks (7 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). 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

Meaning of Drug Abuse:

(i)Meaning, Nature, Types and Extent of Drug Abuse in India and Punjab.

(ii)Consequences of Drug Abuse for:

 Individual: Education, Employment, Income.
 Family: Violence.
 Society: Crime, Social Disorganization

UNIT-II

 MANAGEMENT OF DRUG ABUSE:

 (i)   Medical management: medication for treatment and to withdrawal   effects.

 (ii)   Psychiatric Management: Counseling, Behavioral and Cognitive therapy.

UNIT-III

Prevention of Drug abuse:

 (i) Role of family: Parent child relationship, Family support,   Supervision, Shaping
                                values, Active Scrutiny.

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

UNIT-IV

Controlling Drug Abuse:

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

Suggested Readings:

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: Rawat Publication.

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: Mittal Publications.

8.Sandhu, Ranvinder Singh, 2009, *Drug Addiction in Punjab*: A Sociological Study. Amritsar: Guru Nanak Dev University.

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 University Press.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

Scheme and Curriculum of Examinations of Five Years Integrated Programme

(Under Credit Based Continuous Evaluation Grading System) (CBCEGS)

Master of Science (Mathematics) (FYIP)

Semester-III

Session- 2024-25

Master of Science (Mathematics) (FYIP) Semester-III										
Course Code	Cour type	Course Title	Hours Per Week L-T-P	Credits L-T-P	Total Credits	Max.Marks				Examination time in hours
						Total	Th	P	CA	
FMAL -3331	C	Calculus III	3-1-0	3-1-0	4	100	80	-	20	3
FMAL -3332	C	Ordinary Differential Equations and Special Functions	3-1-0	3-1-0	4	100	80	-	20	3
FMAL - 3333	C	Probability Theory	3-1-0	3-1-0	4	100	80	-	20	3
FMAL - 3334	C	Linear Algebra	3-1-0	3-1-0	4	100	80	-	20	3
FMAM - 3135	C	Python Programming	3-0-2	3-0-1	4	100	50	30	20	3+3
AECE-3221	AC	*Environmental Studies (Compulsory)	1-0-2	1-0-1	2	50	30	10	10	3
SECP-3512	AC	*Personality Development	2-0-0	2-0-0	2	50	40	-	10	1
Total					24	500				

Note:

*Credits/Grade points of these courses will not be included in SGPA/CGPA of Semester/Programme. Only grades will be provided.

C-Compulsory

AC-Audit Course

Master of Science (Mathematics) (FYIP)

Semester–III

Session: 2024-25

Course Title: Calculus III

Course Code: FMAL-3331

Course Outcomes

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

CO1: Evaluate Partial derivatives, Limits and continuity, Homogenous Functions, Euler's Theorem and recognize the various notations used in partial derivatives.

CO2: Analyse functions using Chain Rule, Jacobians, Directional Derivatives and Gradient Vectors.

CO3: To find optimization value for a function of two variables.

CO4: Apply double integration technique in finding the area of a region and triple integrals to find volume.

Master of Science (Mathematics) (FYIP)

Semester–III

Session: 2024-25

Course Title: Calculus III

Course Code: FMAL-3331

Examination Time: 3 Hours
 L T P
3 1 0

Max. Marks: 100
Theory: 80
CA: 20

Instructions for Paper Setter

Eight questions of equal marks (16 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). 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

Real Valued functions of several variables with emphasis on functions of two variables, Limits and continuity, Partial derivatives, Homogeneous Functions, Euler's Theorem

Unit II

Total differentiation, Differentiation of composite functions, Implicit functions, Chain Rule, Jacobians, Directional Derivatives, Gradient Vectors.

Unit III

Saddle Points, Maxima and Minima of functions of two variables, Lagrange's Multiplier method, Higher dimensional analogues of Lagrange's Mean value Theorem and Taylor's theorem for functions of two variables.

Unit IV

Double integration over rectangular and non-rectangular regions, change of order of integration, double integration in polar co-ordinates, triple integration over parallelepiped and other solid regions, Applications of double and triple integrals to area, volume, centre of gravity, moment of inertiaetc.

Text Book:
George B. Thomas and Ross L. Finney, Calculus and Analytic Geometry, Pearson publication, 9th Edition, 1998. (Scope as in Ch.12-13)

Reference Books:
1. Sudhir R. Ghorpade and B.V. Limaye, A course in calculus and real analysis, Springer, 2006.
2. E. Kreyszig, Advanced Engineering Mathematics, Wiley Publication, 10th Edition, 2011.

Master of Science (Mathematics) (FYIP)

Semester–III

Session: 2024-25

Course Title: Ordinary Differential Equations and Special Functions

Course Code: FMAL-3332

Course Outcomes

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

CO1: Identify differential equation, its order and degree, exact differential equations. Solve equations of first order and higher degree and demonstrate the concept of Linear Differential equation with constant coefficients.

CO2: Demonstrate the concept of linear differential equations with variable coefficients and find its solution using power series method

CO 3: Understand the concept of Bessel's Function with their properties like Orthogonal Property, Recurrence Relations, and Generating Function etc. and to recognize some of the Partial Differential Equations that can be solved by application of Bessel Function.

CO 4: Understand the concept of Legendre's Function with their properties like Orthogonal Property, Recurrence Relations, Rodrigue's formula and Generating Function etc. and to recognize some of the Partial Differential Equations that can be solved by application of Legendre Function.

Master of Science (Mathematics) (FYIP)

Semester–III

Session: 2024-25

Course Title: Ordinary Differential Equations and Special Functions

Course Code: FMAL-3332

Examination Time: 3 Hours   Max. Marks: 100
 L T P   Theory: 80
3 1 0   CA: 20

Instructions for Paper Setter:

Eight questions of equal marks (16 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). 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

Exact differential equations. First order and higher degree equations solvable for *x, y, p*. Clairaut's form and singular solutions. Geometrical meaning of a differential equation. Orthogonal trajectories. Linear differential equations with constant coefficients.

Unit II

Linear differential equations with variable coefficients, Variation of Parameters method, reduction method, series solutions of differential equations. Power series method, Bessel and Legendre equations (only series solution).

Unit III

Bessel's Functions: Recurrence relations, Generating Function, Orthogonal Property, Trigonometric Expansions involving Bessel's Functions.

Unit –IV

Legendre's Functions: Recurrence Relations, Generating Function, Rodrigue's Formula, Orthogonal Property, Trigonometric Series, Laplace definite integrals, Christoffel's expansion

Text Book:

M.D.Rai Singhania, Ordinary and Partial Differential Equations, S Chand Publishing, New Delhi, 11th Edition, 2009.

Reference Books:

1. E.A. Coddington, An Introduction to Ordinary Differential Equations, Dover Publications, Inc., New York.
2. D.A.Murray, Introductory Course in Differential Equations, Orient Longman Private Limited, Hyderabad, 11th edition,2003.
3. G.F.Simmons, Differential Equations, McGraw Hill Education, 2nd edition, 2017.
4. E.D. Rainville, Special Functions, The Macmillan Company, New York.

Master of Science (Mathematics) (FYIP)

Semester–III

Session: 2024-25

Course Title: Probability Theory

Course Code: FMAL-3333

Course Outcomes

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

CO1: Translate the realworld problem into probability based mathematical model. They will be able to analyze, examine and control real time data.

CO2: Distinguish between discrete and continuous random variable primarily in their application and usage in real life.

CO3: Apply general properties and applications of expectation, variance and moments.

CO4: Identify the characteristics of different continuous and discrete distribution. In

particular they will be able to differentiate between widely used events with Binomial and Poisson distribution; and apply Normal distribution in real time applications.

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Master of Science (Mathematics) (FYIP)

Semester–III

Session: 2024-25

Course Title: Probability Theory

Course Code: FMAL-3333

Examination Time: 3 Hours   Max. Marks: 100

 L T P   Theory: 80

3 1 0   CA: 20

Instructions for Paper Setter: Eight questions of equal marks (16 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). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section. The students can use only Non Programmable& Non Storage Type Calculator and statistical tables.The question paper must contain 30% of the article/theory from the syllabus.

Unit I
Measures of central tendency: Mean, Median, Mode, and Measure of Dispersion: Range, Quartile Deviation, Mean Deviation, Standard Deviation, Variance, Skewness, Kurtosis, Sample Space, Probability axioms, Probability on finite sample space, Conditional probability and Independence, Baye's theorem.

Unit II
Random variables, Probability mass function, Probability density function, Distribution function, Function of a random variable and its distribution. Multiple random variables, Joint distribution, Marginal and Conditional distributions.

Unit III
Mathematical Expectation, Conditional Expectation, Variance, Covariance, Moments, Moment generating function, Chebychev's inequality, Bernoulli's Law of large numbers.

Unit –IV
Discrete Probability Distributions: Bernoulli, Binomial, Poisson, Negative Binomial, Geometric distribution. Continuous Probability Distributions: Uniform, Normal, Gamma, Beta, Exponential distribution (For All distributions only Mean, Variance, Moment Generating Function)

Text Book:
S.C Gupta and V.K Kapoor: Fundamentals of Mathematical Statistics, Sultan
Chand and Sons, New Delhi, 11th edition, 2018. (Scope in Chapters 2-8).

Reference Book:

 A.M. Mood , F.A. Graybill , D.C. Boes: Introduction to the Theory of
Statistics, Chennai: McGraw Hill Education (India) Pvt. Ltd, 3rd edition, 2017.

Master of Science (Mathematics) (FYIP)

Semester–III

Session: 2024-25

Course Title: Linear Algebra
Course Code: FMAL-3334

Course Outcomes

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

CO1: Express the algebraic concepts such as binary operation, groups, rings

and fields. Define a vector space and subspace of a vector space and check the
linear dependence and linear independence of vectors

CO2: To understand the concepts of basis and dimension of vector space.

CO3: To understand matrix representation of a linear transformation

CO4: To find rank and normal form of a matrix, invertible matrix and to solve system of linear
equations.

Master of Science (Mathematics) (FYIP)

Semester–III

Session: 2024-25

Course Title: Linear Algebra
Course Code: FMAL-3334

Examination Time: 3 Hours   Max. Marks: 100
 L T P   Theory: 80
3 1 0   CA: 20

Instructions for the Paper Setters:

Eight questions of equal marks (16 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). 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

Definition and examples of vector spaces, properties of vector spaces, subspaces, examples ofsubspaces, sums and direct sums of subspaces, finite dimensional vector space: span of a list of vectors, linear independence and dependence of vectors.

Unit II

Basis of a vector space, extension of a list to a Linear Independent basis, reduction of a spanning list to a basis, direct complement of subspace, dimension theorems, quotient space, dimension of a quotient space.

Unit III

Linear maps, Null space, Range space, Rank-Nullity Theorem, Matrix of a linear map, invertibility of a linear map, algebra of linear maps.

Unit IV

Elementary matrix operations, elementary matrices, rank of a matrix, equality of row and column rank, normal form for a matrix, invertible matrix as a product of elementary matrices, system of linear equations

Text Book:

 S. Axler, Linear Algebra Done Right, Springer, Second edition, 1997.

Reference Books:

1. S. H. Friedberg, A.J. Insel and L.E. Spence., Linear Algebra, PHI Learning Pvt. Ltd, New Jersey, 1979

2. V. Sahai and V. Bist., Linear Algebra, Narosa Publishing House Pvt. Ltd, Delhi, 2013

Master of Science (Mathematics) (FYIP)

Semester–III

Session: 2024-25

Course Title: Python Programming

Course Code: FMAM-3135

Course Outcomes:

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

CO1: Comprehend basics of Python programming like operators, data types, I/O, etc.

CO2: Apply various control statements of Python Programming Language for designing solutions to different real world problems.

CO3: Implement various built-in and user defined function, packages and modules to solve mathematical problems.

CO4: Apply different matrix operations using NumPy and perform file manipulations.

Master of Science (Mathematics) (FYIP)

Semester–III

Session: 2024-25

Course Title: Python Programming

Course Code: FMAM-3135

Examination Time: (3+3) Hours	Max. Marks: 100
	Theory: 50
L-T-P: 3-0-1	Practical: 30
Credit: 4	CA: 20

Instructions for the Paper Setters:

Eight questions of equal marks (10 marks each), (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). 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 any Section.

UNIT-I

Introduction to python and Setting up the Python development Environment, Basic syntax, interactiveshell, editing, saving, and running a script, Concept of data types, Declaring and using Numeric datatypes: int, float, complex Lists and Tuples and their basic operations, Python console Input / Output.Arithmetic operators and expressions, Conditions, Comparison operators, Logical Operators, Is and Inoperators.

UNIT-II

Calculation of area, surface area and volume of geometrical objects. String Handling, Unicode strings, Strings Manipulation: - compare strings, concatenation of strings,slicing strings in python, converting strings to numbers and vice versa. Dictionaries Controlstatements: if-else, Nested If-Else, Loops (for, while) Loop manipulation using pass, continue, breakand else.

UNIT-III

Built in function and modules in python, user defined functions, passing parameters, arguments and return values; formal vs actual arguments, Lamda function in python, Recursion, organizing python codes using functions, modules and external packages.

Math Module: Constants, Arithmetic functions, Power functions, Logarithmic functions, Trigonometric and Angular functions.

UNIT-IV

Matrix operations using NumPy array (Multiplication. Addition, matrix multiplication, inverse, determinant, adjoint, Eigenvalues, etc).

Files: manipulating files and directories, OS and Sys modules; creating and reading a geometric file (csv or tab separated) understanding readfunctions, read(), readline() andreadlines(), Understandingwritefunctions, write() and writelines(), Manipulatingfile pointerusingseek. Introduction to graphic. Plotting graphs and objects.

References / Textbooks:

1. Mark Lutz, Learning Python, O'Reilly Media, 2013.

2. David Beazley, Python cookbook, O'Reilly Media, 2013.
3. David Beazley, Python Essential Reference, Addison-Wesley Professional, 2009.
4. John Zelle, Python programming: An Introduction to Computer Science, Franklin, Beedle & Associates Inc, 2004.
5. Alex Mortelli, Python in a Nutshell, O'Reilly Media, 2006.

Note: The latest editions of the books should be followed.

Master of Science (Mathematics) (FYIP)

Semester–III

Session: 2024-25

Course Title: Environmental Studies (Compulsory)

Course Code: AECE-3221

COURSEOUTCOMES:

After passing this course, students will be able to:

- ➢ CO1.Understandtheconceptandneedofenvironmentaleducation.
- ➢ CO2.Understandtheroleofanindividualinconservationofnaturalresources.
- ➢ CO3.LearnaboutroleofmajorEcosystemand theirconservation.
- ➢ CO4.Developdesirableattitude, valueandrespectforprotectionofBiodiversity.
- ➢ CO5.Learnaboutthecontrolmeasureofpollutionandsolidwastemanagement.
- ➢ CO6.Understandtheroleofdifferentagenciesintheprotectionofenvironment.
- ➢ CO7. Knowledgeregardingwelfareprogrammesand Human rights.
- ➢ CO8.Knowledgeabouttheappliedvalueofenvironmentalstudies.

Master of Science (Mathematics) (FYIP)

Semester–III

Session: 2024-25

Environmental Studies

Course Code: AECE-3221

Time: 3Hrs.
Credit:1-0-1

Max. Marks: 50
Theory: 30
Practical: 10
CA: 10

Instructions for the Paper Setter:
The question paper should carry 30 marks. The structure of the question paper being:
Part-
    A: Attemptanyfivequestionsoutofseven.Eachquestioncarries2marks.Answertoeachquestion should notexceed 1 page
Part-B, Essaytypewithinbuiltchoice–20marks
Attemptanyfivequestionsoutofeight.Eachquestioncarries4marks.Answertoeachquestionshould notexceed 3 pages.

UnitI

Themultidisciplinarynatureofenvironmentalstudies

Definition,scopeandimportance,Needforpublicawareness

UnitII

NaturalResources:Renewableandnon-renewableresources

Naturalresourcesandassociatedproblems.

(a) Forestresources:Useandover-exploitation,deforestation,casestudies.Timberextraction,mining,damsandtheireffectson forests and tribalpeople.

(b) Waterresources:Useandover-utilizationofsurfaceandgroundwater,floods,drought,conflictsoverwater,   dams-benefitsand problems.

(c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineralresources,casestudies.

(d) Foodresources:Worldfoodproblems,changescausedbyagriculture andovergrazing,effectsofmodernagriculture,fertilizer-pesticideproblems,waterlogging,salinity,casestudies.

(e) Energyresources:Growingenergyneeds,renewableandnon-renewableenergysources,useofalternateenergy sources, casestudies.

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

erosion anddesertification.

- Roleofanindividualinconservationofnaturalresources.

- Equitableuseofresourcesforsustainable lifestyles.

UnitIII

Ecosystems

- Conceptofanecosystem
- Structureandfunctionofanecosystem
- Producers,consumersanddecomposers
- Energyflow intheecosystem
- Ecologicalsuccession
- Foodchains,foodwebsandecologicalpyramids
- Introduction,types,characteristicfeatures,structureandfunctionofthefollowingec osystem:Forestecosystem,Grasslandecosystem,Desertecosystem,Aquaticecosys tems(ponds,streams, lakes, rivers, oceanestuaries)

UnitIV

Biodiversityanditsconservation

- Introduction–Definition:genetic,speciesandecosystemdiversity
- BiogeographicalclassificationofIndia
- Value of biodiversity: consumptive use, productive use, social, ethical aesthetic and optionvalues
- Biodiversityatglobal,nationalandlocallevels
- Indiaas amega-diversitynation
- Hot-spotsofbiodiversity
- Threatstobiodiversity:habitatloss,poachingofwildlife,manwildlifeconflicts
- EndangeredandendemicspeciesofIndia
- Conservationofbiodiversity:In-situandEx-situconservationofbiodiversity

UnitV

EnvironmentalPollution

Definition

- Causes,effectsandcontrolmeasuresofAirpollution,Waterpollution,Soil pollution , Marinepollution,Noisepollution,Thermalpollution,Nuclear pollution
- Solidwastemanagement:Causes,effectsandcontrolmeasuresofurbanandindustrialwastes .
- Roleofanindividualinpreventionofpollution
- Pollutioncasestudies
- Disastermanagement:floods,earthquake, cycloneandlandslides

UnitVI

SocialIssuesand theEnvironment

- Fromunsustainable tosustainabledevelopment

- Urbanproblemsandrelatedtoenergy
- Waterconservation,rainwaterharvesting,watershedmanagement
- Resettlementandrehabilitationofpeople;itsproblemsandconcerns.Casestudies.
- Environmentalethics:Issuesandpossiblesolutions
- Climatechange,globalwarming,acidrain,ozonelayerdepletion,nuclearaccidentsandholocaust.Casestudies.
- Wastelandreclamation
- Consumerismandwasteproducts
- EnvironmentalProtectionAct,1986
- Air(PreventionandControlofPollution)Act,1981
- Water(PreventionandcontrolofPollution)Act,1974
- WildlifeProtectionAct
- ForestConservationAct
- Issuesinvolvedinenforcementofenvironmentallegislation
- Publicawareness

UnitVII

HumanPopulation and theEnvironment

- Populationgrowth,variationamongnations
- Populationexplosion–FamilyWelfareProgrammes
- Environmentandhumanhealth
- HumanRights
- ValueEducation
- HIV/AIDS
- WomenandChildWelfare
- RoleofInformationTechnologyinEnvironmentandHumanHealth
- CaseStudies

Unit VIII

FieldWork

- Visittoalocal area todocumentenvironmentalassetsriver/forest/grassland/hill/mountain
- Visittoalocalpollutedsite –Urban/Rural/Industrial/Agricultural
- Studyofcommonplants,insects,birds
- Studyofsimpleecosystems-pond,river,hillslopes,etc

References:

1. Bharucha,E.2005.TextbookofEnvironmentalStudies,UniversitiesPress,Hyderabad.

2. DowntoEarth,CentreforScienceandEnvironment,NewDelhi.

3. Heywood,V.H.&Waston,R.T.1995.GlobalBiodiversityAssessment,CambridgeHouse,Delhi.

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

5. Kaushik,A.&Kaushik,C.P.2004.PerspectiveinEnvironmentalStudies,NewAgeInter

national(P) Ltd, NewDelhi.

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.ComprehensiveEnvironmentalStudies ,LaxmiPublications, NewDelhi.

8. Sharma,P.D.2009.EcologyandEnvironment,RastogiPublications,Meerut

9. StateofIndia'sEnvironment2018byCentreforSciencesandEnvironment,NewDelhi

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

PERSONALITY DEVELOPMENT
Course Code: SECP-3512

PURPOSE
To enhanceholisticdevelopmentofstudents and improve their employability skills.

INSTRUCTIONAL OBJECTIVES
- To re-engineer attitude and understand its influence on behaviour.
- To develop inter-personal skills and be an effective goal-oriented team player.
- To develop communication and problem solving skills.
- To develop professionals with idealistic, practical and moral values.

LEARNING OUTCOMES
- On completion of the course, students will be able to hone their personality by
- Realisation of the importance and incorporation of positive thinking and attitude in life
- Enhacement of self confidence and analysis of self capabilities
- Learning the different communication skills for self expression
- Effective use of time to combat stress and increase in productivity
- Enhancing personality by physical grooming and fitness
- Understanding the role of design principles and appropriateness of apparel
- Incorporating social etiquettes in daily life and conduct
- Excelling in decision making and leadership qualities

CURRICULUM

MODULE	TITLE	HOURS
1.	Positive Thinking & Attitude	2
2.	Self Analysis & Self Confidence	2
3.	Communication Skills	10
	- Basic Communication Skills - Body Language - Interview Skills - Résumé Writing - Group Discussion - Telephone and E-mail etiquette - Public Speaking	
4.	Time Management	2
5.	Stress and Conflict Management	2
6.	Physical Fitness and Personal Grooming	2
7.	Appropriateness of Apparel	2
8.	Social Etiquette	2
9.	Decision Making process & Problem Solving Skills - Leadership Skills - Goal Setting - Motivation	5
10.	Closure	1

EXAMINATION

1. Total marks of the course will be 25 (Final Examination: 20 Marks; Internal Assessment: 5Marks)
2. The pattern of the final examination will be multiple choice questions. 25 multiple choice type questions will be set. The student shall attempt 20 questions. Each question will carry 1 mark (20 X 1 = 20). Total time allotted will be 1 hour.
3. Internal Assessment will consist of Attendance: 2 Marks, Internal: 3 Marks.(Total Internal Assessment:5 Marks)

SYLLABUS

<u>MODULE 1</u>: Positive Thinking & Attitude
- Factors Influencing Attitude
- Essentials to develop Positive Attitude
- Challenges &lessons from Attitude

<u>MODULE 2:</u> Self Analysis & Self Confidence
- Who am I
- Importance of Self Confidence
- SWOT Analysis

<u>MODULE 3</u>: Communication Skills

(i) Basic Communication Skills
- Speaking skills
- Listening skills
- Presentation skills

(ii) Body Language
- Forms of Non-Verbal Communication
- Interpreting body language clues
- Effective use of body language

(iii) Interview Skills
- Type of Interviews
- Ensuring success in job interviews
- Appropriate use of Non-verbal Communication

(iv) Résumé Writing
- Features
- Different types of résumé for Different posts

(v) Group Discussion
- Difference between Group discussion and debate
- Importance of Group Discussion
- Group Decision
- Ensuring success in group discussions

(vi) Telephone & E-mail Etiquette
- Telephone etiquette
- E-mail etiquette

(vii) Public Speaking
- Introductory speech
- Informative speech
- Persuasive speech
- Extemporesession

MODULE 4: Time Management
- Importance of time management
- Values & beliefs
- Goals and benchmarks – The ladders of success
- Managing projects and commitments
- Prioritizing your To-do's
- Getting the results you need

MODULE 5: Stress & Conflict Management
- Introduction to stress
- Types of stressors
- Small changes and large rewards
- Stress prevention
- Overcoming unhealthy worry
- Stress at home and workplace
- Dealing with frustration and anger
- Stress reducing exercises
- Understanding conflicts
- Violent and Non-violent conflicts
- Source of conflict
- Structural and cultural violence

MODULE 6: Physical Fitness and Personal Grooming
- Fitness and exercise
- Balanced & healthy diet
- Skin care & Hair care
- Make-up skills

MODULE 7: Appropriateness of Apparel
- Apparel & Personality
- Psycho-social aspects of apparel
- Style-tips for smart dressing & effective use of design elements

MODULE 8: Social Etiquette
- Civic Sense
- Workplace skills
- Meeting and greeting people
- Table Setting and table manners

MODULE 9: Decision Making Process and Problem Solving Skills
- Anatomy of a decision
- How to use problem solving steps and problem solving tools
- How to distinguish root causes from symptoms to identify right solution for right problems
- How to improve problem solving and decision making by identifying individual problem solving styles

- The creative process for making decisions
- Tools to improve creativity
- Implementing the decision – Wrap up

(i) Leadership Skills
- Handling peer pressure and bullies
- Team work
- Decision making
- Taking initiatives

(ii) Goal Setting
- Wish list
- SMART goals
- Blueprint for success
- Short-term, Long-term, Life-term Goals

(iii) Motivation
- Factors of motivation
- Self talk
- Intrinsic & extrinsic motivators

Books Recommended
1. Rossi, P.(2011).*Everyday Etiquette: How to navigate 101 common and uncommon social situations*. St Martins Pr.
2. Pietrzak, T.,& Fraum,M. (2005). *Building career success skills*. ASTD Press.
3. Treffinger, D.J., Isaksen, S.G., &Brian, K. (2005). *Creative problem solving: An Introduction*.
4. Carr, A. (2004).*Positive Psychology: The science of happiness and human strengths*. Burnner-Routlrdge.
5. Oberg, B.C. (1994).*Speech craft: An Introduction to public speaking*. Meriwether Publishing.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

Scheme and Curriculum of Examinations of Five Years Integrated Programme

(Under Credit Based Continuous Evaluation Grading System) (CBCEGS)

Master of Science (Mathematics) (FYIP)

Semester-IV

Session- 2024-25

Master of Science (Mathematics) (FYIP) Semester-IV										
Course Code	Course Type	Course Title	Hours Per Week L-T-P	Credits L-T-P	Total Credit	Marks				Examination time in hours
						Total	Th	P	CA	
FMAL-4331	C	Vector calculus	3-1-0	3-1-0	4	100	80	-	20	3
FMAL-4332	C	Partial Differential Equations	3-1-0	3-1-0	4	100	80	-	20	3
FMAL-4333	C	Group Theory	3-1-0	3-1-0	4	100	80	-	20	3
FMAM-4334	C	Statistical Methods	3-0-2	3-0-1	4	100	50	30	20	3+3
FMAM-4135	C	Foundation of Statistical Computing	3-0-2	3-0-1	4	100	50	30	20	3+3
SECS-4522	AC	*Social Outreach	0-0-2	0-0-1	1	25	-	20	5	-
Total					21	500				

Note:

*Credits/Grade points of these courses will not be included in SGPA/CGPA of Semester/Programme. Only grades will be provided.   .

C- Compulsory

AC- Audit Course

Master of Science (Mathematics) (FYIP)

Semester–IV

Session: 2024-25

Course Title: Vector Calculus
Course Code: FMAL-4331
Course Outcomes

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

CO 1: Understand the physical concept of vectors and perform basic calculus on vector-valued functions.

CO 2: Solve physical problems based on calculus using vector-valued functions and calculate the tangent vector and normal vector at a point on a space curve described by a vector-valued position function.

CO 3: Find the values of gradient, divergence and curl operator of given vectors in orthogonal system and understand the concept of line integral.

CO 4: Find the application of Gauss theorem and Stokes's theorem in real life problems.

Master of Science (Mathematics) (FYIP)

Semester–IV

Session: 2024-25

Course Title: Vector Calculus
Course Code: FMAL-4331

Examination Time: 3 Hours   Max. Marks: 100
 L T P   Theory: 80
3 1 0   CA: 20

Instructions for the Paper Setters:

Eight questions of equal marks (16 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). 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

Scalar and vector product of three vectors, Product of four vectors, Reciprocal vectors, Vector differentiation, Scalar valued point functions, Vector valued point functions, Directional derivatives and the Gradient, Tangent plane and normal to a given surface.

Unit II

Gradient of a scalar point function, Divergence and Curl of a vector point function, Divergence and Curl of sums and products and their related vector identities, Laplacian operator.

Unit III

Orthogonal Curvilinear Coordinates, Conditions for orthogonality, Gradient, Divergence and Curl in terms of orthogonal curvilinear coordinates, Line integrals: Scalar and vector line integrals, line integrals along curves, Work done, Conservative vector fields, Green's theorem in plane.

Unit IV

Surface integral, Volume integral, Gauss Divergence Theorem, Stokes theorem and the problems based on these theorems.

Reference Books:

1. D. E. Bourne and P. C. Kendall, Vector analysis and Cartesian tensors, CRC Press, Taylor and Francis Group, London, Third edition, 1992 (Scope as in Chapters: 2-6)
2. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, New Delhi, 42nd edition, 2012 (Scope as in Chapters: 3 (3.8-3.10) and 8)

Master of Science (Mathematics) (FYIP)

Semester–IV

Session: 2024-25

Course Title: Partial Differential Equations
Course Code: FMAL- 4332
Course Outcomes

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

CO 1: Formulate partial differential equations &Apply Lagrange's Method to find solutions of partial differential equations and understand basic properties of standard partial differential equations.

CO 2: Perform various methods to solve homogeneous partial differential equations and apply Charpit method in solving problems.

CO 3: Use computational tools to solve Non homogeneous linear P.D.E. with constant coefficients, reducible and irreducible linear P.D.E. with constant coefficients, method of finding the complementary function and particular integral.

CO 4: Classify and transform partial differential equations into canonical form.

Master of Science (Mathematics) (FYIP)

Semester–IV

Session: 2024-25

Course Title: Partial Differential Equations
Course Code: FMAL- 4332

Examination Time: 3 Hours   Max. Marks: 100
 L T P   Theory: 80
3 1 0   CA: 20

Instructions for the Paper Setters:

Eight questions of equal marks (16 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). 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

Partial Differential Equations of First Order: origin of first order partial differential equations. Formation of partial differential equations, Cauchy problem of first order equations, Linear P.D.E. of first order, Lagrange's Method

Unit-II

Integral surface through a given curve, Surface orthogonal to given system of surfaces, Non linearP.D.E of first order, Charpit's method, Homogeneous linear P.D.E. with constant coefficients, method of finding the complementary function and particular integral.

Unit-III

Non homogeneous linear P.D.E. with constant coefficients, reducible and irreducible linear P.D.E. with constant coefficients, method of finding the complementary function and particular integral.

Unit-IV

Partial differential equations of the second order. Origin of 2nd order equations. Linear P.D.E. with constant coefficients and their complete solutions.Second order equation with variable coefficient and their classification and reduction to standard form.

Text Book:

M D Rai Singhania, Ordinary and Partial Differential Equations, S Chand Publishing, New Delhi, 11th Edition, 2009

Reference Books:

1. H.T.H. Piaggio: Differential equations, CBS Publishers

2. IAN N.Sneddon, Elements of partial differential equations, Dover Publisher, 2006

Master of Science (Mathematics) (FYIP)

Semester–IV

Session: 2024-25

Course Title: Group Theory
Course Code: FMAL - 4333
Course Outcomes

Upon completion of this course, students should be able to:

CO 1: Understand the concept of integers, divisors, division algorithm and equivalence   relation and its classes.

CO 2: Demonstrate understanding of algebraic structures and its properties with regard to working with various number system. Understand the concept of groups, subgroups, centralizer, normalizer and various properties of groups.

CO 3: Explain the notion of cosets, normal subgroup, quotient group, cyclic group, generator of cyclic group.

CO 4: Describe all permutation concepts, order, permutation as a product of two cycles, even odd permutations, alternating group.

Master of Science (Mathematics) (FYIP)

Semester–IV

Session: 2024-25

Course Title: Group Theory
Course Code: FMAL - 4333

Examination Time: 3 Hours   Max. Marks: 100
 L T P   Theory: 80
3 1 0   CA: 20

Instructions for the Paper Setters:

Eight questions of equal marks (16 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). 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

Properties of Integers: Well ordering Principle, Division algorithm, Greatest common divisor, G.C.D. as a linear combination, Euclidean algorithm, Euclid's Lemma, Least common multiple, Fundamental Theorem of arithmetic, Integers modulo n, Binary relations, Equivalence relations, Equivalence classes partition.

Unit-II

Definition & examples of groups, Elementary properties of groups, Uniqueness of the identity element, Cancellation, Uniqueness of inverses, Subgroups, Examples of subgroups, Tests for a set to be a subgroup, Centralizer, Normalizer, Centre of a group.

Unit-III

Product of two subgroups, Properties of cosets, Lagrange's theorem, Normal subgroups, Factor groups, Cyclic groups, Properties of cyclic groups, Generators of cyclic groups, Fundamental theorem of cyclic groups.

Unit-IV

Permutation groups, Cyclic notation for permutations, Permutation as product of disjoint cycles, Order of a permutation, Commutativity of product of disjoint cycles, Permutation as a product of 2-cycles, Even and odd permutations, Alternating group.

Reference Books:
1. D. Burton, Elementary Number Theory, McGraw-Hill Education, New York, Seventh Edition, 2011 (Scope as in Chapters: 2, 3, 8).
2. J. A. Gallian, Contemporary Abstract Algebra, CRC Press, Taylor & Francis Group, New York, Ninth Edition, 2015 (Scope as in Chapters: 1-5, 7, 9).

Master of Science (Mathematics) (FYIP)

Semester–IV

Session: 2024-25

Course Title: Statistical Methods
Course Code: FMAM-4334
Course Outcomes

Upon completion of this course, students should be able to:

CO 1: Understand the concept of correlation, and apply its techniques to identify correlation between given set of data and regression curves depicting relation among the physical quantities.

CO 2: Understand all the concepts related to sampling distribution.

CO 3: Demonstrate understanding the logic and framework of the inference of hypothesis testing as making an argument.

CO 4: Interpret the results of the hypothesis test.

Master of Science (Mathematics) (FYIP)

Semester–IV

Session: 2024-25

Course Title: Statistical Methods

Course Code: FMAM-4334

Examination Time: (3+3) Hours

L-T-P: 3-0-1

Max. Marks: 100
Theory: 50
Practical: 30
CA: 20

Instructions for the Paper Setters:
Eight questions of equal marks (10 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). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section. The students can use only Non Programmable& Non Storage Type Calculator and statistical tables.

The question paper must contain 30% of the article/theory from the syllabus.

Unit-I
Bivariate data, Karl–Pearson's correlation coefficient and its Properties, Spearman's rank correlation coefficient, fitting of straight line, regression analysis.

Unit-II
Sampling Distributions: Chi-square, t and F-distributions with their mean and variance. Relation between Chi-square, t and F-distributions.

Unit-III
Large Sample test (Z Test): Test of single mean and difference of means, test for single proportion and difference of proportions, t test for single mean and equality of means.

Unit –IV
Chi-square test - as goodness of fit and association of attributes, F-test as test of equality of population of variance.

Note:
Practical: Based on syllabus of Statistical Methods for inferential Statistics.

Text Book:
S.C Gupta, V.K. Kapoor, Fundamental of Mathematical Statistics, Sultan Chand & Sons, New Delhi, eleventh edition, 2019.

Reference Book:
R. V. Hogg, Joseph W. Mackean, and C. Allen, Introduction to Mathematical Statistics, Pearson Education, Sixth edition, 2009.

Master of Science (Mathematics) (FYIP)

Semester–IV

Session: 2024-25

Course Title: Foundation of Statistical Computing

Course Code: FMAM-4135

Course Outcomes:

After passing this course the student will be able to:

CO1: Comprehend basics of Statistical Computing and managing data structures like vector, matrix, etc.

CO2: Create, operate and manage lists and data frames.

CO3: Apply control and I/O statements for generating outputs.

CO4: Simulate various descriptive and analytical algorithms using R language along with their visualization.

Master of Science (Mathematics) (FYIP)

Semester–IV

Session: 2024-25

Course Title: Foundation of Statistical Computing

Course Code: FMAM-4135

Examination Time: (3+3) Hours	Max. Marks: 100
	Theory: 50
L-T-P: 3-0-1	Practical: 30
Credit: 4	CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 marks each) 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

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, lists, Creating lists, general list operations, Accessing list components and values, applying functions to lists, recursive lists

UNIT - II

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 Nonvector, Sets, if-else , writing user defined function, scope of the variable, R script file

UNIT - IV

Graphics in R: Graph Syntax ((title, xlabel, ylabel, pch, lty, col.), Simple graphics (Bar, Multiple Bar, Histogram, Pie, Box-Plot, Scatter plot, qqplot), Low-level and High-Level plot functions, par() command to generate multiple plots.

Note:

Practical: Based on simple mathematical problems and based on syllabus of Statistical Methods for descriptive Statistics.

References / Textbooks:

1. Andrie de Vries and Joris Meys, R Programming for Dummies, Wiley (2016), 2nd Edition.
2. Sandip Rakshit, R Programming for Beginners, McGraw Hill Education (2017), 1st Edition.
3. Sandip Rakhsit, Statistics with R Programming, McGraw Hill Education (2018), 1st Edition.
4. Garrett Grolemund, Hands on Programming with R, O'Reilly (2014), 1st Edition
5. Mark Gardener, Beginning R: The Statistical Programming Language, Wiley (2013)
6. Tilman M. Davies, The Book of R: A first Course in Programming and Statistics, No Strach Press (2016), 1st Edition