Faculty of Sciences

Syllabus for

Bachelor of Science (Honours) Mathematics

(Under Continuous Evaluation System)
(SEMESTER I-IV)

Session- 2020-21

Kanya Maha Vidyalaya, Jalandhar
(Autonomous)
The Heritage Institution

<center>

Bachelor of Science (Honours) Mathematics
Semester-I
Session: 2020 -21
Programme Specific Outcomes

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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 Three Year Degree Programme
Bachelor of Science (Honours) Mathematics Semester-I
Session- 2020-21

Course Code	Course type	Course Title	Max.Marks				Examination time in hours
			Total	Ext. L	P	CA	
BOML-1421/ BOML-1031/ BOML-1431	C	Punjabi (Compulsory) [1] Basic Punjabi/ [2] Punjab History and Culture	50	40	-	10	3
BOML-1102	C	Communication Skills in English	50	40	-	10	3
BOML-1333	C	Calculus-I	100	80	-	20	3
BOML-1334	C	Coordinate Geometry	100	80	-	20	3
BOMM-1085 OR	C	[5] Physical Chemistry OR	100	60	*20*	20	3
BOML-1175	C	[4] Micro Economics-I	100	80	-	20	3
BOML-1336 OR	C	[4] Statics OR [5] Mechanics	100	80	-	20	3
BOMM-1396	C		100	60	20	20	3
AECD-1161	AC	[3] Drug Abuse: Problem, Management and Prevention (Compulsory)	50	40	-	10	3
SECF-1492	AC	[3] Foundation Course	25	20	-	5	1
		Total Marks	500				

Note:
[1] Special Course in lieu of Punjabi(Compulsory)
[2] Special Course in lieu of Punjabi (Compulsory) for those students who are not domicile of Punjab.
[3] Marks of these papers will not be added in total marks. Grades will be provided.
[4] Only those students can opt these courses who have not studied Chemistry at +2 level.
[5] Only those students can opt these courses who have studied Chemistry at +2 level.
C-Compulsory
AC-Audit Course

Bachelor of Science (Honours) Mathematics
Semester–I
SESSION 2020-21
Punjabi (Compulsory)
COURSE CODE- BOML-1421

COURSE OUTCOMES

Co1:'ਸਾਹਿਤ ਦੇ ਰੰਗ' ਪੁਸਤਕ ਦੇ ਕਵਿਤਾਭਾਗਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥਵਿਦਿਆਰਥੀਆਂਅੰਦਰਕਵਿਤਾਪ੍ਰਤੀਦਿਲਚਸਪੀ, ਸੂਝ ਨੂੰ ਪੈਦਾਕਰਨਾ ਹੈ ਤਾਂਕਿ ਉਹ ਆਧੁਨਿਕਦੌਰਵਿਚਚਲਰਹੀਆਂਕਾਵਿਧਾਰਾਵਾਂ ਅਤੇ ਕਵੀਆਂਬਾਰੇ ਗਿਆਨਹਾਸਲਕਰ ਸਕਣ।ਇਸ ਦਾ ਹੋਰਮਨੋਰਥਕਵਿਤਾ ਦੀ ਵਿਆਖਿਆ, ਵਿਸ਼ਲੇਸ਼ਣ ਤੇ ਮੁਲੰਕਣ ਦੀ ਪ੍ਰਕਿਰਿਆਤੋਂਜਾਣੂ ਕਰਾਉਣਾ ਵੀ 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 ਦਾ ਮਨਰੋਥਵਿਦਿਆਰਥੀਆਂ ਦੀ ਬੁੱਧੀ ਨੂੰ ਤੀਖਣਕਰਦਿਆਂ ਉਨਾਂ ਦੀ ਲਿਖਣਪ੍ਰਤਿਭਾ ਨੂੰ ਉਜਾਗਰਕਰਨਾ ਹੈ।

Co4:ਧੁਨੀਵਿਉਂਤ ਪੜ੍ਹਨਾਲਵਿਦਿਆਰਥੀ ਧੁਨੀਆਂ ਦੀ ਉਚਾਰਨਪ੍ਰਣਾਲੀਤੋਂਵਾਕ਼ਫ ਹੋਣਗੇ।

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Bachelor of Science (Honours) Mathematics
Semester–I
SESSION 2020-21
Punjabi (Compulsory)

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 COURSE CODE- BOML-1421

ਸਮਾਂ : 3 ਘੰਟੇ   **Maximum Marks: 50**

Theory: 40

CA: 10

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ਪਾਠਕ੍ਰਮ ਅਤੇ ਪਾਠਪੁਸਤਕਾਂ
ਯੂਨਿਟ-I

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ਸਾਹਿਤ ਦੇ ਰੰਗ (ਸੰਪਾ.ਡਾਮਹਿਲਸਿੰਘ),ਭਾਗਪਹਿਲਾ(ਕਵਿਤਾ),
ਰਵੀ ਸਾਹਿਤਪ੍ਰਕਾਸ਼ਨ,ਅੰਮ੍ਰਿਤਸਰ।
(ਸਾਰ,ਵਿਸ਼ਾਵਸਤੂ)
(ਡਾ.ਹਰਿਭਜਨਸਿੰਘ,ਪਾਸ਼,ਸੁਰਜੀਤਪਾਤਰ ਕਵੀ ਪਾਠਕ੍ਰਮ ਦਾ ਹਿੱਸਾਨਹੀਂਹਨ)

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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, ਆਪਣਾਆਪਣਾਹਿੱਸਾਕਹਾਣੀਆਂਪਾਠਕ੍ਰਮ ਦਾ ਹਿੱਸਾਨਹੀਂਹਨ)

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ਯੂਨਿਟ-III

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ਪੈਰ੍ਹਾਰਚਨਾ

ਪੈਰ੍ਹਾਪੜ੍ਹ ਕੇ ਪਸ਼੍ਨਾਂ ਦੇ ਉਤਰ।

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ਯੂਨਿਟ-IV

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(ੳ)   ਪੰਜਾਬੀਧੁਨੀਵਿਉਂਤ :ਪਰਿਭਾਸ਼ਾ ਤੇਉਚਾਰਨਅੰਗ
(ਅ) ਸਵਰ, ਵਿਅੰਜਨ8 ਅੰਕ

ਅੰਕਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕਲਈਹਦਾਇਤਾਂ

1.   ਪ੍ਰਸ਼ਨਪੱਤਰ ਦੇ ਚਾਰ ਯੂਨਿਟਹੋਣਗੇ।ਸੈਕਸ਼ਨA-Dਤੱਕ ਦੇ ਪ੍ਰਸ਼ਨ ਯੂਨਿਟI-IV ਵਿਚੋਂ ਪੁੱਛੇ ਜਾਣਗੇ।ਹਰ ਯੂਨਿਟਵਿਚ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2.   ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜਪ੍ਰਸ਼ਨਕਰਨੇ ਹਨ। ਹਰ ਭਾਗਵਿਚੋਂਇਕਪ੍ਰਸ਼ਨਲਾਜ਼ਮੀਹੈ।ਪੰਜਵਾਂਪ੍ਰਸ਼ਨਕਿਸੇ ਵੀ ਯੂਨਿਟਵਿਚੋਂਕੀਤਾਜਾ ਸਕਦਾ ਹੈ।
3.   ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 08 ਅੰਕਹਨ।
4.   ਪੇਪਰ ਸੈੱਟਕਰਨਵਾਲਾਜੇਕਰਚਾਹੇ ਤਾਂਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡਅੱਗੋਂਵੱਧਤੋਂਵੱਧਚਾਰ ਉਪ ਪ੍ਰਸ਼ਨਾਂਵਿਚਕਰ ਸਕਦਾ ਹੈ।

Bachelor of Science (Honours) Mathematics
Semester–I
SESSION 2020-21
Basic Punjabi
COURSE CODE- BOML-1031

COURSE OUTCOMES

CO1:ਮੁੱਢਲੀਪੰਜਾਬੀਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੰਜਾਬੀਭਾਸ਼ਾ ਨੂੰ ਸਿਖਾਉਣ ਦੀ ਪ੍ਰਕਿਰਿਆਵਿਚ�犾 ਕੇ ਇਕਹੋਰਭਾਸ਼ਾਸਿੱਖਣ ਦੇ ਮੌਕੇ ਪ੍ਰਦਾਨਕਰਨਾ ਹੈ।

CO2:ਇਸ ਵਿਚਵਿਦਿਆਰਥੀ ਨੂੰ ਬਾਰੀਕਬੀਨੀਨਾਲਭਾਸ਼ਾ ਦਾ ਅਧਿਐਨਕਰਵਾਇਆਜਾਵੇਗਾ।

CO3:ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੰਜਾਬੀਸ਼ਬਦਰਚਨਾਤੋਂਜਾਣੂ ਕਰਵਾਇਆਜਾਵੇਗਾ।

CO4:ਮੁੱਢਲੀਪੰਜਾਬੀਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਨਿੱਤਵਰਤੋਂ ਦੀ ਪੰਜਾਬੀਸ਼ਬਦਾਵਲੀਬਾਰੇ ਦੱਸਣਾ ਹੈ।

CO5:ਮੁੱਢਲੀਪੰਜਾਬੀਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥਵਿਦਿਆਰਥੀਆਂ ਦਾ ਸ਼ਬਦ ਘੇਰਾ ਵਿਸ਼ਾਲਕਰਨਾ ਹੈ।

CO6:ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੰਜਾਬੀਵਿਚਹਫ਼ਤੇ ਦੇ ਸੱਤਦਿਨਾਂ ਦੇ ਨਾਂ, ਬਾਰ੍ਹਾਂਮਹੀਨਿਆਂ ਦੇ ਨਾਂ, ਰੁੱਤਾਂ ਦੇ ਨਾਂ, ਇਕਤੋਂ ਸੌ ਤੱਕਗਿਣਤੀਸ਼ਬਦਾਂਵਿਚਸਿਖਾਉਣਾ ਹੈ।

Bachelor of Science (Honours) Mathematics
Semester–I
SESSION 2020-21
Basic Punjabi –I
COURSE CODE- BOML-1031

ਸਮਾਂ : 3 ਘੰਟੇ   **Maximum Marks: 50**

Theory: 40

                                                                    CA: 10

<div align="center">ਪਾਠਕ੍ਰਮ</div>

ਯੂਨਿਟ-I

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

                                                                    08ਅੰਕ

ਯੂਨਿਟ-II

ਪੰਜਾਬੀਸ਼ਬਦਬਣਤਰ : ਮੁੱਢਲੀਜਾਣਪਛਾਣ (ਸਾਧਾਰਨਸ਼ਬਦ, ਸੰਯੁਕਤ ਸ਼ਬਦ, ਮਿਸ਼ਰਤਸ਼ਬਦ, ਮੂਲ ਸ਼ਬਦ, ਅਗੇਤਰ ਅਤੇ ਪਿਛੇਤਰ)   08ਅੰਕ

ਯੂਨਿਟ-III

ਨਿੱਤਵਰਤੋਂ ਦੀ ਪੰਜਾਬੀਸ਼ਬਦਾਵਲੀ : ਬਾਜ਼ਾਰ, ਵਪਾਰ, ਰਿਸ਼ਤੇਨਾਤੇ, ਖੇਤੀ ਅਤੇ ਹੋਰਧੰਦਿਆਂਆਦਿਨਾਲ ਸੰਬੰਧਤ।   08 ਅੰਕ

ਯੂਨਿਟ-IV

ਹਫ਼ਤੇ ਦੇ ਸੱਤਦਿਨਾਂ ਦੇ ਨਾਂ, ਬਾਰ੍ਹਾਂਮਹੀਨਿਆਂ ਦੇ ਨਾਂ, ਰੁੱਤਾਂ ਦੇ ਨਾਂ, ਇਕਤੋਂ ਸੌ ਤੱਕਗਿਣਤੀਸ਼ਬਦਾਂਵਿਚ

                                                                    08ਅੰਕ

ਅੰਕਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕਲਈਹਦਾਇਤਾਂ

1.   ਪ੍ਰਸ਼ਨਪੱਤਰ ਦੇ ਚਾਰ ਯੂਨਿਟਹੋਣਗੇ।।ਸੈਕਸ਼ਨA-Dਤੱਕ ਦੇ ਪ੍ਰਸ਼ਨ ਯੂਨਿਟI-IV ਵਿਚੋਂ ਪੁੱਛੇ ਜਾਣਗੇ।ਹਰ ਯੂਨਿਟਵਿਚ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।

2.   ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜਪ੍ਰਸ਼ਨਕਰਨੇ ਹਨ। ਹਰ ਭਾਗਵਿਚੋਂਇਕਪ੍ਰਸ਼ਨਲਾਜ਼ਮੀ ਹੈ।ਪੰਜਵਾਂਪ੍ਰਸ਼ਨਕਿਸੇ ਵੀਭਾਗਵਿਚੋਂਕੀਤਾਜਾ ਸਕਦਾ ਹੈ।

3.   ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਅੱਠਅੰਕਹਨ।

4.   ਪੇਪਰ ਸੈੱਟਕਰਨਵਾਲਾਜੇਕਰਚਾਹੇ ਤਾਂਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡਅੱਗੋਂਵੱਧਤੋਂਵੱਧਚਾਰ ਉਪ ਪ੍ਰਸ਼ਨਾਂਵਿਚਕਰ ਸਕਦਾ ਹੈ।

Bachelor of Science (Honours) Mathematics
Semester–I
Session- 2020-21
Course Title: Punjab History & Culture (From Earliest Times to C. 320)
(Special Paper in lieu of Punjabi compulsory)
Course Code: BOML-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.

CO 1: Identify and describe the emergence of earliest civilizations in: Indus Valley Civilization and Aryan Societies.

CO 2: Identify and analyses the Buddhist, Jain and Hindu faith in the Punjab

CO 3: Analyses the emergence of Early Aryans and Later Vedic Period, their Society, Culture, Polity and Economy

CO 4: To make students understand the concepts of two faiths Jainism and Buddhism, its principles and their application and relevance in present times

Course Title: Punjab History & Culture (From Earliest Times to C. 320)
(Special Paper in lieu of Punjabi compulsory)
Course Code: BOML-1431

Examination Time: 3 Hours   Max. Marks: 50
Theory: 40
CA: 10

Instructions for Paper Setters
The question paper will have 4 units, namely unit I, II, III and IV.

Question paper shall consist of four Units. Candidates shall attempt 5 questions in all, by at least selecting one question from each section and the 5th question may be attempted from any of the four units. Each question will carry 8 marks.

Unit -I
- Physical features of the Punjab and impact on history.

- Sources of the ancient history of Punjab

Unit- II
- Harappan Civilization: Town planning; social, economic and religious life of the India Valley People.

- The Indo-Aryans: Original home and settlement in Punjab.

Unit -III
- Social, Religious and Economic life during later *Rig* Vedic Age.

- Social, Religious and Economic life during later Vedic Age.

Unit -IV
- Teaching and impact of Buddhism

- Jainism in the Punjab

Books Recommended:
- L. 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.

- BudhaParkash :*Glimpses of Ancient Punjab*, Patiala, 1983.

- B.N. Sharma: *Life in Northern India*, Delhi. 1966.

Bachelor of Science (Honours) Mathematics

Semester–I
Session- 2020-21
Course Title: Communication Skills in English
Course Code: BOML-1102

Course Outcomes:

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

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

CO 2: The ability to realise not only language productivity but also the pleasure of being able to articulate well

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

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

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

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

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

Examination Time: 3 Hours   Max. Marks: 50
Theory: 40
CA: 10

Instructions for the paper setter and distribution of marks:
The question paper will consist of four sections and distribution of marks will be as under:
Section-A: The question of theoretical nature will be set from Unit I of the syllabus with internal choice and it will consist of 8 marks.
Section-B: Two comprehension passages will be given to the students based on the Unit II and the candidates will have to attempt one carrying 8 marks.
Section-C: Two questions will be given based on the topics given in the Unit III and the candidates will have to attempt one carrying 8 marks.
Section-D: One out of the two questions will have to be attempted by the candidates based on the topics given in Unit IV of the syllabus. It will carry 8 marks.
Important Note:
The candidate will have to attempt five questions in all selecting one from each section of the question paper and the fifth question may be attempted from any of the four sections.
                    (8 x 5 = 40)

The syllabus is divided in four units as mentioned below:

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

Unit II
Reading for understanding concepts, details, coherence, logical progression and meanings of phrases/ expressions
Activities:
- Comprehension questions in multiple choice format
- Short comprehension questions based on content and development of ideas

Unit III
Writing Skills: Guidelines for effective writing; writing styles for application, personal letter, official/ business letter.
Activities
- Formatting personal and business letters.
- Organising the details in a sequential order

Unit IV
Resume, memo, notices etc.; outline and revision.
Activities:
- Converting a biographical note into a sequenced resume or vice-versa
- Ordering and sub-dividing the contents while making notes.
- Writing notices for circulation/ boards

Books Recommended:

1. *Oxford Guide to Effective Writing and Speaking* by John Seely.
2. *Business Communication,* by Sinha, K.K. Galgotia Publishers, 2003.
3. *Business Communication* by Sethi, A and Adhikari, B., McGraw Hill Education 2009.
4. *Communication Skills* by Raman, M. & S. Sharma, OUP, New Delhi, India (2011).
5. *English Grammar in Use: A Self Study Reference and Practice Book Intermediate Learners Book* by Raymond Murphy, Cambridge University Press.

Bachelor of Science (Honours) Mathematics
Semester–I
Session- 2020-21
Course Title: Calculus-I
Course Code: BOML-1333

Course Outcomes

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

CO 1: Understand real number system, lub&glb of set of real numbers, limit of a function, basic properties of limit & to apply it in real world problem.

CO 2: Analyses continuous and discontinuous function, Apply concept of continuity in uniform continuity.

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

CO 4: Apply reduction formula on different functions & to apply in a wide variety of disciplines like Bio, Eco, Physics & Engineering.

CO 5 : To understand the concepts of Riemann sum, partitions, upper and lower sums, Riemann integrability of continuous functions and of monotone functions.

CO 6: To Classify the difference between increasing and decreasing functions.

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Bachelor of Science (Honours) Mathematics
Semester–I
Session-2020-21
Course Title: Calculus-I
Course Code: BOML-1333

Examination Time: 3 Hours   Max. Marks: 100
 Theory: 80
CA:20

Instructions for Paper Setters:
Eight questions of equal marks (16 marks each) are to be set, two in each of the fourSections (A-D). Questions of Sections A-D should be set from Units I-IV of thesyllabus respectively. Questions may be subdivided into parts (not exceeding four).Candidates are required to attempt five questions, selecting at least one questionfrom each section. The fifth question may be attempted from any Section.

Unit I
Real line, intervals, l.u.b. and g.l.b., the l.u.b. property of real numbers and order properties of real numbers , Archimedean property, definition of the limit of a function of real variable, algebra of limits,continuity, classification of discontinuities

Unit II
Differentiability of functions of real variable, increasing and decreasing functions, maxima and minima, mean values theorems

Unit III
Intermediate-value theorems, Asymptotes, concavity and convexity, points of inflexion, curve tracing .

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 curves, Reduction Formulae.

Text Book:
 George B. Thomas and Ross L. Finney: Calculus and Analytic Geometry, 9th Edition, Addison Wesley, 1998(Scope as inCh.1-5)
Reference Books:
1. A.D.R. Choudary and C.P. Niculescu. Real Analysis on Intervals, Springer, 2014. (Chapter 1).
2. Kreyszig, E.: Advanced Engineering Mathematics.
3. Ghorpade, Sudhir R., Limaye, BalmohanV. :A Course in Calculus and Real Analysis.

Bachelor of Science (Honours) Mathematics
Semester–I
Session- 2020 -21
Course Title: Coordinate Geometry
Course Code: BOML-1334

Course Outcomes

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

CO 1: Understand the concept of the geometry of lines and conics in the Euclidian plane.

CO 2: Develop geometry with a degree of confidence and will gain fluency in the basics of Euclidian geometry.

CO 3: Sketch conic sections; identify conic sections, their focal properties and classifications.

CO 4: Demonstrate the concept of parabola, ellipse, hyperbola, sphere and the general quadratic equation.

CO 5: Understand the concept of coordinate geometry on a wider scale with the help of shifting of origin and rotation of axis.

Bachelor of Science (Honours) Mathematics
Semester–I
Session 2020 -21
Course Title: Coordinate Geometry
Course Code: BOML-1334

 Examination Time: 3 HoursMax. Marks: 100
Theory: 80
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 thesyllabus 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
Pair of Straight lines: Joint equation of pair of straight lines and angle between them,condition of parallelism and perpendicularity, joint equation of the angle bisectors, joint equation of lines joining origin to the intersection of a line and a curve.

Unit II
Circle: General equation of circle, circle through intersection of two lines, tangent andnormal, Chord of contact, pole and polar, pair of tangents from a point, equation of chord in midpoint form, angle of intersection and orthogonality, power of a point w.r.t circle, radical axis, co-axial family of circles, limiting points.

Unit III
Conic sections: Parabola, ellipse and hyperbola, tangent and normal, chord of contact, poleand polar of tangent from a point, equation of chord in terms of midpoint, diameter, conjugate diameters of ellipse and hyperbola, conjugate hyperbola, asymptotes of hyperbola, rectangular hyperbola.

Unit IV
 Transformation of axes in two dimensions: shifting of origin, rotation of axes, the seconddegree equation $S=ax^2+2hxy+by^2+2gx+2fy+c=0$, its invariants t, Δ, and O. Reduction of the second degree equation into standard form. Identification of curves represented by S=0 (including pair of lines).Polar coordinates: Polar equations of straight lines, circles and conics.

Text Book:
Loney, S.L.: The Elements of Coordinate Geometry, London, Macmillan

Reference Book:
    P.K Jain and Khalil Ahmed: Text book of Analytical Geometry, New Age International Publishers

Bachelor of Science (Honours) Mathematics
Semester–I
Session:2020 -21
Course Title: Physical Chemistry
Course Code: BOMM-1085
Course outcomes

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

CO1: understand the various thermodynamic properties and laws of Thermodynamics.

CO2: acquire knowledge about the various thermodynamic terms like enthalpy of formation,

enthalpy of ionisation, entropy, internal energy.

CO3: calculate entropy change for reversible and irreversible processes under isothermal and non-isothermal conditions and also absolute entropies of substances.

CO4: understand the relation between free energy change and equilibrium constants K_p, K_c and K_f.

CO5: describe the Phases and Phase rule and its thermodynamic derivation.

CO6: draw and explain the phase diagrams of water system, sulphur system

CO7: understand the concept of Electrochemistry and various terms related to it like resistance, conductance, specific resistance, cell constant, EMF.

CO8: understand the importance of Nernst Equation in electrochemistry.

CO9: determine the transference number of ions using Hittorf and moving boundary methods.

CO10: understand the concept of reaction rates and determine the rate law from initial rate data

CO11: determine the order of reaction with respect to each reactant, the overall order of reaction, the rate constant with units

Bachelor of Science (Honours) Mathematics
Semester–I
Session- 2020 -21
Course Title: Physical Chemistry
Course Code: BOMM-1085

Examination Time: 3 Hours   Max. Marks:100
                                        Theory:60
Practical:20
CA:20

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

Unit I
Chemical Thermodynamics
Laws of thermodynamics, Enthalpy of a system, heat capacity, Isothermal &adiabatic process in ideal gases, Carnot cycle, thermodynamic efficiency, Thermo-Chemistry : heat of reaction at constant volume and pressure thermo chemical equations, calculations of E from H & vice versa, Hess's law of heat summation, heat of formation, heats of combustion, heat of solution, heat of neutralization of acids and bases, dependence of H & E for a reaction (Kirchoff's equation). II and III law of thermodynamics : Entropy, dependence of entropy on variables of a system, Entropy change in ideal gases, entropy of mixing for ideal gases, entropy change in physical transformations, Entropy change in chemical reactions, absolute Entropies, residual entropy, thermodynamics of III Law.

Unit II
 Equilibrium
Equilibrium and Spontaneity under constraints- General conditions. Helmholdz free energy (A) for reactions. Gibbs free energy.Chemical potential, Gibbs free energy and entropy of mixing of ideal gases. The Equilibrium constants K_p and K_c of real gases. Phase Rule, Gibbs Phase rule, derivation of phase rule, one component system, the water system, the sulphur system.

Unit III
Chemical Kinetics
Measurement of reaction rate, order, molecularity of reaction, first order reactions, second order reactions, third order reactions, Methods of determination of order, effect of temperature, activation energy.

Unit IV

Electro Chemistry
Conductance and Ionic Equilibrium: Faraday's law of electrolysis, Kohlrausch law of independent migration of ions, transference numbers, determination of transference numbers, electrolytic conductance, variation of conductance with concentration, equivalent conductance at infinite dilution, Applications of conductance measurements, Reversible and Irreversible cells,
standard cells, cell reaction & EMF. Single electrode potential and its calculation, thermodynamic and EMF, standard potential and equilibrium constants.

Books Recommended:

1. Physical Chemistry by Samuel H, Carl P. PuttonAmeric Inc. Co.
2. Physical Chemistry by Glassstone, The Macmillian Press Ltd.
3. Kinetic and Mechanism by Frost A and Pearson R.G, Wiley Eastern Pvt. Ltd.
4. Chemical Kinetic by K.J. Laidler, Harper and Row.
5. Physical Chemistry by Glberg W. Castellian Addison- Wesley publishing Comp

Bachelor of Science (Honours) Mathematics

Semester–I

Session-2020-21

Course Title: Chemistry Practical

Course Code: BOMM-1085(P)

Course outcomes:

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

CO1: determine the surface tension of different liquids and solutions

CO2: determine the viscosity of different liquids and solutions

CO3: efficiently use of calorimeter in various experiments

CO4: determine heat of neutralization and heat of solution

Bachelor of Science (Honours) Mathematics

Semester–I

Session-2020-21

Course Title: Chemistry Practical

Course Code: BOMM-1085(P)

Examination Time: 3.5 Hours   Max. Marks: 20

Instruction for practical examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners.Two copies of the same should be submitted for the record to COE Office, Kanya Maha
 Vidyalaya, Jalandhar.

Viscosity, Surface Tension (Pure Liquids)

1. Determine the coefficient of viscosity of the given liquid (CCl_4, glycerine solution in water).

2. Determine the surface tension of given liquid (CCl_4, glycerine solution in water) by drop number method.

3. Determine the surface tension of given liquid (CCl_4, glycerine solution in water) by drop weight method.

4. Determine the water equivalent of given calorimeter.

5. Determine the enthalpy of neutralisation of a strong acid versus strong base.

6. Determine the enthalpy of neutralisation of a weak acid/weak base versus strong base/strong acid and

    determine the enthalpy of ionisation of the weak acid/weak base.

7.   Determine the enthalpy of dissolution of solid calcium chloride in water at room temperature.

Books Recommended:
1. Experiments in General Chemistry, C.N.R. Rao and U.C. Aggarwal, East-West Press.
2. Experiments in Physical Chemistry, R.C. Das and B. Behra, Tata McGraw Hill.
3. Advanced Practical Physical Chemistry, J.B. Yadav, Goel Publishing House.
4. Advanced Experimental Chemistry, Vol. I, Physical, J.N. Guru and R. Kapoor, S. Chand & Co.
5. Selected Experiments in Physical Chemistry, N.G. Mukherjee, J.N. Ghosh & Sons.
6. Experiments Physical Chemistry, J.C. Ghosh, Bharati Bhavan.

Bachelor of Science (Honours) Mathematics
Semester–I
Session: 2020 -21
Course Title: Micro Economics-I
Course Code: BOML-1175

Course Outcomes:

After passing this course students will be able to:

CO1: understand the various aspects of demand for a particular product and consumer behaviour in the context of demand for a product and multiple productions.

CO2: understand different concepts of cost structure of a firm in short run and long run and revenue analysis.

CO3: understand the production decisions of a producer in the context of inputs.

CO4: think analytically and apply themselves mathematically to problems in above mentioned topics.

Bachelor of Science (Honours) Mathematics
Semester–I
Session: 2020-21
Course Title: Micro Economics-I
Course Code: BOML-1175

Examination Time: 3 Hours   Max. Marks: 100
Theory:80
                                    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

Basic problems of an economy. Demand and Supply functions – an introductory view of price formation. Role of time element in price formation
Price, income and cross elasticities of demand, Measurement of price elasticity of demand, Elasticity of substitution and the relationship between price elasticity, income elasticity and elasticity of substitution, elasticity of supply.

Unit II
Theories of demand; The classical utility approach, indifference curves approach, the revealed preference approach, consumer's surplus.

Unit III
Theory of production: Production function, isoquants, returns to a factor and returns to scale and their compatibility. Elasticity of substitution; economies of scale.
Unit IV
Cobb–Douglas production function; production function of a multi product firm.
Theory of Costs; Short and long period costs, traditional and modern theories of costs, derivation of cost function from production function.
Revenue analysis: Revenue curves and their mutual relationship.

    Books Recommended:

1. Koutsoyiannis, A. : Modern Microeconomics.
2. Lipsey, G. : An Introduction to Positive Economics.
3. Stonier &Hague : A text book of Economic Theory.

Bachelor of Science (Honours) Mathematics
Semester–I
Session-2020 -21
Course Title: Statics
Course Code: BOML-1336

Course Outcomes

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

CO 1: Apply parallelogram law of forces, triangle law of forces, Lami's theorem to real life problems.

CO 2: Understand that how one can resolve number of coplanar forces, parallel forces and concurrent forces acting at a body.

CO 3: Find the moments of number of coplanar forces acting at a particle

CO 4: Find the resultant of a force and couple acting on a body.

CO 5: Find the applications of CG of a rod, triangular lamina, solid hemisphere, hollow hemisphere, solid cone and hollow cone.

Bachelor of Science (Honours) Mathematics
Semester-I
Session 2020 -21
Course Title: Statics
Course Code: BOML-1336

Examination Time: 3 Hours   Max. Marks: 100
        Theory:80
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. The question paper must contain 30% of the article/theory from the syllabus.

Unit I
Composition and resolution of forces (parallelogram law, triangle law, polygon law, Lami's Theorem, (λ-μ) theorem). Resultant of a number of coplanar forces.

Unit II
Parallel forces, Moments, Varignon'stheorem of moments, Couples, Resultant of two Coplanar Couples, Equilibrium of two coplanar couples, Resultant of a force and a couple.

Unit III
Equilibrium of a rigid body acted on by three forces in a plane, General Conditions of equilibrium of a rigid body acted on by forces in one plane.

Unit IV
Friction, Laws of friction, Equilibrium of a particle on a rough plane. Centre of Gravity: Centre of gravity of a rod, triangular lamina, solid hemisphere, hollow hemisphere, solid cone and hollow cone.

Text Book:
S.L. Loney: The Elements of Statics and Dynamics Part-I Statics

Bachelor of Science (Honours) Mathematics
Semester–I
Session- 2020-21
Course Title: Mechanics
Course Code: BOMM-1396

Course Outcomes

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

CO1: Understand the various coordinate systems and its applications. Students will be able to know the conservations laws and the symmetries of space & time.

CO2: Know the fundamental forces of nature, concept of centre mass, central forces and the motion of particle under central force and to determine the turning points of orbit.

CO3: Understand the frames of reference, Kepler's laws, and effect of rotation of earth on g.

CO4: know the rotational motion of rigid body, its kinematics and Euler's equations

Bachelor of Science (Honours) Mathematics
Semester–I
Session- 2020 -21
Course Title: Mechanics
Course Code: BOMM-1396

Examination Time: 3 Hours   Max. Marks: 100
Theory:60
 Practical:20
CA:20

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

Unit I
Inertial Carterianand spherical polar co-ordinate systems: area, volume, displacement   ,   velocity   and acceleration in these systems, solid angles and frames of reference, Galilean transformation, Galilean Invariance of space & time intervals; fictitious forces. Effect of rotation of earth on 'g'. Effects of centrifugal and Coriolis forces produced as a result of earth's rotation.

Unit II
Internal forces and momentum conservation.Centre of mass.Elastic collisions in laboratory and center of mass systems; velocities, angles, energies in these systems and their relationships. Conservation of angular momentum and examples-shape of the galaxy, angular momentum of solar system. Torques due to internal forces, angularmomentum about centre of mass. Cross-section of elastic scattering and impact parameter, Rutherford scattering.

Unit III
Forces in nature (qualitative). Central forces, Potential energy and force between a point mass and spherical shell, a point mass and solid sphere, gravitational and electrostatic self energy. Two body problem and concept of reduced mass. Motion of a body under central force; differential equation of the orbit, equation of orbit in inverse-square force field.Kepler'slawsand their derivation.

Unit IV
Equation of motion of a rigid body, Rotational motion of a rigid body in general and that ofplane lamina. Rotation of angular momentum vector about a fixed axis.Angular momentum and kinetic energy of a rigid body about principal axis, Euler's equations.

Books Recommended:

1. Mechanics-Berkeley Physics Course, Vol-I (second edition):C. Kittel, W. D. Knight, M. A. Ruderman, C. A. Helmholtz and R. J. Moyer-Tata McGraw Hill Publishing Company Ltd., New Delhi.

2. Fundamentals of Physics: D. Halliday, R. Resnick and J. Walker (sixth edition)-Wiley India Pvt. Ltd., New Delhi, 2004.

3. Analytical Mechanics: S. K. Gupta, Modern Publishers.

4. An Introduction to Mechanics. Daniel Kleppner& Robert Kolenkow Tata McGraw Hill Publishing Company Ltd., New Delhi

Bachelor of Science (Honours) Mathematics
SEMESTER–I
PHYSICS PRACTICAL
Course code:BOMM-1396 (P)

Instructions to Practical Examiner
Question paper is to be set on the spot jointly by the external and internal examiners. Two copies of the same to be submitted for the record to COE office, KanyaMahaVidyalaya, Jalandhar

General Guidelines for Practical Examination
I. The distribution of marks is as follows: **Marks: 20**
i) One experiment **7 Marks**
ii) Brief Theory **3 Marks**
iii) Viva–Voce **5 Marks**
iv) Record (Practical file) **5 Marks**
II. There will be one sessions of 3 hours duration. The paper will have one session.
Paper will consist of 8 experiments out of which an examinee will mark 6 experiments andone of these is to be allotted by the external examiner.
III. Number of candidates in a group for practical examination should not exceed 12.
IV. In a single group no experiment isto be allotted to more than three examinees in any group.

LIST OF EXPERIMENTS
1. To study the dependence of moment of inertia on distribution of mass (by noting time periodsof oscillations using objects of various geometrical shapes but of same mass).
2. To establish relationship between torque and angular acceleration using fly wheel.
3. To find the moment of inertia of a flywheel.
4. Study of bending of beams and determination of Young‟s modulus.
5. Determination of Poisson‟s ratio for rubber.
6. To determine energy transfer, coefficient of restitution and verify laws of conservation of linear momentum and kinetic energy in elastic collisions using one dimensional collisions of hanging spheres.
7. Measure time period as a function of distance of centre of suspension (oscillation) fromcentre of mass, plot relevant graphs, determine radius of gyration and acceleration due togravity.
8. Find the value of „g‟ by Kater‟s pendulum.
9. Measure time period of oscillation of a Maxwell needle and determine modulus of rigidity of the material of a given wire.
10. To measure logarithmic decrement, coefficient of damping, relaxation time, and quality factor of a damped simple pendulum.

Bachelor of Science (Honours) Mathematics
Semester–I
Session: 2020 -21
Course Title: Drug Abuse: Problem, Management and Prevention (Compulsory)
PROBLEM OF DRUG ABUSE
Course Code: AECD-1161

Course Outcomes:

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

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

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

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

Bachelor of Science (Honours) Mathematics
Semester–I
Session-2020-21
Course Title: Drug Abuse: Problem, Management and Prevention (Compulsory)
PROBLEM OF DRUG ABUSE
Course Code: AECD-1161

Examination Time: 3 Hrs

Max. Marks: 50Theory: 40

CA: 10

Instructions for the Paper Setter
Eight questions of equal marks (8 marks each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). 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
1) Meaning of Drug Abuse: Meaning, Nature and Extent of Drug Abuse in India and Punjab.

UNIT-II
2) Consequences of Drug Abuse for:
Individual : Education, Employment, Income.
Family : Violence.
Society : Crime
Nation : Law and Order problem.

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

UNIT-IV
4) Psychiatric Management: Counselling, Behavioural and Cognitive therapy.
Social Management: Family, Group therapy and Environmental Intervention.

Books Recommended:
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: Sage Publications.
4. Kapoor. T. (1985) *Drug epidemic among Indian Youth*, New Delhi: Mittal Pub.
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: MittalPublications.
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.

Bachelor of Science (Honours) Mathematics
Semester–I
Session -2020-21
Course Title: Foundation Programme
Course Code: SECF-1492

Examination Time: 1 Hour (Grade only)   Maximum Marks: 25

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, peaks of human intellect, social/political benchmarks and inventors & discoverers who have impacted human life. For a student, the process of transformation from school to college is full of apprehension and intimidation of the 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.

INSTRUCTIONAL OBJECTIVES

- to enable the students to realise their position in the whole saga 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
- to make them responsible and humane world citizens so that they can carry forward the rich legacy of humanity

CURRICULUM

MODULE	TITLE	CONTACT HOURS
I	Introduction & Initial Assessment	2
II	The Human Story	3
III	*The Vedas*, *The Gita*& Eastern Philosophy	2.5
IV	*The Holy Bible*& Genesis	2.5
V	Woman: A Journey through the Ages	2.5
VI	Changing Paradigms in Society, Religion & Literature	2.5
VII	Makers of Modern India	2.5
VIII	Racism & Martin Luther King Jr.	2.5
IX	Modern World at a Glance: Political & Economic Perspective	2.5
X	Technology & Human Life	2.5
XI	The KMV Experience	2.5

XII	Final Assessment, Feedback & Closure	2.5

EXAMINATION
- Total Marks: 25 (Final Exam: 20; Internal Assessment: 5)
- Final Exam: multiple choice quiz. Marks – 20; Time: 1 hour
- Internal Assessment: 5 (Assessment: 3; Attendance:2)
  Comparative assessment questions (medium length) in the beginning and close of the programme. Marks: 3; Time: 0.5 hour each at the beginning and end.
- Total marks: 25 converted to grade for final result
- Grading system: 90% marks & above: A grade
  80% - 89% marks   : B grade
  70% - 79% marks   : C grade
  60% - 69% marks   : D grade
  50% - 59% marks   : E grade
  Below 50% marks   : F grade (Fail - must give the exam again)

SYLLABUS

Module I   Being a Human: Introduction & Initial Assessment
- Introduction to the programme
- Initial Assessment of the students through written answers to a couple of questions

Module 2   The Human Story
- Comprehensive overview of human intellectual growth right from the birth of human history
- The wisdom of the Ancients
- Dark Middle Ages
- Revolutionary Renaissance
- Progressive modern times
- Most momentous turning points, inventions and discoveries

Module 3   *The Vedas*, *The Gita*& The Indian Philosophy
- Origin, teachings and significance of *The Vedas*
- Upnishads and Puranas
- Karma Theory of *The Bhagwad Gita*
- Main tenets of Buddhism & Jainism
- Teachings of Guru Granth Sahib

Module 4   *The Holy Bible*& Genesis
- Book of Genesis: Creation and Fall
- Noah's Ark
- Moses & The Ten Commandments
- Christ and His teachings

- Christianity and the world

Module 5 Changing Paradigms in Society, Religion & Literature
- Renaissance: The Age of Rebirth

- Transformation in human thought

- Importance of humanism

- Geocentricism to heliocentricism

- Copernicus, Galileo, Columbus, Darwin and Saint Joan

- Empathy and Compassion

Module 6 Woman: A Journey through the Ages
- Status of women in pre-vedic times

- Women in ancient Greek and Roman civilizations

- Women in vedic and ancient India

- Status of women in the Muslim world

- Women in the modern world

- Crimes against women

- Women labour workforce participation

- Women in politics

- Status of women- our dream

Module 7 Makers of Modern India
- Early engagement of foreigners with India

- Education: The first step to modernization

- Railways: The lifeline of India

- Raja Ram Mohan Roy, Gandhi, Nehru, Vivekanand, Sardar Patel etc.

- Indira Gandhi, Mother Teresa, HomaiVyarawala etc.

- The Way Ahead

Module 8 Racism: Story of the West
- European beginnings of racism

- Racism in the USA - Jim Crow Laws

- Martin Luther King Jr. and the battle against racism

- Apartheid and Nelson Mandela

- Changing face of racism in the modern world

Module 9 Modern World at A Glance: Political & Economic Perspective
- Changing world order

- World War I & II

- UNO and The Commonwealth

- Nuclear Powers; Terrorism

- Economic Scenario: IMF, World Bank

- International Regional Economic Integration

Module 10 Technology and Human Life
- Impact of technology on modern life

- Technological gadgets and their role in our lives

- Technology and environment

- Consumerism and materialism

- Psychological and emotional consequences of technology

- Harmonising technology with ethics and humaneness

Module 11 The KMV Experience
- Historical Legacy of KMV

- Pioneering role in women emancipation and empowerment

- KMV Contribution in the Indian Freedom Struggle

- Moral, cultural and intellectual heritage of KMV

- Landmark achievements

- Innovative initiatives; international endeavours

- Vision, mission and focus

- Conduct guidelines for students

Module 12 Final Assessment, Feedback & Closure
- Final multiple choice quiz

- Assessment through the same questions asked in the beginning

- Feedback about the programme from the students

- Closure of the programme

PRESCRIBED READING

- *The Human Story* published by Dawn Publications

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Scheme and Curriculum of Examinations of Three-Year Degree Programme
Bachelor of Science (Honours) Mathematics Semester-II
Session 2020-21

Bachelor of Science (Honours) Mathematics Semester-II							
Course Code	Course type	Course Title	Max.Marks				Examination time in hour
			Total	Ext.		CA	
				L	P		
BOML-2421/ BOML-2031/ BOML-2431	C	Punjabi (Compulsory)/ [1] Basic Punjabi/ [2] Punjab History and Culture	50	40	-	10	3
BOMM-2102	C	Communication skills in English	50	25	15	10	3
BOML-2333	C	Calculus-II	100	80	-	20	3
BOML-2334	C	Matrices and Theory of Equations	100	80	-	20	3
BOML-2335	C	Solid Geometry	100	80	-	20	3
BOML-2336 OR BOMM-2396	C C	[3]Dynamics OR [4]Modern Physics-I	100 100	80 60	- 20	20 20	3 3
BOMM-2137	C	Computer Fundamentals and Introduction to 'C' Language	100	50	30	20	3+3
AECD-2161	AC	[*]Drug Abuse : Problem, Management and Prevention (Compulsory)	50	40	-	10	3
SECM-2502	AC	[*]Moral Education	25	20	-	5	1
		Total Marks	600				

Note:
[1] Special Course in lieu of Punjabi (Compulsory)
[2] Special Course in lieu of Punjabi (Compulsory) for those students who are not domicile of Punjab.
[3] Only those students can opt these courses who have not studied Chemistry at +2 level.
[4] Only those students can opt these courses who have studied Chemistry at +2 level.
[*] Marks of these papers will not be added in total marks. Grades will be provided.

C-Compulsory
AC-Audit Course

Punjabi(Compulsory)

COURSE CODE:BOML-2421

COURSE OUTCOMES

CO1:'ਸਾਹਿਤ ਦੇ ਰੰਗ' ਪੁਸਤਕ ਦੇ ਵਾਰਤਕਭਾਗਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥਵਿਦਿਆਰਥੀਆਂਅੰਦਰਵਾਰਤਕਪ੍ਰਤੀਦਿਲਚਸਪੀ, ਸੂਝ ਨੂੰ ਪੈਦਾਕਰਨਾ ਹੈ।

CO2:ਇਸ ਦਾ ਹੋਰਮਨੋਰਥਭਾਸ਼ਨਕਲਾ ਤੇ ਲਿਖਣਕਲਾ ਦੀ ਨਿਪੁੰਨਤਾਪੈਦਾਕਰਨਾ ਹੈ।

CO3:'ਸਾਹਿਤ ਦੇ ਰੰਗ' ਪੁਸਤਕ ਦੇ ਰੇਖਾਚਿੱਤਰਭਾਗ ਨੂੰ ਸਿਲੇਬਸ ਵਿਚਸ਼ਾਮਿਲਕਰ ਕੇ ਵਿਦਿਆਰਥੀਆਂਅੰਦਰ ਰੇਖਾਚਿਤਰਨੂੰ ਪੜ੍ਹਨ ਦੀ ਰੁਚੀ ਨੂੰ ਪੈਦਾਕਰਨਾ ਹੈ ਤੇ ਇਹਨਾਂਮਹਾਨ ਸ਼ਖਸੀਅਤਾਂ ਦੀ ਸਫਲਤਾਪਿੱਛੇ ਘਾਲੀਆਂਘਾਲਣਾਵਾਂ ਤੋ ਵਾਕਫ਼ ਕਰਵਾਉਂਦਿਆਂਜੀਵਨ ਸੇਧ ਪ੍ਰਦਾਨਕਰਨਾ ਹੈ।

CO4:ਪੈਰ੍ਹਾ ਪੜ੍ਹ ਕੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਉੱਤਰ ਦੇਣ ਦਾ ਮਨੋਰਥਵਿਦਿਆਰਥੀਆਂ ਦੀ ਬੁੱਧੀ ਨੂੰ ਤੀਖਣਕਰਦਿਆਂ ਉਨਾਂ ਦੀ ਲਿਖਣਪ੍ਰਤਿਭਾ ਨੂੰ ਉਜਾਗਰਕਰਨਾ ਹੈ।

CO5:ਸ਼ਬਦਬਣਤਰ ਅਤੇ ਸ਼ਬਦਰਚਨਾਪੜ੍ਹਨਨਾਲਵਿਦਿਆਰਥੀਇਸਦੇ ਮੁੱਢਲੇ ਸੰਕਲਪਾਂ ਨੂੰ ਆਧਾਰਬਣਾ ਕੇ ਇਹਨਾਂ ਸੰਕਲਪਾਂਤੋਂਜਾਣੂ ਹੋਣਗੇ ।

CO6:ਸ਼ਬਦਸ਼੍ਰੇਣੀਆਂਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥਵਿਦਿਆਰਥੀਆਂਅੰਦਰਪੰਜਾਬੀਭਾਸ਼ਾ ਦੀ ਅਮੀਰੀ ਦਾ ਅਤੇ ਬਾਰੀਕੀਆਂਨੂੰ ਸਮਝਣਲਈਵੱਖਰੇ -ਵੱਖਰੇ ਸਿਧਾਂਤਾਂ ਦਾ ਵਿਕਾਸ ਕਰਨਾ ਹੈ।

CO7:ਅਖਾਣ ਅਤੇ ਮੁਹਾਵਰਿਆਂ ਦੀ ਵਰਤੋਂਨਾਲਗੱਲਬਾਤਵਿਚਪਰਪੱਕਤਾਆਉਂਦੀ ਹੈ।ਇਹਵਿਦਿਆਰਥੀਆਂ ਦੀ ਗੱਲਬਾਤਵਿਚਨਿਖਾਰਲਿਆਉਣ ਦਾ ਕੰਮਕਰਨਗੇ।

Punjabi(Compulsory)

COURSE CODE:BOML-2421

ਸਮਾਂ : 3 ਘੰਟੇ   **Maximum Marks: 50**

Theory: 40

 CA: 10

ਪਾਠਕ੍ਰਮ ਅਤੇ ਪਾਠਪੁਸਤਕਾਂ

ਯੂਨਿਟ-**I**

ਯੂਨਿਟ-**I**

ਸਾਹਿਤ ਦੇ ਰੰਗ (ਸੰਪਾ.ਡਾਮਹਿਲਸਿੰਘ),ਭਾਗਦੂਜਾ(ਵਾਰਤਕ),ਰਵੀ ਸਾਹਿਤਪ੍ਰਕਾਸ਼ਨ,ਅੰਮ੍ਰਿਤਸਰ।
(ਲਾਲਬਾਦਸ਼ਾਹ,ਹਾਰਸ਼ਿੰਗਾਰ,ਭੁੰਘੀਆਂਸਿਖਰਾਂ ਲੇਖ ਪਾਠਕ੍ਰਮ ਦਾ ਹਿੱਸਾਨਹੀਂਹਨ)
(ਸਾਰ,ਵਿਸ਼ਾਵਸਤੂ)

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ਯੂਨਿਟ-**II**

ਸਾਹਿਤ ਦੇ ਰੰਗ (ਸੰਪਾ.ਡਾਮਹਿਲਸਿੰਘ),ਭਾਗਦੂਜਾ(ਰੇਖਾਚਿੱਤਰ),ਰਵੀ ਸਾਹਿਤਪ੍ਰਕਾਸ਼ਨ,ਅੰਮ੍ਰਿਤਸਰ।
(ਬਾਤਾਂਮੋਹਨਸਿੰਘਕੀਆਂ, ਗੁਲਾਬੀਕਾਗਜ਼ ਉੱਤੇ ਲਿਖੀਕਵੀਤਾ:ਸੰਤੋਖਸਿੰਘਧੀਰ,ਸਤਿੰਦਰਸਿੰਘ ਨੂਰ :ਸਾਹਿਤ ਦਾ
ਜਥੇਦਾਰਰੇਖਾਚਿੱਤਰਪਾਠਕ੍ਰਮ ਦਾ ਹਿੱਸਾਨਹੀਂਹਨ)
(ਸਾਰ,ਵਿਸ਼ਾਵਸਤੂ)

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ਯੂਨਿਟ-**III**

(ੳ) ਮੁਹਾਵਰੇ

                 (ਅ) ਪੈਰ੍ਹਾਪੜ੍ਹ ਕੇ ਪਸ਼੍ਨਾਂ ਦੇ ਉਤਰ। 08 ਅੰਕ

ਯੂਨਿਟ-**IV**

(ੳ) ਸ਼ਬਦਸ਼੍ਰੇਣੀਆਂ : ਨਾਂਵ,ਪੜਨਾਂਵ,ਕਿਰਿਆ,ਵਿਸ਼ੇਸ਼ਣ
(ਅ) ਸ਼ਬਦਸ਼੍ਰੇਣੀਆਂ: ਕਿਰਿਆਵਿਸ਼ੇਸ਼ਣ,ਸੰਬੰਧਕ,ਯੋਜਕ,ਵਿਸਮਿਕ08 ਅੰਕ

ਅੰਕਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕਲਈਹਿਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨਪੱਤਰ ਦੇ ਚਾਰਯੂਨਿਟਹੋਣਗੇ।ਸੈਕਸ਼ਨA-Dਤੱਕ ਦੇ ਪ੍ਰਸ਼ਨ ਯੂਨਿਟI-IV ਵਿੱਚੋਂ ਪੁੱਛੇ ਜਾਣਗੇ।ਹਰ ਯੂਨਿਟਵਿਚ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।

2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲਪੰਜਪ੍ਰਸ਼ਨਕਰਨੇ ਹਨ।ਹਰ ਯੂਨਿਟਵਿਚੋਂਇਕਪ੍ਰਸ਼ਨਲਾਜ਼ਮੀ ਹੈ।ਪੰਜਵਾਂਪ੍ਰਸ਼ਨਕਿਸੇ ਵੀ ਯੂਨਿਟਵਿਚੋਂਕੀਤਾਜਾ ਸਕਦਾ ਹੈ।

3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 08 ਅੰਕਹਨ।

4. ਪੇਪਰ ਸੈੱਟਕਰਨਵਾਲਾਜੇਕਰਚਾਹੇ ਤਾਂਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡਅੱਗੋਂਵੱਧਤੋਂਵੱਧਚਾਰ ਉਪ ਪ੍ਰਸ਼ਨਾਂਵਿਚਕਰ ਸਕਦਾ ਹੈ।

Basic Punjabi
(In lieu of Punjabi Compulsory)
COURSECODE:BOML 2031

COURSE OUTCOMES

CO1:ਮੁੱਢਲੀਪੰਜਾਬੀਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੰਜਾਬੀਭਾਸ਼ਾ ਨੂੰ ਸਿਖਾਉਣ ਦੀ ਪ੍ਰਕਿਰਿਆਵਿਚਪਾ ਕੇ ਇਕਹੋਰਭਾਸ਼ਾਸਿੱਖਣ ਦੇ ਮੌਕੇ ਪ੍ਰਦਾਨਕਰਨਾ ਹੈ।

CO2:ਇਸ ਵਿਚਵਿਦਿਆਰਥੀ ਨੂੰ ਬਾਰੀਕਬੀਨੀਨਾਲਭਾਸ਼ਾ ਦਾ ਅਧਿਐਨਕਰਵਾਇਆਜਾਵੇਗਾ।

CO3:ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੰਜਾਬੀਸ਼ਬਦਰਚਨਾਤੋਂਜਾਣੂ ਕਰਵਾਇਆਜਾਵੇਗਾ।

CO4:ਸ਼ਬਦਸ਼੍ਰੇਣੀਆਂਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥਵਿਦਿਆਰਥੀਆਂਅੰਦਰਪੰਜਾਬੀਭਾਸ਼ਾ ਦੀ ਅਮੀਰੀ ਦਾ ਅਤੇ ਬਾਰੀਕੀਆਂਨੂੰ ਸਮਝਣਲਈਵੱਖਰੇ -ਵੱਖਰੇ ਸਿਧਾਂਤਾਂ ਦਾ ਵਿਕਾਸ ਕਰਨਾ ਹੈ।
CO5:ਮੁੱਢਲੀਪੰਜਾਬੀਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥਵਿਦਿਆਰਥੀਆਂ ਦਾ ਸ਼ਬਦ ਘੇਰਾ ਵਿਸ਼ਾਲਕਰਨਾ ਹੈ।

CO6:ਵਿਦਿਆਰਥੀਵਾਕ ਦੀ ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਇਸਦੀਬਣਤਰਤੋਂਜਾਣੂ ਹੋਣਗੇ ਅਤੇ ਭਾਸ਼ਾ ਤੇ ਪਕੜਮਜਬੂਤ ਹੋਵੇਗੀ।

CO7:ਪੈਰ੍ਹਾ ਰਚਨਾ ਦਾ ਮਨੋਰਥਵਿਦਿਆਰਥੀਆਂ ਦੀ ਬੁੱਧੀ ਨੂੰ ਤੀਖਣਕਰਦਿਆਂ ਉਨਾਂ ਦੀ ਲਿਖਣਪ੍ਰਤਿਭਾ ਨੂੰ ਉਜਾਗਰਕਰਨਾ ਹੈ।

CO8: ਸੰਖੇਪ ਰਚਨਾਕਰਨਨਾਲਵਿਦਿਆਰਥੀਆਪਣੀਗੱਲ ਨੂੰ ਸੰਖੇਪ ਵਿਚਕਹਿਣ ਦੀ ਜਾਚਸਿੱਖਣਗੇ ਅਤੇ ਇਹਦਿਮਾਗੀਕਸਰਤਵਿਚ ਸਹਾਈਹੋਵੇਗੀ।

CO9:ਘਰੇਲੂ ਅਤੇ ਦਫ਼ਤਰੀਚਿੱਠੀਪੱਤਰਲਿਖਣ ਦਾ ਮਨੋਰਥਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਇਸ ਕਲਾਵਿਚਨਿਪੁੰਨਕਰਨਾ ਹੈ।

CO10:ਅਖਾਣ ਅਤੇ ਮੁਹਾਵਰਿਆਂ ਦੀ ਵਰਤੋਂਨਾਲਗੱਲਬਾਤਵਿਚਪਰਪੱਕਤਾਆਉਂਦੀ ਹੈ।ਇਹਵਿਦਿਆਰਥੀਆਂ ਦੀ ਗੱਲਬਾਤਵਿਚਨਿਖਾਰਲਿਆਉਣ ਦਾ ਕੰਮਕਰਨਗੇ।

Basic Punjabi
(In lieu of Punjabi Compulsory)

COURSE CODE:BOML 2031

ਸਮਾਂ : 3 ਘੰਟੇ **Maximum Marks: 50**

Theory: 40

CA: 10

ਪਾਠਕ੍ਰਮ

ਯੂਨਿਟ-**I**

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

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ਯੂਨਿਟ-**II**

ਪੰਜਾਬੀਵਾਕਬਣਤਰ : ਮੁੱਢਲੀਜਾਣਪਛਾਣ

(ੳ) ਸਾਧਾਰਨਵਾਕ, ਸੰਯੁਕਤ ਵਾਕ ਅਤੇ ਮਿਸ਼ਰਤਵਾਕ (ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ)

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

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ਯੂਨਿਟ-**III**

ਪੈਰ੍ਹਾਰਚਨਾ

ਸੰਖੇਪ ਰਚਨਾ08 ਅੰਕ

ਯੂਨਿਟ-**IV**

ਚਿੱਠੀਪੱਤਰ (ਘਰੇਲੂ ਅਤੇ ਦਫ਼ਤਰੀ)

ਅਖਾਣ ਅਤੇ ਮੁਹਾਵਰੇ 08 ਅੰਕ

ਅੰਕਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕਲਈਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨਪੱਤਰ ਦੇ ਚਾਰ ਯੂਨਿਟਹੋਣਗੇ।ਸੈਕਸ਼ਨA-Dਤੱਕ ਦੇ ਪ੍ਰਸ਼ਨ ਯੂਨਿਟI-IV ਵਿਚੋਂ ਪੁੱਛੇ ਜਾਣਗੇ।ਹਰ ਯੂਨਿਟਵਿਚ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।

2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜਪ੍ਰਸ਼ਨਕਰਨੇ ਹਨ। ਹਰ ਭਾਗਵਿਚੋਂਇਕਪ੍ਰਸ਼ਨਲਾਜ਼ਮੀਹੈ।ਪੰਜਵਾਂਪ੍ਰਸ਼ਨਕਿਸੇ ਵੀਭਾਗਵਿਚੋਂਕੀਤਾਜਾ ਸਕਦਾ ਹੈ।

3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 08 ਅੰਕਹਨ।

4. ਪੇਪਰ ਸੈੱਟਕਰਨਵਾਲਾਜੇਕਰਚਾਹੇ ਤਾਂਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡਅੱਗੋਂਵੱਧਤੋਂਵੱਧਚਾਰ ਉਪ ਪ੍ਰਸ਼ਨਾਂਵਿਚਕਰ ਸਕਦਾ ਹੈ।

Bachelor of Science (Honours) Mathematics Semester–II
Session 2020-21
Course Title: Punjab History & Culture (From Earliest Times to C. 320)
(Special Paper in lieu of Punjabi compulsory)
Course Code :BOML-2431

COURSE OUTCOMES

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

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

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

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

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

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

Bachelor of Science (Honours) Mathematics Semester–II
Session 2020-21
Course Title: Punjab History & Culture (From Earliest Times to C. 320)
(Special Paper in lieu of Punjabi compulsory)
Course Code:BOML-2431

Examination Time: 3 Hours   Max. Marks: 50
                                                                              Theory: 40
                                                                              CA: 10

Instructions for the Paper Setters
The question paper will have 4 units, namely unit I, II, III and IV.
Question paper shall consist of four Units. Candidates shall attempt 5 questions in all, by at least selecting one question from each unit and the 5th question may be attempted from any of the four units. Each question will carry 8 marks.

Unit I
        Punjab under Chandragupta Maurya and Ashoka.
        The Kushans and their Contribution to the Punjab.

Unit II
        The Panjab under the Gupta Emperor.
        The Punjab under the Vardhana Emperors

Unit III
        Political Developments 17th Century to 1000 A.D. (Survey of Political)
        Socio-cultural History of Punjab from 7th to 1000 A.D.

Unit IV
        Development of languages and Literature.
        Development of art & Architecture

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

Bachelor of Science (Honours) Mathematics Semester–II
Session 2020-21
Course Title: Communication Skills in English
Course Code :BOMM-2102

COURSE OUTCOMES

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

CO 1: Enhancement of listening skills with the help of listening exercises based on conversation, news and TV
reports
CO 2: Improvement of speaking skills enabling them to converse in a specific situation
CO 3: Acquisition of knowledge of phonetics which will help them in learning about correct pronunciation as
well as effective speaking
CO 4: The capability to present themselves well in a job interview
CO 5: The ability of Note-Taking to be able to distinguish the main points from the supporting details and the
irrelevant information from the relevant one
CO 6: Speaking skills of the students enabling them to take active part in group discussion and present their
own ideas
CO 7: The capability of narrating events and incidents in a logical sequence

Bachelor of Science (Honours) Mathematics Semester–II
Session 2020-21
Course Title: Communication Skills in English
Course Code :BOMM-2102

Examination Time: 3 Hours   Max. Marks: 50
Theory: 25
Practical:15
CA: 10

Instructions for the paper setters and distribution of marks:

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

Section-A: Two questions with internal choice will be set from Unit I of the syllabus and these questions will be theoretical in nature corresponding to the syllabus of Section-I. Each will carry 5 marks.

Section-B: Two questions with internal choice will be set from Unit II of the syllabus. One will be theoretical and the second will be practical in nature. Each will carry 5 marks.

Section-C: Two questions with internal choice will be set from Unit III of the syllabus and these will be theoretical in nature. Each will carry 5 marks.

Section-D: Two questions with internal choice will be set from Unit IV of the syllabus. One question will be theoretical in nature and the other will be practical in nature (based on phonetic transcription and stress). Each will carry 5 marks.

Important Note:

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

(5 x 5 = 25)

Time: 3 hours   Marks: 15

Course Contents:
1. Oral Presentation with/without audio visual aids.
2. Group Discussion.
3. Listening to any recorded or live material and asking oral questions for listening comprehension.
Questions:
1. Oral Presentation will be of 5 to 7 minutes duration. (Topic can be given in advance or it can be of student's own choice). Use of audio visual aids is desirable.
2. Group discussion comprising 8 to 10 students on a familiar topic. Time for each group will be 15 to 20 minutes.
Note: Oral test will be conducted by external examiner with the help of internal examiner.

Course Contents:

Unit I
Listening Skills: Barriers to listening; effective listening skills; feedback skills
Activities: Listening exercises – Listening to conversation, News and TV reports

Unit II
Attending telephone calls; note taking and note making
Activities: Taking notes on a speech/lecture

Unit III
Speaking and Conversational Skills: Components of a meaningful and easy conversation; understanding the cue

and making appropriate responses; forms of polite speech; asking and providing information on general topics.

Activities: 1) Making conversation and taking turns

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

Unit IV
The study of sounds of English, stress Situation based

Conversation in English Essentials of Spoken English

Activities: Giving Interviews

Recommended Books:

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

Bachelor of Science (Honours) Mathematics Semester–II
Session 2020-21
Course Title: Calculus-II
Course Code: BOML-2333

Course Outcomes

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

CO 1: Demonstrate an understanding of limits and how they are used in sequences and series.

CO 2: Know and describe the converging behaviour of Power series and Taylor series.

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.

Examination Time: 3 Hours   Max. Marks: 100
                                                                                                      Theory:80
                                                                                                      CA:20

Instructions for the 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

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 of series, series of non-negative terms, comparison tests, Cauchys' Integral test. Ratio test, Raabe's test, logarithmic test and Gauss test (all tests with proofs).

Unit-III

Alternating series, absolute and conditional convergence, Leibnitz Theorem, Convergence of Power Series, Taylor Series, Error estimates

Unit-IV

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

Text Books:
1.Malik, S. C. and Savita Arora. Mathematical Analysis, 3rd Edition. New Age International Publishers, 2008.
2.George B. Thomas and Ross L. Finney: Calculus and Analytic Geometry, 9th Edition, Addison Wesley, 1998.

Reference Books:
1. Ghorpade Sudhir R. and Limaye B.V.: A course in calculus and real analysis, Springer, 2006.
2.Kreyszig Erwin. Advanced Engineering Mathematics, 9th edition, Wiley India Edition, 2011.

Bachelor of Science (Honours) Mathematics Semester–II
Session 2020-21
Course Title: Matrices and Theory of Equations
Course Code: BOML-2334

Course Outcomes

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

CO 1: Distinguish between solution of cubic equations and Bi-quadratic equations.

CO 2: Explain how all polynomials can be broken down by using Fundamental Theorem of Algebra to provide structure for abstraction into fields like Modern Algebra.

CO 3: Understand the concept of matrix congruence of skew symmetric matrices and its reduction in real field.

CO 4: Solve system of linear equations and obtain Eigen values, Eigen vectors, minimal and characteristic equation of a matrix and to apply it in advanced dynamics and electric current.

CO 5: To find the relations between the roots and coefficients of general polynomial equation in one variable.

Bachelor of Science (Honours) Mathematics Semester–II
Session 2020-21
Course Title: Matrices and Theory of Equations
Course Code: BOML-2334

Examination Time: 3 Hours   Max. Marks: 100
                                                                                          Theory:80
                                                                                          CA:20

Instructions for the 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
Hermitian,Skew-Hermitian,   Orthogonal   and   Unitary   matrices,   Linear independence/dependence of row and column vectors, Elementary operations on matrices, Inverse of a matrix using Gauss Jordan method, Row rank, column rank and their equivalence, System of linear equations and conditions for consistency

Unit-II
Eigen values, Eigen vectors and the characteristic equation of a matrix, Cayley-Hamilton Theorem and its applications, Polynomials, zeros of a polynomial, division algorithm, greatest common divisor, repeated roots, equal roots, unique factorization of polynomials over fields, The fundamental theorem of algebra.

Unit-III
Relationship between roots and the coefficients, Fundamental theorem of symmetric polynomials (without proof). Evaluation of symmetric functions of roots, Rational roots of polynomials with integral coefficients. Descartes rule of sign.

Unit-IV
Strum's theorem (statement only), Solution of cubic equation using Cardano's method, and biquadratic equation by Descartes method and Ferrari's method.
 Text Book:
   1. Algebra &Trigonometry, Romesh Kumar,Pardeep publication.

Reference Books:
    1. Higher Algebra: A. Kurosh (Moscow Mir Publisher 1972).
    2. Theory of Equations. (Lecture notes for inter University Leadership
       project in Mathematics by R.N. Gupta, Surjeet Singh and R.J. Hans-
       Gill.)
    3. K.B. Datta, Matrix and Linear Algebra. Prentice Hall of India Pvt. Ltd.,
       New Delhi-2000.
    4. P.B. Bhattacharya, S.K. Jain and S.R. Nagpaul. First course in Linear
       Algebra, Wiley Eastern, New Delhi 1983.
    5. Shanti Narayan &P.K.Mittal.A Text Book of Matrices, S.Chand&
       Co. Ltd., New Delhi, Reprint 2002.
    6. J. Gilbert & L. Gilbert . Linear Algebra and Matrix Theory, Academic Press.

Bachelor of Science (Honours) Mathematics Semester–II
Session 2020-21
Course Title: Solid Geometry
Course Code: BOML-2335

Course Outcomes

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

CO 1: Demonstrate the concept of cone, classification of cone, intersection of line and cone, reciprocal cone.

CO 2: Understand the concept of cylinder, enveloping cylinder and its limiting form.

CO 3: Describe the concept of conicoids or quadratic surface, its classification, trace different types of conicoids.

CO 4:   Manage to find surface of revolution and concept of tangent and normal to the conicoid

CO 5: Identify the conicoids and representing it in the form of hyperboloid, ellipsoid, paraboloid.

Bachelor of Science (Honours) Mathematics Semester–II
Session 2020-21
Course Title: Solid Geometry
Course Code: BOML-2335

Examination Time: 3 Hours   Max. Marks: 100
                                                                      Theory:80
                                                                      CA:20

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

Unit-I
Intersection of three planes, condition for three planes to intersect in a point or along a line or to form a prism, change of axes, shift of origin, rotation of axes, sphere and section of a sphere by a plane. Sphere through a given circle. Intersection of a line and sphere.

Unit-II
Tangent and normal, tangent plane, angle of intersection of two spheres and condition of orthogonality, power of a point w.r.t. a sphere, Radical planes, radical axis, radical centre, coaxial family of spheres, limiting points.

Unit-III
Cylinder: Cylinder as surface generated by a line moving parallel to a fixed line and through fixed curve. Right circular cylinder, enveloping cylinder, Cone: homogeneous equation of cone in second degree in x,y,z, Quadratic cone, reciprocal cone, right circular cone, enveloping cones.

Unit-IV
Surface of revolution, Identification of quadratic surfaces: Ellipsoid, hyperboloid, paraboloid.

Text Book
 1. P.K Jain and Khalil Ahmed: A text book of Analytical Geometry of three
 dimensions,   Wiley Eastern Ltd, 1999.

Bachelor of Science (Honours) Mathematics Semester–II
Session 2020-21
Course Title: Dynamics
Course Code: BOML-2336

Course Outcomes

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

CO 1: Identify the basic relations between distance, time, velocity and acceleration.
CO 2: Explain the relationship between forces and motion. Differentiate between balanced and unbalanced forces and Explain how unbalanced force affect motion.
CO 3: Understand Newton's Laws of Motion and Apply the laws to solve many problems.
CO 4: Discuss the motion of particles connected by a string, motion along a smooth inclined plane.
CO 5: Solve different types of problems with Variable Acceleration.
CO 6: Discuss Simple Harmonic Motion and Illustrate it with a variety of examples.
CO 7: Solve Pendulum, Damped and forced Oscillations oscillating system problems.
CO 8: 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.
 CO 9: Define Energy and Identify the different types that exist

Bachelor of Science (Honours) Mathematics Semester–II
Session 2020-21
Course Title: Dynamics
Course Code: BOML-2336

Examination Time: 3 Hours   Max. Marks: 100
                                                             Theory:80
                                                             CA:20

Instructions for the 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 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:
1.S.R.Gupta: A text book of Dynamics
Reference Books:
    1. F. Chorlton: Dynamics.
    2. S.L. Loney: An Elementary Treatise on the Dynamics of a Particle and of Rigid
       Bodies, Cambridge University Press, 1956.

Bachelor of Science (Honours) Mathematics Semester–II
Session 2020-21
Course Title: Modern Physics-I
Course Code: BOMM-2396

Course Outcomes

On passing this course the students will be able to
CO1: understand wave particle duality and use of this duality in studying crystal structure.
CO2: understand radioactivity and use of radio isotopes and radiation.
CO3: understand working and uses of nuclear radiation detectors.
CO4: Know about elementary particles and cosmic rays, their properties and conservation rules.

Bachelor of Science (Honours) Mathematics Semester–II
Session 2020-21
Course Title: Modern Physics-I
Course Code: BOMM-2396

Examination Time: 3 Hours   Max. Marks: 100
                                                                    Theory:60
                                                                    Practical:20
                                                                    CA:20

Instructions for the Paper Setter: Eight questions of equal marks (12 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
Dual Nature of Matter and Radiation: De Brogile's hypothesis, electron diffractionexperiments of Davission and Germer, Wave group and particle velocities, Heisenberg'suncertainty principle, principle of the electron microscope, Diffraction of X-rays fromcrystals, Planck's quantum hypothesis, Bragg's law of determination of structure of simple crystals.

Unit-II
Radioisotopes and their Application: Radioactive decay laws, Uranium and Carbon dating, introduction to α, β and γ decays, Radioisotopes, their production and separation, massspectrograph, uses of radioisotopes in medicine, agriculture and geology Radiation doses and their units, Biological effects of radiation.

Unit-III
Nuclear detection, Ionization detector, proportional counter, Geiger Muller detector, Cloud chamber, Scintillation counter and photographic emulsions as detectors.

Unit-IV
Elementary particles and cosmic rays, Classification of elementary particles and their properties, conservation laws. Antiparticles, Origin and general characterization of cosmic rays (Primary and Secondary)

Suggested Readings:
   1. Concepts of Modern Physics: A. Beiser.
   2. Essentials of Modern Physics: V. Acota and C. L. Grown
   3. Fundamentals of Modern Physics: B.D. Duggal and C. L. Chhabra

COURSE CODE: BOMM-2396(P)
Physics Lab-II
(Practical)

Maximum Marks: 20   Examination Time: 3Hour
Pass Marks: 40%

Instructions to Practical Examiner
Question paper is to be set on the spot jointly by the external and internal examiners. Two copies of the same to be submitted for the record to COE office, KanyaMahaVidyalaya, Jalandhar

General Guidelines for Practical Examination
I. The distribution of marks is as follows: **Marks: 20**
i) One experiment **7 Marks**
ii) Brief Theory **3 Marks**
iii) Viva–Voce **5 Marks**
iv) Record (Practical file) **5 Marks**
II. There will be one sessions of 3 hours duration. The paper will have one session.
Paper will consist of 8 experiments out of which an examinee will mark 6 experiments andone of these is to be allotted by the external examiner.
III. Number of candidates in a group for practical examination should not exceed 12.
IV. In a single group no experiment is to be allotted to more than three examinees in any group.

1. To Study characteristics of a solar cell.

2. To determine the ionization potential of mercury.

3. To study the photoelectric effect and determine the value of Planck's constant.

4. Study of variation of light intensity with distance using photovoltaic cell(Inverse SquareLaw).

5.To determine e/m ratio of electron using long solenoid method.

6. To draw the plateau of a GM counter and find the operating voltage of GM tube.

7. To study the absorption coefficient beta particles in aluminium using GM counter and find the absorption coefficients.

8. Study of C.R.O. as display and measuring device, Study of Sine wave, square wave signals

9. To measure an accessible distance between two points using a sextant.

10.To measure an inaccessible distance between two points using a sextant.

Text and Reference Books:
1. Practical Physics Vol.II, T.S. Bhatia, GursharanKaur, Iqbal Singh, Vishal Publications
2. Practical Physics, C.L. Arora, S. Chand & Co.

Bachelor of Science (Honours) Mathematics Semester–II
Session 2020-21
Course Title: Computer Fundamentals and Introduction to C Language
Course Code: BOMM-2137

Course Outcomes

After passing course the student will be able to:

CO1: Have knowledge of Computer fundamentals

CO2: Gain knowledge on C language basics

CO3: Comprehend control structures and arrays.

Bachelor of Science (Honours) Mathematics Semester–II
Session 2020-21
Course Title: Computer Fundamentals and Introduction to C Language
Course Code: BOMM-2137

Examination Time: (3+3) Hrs.
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 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 : Early computing devices, diverse uses of computers, block diagram, use of CPU and I/O devices, software and hardware, application software and system software, primary and secondary storage devices, Flowcharts and algorithms.

UNIT-II

Introduction to 'C' language: Tokens, Identifiers, Keywords, constants and literals, Data types. Operators: arithmetic, relational and logical, precedence and order of evaluation

UNIT-III

Control Statements: Decision control, loop control and case control. Functions and storage classes.

UNIT-IV

Arrays: initializing an array. one dimensional arrays: array manipulation; searching, insertion, deletion of an element from an array; finding the largest/smallest element in array; two dimensional arrays, addition/multiplication of two matrices, program to transpose a square matrix; null terminated strings as array of characters.

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. Rachhpal Singh, Gurvinder Singh, Windows based computer courses, Kalyani Publishers (2011).
4. YashwantKanetkar, Let us C, BPB Publications (2020), 17th edition.
5. R.S. Salari, Application Programming in C, Khanna Book Publishing (2012), 4th edition.
6. Anshuman Sharma, Learn programming in C, Lakhanpal Publishers (2016), 7th edition.

Bachelor of Science (Honours) Mathematics Semester–II
Session 2020-21
Course Title: Drug Abuse: Problem, Management and Prevention (Compulsory)
PROBLEM OF DRUG ABUSE
Course Code: AECD-2161

Course Outcomes:

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

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

CO3. Main focus of substance abuse education is teaching individuals about drug and alcohal abuse and how to avoid,stop and get help for substance use disorder.

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

Bachelor of Science (Honours) Mathematics Semester–II
Session 2020-21
Course Title: Drug Abuse: Problem, Management and Prevention (Compulsory)
PROBLEM OF DRUG ABUSE
Course Code: AECD-2161

Examination Time: 3 Hrs

Max.
Marks:50 Theory: 40
CA: 10

Instructions for the Paper Setter
Eight questions of equal marks(8 marks each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). 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
Prevention of Drug abuse: Role of family: Parent child relationship, Family support, Supervision, Shaping values, Active Scrutiny.

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

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

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

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: Sage Publications.
4. Kapoor. T. (1985) *Drug epidemic among Indian Youth*, New Delhi: Mittal Pub.
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.

Course title: Moral Education
Course duration: 30 hours
Course code: SECM-2502

Course Objectives:
➢ To sensitize students about the role and importance of human values and ethics in personal, social and professional life.
➢ To enable students to understand and appreciate ethical concerns relevant to modern lives.
➢ To prepare a foundation for appearing in various competitive examinations.
➢ To sensitize the students about the current issues and events of national and international importance.
➢ To highlight plausible implications of ethical human conduct, trustful and mutually fulfilling human behaviour and mutually enriching interaction with nature.

Course Contents:
- Introduction to Moral Education
- Need , content and purpose
- Vedic values
- Character building

The Self and You
- Understanding the Self −Self awareness, fighting the five evils (lust, anger, attachment, ego and greed), Self growth.
- Personal ethics
- Aspiration v/s ambition, self- seeking v/s selflessness
- Physical and mental health

The Family and You
- Importance of family- the basic unit of human interaction.
- Generation gap
- Relationship with siblings and elders

The Society and You
- Social responsibility
- Our rights and duties
- Civic sense
- Opposite sex relations
- Globalization and IT boom – cellphone menace
- Peer pressure
- Gender issues

The Nation and You
- International peace and brotherhood
- Saving the environment
- Communal harmony, Tolerance, Understanding of Cultures
- Respect for Martyrs
- National Pride

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

Scheme and Curriculum of Examinations of Three-Year Degree Programme
Bachelor of Science (Honours) Mathematics
Semester-III
Session: 2020-21

Sr. No.	Course Code	Course type	Course Title	Max.Marks				Examination Time in hours
				Total	Ext.		CA	
					L	P		
1	BOML-3331	C	Calculus III	100	80	-	20	3
2	BOML-3332	C	Ordinary Differential Equations and Special Functions	100	80	-	20	3
3	BOML-3333	C	Probability Theory	100	80	-	20	3
4	BOML-3334	C	Linear Algebra	100	80	-	20	3
5	BOMM-3135	C	Python Programming	100	50	30	20	3
6	AECE-3221	AECC	[1] Environmental Studies (Compulsory)	100	60	20	20	3
7	SECG-3532	AC	[1] Gender Sensitization	25	10	*10*	*5*	1
	Total Marks			500				

Note:

C-Compulsory
AECC-Ability Enhancement Compulsory Course
AC-Audit Course

[1] Marks of these papers will not be added in total marks and only grades will be provided

Bachelor of Science (Honours) Mathematics
Semester–III
Session- 2020-21
Course Title: Calculus III
Course Code: BOML-3331

Course Outcomes

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

CO1: Evaluate Partial derivatives and recognize the various notations used r partial derivatives.
CO2: To find optimization value for a function of several variables
 CO3: Apply double integration technique in finding the area of a region.
 CO4: Recognize the appropriate tools of calculus to solve applied problems.
 CO5: Analyze functions using limit, continuity,derivative and integration

Bachelor of Science (Honours) Mathematics
Semester–III
Session- 2020-21
Course Title: Calculus III
Course Code: BOML-3331

Examination Time: 3 Hours   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 questions 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, Homogenous 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 Multipler method, Higher dimensional analogues of Lagrange's Mean value Theorem and Taylor's theorem for functions of twovariables.

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, 9th Edition, Addison Wesley, 1998. (Scope as inCh.12-13)

Reference Books:

1. Kreyszig, E.: Advanced Engineering Mathematics.
2. Ghorpade, Sudhir R., Limaye, BalmohanV. :A Course in Calculus and Real Analysis.

Bachelor of Science (Honours) Mathematics

Semester–III

Session- 2020 -21

Course Title: Ordinary Differential Equations and Special Functions

Course Code: BOML-3332

Course Outcomes

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

CO1: Demonstrate the concept Of Linear Differential equation with constant
and variable coefficients

CO2: Apply in wide variety of disciplines Physics, Biology, Economics

CO3: Manage to solve the problems related to series solution of Differential equation
by power series method.

CO4: Understand the Bessel function and their application to physical world

CO5: Understand the Legendre function and their application to physical world

Bachelor of Science (Honours) Mathematics
Semester–III
Session- 2020-21
Course Title: Ordinary Differential Equations and Special Functions
Course Code: BOML-3332

Examination Time:3Hours   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 fourSections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from 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 constantcoefficients.
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 Raisinghania: Ordinary and Partial Differential Equations. S Chand Publication

Reference Books:

1.D.A. Murray: Introductory Course in Differential Equations. Orient
Longman (India), 1967.
2.G.F. Simmons: Differential Equations, Tata McGraw Hill,1972.
3.E.A. Codington: An Introduction to Ordinary Differential Equations,
Prentice Hall of India,1961.
4.F.D. Rainville: SpecialFunctions

Bachelor of Science (Honours) Mathematics
Semester–III
Session- 2020-21
Course Title: Probability Theory
Course Code: BOML-3333
Course Outcomes

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

CO1: Find the probability of single event and compound and complimentary event

CO2: Contrast discrete and continuous random variable

CO3: Apply general Properties of expectation and variance

CO4: Differentiate between the events with Binomial and Poisson distribution

CO5: Apply Normal distribution in real time applications

CO6: Translate the real world problem into probability based mathematical model

CO7: Identify the characteristics of different continuous and discrete distribution

CO8: Use different distributions to solve practical problems

Bachelor of Science (Honours) Mathematics
Semester–III

Session 2020-21
Course Title: Probability Theory
Course Code: BOML-3333

Examination Time:3Hours   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. 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
(Scope in Chapters 2-8).

Reference Book:
 A.M. Mood , F.A. Graybill , D.C. Boes: Introduction to the Theory of Statistics

Bachelor of Science (Honours) Mathematics
Semester–III

Session- 2020-21
Course Title: Linear Algebra
Course Code: BOML-3334

Course Outcomes

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

CO1: To understand the concepts of base and dimension of vector space.

CO2: To get familiar with row and column space of a matrix.

CO3: To understand matrix representation of a linear transformation

CO4: To find kernel and image spaces of a linear transformation.

Bachelor of Science (Honours) Mathematics
Semester-III
Session 2020-21
Course Title: Linear Algebra
Course Code: BOML-3334

Examination Time: 3 Hours
Max. Marks: 100
Theory: 80
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 listof 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 aspanning 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 andcolumn rank, normal form for a matrix, invertible matrix as a product of elementary matrices,system of linear equations

Text Books:
1. Linear Algebra Done Rght by Sheldon Axler, Springer
2. Linear Algebra by Friedberg, S.H. Insel, A.J., Spence, L.E., PHI Learning Pvt. Ltd.
3. Linear Algebra by Vivek Sahai, Vikas Bist., Narosa Publishing House Pvt. Ltd.

Bachelor of Science (Honours) Mathematics
Semester–III
Session- 2020-21
Course Title: Python Programming
Course Code: BOMM-3135

Course Outcome
After passing the course the students will be able to:
CO 1: Understand formulation of algorithm and programs for problem solving.
CO 2: Gain understanding of various programming constructs like data types, operators, string processing and controlstructures.
CO 3: Have knowledge of object oriented programming paradigm
CO 4: Have understanding of file handling, exception handling and SQLites database connectivity in python.

Bachelor of Science (Honours) Mathematics
Semester–III
Session- 2020-21
Course Title: Python Programming
Course Code: BOMM-3135

Examination Time:(3+3)Hours   Max. Marks:100
                                                                      Theory: 50.
                                                                      Practical:30
                                                                      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 Section.

UNIT I
Introduction to python and Setting up the Python development Environment, Basic syntax, interactive shell, editing, saving, and running a script, Concept of data types, Declaring and using Numeric data types: 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 In operators.

UNIT II
String Handling, Unicode strings, Strings Manipulation: - compare strings, concatenation of strings, slicing strings in python, converting strings to numbers and vice versa. Dictionaries Control statements: if-else, Nested If-Else, Loops (for, while) Loop manipulation using pass, continue, break and 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, Programming using functions, modules and external packages

UNIT IV
Files: manipulating files and directories, os and sys modules; text files: reading/writing text and numbers from/to a file; creating and reading a formatted file (csv or tab separated) understanding read functions, read(), readline() and readlines() Understanding write functions, write() and writelines() Manipulating file pointer using seek. Introduction to graphics.

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.

Bachelor of Science (Honours) Mathematics
Semester–III

Session- 2020 -21

Course Title: Environmental Studies
Course Code:AECE-3221

Course Outcomes

After passing this course the student will be able to:

CO1: Demonstrate and Understand the ecological relationships between organisms and their environment.

CO2: Present an overview of diversity of life forms in an ecosystem.

CO3: Explain and identify the role of the organism in energy transfers.

CO4: Understand the Environmental Pollution and their management.

CO5: Understanding and awareness for wildlife conservation.

CO6: Knowledge of conservation of threatened animal species

Course Title: ENVIRONMENTAL STUDIES (Compulsory Paper)
Course Code: AECE-3221

Instructions for Paper Setter

The Question Paper shall carry 60 Marks

The structure of question paper being

Part-A, Short answer pattern – 20 marks

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

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

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

Unit-I
The multidisciplinary nature of environmental studies
Definition, scope and importance, Need for public awareness

Unit-II
Natural Resources: Renewable and non-renewable resources:
Natural resources and associated problems.
- Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribalpeople.
- Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits andproblems.
- Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, casestudies.
- Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.

- Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, casestudies.
- Land resources: Land as a resource, land degradation, man induced landslides, soil erosion anddesertification.
  - Role of an individual in conservation of naturalresources.
  - Equitable use of resources for sustainablelifestyles.

Unit-III

Ecosystems
- Concept of an ecosystem.
- Structure and function of anecosystem
- Producers, consumers anddecomposers
- Energy flow in theecosystem
- Ecologicalsuccession
- Food chains, food webs and ecologicalpyramids
- Introduction, types, characteristic features, structure and function of the following ecosystem: Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, oceanestuaries)

Unit-IV

Biodiversity and its conservation
- Introduction – Definition: genetic, species and ecosystemdiversity
- Biogeographical classification ofIndia
- Value of biodiversity: consumptive use, productive use, social, ethical aesthetic and optionvalues
- Biodiversity at global, national and locallevels
- India as a mega-diversitynation
- Hot-spots ofbiodiversity
- Threats to biodiversity: habitat loss, poaching of wildlife, man wildlifeconflicts
- Endangered and endemic species ofIndia
- Conservation of biodiversity: In-situ and Ex-situ conservation ofbiodiversity

Unit-V

Environmental Pollution
  Definition
- Causes, effects and control measures of Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclearpollution
- Solid waste management: Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention ofpollution
- Pollution casestudies
- Disaster management: floods, earthquake, cyclone andlandslides

Social Issues and the Environment

Unit-VI

- From unsustainable to sustainabledevelopment
- Urban problems and related toenergy
- Water conservation, rain water harvesting, watershedmanagement
- Resettlement and rehabilitation of people; its problems and concerns. Casestudies.
- Environmental ethics: Issues and possiblesolutions
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Casestudies.
- Wastelandreclamation
- Consumerism and wasteproducts
- Environmental Protection Act,1986
- Air (Prevention and Control of Pollution) Act,1981
- Water (Prevention and control of Pollution) Act,1974
- Wildlife ProtectionAct
- Forest ConservationAct
- Issues involved in enforcement of environmentallegislation
- Publicawareness

Unit-VII

Human Population and the Environment
- Population growth, variation amongnations
- Population explosion – Family WelfareProgrammes
- Environment and humanhealth
- HumanRights
- ValueEducation
- HIV /AIDS
- Women and ChildWelfare
- Role of Information Technology inEnvironment and Human Health
- CaseStudies

Field Work
- Visit to a local area to document environmental assetsriver/forest/grassland/hill/mountain
- Visit to a local polluted site – Urban / Rural / Industrial /Agricultural
- Study of common plants, insects,birds
- Study of simple ecosystems-pond, river, hill slopes,etc

Books Recommended:
1.Bharucha, E. 2005. Textbook of Environmental Studies, Universities Press,Hyderabad.
2.Down to Earth, Centre for Science and Environment, NewDelhi.
3.Heywood, V.H. &Waston, R.T. 1995. Global Biodiversity Assessment, 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. Perspective in Environmental Studies, New Age International (P) Ltd, NewDelhi.

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

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

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

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

10.Subramanian, V. 2002. A Text Book in Environmental Sciences, NarosaPublishing House, NewDelhi.

Bachelor of Science (Honours) Mathematics
Semester–III

Session- 2020-21
Course Title: GENDER SENSITIZATION

Course Duration: 30 hours
Course intended for: Semester III students of undergraduate degree programmes of all streams.
Course Credits: 2
Course Code: SECG 3532
The program has been designed to inculcate value of gender equality among students so that they can identify the areas of gender discrimination and raise their voice against gender discrimination and work towards making the society gender neutral.
INSTRUCTIONAL OBJECTIVES:
1. To sensitize students about gender rights, gender roles and relations.

2. To make students aware and capable of realizing their true potential.

3. To ensure equal participation of men and women in all economic, social and political processes.

4. To develop gender prospective to transform the mind set of society.

CURRICULUM
Course Code: SECG3531   **Course Credits: 2**   **Total contact hours: 30**

MODULE	TITLE	HOURS
1	**Introduction and Initial Assessment**	2 Hrs
2	**Workshop in Self Defense Techniques**	10 Hrs
3	**Open House (An Inter-active Session)**	2 Hrs
4 I	**Cultural Roles and Gender Sensitivity**	2 Hrs
4II	**Gender Concerns in Leadership and Political Participation**	2 Hrs
4 III	**Gender Dimensions in Economic Participation and wage Gap**	2 Hrs
4 IV	**Gender Rights: Constitutional Rights & Legal Rights**	2 Hrs
4 V	**Social problems and Ethos : Gender Prospective with focus on Indian Society**	2 Hrs

4VI	Gender Issues and Health care system	2 Hrs
4VII	Champions of Gender Equality from Punjab Or Voices On Gender Equality From Punjab	2 Hrs
5	Final Assessment Feedback and Closure	2 Hrs

EXAMINATION
- **Total Marks: 25 (Workshop in Self Defense Techniques :10 marks ; Multiple Choice Quiz. / Project – 10 marks ; Internal Assessment: 5)**

- **Internal Assessment: 5 Marks (Assessment Feedback : 3 marks; Attendance : 2 marks)**

- **Total marks: 25 converted to grade for final result**

- **Grading system:**

90% marks & above: A grade
80% - 89% marks   : B grade
70% - 79% marks   : C grade
60% - 69% marks   : D grade
50% - 59% marks   : E grade
Below 50% marks   : F grade (Fail - must give the exam again)

FACULTY OF SCIENCES

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

Scheme and Curriculum of Examinations of Three-Year Degree Programme
Bachelor of Science (Honours) Mathematics Semester-IV
Session: 2020-21

Bachelor of Science (Honours) Mathematics Semester-IV							
Course Code	Course Type	Course Title	Max.Marks				Examination time in hours
			Total	Ext.		CA	
				L	P		
BOML-4331	C	Vector calculus	100	80	--	20	3
BOML-4332	C	Partial Differential Equations	100	80	--	20	3
BOML-4333	C	Group Theory	100	80	--	20	3
BOMM-4334	C	Statistical Methods	100	50	30	20	3+3
BOMM-4135	C	Foundation of Statistical Computing	100	50	30	20	3+3
SECS-4522	AC	*Social Outreach	25	20	-	5	No Exam
		Total Marks	500				

Note:

C Compulsory
AC Audit Course

*Marks of these papers will not be added in total marks and only grades will be provided.

Bachelor of Science (Honours) Mathematics Semester-IV
Session: 2020-21
Course Title : Vector Calculus
Course Code:BOML-4331
Course Outcomes

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

CO 1: Apply the concepts of line integral, double integral and triple integral in solving engineering problems.

CO 2: Understand the physical concept of vectors.

CO 3: Perform basic calculus on vector-valued functions.

CO 4: Solve physical problems based on calculus using vector-valued functions.

CO 5: Calculate the unit tangent vector, the unit normal vector and the unit binomial vector at a point on a space curve described by a vector-valued position function.

CO 6: Find the values of gradient, divergence and curl operator of given vectors.

CO 7: Find the application of Gauss theorem, Green's theorem and Stokes's theorem in real life problems.

Bachelor of Science (Honours) Mathematics Semester-IV
Session: 2020-21
Course Title : Vector Calculus
Course Code: BOML-4331

Examination Time: 3 Hours   Max. Marks: 100
                                                             Theory : 80
                                                             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.

UnitI
 Geometry of Rn: dot product and its geometry, norm, angle between two vectors, Cauchy Schwarz
inequality, the triangle inequality, cross product and its geometric interpretation, Open and Closed
sets in Rn, Review of calculus of several variables.

UnitII
Differentiation in several variables:, Derivative as Jacobian matrix, directional derivativeand the
gradient, tangent plane to a surface, the inverse function theorem and the implicit function theorem
(without proofs) and their applications, Newton's method

UnitIII
Vector-valued functions: Scalar and Vector fields, gradient fields and potentials, flow
line,gradient, divergence, curl and the del operator, Orthogonal curvilinear coordinates

Line integrals: Scalar and vector line integrals, work, line integrals along curves, Green'stheorem
and divergence theorem in plane, Conservative vector fields, gradient fields and line integrals, scalar
potentials
UnitIV
Surface Integrals: Parameterized surfaces, piecewise smooth parameterized surface and its area,
scalar and vector surface integrals with interpretations, Stokes theorem
Volume Integrals: Volume integrals, Gauss Divergence Theorem, Stoke's theorem from the
Divergence theorem, Meaning of divergence and curl

    Text Books:

1. George B. Thomas and Ross L. Finney: Calculus and Analytic Geometry, 9th Edition, Addison Wesley, 1998. (Scope as in Ch 11, 14)
2. Susan Jane Colley, Vector Calculus (Fourth Ed.), Pearson Education, Inc, 2012 (Scope as in Ch. 1-3, 6-7)

Bachelor of Science (Honours) Mathematics Semester-IV
Session: 2020-21
Course Title:Partial Differential Equations
Course Code: BOML- 4332
Course Outcomes

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

CO 1: Apply a range of techniques to find solutions of partial differential equations.
CO 2: Understand basic properties of standard partial differential equations.
CO 3:Perform various methods to solve homogeneous and non-homogeneous partial differential equations and apply these methods in solving some physical problems.
CO 4: Formulate, classify and transform partial differential equations into canonical form.
CO 5:Determine the existence, uniqueness, and well-posedness of solution of PDEs
CO 6:Use computational tools to solve problems and applications of Partial Differential Equations.
CO 7:Apply in wide variety of disciplines Physics, Biology and Economics

Bachelor of Science (Honours) Mathematics Semester-IV
Session: 2020-21
Course Title: Partial Differential Equations
Course Code: BOML- 4332

Examination Time: 3 Hours   Max. Marks: 100
                        Theory : 80
   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, Langrange'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:
1.MD Raisinghania: Ordinary and Partial Differential Equations, S Chand Publishing

Reference Books:
1. Piaggio: Differential equations.
2. Sneddon, I.N.: Elements of partial differential equations.

Bachelor of Science (Honours) Mathematics Semester-IV
Session: 2020-21
Course Title :Group Theory
Course Code:BOML - 4333
Course Outcomes

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

CO 1: Demonstrate understanding and the ability to work within various algebraic structures.
CO 2: Demonstrate understanding of the importance of algebraic properties with regard to working with various number systems.
CO 3: Effectively write abstract mathematical proofs in a clear and logical manner.
CO 4: Explain the fundamental concepts of groups and subgroups.
CO 5: Use Lagrange's theorem to analyze the cyclic subgroups of a group.
CO 6: Explain the significance of the notion of a normal subgroup, quotient group, cyclic group and simple group.
CO 7: Use the concepts of homomorphism, isomorphism and automorphism.
CO 8: State isomorphism theorems and use them to work with permutation, cyclic and normal groups.
CO 9: Describe the structure of finite abelian group.
CO 10: Use Cauchy's theorems to describe the structures of certain abelion groups.

Bachelor of Science (Honours) Mathematics Semester-IV
Session: 2020-21
Course Title : Group Theory
Course Code:BOML - 4333

Insructions 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 commonMultiple, Fundamental Theorem of Arithmetic, Integers modulo n, binary relations, Equivalence relations, Equivalence classes partition.

Unit-II
Symmetries of a square, dihedral groups, definition & examples of groups including permutation groups and quartenion groups (through matrices). Elementary properties of groups, uniqueness of the identity, cancellation, Uniqueness of inverses, subgroups, examples of subgroups, tests for a set to be a subgroup, centralize, normalizer, center of a group.

Unit-III
Product of two subgroups, cyclic groups, properties of cyclic groups, generators of cyclic groups, fundamental theorem of cyclic group, permutation groups, cyclic notation for permutations, permutation as products of disjoint cycles, order of a permutation, commutness of disjoint cycles, permutation as a product of 2-cycles, even and odd permutations, alternating group.

Unit-IV
Properties of cosets, Lagrange's theorem and consequences including fermat's little theorem, normal subgroups, factor groups, Cauchy's Theorem for finite abelian groups, External directproduct of a finite number of groups, Groups homomorphism, First, second and third isomorphism theorems

Text Book:
1.Bhattacharya, P.B., Jain. S.K., Nagpaul, S.R.: Basic Abstract Algebra,
   Cambridge University Press.

Reference Books:

1. Gallian, Joseph: Contemporary Abstract Algebra, Narosa Publishing House
2. Burton, David: Elementary Number Theory, McGraw Hill
3. Surjeet Singh, Qazi Zameerudin: Modren Algebra, Vikas Publishing House Pvt. Ltd.

Bachelor of Science (Honours) Mathematics Semester-IV
Session: 2020-21
Course Title:Statistical Methods
Course Code:BOMM-4334
Course Outcomes

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

CO 1: Understand the concept ofcorrelation among the data and its physical significances.

CO 2: State and apply the techniques to identify correlation between given set of data.

CO 3: Fit regression curves depicting relation among the physical quantities.

CO 4: Understand the logic and framework of the inference of hypothesis testing.

CO 5: Understand hypothesis testing as making an argument

CO 6: Interpret the results of the hypothesis test.

Bachelor of Science (Honours) Mathematics Semester-IV
Session: 2020-21
Course Title :Statistical Methods
Course Code:BOMM-4334

Examination Time: (3+3) Hours   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 Books:
1. Gupta, S.C. and Kapoor, V.K.: Fundamentals of Mathematical Statistics
2. Hogg R.V. ,Mckean, J.W. and Craig A.T.: Introduction to Mathematical Statistics

Bachelor of Science (Honours) Mathematics Semester-IV
Session: 2020-21
Course Title: Foundation of Statistical Computing
Course Code: BOMM-4135

Course Outcomes:

After passing this course the student will be able to:

CO1: Comprehend basic constructs like control statements, string functions, array, list, etc. in R programming.

CO2: Create, operate and manage data frames.

CO3: Apply R programming from a statistical perspective.

CO4: Simulate various descriptive and analytical algorithms using R language.

Bachelor of Science (Honours) Mathematics Semester-IV
Session: 2020-21
Course Title: Foundation of Statistical Computing
Course Code: BOMM-4135

Examination Time: (3+3) Hrs.   Max. Marks: 100
                                                                   Theory: 50
                                                                   Practical: 30
                                                                   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

Statistical Computing: Introduction, Role of Programming and Statistical Software. Data Statistics:
Sampling, Cumulative statistics, Statistics for Data frames, matrix objects and lists.

Introduction to R, Help functions in R, Vectors, Common Vector Operations, Using all and any
function, subletting of vector. Creating matrices, Matrix operations, Applying Functions to Matrix
Rows and Columns, Adding and deleting rows and columns.

UNIT - II

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

Creating Data Frames – Matrix-like operations in frames , Merging 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.
Using Analytical Algorithms (KNN, K-means,Naive Bayes) for Predictive analysis and Modelling.

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 Rakshit, 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

SOCIAL OUTREACH
AUDIT COURSE (Value Based)

Course Title: Social Outreach Programme

Course Duration: 30 hours

Course intended for: Semester IV students of undergraduate degree programmes of all streams.
Course Credits: 2

Course Code: SECS- 4522

Course Description:-

The Social outreach programme proposes to equip the students for community upliftment work. It will strive to prepare citizens who will make a marked difference in the society. The students will be provided with numerous opportunities to build their knowledge and skills on the fundamental values of social fairness and compassion.

             The programme will focus on integrating academic work with community services. It will equip the students to learn to connect knowledge gained in classroom with real life situation by getting hands on experience through community services. It will also foster the development of civic responsibility. The students will get an opportunity to

- Engage in social service.
- Reflect upon larger issues that affect communities through readings and discussions.
- Integrate academic learning and community engagement through practical field work.
- Develop awareness, knowledge and skills for working with diverse groups in the society.

Expectations:-
The students are expected to be actively engaged in working on any of the projects listed below as volunteers. Evaluation will be based on consistency, commitment and results achieved in areas taken up.

List of Projects under Social Outreach Programmes :

- Working as Motivators under the Swatch Bharat Campaign of the Government,
- Literacy drive : (i). Teaching in the Charitable School Adopted by the College
                        (ii). Work in projects undertaken by Rotary Club of Jalandhar .
    for inducting students in child labour Schools.
- Enroll as NSS Volunteers for various projects (Cleanliness, Women health awareness)
- Counseling camps in villages

- Tree plantation (i) Maintaining the trees in the park adopted by the college .
  in Vikas Puri, Jalandhar
  > (ii)Enroll for projects undertaken by JCI Jalandhar City
- Enroll in the Gandhian Studies Centre as student Volunteer for surveys in villages.
- Women Empowerment Programmes in collaboration with JCI Jalandhar Grace
- Generating awareness on voting among the youth.
- Drug Abuse (Generate awareness among the school children)
- Environment Awareness(Reduce Pollution)
- Old Age Homes/Orphanages
- Operating the Empathy Corner outside the college gate.
- Disaster Management/Relief Work

Evaluation /Assessment:
In the beginning of the semester the students after enrolling for one of the Projects offered will be given deadlines for the project.

- Students will be responsible for getting their hours of service recorded with the faculty and also map the progress of their subjects (children, old people, saplings etc.) .
- The respective departments will monitor the involvement of their students
- The students will submit a report of the project taken up by them.
- There will be no written examination, The students will be given grade on the basis of evaluation of the projects by an evaluation committee, comprising of the Dean of the respective streams, Head and two teachers of the concerned department.