

# **FACULTY OF SCIENCES**

## **SYLLABUS of BACHELOR OF SCIENCE (MEDICAL) (Semester I-II)**

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

**Session: 2023-24**



**The Heritage Institution  
KANYA MAHA VIDYALAYA  
JALANDHAR (AUTONOMOUS)**

**Kanya Maha Vidyalaya, Jalandhar (Autonomous)**  
**CURRICULUM AND SCHEME OF EXAMINATIONS OF THREE-YEAR DEGREE PROGRAM (2023-24)**

<b>Bachelor of Science (Medical) Semester - I</b>														
Course Code	Course Name	Course Type	Credits (L-T-P)	Total Credits	Marks				Examination time (Hours)					
					Total	Ext.		CA						
						L	P							
BSML-1421	Punjabi (Compulsory)	C	4-0-0	4	100	80	-	20	3					
BSML-1031	<sup>1</sup> Basic Punjabi													
BSML-1431	<sup>2</sup> Punjab History & Culture													
BSML-1212	English (Compulsory)	C	4-0-0	4	100	80	-	20	3					
BSMM-1483	(I) Zoology (Cell Biology)	E	2-0-0	7	50	40	-	10	3					
	(II) Zoology (Biodiversity-I)		3-0-0							75	60	-	15	3
	(P) Zoology (PRACTICAL-I - Related to Cell Biology & Biodiversity-I)		0-0-2							50	-	40	10	3
BSMM-1343	(I) Microbiology (Fundamentals of Microbiology)	E	4-0-0	5	100	60	-	20	3					
	(P) Microbiology (PRACTICAL Related to Fundamentals of Microbiology)		0-0-1							-	20	3		
BSMM-1084	(I) Chemistry (Inorganic Chemistry)	C	2-0-0	7	50	40	-	10	3					
	(II) Chemistry (Organic Chemistry)		3-0-0							75	60	-	15	3
	(P) Chemistry (Practical)		0-0-2							50	-	40	10	3.5
BSMM-1075	(I) Botany (Diversity of Microbes)	E	2-0-0	7	50	40	-	10	3					
	(II) Botany (Diversity of Cryptogams)		3-0-0							75	60	-	15	3
	(P) Botany (PRACTICAL-I - Based on Diversity of Microbes & Diversity of Cryptogams)		0-0-2							50	-	40	10	3
BSMM-1255	(I) Food Science and quality control (Vocational) (Food Chemistry and Nutrition)	E	4-0-0	5	100	60	-	20	3					
	(P) Food Science and quality control (Vocational) (PRACTICAL- Related to Food Chemistry and Nutrition)		0-0-1							-	20	3		
AECD-1161	*Drug Abuse: Problem, Management and Prevention (Compulsory)	C	2-0-0	2	50	40		10	3					
SECF-1492	**Foundation Programme	AC	2-0-0	2	25	20	-	5	2					
<b>Total</b>														

C-Compulsory

E-Elective

AC- Audit Course

<sup>1</sup>Special paper in lieu of Punjabi (Compulsory).

<sup>2</sup> Special paper in lieu of Punjabi (Compulsory) for those students who are not domicile of Punjab.

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

\*\* Ability enhancement compulsory course

**Kanya Maha Vidyalaya, Jalandhar (Autonomous)**  
**CURRICULUM AND SCHEME OF EXAMINATIONS OF THREE-YEAR DEGREE PROGRAM (2023-24)**

<b>Bachelor of Science (Medical) Semester - II</b>														
Course Code	Course Name	Course Type	Credits	Total Credits	Marks				Examination time (Hours)					
					Total	Ext.		CA						
						L	P							
BSML-2421	Punjabi (Compulsory)	C	4-0-0	4	100	80	-	20	3					
BSML-2031	<sup>1</sup> Basic Punjabi													
BSML-2431	<sup>2</sup> Punjab History & Culture													
BSML-2212	English (Compulsory)	C	4-0-0	4	100	80	-	20	3					
BSMM-1483	(I) <b>Zoology</b> (Ecology)	E	2-0-0	7	50	40		10	3					
	(II) <b>Zoology</b> (Biodiversity-II)		3-0-0		75	60		15	3					
	(P) <b>Zoology</b> (Practical -II (Related to Ecology and Biodiversity- II)		0-0-2		50	-	40	10	3					
BSMM-1343	(I) <b>Microbiology</b> (Basic Food Microbiology)	E	4-0-0	5	100	60	-	20	3					
	(P) <b>Microbiology</b> (Practical-Basic Food Microbiology)		0-0-1			-	20		3					
BSMM-2084	(I) <b>Chemistry</b> (Inorganic Chemistry)	C	3-0-0	7	75	60	-	15	3					
	(II) <b>Chemistry</b> (Physical Chemistry)		2-0-0							50	40	-	10	3
	(P) <b>Chemistry</b> (Practical)		0-0-2							50	-	40	10	3.5
BSMM-2075	(I) <b>Botany</b> (Cell Biology)	E	2-0-0	7	50	40	-	10	3					
	(II) <b>Botany</b> (Genetics)		3-0-0							75	60	-	15	3
	(P) <b>Botany</b> (Practical- based on Cell Biology and Genetics)		0-0-2							50	-	40	10	3
BSMM-2255	(I) <b>Food Science and quality control (Vocational)</b> (Food Plant Hygiene and Sanitation)	E	4-0-0	5	100	60	-	20	3					
	(P) <b>Food Science and quality control (Vocational)</b> Practical- Related to Food Plant Hygiene and Sanitation		0-0-1			-	20		3					
SECM-2502	<b>**Moral Education Programme</b>	AC	2-0-0	2	25	20	-	5	2					
<b>Total</b>														

C-Compulsory

E- Elective

AC- Audit Course

<sup>1</sup>Special paper in lieu of Punjabi (Compulsory).

<sup>2</sup> Special paper in lieu of Punjabi (Compulsory) for those students who are not domicile of Punjab.

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

\*\* Ability enhancement compulsory course

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER I (SESSION 2023-24)**

**PUNJABI**

**Course Title: Punjabi (Compulsory)**

**Course Code- BSML -1421**

**COURSE OUTCOMES**

- CO1 : ‘ਦੋ ਰੰਗ’(ਕਵਿਤਾ ਭਾਗ) ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਕਵਿਤਾ ਪ੍ਰਤੀ ਦਿਲਚਸਪੀ, ਸੂਝ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ ਤਾਂ ਕਿ ਉਹ ਆਧੁਨਿਕ ਦੌਰ ਵਿਚ ਚੱਲ ਰਹੀਆਂ ਕਾਵਿ ਧਾਰਾਵਾਂ ਅਤੇ ਕਵੀਆਂ ਬਾਰੇ ਗਿਆਨ ਹਾਸਿਲ ਕਰ ਸਕਣ। ਇਸ ਦਾ ਹੋਰ ਮਨੋਰਥ ਕਵਿਤਾ ਦੀ ਵਿਆਖਿਆ, ਵਿਸ਼ਲੇਸ਼ਣ ਤੇ ਮੁਲੰਕਣ ਦੀ ਪ੍ਰਕਿਰਿਆ ਤੋਂ ਜਾਣੂ ਕਰਾਉਣਾ ਵੀ ਹੈ ਤਾਂ ਕਿ ਉਹ ਸਮਕਾਲੀ ਸਮਾਜ ਦੀਆਂ ਸਮੱਸਿਆਵਾਂ ਨੂੰ ਸਮਝ ਸਕਣ ਅਤੇ ਆਲੋਚਨਾਤਮਕ ਦ੍ਰਿਸ਼ਟੀ ਬਣਾ ਸਕਣ।
- CO2: ‘ਸੰਸਾਰ ਦੀਆਂ ਪ੍ਰਸਿਧ ਹਸਤੀਆਂ’ ਜੀਵਨੀ ਦੀ ਵਿਧਾ ਨੂੰ ਸਿਲੇਬਸ ਵਿਚ ਸ਼ਾਮਿਲ ਕਰ ਕੇ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਜੀਵਨੀ ਨੂੰ ਪੜ੍ਹਣ ਦੀ ਰੁਚੀ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ ਅਤੇ ਜੀਵਨੀ ਜਗਤ ਨਾਲ ਜੋੜਣਾ ਹੈ।
- CO3: ਪੈਰਾ ਰਚਨਾ ਅਤੇ ਪੈਰਾ ਪੜ੍ਹ ਕੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਉਤਰ ਦੇਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਬੁੱਧੀ ਨੂੰ ਤੀਖਣ ਕਰਦਿਆਂ ਉਨਾਂ ਦੀ ਲਿਖਣ ਪ੍ਰਤਿਭਾ ਨੂੰ ਉਜਾਗਰ ਕਰਨਾ ਹੈ।
- CO4: ਧੁਨੀ ਵਿਉਂਤ ਪੜ੍ਹਣ ਨਾਲ ਵਿਦਿਆਰਥੀ ਧੁਨੀਆਂ ਦੀ ਉਚਾਰਨ ਪ੍ਰਣਾਲੀ ਤੋਂ ਵਾਕਫ਼ ਹੋਣਗੇ।

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER I (SESSION 2023-24)**  
**PUNJABI**  
**Course Title: Punjabi (Compulsory)**  
**Course Code- BSML -1421**

ਸਮਾਂ : 3 ਘੰਟੇ  
ਕ੍ਰੈਡਿਟ: 4-0-0

**Maximum Marks: 100**  
**Theory: 80**  
**CA:20**

**ਪਾਠਕ੍ਰਮ ਅਤੇ ਪਾਠ ਪੁਸਤਕਾਂ**

**ਯੂਨਿਟ-I**

ਦੋ ਰੰਗ (ਕਵਿਤਾ ਭਾਗ) (ਸੰਪਾ.ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿਲੋਂ ਅਤੇ ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ), ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ।

(ਪ੍ਰਸੰਗ ਸਹਿਤ ਵਿਆਖਿਆ /ਕਵਿਤਾ ਦਾ ਵਿਸ਼ਾ-ਵਸਤੂ/ਸਾਰ) 16 ਅੰਕ

**ਯੂਨਿਟ-II**

ਸੰਸਾਰ ਦੀਆਂ ਪ੍ਰਸਿੱਧ ਹਸਤੀਆਂ (ਜੀਵਨੀ ਨੰ: 1 ਤੋਂ 9 ਤੱਕ)

(ਸੰਪਾ.ਪ੍ਰਿੰ. ਤੇਜਾ ਸਿੰਘ, ਹਰਨਾਮ ਸਿੰਘ ਸ਼ਾਨ), ਪੰਜਾਬੀ ਸਾਹਿਤ ਪ੍ਰਕਾਸ਼ਨ, ਅੰਮ੍ਰਿਤਸਰ।

(ਵਿਸ਼ਾ-ਵਸਤੂ/ ਨਾਇਕ ਬਿੰਬ ) 16 ਅੰਕ

**ਯੂਨਿਟ-III**

(ੳ) ਪੈਰੂਾ ਰਚਨਾ (ਤਿੰਨ ਵਿਚੋਂ ਇੱਕ)

(ਅ) ਪੈਰੂਾ ਪੜ੍ਹ ਕੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਉੱਤਰ। 16 ਅੰਕ

**ਯੂਨਿਟ-IV**

(ੳ) ਪੰਜਾਬੀ ਧੁਨੀ ਵਿਉਂਤ :ਪਰਿਭਾਸ਼ਾ ਤੇ ਉਚਾਰਨ ਅੰਗ

(ਅ) ਸਵਰ, ਵਿਅੰਜਨ 16 ਅੰਕ

**ਅੰਕ ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ**

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਸੈਕਸ਼ਨ ਹੋਣਗੇ। ਸੈਕਸ਼ਨ A-D ਤੱਕ ਦੇ ਪ੍ਰਸ਼ਨ ਯੂਨਿਟ I-IV ਵਿਚੋਂ ਪੁੱਛੇ ਜਾਣਗੇ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਕਰਨਾ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 16 ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER I (SESSION 2023-24)**

**BASIC PUNJABI**

**Course Title: Basic Punjabi**

**In lieu of Punjabi (Compulsory)**

**Course Code - BSML -1031**

**Course outcomes**

- CO1: ਮੁੱਢਲੀ ਪੰਜਾਬੀ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਨੂੰ ਸਿਖਾਉਣ ਦੀ ਪ੍ਰਕਿਰਿਆ ਵਿਚ ਪਾ ਕੇ ਇਕ ਹੋਰ ਭਾਸ਼ਾ ਸਿੱਖਣ ਦਾ ਮੌਕਾ ਪ੍ਰਦਾਨ ਕਰਨਾ ਹੈ। ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੈਂਤੀ ਅੱਖਰੀ, ਅੱਖਰ ਕ੍ਰਮ, ਪੈਰ ਬਿੰਦੀ ਵਾਲੇ ਵਰਣ ਅਤੇ ਪੈਰ ਵਿਚ ਪੈਣ ਵਾਲੇ ਵਰਣ ਅਤੇ ਮਾਤਰਾਵਾਂ (ਮੁੱਢਲੀ ਜਾਣ ਪਛਾਣ) ਲਗਾਤਾਰ (ਬਿੰਦੀ, ਟਿੱਪੀ, ਅੱਧਕ) ਦੀ ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ ਤੋਂ ਜਾਣੂ ਕਰਵਾਇਆ ਜਾਵੇਗਾ।
- CO2: ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੰਜਾਬੀ ਸ਼ਬਦ ਬਣਤਰ ਦੀ ਮੁੱਢਲੀ ਜਾਣ ਪਛਾਣ (ਸਾਧਾਰਨ ਸ਼ਬਦ, ਸੰਯੁਕਤ ਸ਼ਬਦ, ਮਿਸ਼ਰਤ ਸ਼ਬਦ, ਮੂਲ ਸ਼ਬਦ, ਅਗੇਤਰ ਅਤੇ ਪਿਛੇਤਰ) ਤੋਂ ਜਾਣੂ ਕਰਵਾਇਆ ਜਾਵੇਗਾ।
- CO3: ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਨਿੱਤ ਵਰਤੋਂ ਦੀ ਪੰਜਾਬੀ ਸ਼ਬਦਾਵਲੀ : ਬਾਜ਼ਾਰ, ਵਪਾਰ, ਰਿਸ਼ਤੇਨਾਤੇ, ਖੇਤੀ ਅਤੇ ਹੋਰ ਧੰਦਿਆਂ ਆਦਿ ਤੋਂ ਜਾਣੂ ਕਰਵਾਇਆ ਜਾਵੇਗਾ।
- CO4: ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੰਜਾਬੀ ਵਿਚ ਹਫ਼ਤੇ ਦੇ ਸੱਤ ਦਿਨਾਂ ਦੇ ਨਾਂ, ਬਾਰਾਂ ਮਹੀਨਿਆਂ ਦੇ ਨਾਂ, ਰੁੱਤਾਂ ਦੇ ਨਾਂ, ਇਕ ਤੋਂ ਸੌ ਤੱਕ ਗਿਣਤੀ ਸ਼ਬਦਾਂ ਵਿਚ ਸਿਖਾਉਣਾ ਹੈ।

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER I (SESSION 2023-24)**  
**BASIC PUNJABI**

**Course Title: Basic Punjabi**  
**(In lieu of Punjabi Compulsory)**  
**Course Code: BSML -1031**

ਸਮਾਂ : 3 ਘੰਟੇ  
ਕ੍ਰੈਡਿਟ: 4-0-0

**Maximum Marks: 100**  
**Theory: 80**  
**CA: 20**

**ਪਾਠਕ੍ਰਮ**

**ਯੂਨਿਟ-I**

ਪੈਂਤੀ ਅੱਖਰੀ, ਅੱਖਰ ਕ੍ਰਮ, ਪੈਰ ਬਿੰਦੀ ਵਾਲੇ ਵਰਣ ਅਤੇ ਪੈਰ ਵਿਚ ਪੈਣ ਵਾਲੇ ਵਰਣ ਅਤੇ ਮਾਤ੍ਰਵਾਂ (ਮੁੱਢਲੀ ਜਾਣ ਪਛਾਣ) ਲਗਾਖਰ (ਬਿੰਦੀ, ਟਿੱਪੀ, ਅੱਧਕ) : ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ। 16 ਅੰਕ

**ਯੂਨਿਟ-II**

ਪੰਜਾਬੀ ਸ਼ਬਦ ਬਣਤਰ : ਮੁੱਢਲੀ ਜਾਣ ਪਛਾਣ (ਸਾਧਾਰਨ ਸ਼ਬਦ, ਸੰਯੁਕਤ ਸ਼ਬਦ, ਮਿਸ਼ਰਤ ਸ਼ਬਦ, ਮੂਲ ਸ਼ਬਦ, ਅਗੇਤਰ ਅਤੇ ਪਿਛੇਤਰ) 16 ਅੰਕ

**ਯੂਨਿਟ-III**

ਨਿੱਤ ਵਰਤੋਂ ਦੀ ਪੰਜਾਬੀ ਸ਼ਬਦਾਵਲੀ : ਬਾਜ਼ਾਰ, ਵਪਾਰ, ਰਿਸ਼ਤੇ ਨਾਤੇ, ਖੇਤੀ ਅਤੇ ਹੋਰ ਧੰਦਿਆਂ ਆਦਿ ਨਾਲ ਸੰਬੰਧਤ। 16 ਅੰਕ

**ਯੂਨਿਟ-IV**

ਹਫ਼ਤੇ ਦੇ ਸੱਤ ਦਿਨਾਂ ਦੇ ਨਾਂ, ਬਾਰਾਂ ਮਹੀਨਿਆਂ ਦੇ ਨਾਂ, ਰੁੱਤਾਂ ਦੇ ਨਾਂ, ਇਕ ਤੋਂ ਸੌ ਤਕ ਗਿਣਤੀ ਸ਼ਬਦਾਂ ਵਿਚ । 16 ਅੰਕ

ਅੰਕ ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਸੈਕਸ਼ਨ ਹੋਣਗੇ। ਸੈਕਸ਼ਨ A-D ਤੱਕ ਦੇ ਪ੍ਰਸ਼ਨ ਯੂਨਿਟ I-IV ਵਿਚੋਂ ਪੁੱਛੇ ਜਾਣਗੇ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਕਰਨਾ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 16 ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER I (SESSION 2023-24)**  
**PUNJAB HISTORY AND CULTURE**  
**Course Title: Punjab History and Culture (From Earliest Times to C 320)**  
**(Special paper in lieu of Punjabi Compulsory)**  
**(For those students who are not domicile of Punjab)**  
**Course Code: BSML-1431**

**COURSE OUTCOMES**

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

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

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

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

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



**BACHELOR OF SCIENCE (MEDICAL) SEMESTER I (SESSION 2023-24)**  
**PUNJAB HISTORY AND CULTURE**

**Course Title: Punjab History and Culture (From Earliest Times to C 320)**  
**(Special paper in lieu of Punjabi Compulsory)**  
**(For those students who are not domicile of Punjab)**  
**Course Code: BSML-1431**

**Examination Time: 3 Hours**  
**Credits L-T-P: 4-0-0**

**Max. Marks: 100**  
**Theory: 80**  
**CA: 20**

**Instructions for the Paper Setter:**

1. Question paper shall consist of four Units
2. Examiner shall set 8 questions in all by selecting Two Questions of equal marks from each Unit.
3. Candidates shall attempt 5 questions in 1000 words, by at least selecting One Question from each Unit and the 5<sup>th</sup> question may be attempted from any of the four Units.
4. Each question will carry 16 marks

**Unit-I**

1. Physical features of the Punjab
2. Sources of the ancient history of Punjab

**Unit-II**

3. Harappan Civilization: social, economic and religious life of the Indus Valley People.
4. The Indo-Aryans: Original home

**Unit-III**

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

**UNIT-IV**

7. Teachings of Buddhism
8. Teachings of Jainism

**Suggested Readings**

- B.N. Sharma, Life in Northern India, Delhi. 1966.
- Budha Parkash, Glimpses of Ancient Punjab, Patiala, 1983.

- Chopra, P.N., Puri, B.N., & Das, M.N.(1974). A Social, Cultural & Economic History of India, Vol. I, New Delhi: Macmillan India.
- L. M Joshi (ed.), History and Culture of the Punjab, Art-I, Patiala, 1989 (3<sup>rd</sup> edition)
- L.M. Joshi and Fauja Singh (ed.), History of Punjab, Vol.I, Patiala 1977.

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER I (SESSION 2023-24)**

**ENGLISH**

**Course Title: English (Compulsory)**

**Course Code: BSML -1212**

**COURSE OUTCOMES**

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

- CO1:** Understand fundamental grammatical rules governing tenses, the use of modal verbs and make correct usage in their language through the study of “English Grammar in Use” by Raymond Murphy
- CO2:** Write paragraphs on any given topic and translate any passage from Hindi/Punjabi to English
- CO3:** Comprehend the meaning of texts and answer questions related to situations, episodes, themes and characters depicted in them through the study of the stories in text “Tales of Life”.
- CO4:** Appreciate the writings of various Indian and foreign story and prose writers and relate them to their socio-cultural milieu through the study of the essays in text “Prose for Young Learners”

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER I (SESSION 2023-24)**

**ENGLISH**

**Course Title: English (Compulsory)**

**Course Code: BSML -1212**

**Examination Time: 3 Hrs**

**Credits: 4-0-0**

**Max. Marks: 100**

**Theory: 80**

**CA: 20**

**Instructions for the Examiner:**

**The question paper will consist of 4 sections & distribution of marks will be as under:**

**Section A:** The question will be set from Unit I of the syllabus. Fifteen sentences will be set and the students would be required to attempt any Ten. Each sentence will carry two marks.

**(10x2=20)**

**Section B:** Two questions will be set from unit II of the syllabus. (I) paragraph (with internal choice) and (II) One translation passage, which has to be translated into English from the given Hindi/Punjabi passage. The student will attempt (I) any one paragraph and (II) the translation). Both the paragraph and the translation passage will carry 10 marks each.

**(2x10=20)**

**Section C:** This section will be divided into two parts. Two questions will be set from Unit III of the syllabus. Part one will have one essay type question with internal choice carrying 10 marks (word limit 400 words). The students would be required to attempt any one. Part two will have three questions. The students would be required to attempt any two (word limit 150 words each). Each question in part two will carry five marks.

**(10+5+5=20)**

**Section D:** This section will be divided into two parts. Two questions will be set from Unit IV of the syllabus. Part one will have one essay type question with internal choice carrying 10 marks (word limit 400 words). The students would be required to attempt any one. Part two will have three questions. The students would be required to attempt any two (word limit 150 words each). Each question will carry five marks.

**(10+5+5=20)**

**Unit I**

English Grammar in Use, 4<sup>th</sup> Edition by Raymond Murphy, CUP (Units: 1-37)

**Unit II**

Paragraph Writing and Translation of paragraph (from Hindi/Punjabi to English)

**Unit III**

*Tales of Life* (Guru Nanak Dev University, Amritsar): Stories at Sr. No. 1, 2, 3, 5, 6

## **Unit IV**

*Prose for Young Learners*: Essays at Sr. No. 1, 2, 3, 5, 6

### **Texts Prescribed:**

1. *English Grammar in Use* (Fourth Edition) by Raymond Murphy, CUP
2. *Tales of Life* (Guru Nanak Dev University, Amritsar)
3. *Prose for Young Learners* (Guru Nanak Dev University, Amritsar)

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-I (SESSION 2023-24)**

**ZOOLOGY**

**Course Title: Cell Biology**

**Course Code: BSMM-1483 (I)  
(THEORY)**

**Course Outcome**

After passing this course the student will be able to:

CO1: Perform a variety of molecular and cellular biology techniques

CO2: Describe cellular membrane structure and function, fine structure and function of cell organelles.

CO3: Gain knowledge about structure and function of cell organelles.

CO4: Learn elementary idea about Cancer and Immunity.

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-I (SESSION 2023-24)**

**ZOOLOGY**

**Course Title: Cell Biology**

**Course Code: BSMM-1483 (I)**

**(THEORY)**

**Time: 3 Hours**

**Credits: 2-0-0**

**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**

Methods in Cell Biology

- (a) Principles of light and phase contrast microscopy
- (b) Electron microscopy (TEM and SEM)
- (c) Fixation and fixatives
- (d) Staining techniques.

**UNIT-II**

Organization of Cell: Extra nuclear and nuclear, ultrastructure and functions of cell organelles

- (a) Plasma Membrane: Structure, osmosis, active and passive transport, endocytosis and exocytosis.
- (b) Endoplasmic reticulum: Structure, types and associated enzymes.
- (c) Mitochondria: Structure, mitochondrial enzymes and role of mitochondria in respiration and mitochondrial DNA.

**UNIT-III**

Organization of Cell:

- (a) Golgi complex: Structure and functions.
- (b) Ribosomes: Types of ribosomes, their structure and functions.
- (c) Lysosomes: Polymorphism and their function.
- (d) Centrosome: Structure and functions.

**UNIT-IV**

Nucleus: Structure and functions of nuclear membrane, nucleolus and chromosomes.

An elementary idea of cell transformation in cancer

An elementary idea of cellular basis of immunity

**Suggested Readings:**

1. Cooper, G. M. (2004), The cell, A Molecular Approach, ASM press, Washington, D. C.
2. Karp, G. (1984). Cell Biology (4<sup>th</sup> ed), McGraw Hill, New York.
3. Pawar, C.B (1999), Cell Biology, Himalaya Publishing House, Bombay.
4. Dhami P. K. (2000) Zoology I, Pradeep Publishers.



**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-I (SESSION 2023-24)**  
**ZOOLOGY**

**Course Title: Biodiversity- I (Protozoa to Annelida)**

**Course Code: BSMM-1483 (II)**  
**(THEORY)**

**Course Outcome**

After passing this course the student will be able to:

CO1: Gain knowledge about physiology of unicellular life and parasitic protozoan.

CO2: Understand the important marine water non chordates.

CO3: Learn about parasitic Platyhelminthes

CO4: Understand the economic importance and physiology of Ascaris and earthworm

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-I (SESSION 2023-24)**

**ZOOLOGY**

**Course Title: Biodiversity- I (Protozoa to Annelida)**

**Course Code: BSMM-1483 (II)**

**(THEORY)**

**Time: 3 Hours**

**Credits: 3-0-0**

**Max. Marks: 75**

**Theory: 60**

**CA: 15**

**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.

**Detailed Type study of the following animals**

**UNIT-I**

Protozoa: *Amoeba proteus*,

*Paramecium caudatum* (with special reference to Kappa particles in *P. aurelia*)

*Plasmodium vivax*.

**UNIT-II**

Parazoa (Porifera): *Sycon*,

Cnidaria (Coelentrata): *Obelia*

**UNIT-III**

Platyhelminthes: *Fasciola hepatica*,

*Taenia solium*

Larvae of *Fasciola hepatica* and *Taenia solium*

**UNIT-IV**

Aschelminthes: *Ascaris*, Parasitic adaptations in Helminthes

Annelida: *Pheretima posthuman* (Earthworm)

**Suggested Readings:**

1. Dhama, P.S. & Dhama, J. K. (2001), Invertebrates, R. Chand & Co., New Delhi.
2. Brusca, R. C. and Brusca, G. J. (2003), Invertebrates (2<sup>nd</sup> ed). Sinauer Associates, Inc. Publishers, Sunderland, Massachusetts.
3. Engemann, J. G. and Hegner, R. W. (1981), Invertebrate Zoology (3rd ed.) Macmillan, New York.

4. Gardiner, M. S. (1972), *The Biology of Invertebrates*, McGraw Hill, New York.
5. Meglitsch, P. A. and Schran, F. R. (1991), *Invertebrate Zoology* (3<sup>rd</sup> ed). Oxford University Press, New York.
6. Pechenik, A. Jan. (2000), *Biology of the invertebrates*, (4<sup>th</sup> ed), McGraw Hill Book Co. Singapore.

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-I (SESSION 2023-24)**

**ZOOLOGY**

**Course Title: Practical-I (Related to Cell Biology & Biodiversity-I)**

**Course Code: BSMM-1483 (P)**

**(PRACTICAL)**

**Course Outcome**

After passing this course the student will be able to:

CO1: Familiarise with Scientific method

CO2: Recognise the importance of conservation

CO3: Observe chromosomal arrangements during cell division

CO4: Understand role of invertebrates

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-I (SESSION 2023-24)**  
**ZOOLOGY**

**Course Title: Practical-I (Related to Cell Biology & Biodiversity-I)**

**Course Code: BSMM-1483 (P)**  
**(PRACTICAL)**

**Time: 3 Hours**

**Credits: 0-0-2**

**Max. Marks: 50**

**Theory: 40**

**CA: 10**

**Instructions for the Practical Examiners:** Question paper is to 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, KanyaMaha Vidyalaya, Jalandhar

**Guidelines for conduct of practical Examination: -**

1. Identify and classify the specimens upto order level. Write a note on their habit, habitat, special features and economic importance. 8
2. Identify the slides/micrographs and give two reasons for identification. 8
3. Make a temporary mount of protozoa. 4
4. Draw a well labelled sketch of the given system of the organism and explain to the examiner. 6
5. Write down the theory and procedure of gel electrophoresis/ paper chromatography/thin layer chromatography/ SEM & TEM. 4
6. Report 4
7. Viva-voce & Practical file. 6

**1. Classification up to order level with ecological notes and economic importance (if any) of the following animals (Through Specimens or slides):**

**A. Protozoa:** *Amoeba, Euglena, Trypanosoma, Noctiluca, Eimeria, Monocystis, Paramecium Opalina, Vorticella, Balantidium, Nyctotherus and Polystomella.*

**B. Porifera:** *Sycon, Grantia, Euplectella, Hyalonema, Spongilla, Euspongia.*

**C. Cnidaria:** *Porpita, Velella, Physalia, Aurelia, Rhizostoma, Metridium, Millipora, Alcyonium, Tubipora, Zoanthus, Madrepora, Favia, Fungia and Astrangia.*

*Hydra (W.M.), Hydra with buds, Obelia (colony and medusa), Sertularia, Plumularia, Tubularia, Bougainvillea and Aurelia*

**D. Platyhelminthes:** *Dugesia, Fasciola, Taenia, Echinococcus.*

*Miracidium, Sporocyst, Redia, Cercaria of Fasciola, scolex and proglottids of Taenia (mature and gravid).*

**E. Aschelminthes:** *Ascaris (male and female), Trichinella, Ancylostoma.*

**F. Annelida:** *Pheretima, Nereis, Heteronereis, Polynoe, Eunice, Aphrodite, Chaetopterus, Arenicola, Tubifex and Pontobdela*

**2. Study of the following permanent stained preparations:**

- A. L.S. and T.S. *Sycon*, gemmules, spicules and spongin fibers of a sponge.
- B. T.S. *Hydra* (Testis and ovary region)
- C. T.S. *Fasciola*(Different regions)
- D. T.S. *Ascaris* (Male and Female)
- E. T.S. *Pheretima* (pharyngeal and typhlosolar regions), Setae, septal nephridia, spermathecae and ovary of *Pheretima* (Earthworm).

**3. Preparation of the following slides:**

Temporary permanent preparation of freshwater Protozoan culture.

4. **Demonstration of** digestive, reproductive and nervous systems of earthworm with the help of charts/videos/models.

**5. Cell Biology:**

- A. Paper chromatography.
- B. Gel electrophoresis through photographs or through research laboratories
- C. Familiarity with TEM & SEM.
- D. Study of different ultra-structures of cell organelles through photographs.

**6. Visit to a vermi-composting unit and submission of report.**

**Note:- Some changes can be made in the practical depending on the availability of material.**

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-I (SESSION 2023-24)**

**MICROBIOLOGY**

**Course Title: Fundamentals of Microbiology**

**Course Code: BSMM-1343**

**(THEORY)**

**Course Outcomes:**

After passing this course the student will be able to:

- CO1:** Learn about history of microbiology and characterization and identification of microorganisms.
- CO2:** Understand the principle and applications of different microscopes and methods of sterilization, pure culture concept and different staining methods of bacteria.
- CO3:** Understand the structure of bacterial cell and nutritional requirement of microorganisms, different types of media and control of microorganisms by physical and chemical agents.
- CO4:** Understand the reproduction and growth of microorganisms and common bacterial and viral diseases in human.

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-I (SESSION 2023-24)**  
**MICROBIOLOGY**

**Course Title: Fundamentals of Microbiology**

**Course Code: BSMM-1343**  
**(THEORY)**

**Time: 3 Hours**  
**Credits: 4-0-0**

**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**

**Introduction and Scope of Microbiology:** Discovery of microorganisms, history of microbiology, controversy over spontaneous origin or microorganisms, discovery of anaerobic life, germ theory of fermentation as life without oxygen, germ theory of disease.

**Characterization and Identification of Microorganisms:** Place of microorganisms in living world, Haeckel's and Whittaker's system of classification, prokaryotic and eukaryotic cells, characteristics of main groups of microorganisms.

**UNIT-II**

**Microscopy:** Principles and applications of Bright field microscopy, Dark field phase contrast, Fluorescence and Immuno-fluorescence, Electron microscopy.

**Methods in Microbiology:** Methods of sterilization, preparation of a culture media, pure culture concept, staining of bacteria such as simple, negative and differential methods. Antibiotics, properties and mode of action: drug resistance and its significance, antibiotic sensitivity test.

**UNIT- III**

**Structure of Bacteria:** Fine structure of bacterial cell, cell wall, cell membrane, capsule, pili, flagella, ribosomes, Cytoplasmic inclusions, Bacterial movement, Endospore and physiology of endospore formation.

**Nutrition:** Nutritional requirements of microorganisms, nutritional types of bacteria, autotrophs, heterotrophs, parasites, types of culture media, differential media, selective media and enrichment media. Control of microorganisms by physical and chemical agents.



## UNIT-IV

**Reproduction and Growth in Microorganisms:** Modes of cell division, growth curve of bacteria, continuous culture, synchronous growth, quantitative measurement of bacterial growth, Effect of various factors on growth of bacteria.

**Clinical Microbiology:** Epidemiology reservoirs and modes of transmission of infectious diseases. Pathogenesis, diagnosis and treatment of common bacterial and viral diseases (including COVID 19) in humans.

### **Books Recommended:**

1. Pelczar, M.I., Chan, E.C.S. and Krieg, N.R. 2011, 5<sup>th</sup> edition, Microbiology. TataMcGraw Hill Publishing Co., Ltd.,New Delhi.
2. Stanier, R.Y., Ingraham, J.L., Wheelis, M.L. and Painter, P.R. 2005, 5<sup>th</sup> edition,General Microbiology, MacMillan Education Ltd. Publisher.
3. Powar, C.B. and Dagniwala, H.F. 2012, General Microbiology, Volume I and II,Himalaya Publishing House, Delhi.
4. Sharma, P.D. 2010, Microbiology, Rastogi Publications, Meerut. 142.
5. Clinical microbiology by UsmanWaheed, Asim Ansari, Anwar Ullah and IhsanAli., 1<sup>st</sup> Edition, 2013. **(Online available)**
6. General Microbiology by Linda Bruslind, 1<sup>st</sup> Edition. **(Online available)**
7. General Microbiology by H.G. Schlegel, 6<sup>th</sup> Edition. **(Online available)**

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-I (SESSION 2023-24)**  
**MICROBIOLOGY**

**Course Title: Fundamentals of Microbiology**

**Course Code: BSMM-1343**

**(PRACTICAL)**

**COURSE OUTCOMES:**

After passing the course student will be able to:

**CO1:** Understand the basic glassware and equipments to be used in the microbiology laboratory

**CO2:** Demonstrate the preparation of different culture media for different microorganisms

**CO3:** Practice different methods of isolation and cultivation of various microorganisms

**CO4:** Perform simple and differential staining of bacteria

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-I (SESSION 2023-24)**

**MICROBIOLOGY**

**Course Title: Fundamentals of Microbiology**

**Course Code: BSMM-1343**

**(PRACTICAL)**

**Time: 3 Hours**

**Practical: 20**

**Credits: 0-0-1**

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

**LIST OF PRACTICALS**

1. To study the essentials of a microbiology laboratory.
2. To study various parts of a laboratory microscope.
3. To study various sterilization techniques.
4. To prepare the culture media for the cultivation of various microorganisms.
5. To study various laboratory techniques for the isolation and cultivation of pure cultures of microorganisms.
6. To perform the simple staining of bacterial cell.
7. To perform the differential staining of bacterial cell.
8. To study the typical growth curve of bacteria.
9. To measure the size of microbial cells by ocular micrometry.

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER I (SESSION 2023-24)**  
**CHEMISTRY**

**Course Title: Inorganic Chemistry**

**Course Code: BSMM -1084 (I)**  
**(THEORY)**

**Course outcomes:**

Students will be able to

- CO1: Predict electronic properties of atoms using current models and theories in chemistry, sketch the probability density curves, boundary surface diagrams and shapes of orbitals and write the electronic configuration of atoms.
- CO2: Identify the periodic trends in physical and chemical properties of elements, describe the arrangement of the elements in the Periodic Table & change from metallic to nonmetallic character.
- CO3: Describe VBT, VSEPR theory and predicts the geometry of simple molecules & molecular orbital theory of homonuclear diatomic molecules
- CO4: Explain, predict & draw structures of simple ionic compounds.

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER I (SESSION 2023-24)**

**CHEMISTRY**

**Course Title: Inorganic Chemistry**

**Course Code: BSMM -1084 (I)**

**(THEORY)**

**Exam Time: 3 Hrs.**

**Credit: 2-0-0**

**Max. Marks: 50**

**Theory: 40**

**CA: 10**

**Instructions for the Paper Setter**

Eight questions of equal marks (eight 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**

**I. Atomic Structure**

Idea of de Broglie matter waves, Heisenberg uncertainty principle, atomic orbitals, Schrodinger wave equation, significance of  $\psi^1$  and  $\psi^2$ , quantum numbers, radial and angular wave functions and probability distribution curves, shapes of s,p,d orbitals. Aufbau and Pauli exclusion principles, Hund's multiplicity rule. Electronic configurations of the elements and ions.

**UNIT-II**

**II. Periodic Properties**

Position of elements in the periodic table; effective nuclear charge and its calculations. Atomic and ionic radii, ionization energy, electron affinity and electronegativity –definition, methods of determination or evaluation, trends in periodic table and applications in predicting and explaining the chemical behaviour.

**UNIT-III**

**III. Chemical Bonding**

Covalent Bond –Valence bond theory and its limitations, directional characteristics of covalent bond, various types of hybridization and shapes of simple inorganic molecules and ions.  $\text{BeF}_2$ ,  $\text{BF}_3$ ,  $\text{CH}_4$ ,  $\text{PF}_5$ ,  $\text{SF}_6$ ,  $\text{IF}_7$ ,  $\text{SnCl}_2$ ,  $\text{XeF}_4$ ,  $\text{BF}_4^-$ ,  $\text{SnCl}_6^{2-}$ . Valence shell electron pair repulsion (VSEPR) theory to  $\text{NH}_3$ ,  $\text{H}_3\text{O}^+$ ,  $\text{SF}_4$ ,  $\text{ClF}_3$ ,  $\text{ICl}_2$  and  $\text{H}_2\text{O}$ . MO theory, homonuclear (elements and ions of 1st and 2nd row), and heteronuclear ( $\text{BO}$ ,  $\text{CN}^-$ ,  $\text{CO}$ ,  $\text{NO}^+$ ,  $\text{CO}^+$ ,  $\text{CN}$ ), diatomic molecules, multicenter bonding in electron deficient molecule (Boranes). Percentage ionic character from dipole moment and electronegativity difference.

**UNIT-IV**

**IV. Ionic Solids**

Concept of close packing, Ionic structures, ( $\text{NaCl}$  type, Zinc blende, Wurtzite,  $\text{CaF}_2$  and antiferite, radius ratio rule and coordination number, limitation of radius ratio rule, lattice defects, semiconductors, lattice energy and Born–Haber cycle, solvation energy and solubility

of ionic solids, polarizing power and polarisability of ions, Fajan's rule. Metallic bond– free electron, valence bond and band theories.

**Weak Interactions** –Hydrogen bonding, Vander Waals forces

**Books Suggested:**

1. Cotton, F.A., Wilkinson, G., Gaus, P.L., Basic Inorganic Chemistry; 3rd edition, Pubs: John Wiley Sons. 1995.
2. Lee, J.D., Concise Inorganic Chemistry; 4th edition, Pubs: Chapman Hall Ltd., 1991.
3. Shriver, D.E., Alkins, P.W., Langford, C.H., Inorganic Chemistry; 4th edition, Oxford Publisher: Oxford University Press, 2006.
4. Douglas, B. McDaniell, D., Alexander, J., Concepts and Models of Inorganic Chemistry; 3rd edition, Pubs: John Wiley and Sons Inc., 1994.
5. Miessler, G.L., Larr, D.A., Inorganic Chemistry; 3rd edition, Pubs: Pearson Education Inc., 2004.
6. Jolly, W.L., Modern Inorganic Chemistry; 2nd edition, Pubs: McGraw-Hill Publishing Company Limited, 1991.
7. Purcell, K.F., Kotz, J.C., Inorganic Chemistry; Pubs: W.B. Saunders Company, 1977.
8. Puri, B.R., Sharma, L.R., Kalia, K.C., Principles of Inorganic Chemistry; 30th edition, Pubs: Milestones Publisher, 2006-07.
9. University General Chemistry, C.N.R. Rao, Macmillan.
10. Inorganic Chemistry, W.W. Porterfield Addison-Wesley.
11. Inorganic Chemistry, A.G. Sharpe, ELBS.

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER I (SESSION 2023-24)**  
**CHEMISTRY**  
**Course Title: Organic Chemistry**  
**Course Code: BSMM -1084 (II)**  
**(THEORY)**

**Course outcomes:**

Students will be able to

- CO1: Interpret the bonding, hybridization between different organic compounds, explain the various reaction mechanisms and different electron displacement effects
- CO2: Interpret the reactions and properties of alkanes, alkenes & alkynes, derive the electrophilic, nucleophilic addition reactions, free radical mechanisms of halogenation of alkanes.
- CO3: Compare the reactivities of various alkyl and aryl halide, stability of various cycloalkanes
- CO4: Differentiate between aromatic, anti-aromatic and non-aromatic compounds, explain the effect of various substituents on the reactivity of aromatic compounds

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER I (SESSION 2023-24)**

**CHEMISTRY**

**Course Title: Organic Chemistry**

**Course Code: BSMM -1084 (II)**

**(THEORY)**

**Exam Time: 3 Hrs.**

**Credit: 3-0-0**

**Max. Marks: 75**

**Theory: 60**

**CA: 15**

**Instructions for the Paper Setter**

Eight questions of equal marks (twelve 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**

**I. Structure and Bonding**

Hybridization, bond lengths and bond angles, bond energy, localized and delocalized chemical bond, Vander Waals interactions, resonance, hyperconjugation, aromaticity hydrogen bonding and Inductive and electrometric effects.

**II. Mechanism of Organic Reactions**

Curved arrow notation, drawing electron movements with arrows, half-headed and double-headed arrows, homolytic and heterolytic bond breaking. Types of reagents – electrophiles and nucleophiles. Types of organic reactions. Energy considerations.

Reactive intermediates –Carbocations, carbanions, free radicals, carbenes, arenes and nitrenes (with examples). Assigning formal charges on intermediates and other ionic species.

**UNIT-II**

**III. Alkanes**

Isomerism in alkanes, sources, methods of formation (with special reference to Wurtz reaction, Kolbe reaction, Corey–House reaction and decarboxylation of carboxylic acids), physical properties and chemical reactions of alkanes. Mechanism of free radical halogenation of alkanes: orientation, reactivity and selectivity.

**IV. Alkenes and Alkynes**

Nomenclature of alkenes, methods of formation, mechanisms of dehydration of alcohols and dehydrohalogenation of alkyl halides, regioselectivity in alcohol dehydration. The Saytzeff rule, Hofmann elimination, physical properties and relative stabilities of alkenes. Chemical reactions of alkenes-mechanisms involved in hydrogenation, electrophilic and free radical additions, Markownikoff's rule, hydroboration-oxidation, oxymercuration reduction. Epoxidation, ozonolysis, hydration, hydroxylation and oxidation with  $\text{KMnO}_4$ .

Substitution at the allylic and vinylic positions of alkenes.

Nomenclature, structure and bonding in alkynes. Methods of formation. Chemical reactions of alkynes, acidity of alkynes. Mechanism of electrophilic and nucleophilic addition reactions, hydroboration-oxidation, metal-ammonia reductions, oxidation and polymerization.



## UNIT-III

### V. Alkyl and Aryl Halides

Nomenclature and classes of alkyl halides, chemical reactions. Mechanisms of nucleophilic substitution reaction of alkyl halides, SN2 and SN1 reactions with energy profile diagrams. Nuclear and side chain reactions. The addition-elimination and the elimination-addition mechanisms of nucleophilic aromatic substitution reactions. Relative reactivities of alkyl halides vs allyl, vinyl and aryl halides.

### VI. Cycloalkanes:

Baeyer's strain theory and its limitations. Ring strain in small rings (cyclopropane and cyclobutane), theory of strainless rings. The case of cyclopropane ring : banana bonds.

## UNIT-IV

### VII. Arenes and Aromaticity

Nomenclature of benzene derivatives. The aryl group. Aromatic nucleus and side chain. Structure of benzene: Molecular formula and Kekule structure. Stability and carbon carbon bond lengths of benzene, resonance structure, MO picture.

Aromaticity : the Huckel's rule, aromatic ions.

Aromatic electrophilic substitution—general pattern of the mechanism, role of  $\sigma$  and  $\pi$  complexes. Mechanism of nitration, halogenation, sulphonation, mercuration and Friedel Crafts reaction. Energy profile diagrams. Activating and deactivating substituents, orientation and ortho/para ratio. Side chain reactions of benzene derivatives. Methods of formation and chemical reactions of alkylbenzenes.

### Books suggested:

1. Morrison, R.T., Boyd, R.N., Organic Chemistry; 6th edition, Pubs: Prentice-Hall, 1992.
2. Solomons, T.W., Fryhle, C.B., Organic Chemistry; 9th edition, Pubs: Wiley India, 2007.
3. Wade Jr., L.G., Singh, M.S., Organic Chemistry; 6th edition, Pubs: Pearson education, 2008.
4. Mukherji, S.M., Singh, S.P., Kapoor, R.P., Organic Chemistry; Pubs: New Age International, 1985.
5. Carey, F.A., Sundberg, R.J., Advanced Organic Chemistry Part B: Reactions and Synthesis.
6. Fundamentals of Organic Chemistry, Solomons, John Wiley.
7. Introduction to Organic Chemistry, Sireitwieser, Heathcock and Kosover, Macmilan.

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER I (SESSION 2023-24)**

**CHEMISTRY**

**Course Title: Chemistry Practical**

**Course Code: BSMM -1084 (P)**

**(PRACTICAL)**

**Course outcomes**

Students will be able to

CO1: separate and identify the various ions present in the mixture

CO2: accurately note down the melting point of organic compounds

CO3: accurately note down the boiling point of organic compounds.

CO4: Differentiate between pure & impure compounds.

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER I (SESSION 2023-24)**

**CHEMISTRY**

**Course Title: Chemistry Practical**

**Course Code: BSMM -1084 (P)**

**(PRACTICAL)**

**Exam Time: 3.5 Hrs**

**Max. Marks: 50**

**Credit: 0-0-2**

**Practical: 40**

**CA: 10**

**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.

**Inorganic Chemistry:** Semi Micro analysis. Cation analysis, Separation and identification of ions from groups I, II, III, IV, V, and VI. Anionic analysis. Four ions with no interference.

**Organic Chemistry Laboratory  
Techniques**

**Determination of Melting Point**

Naphthalene 80–82°C

Cinnamic acid 132.5–133°C

Benzoic acid 121.5–122°C

Salicylic acid 157.5–158°C

Urea 132.5–133°C

Acetanilide 113.5–114°C

Succinic Acid 184.5–185°C

m-dinitro benzene 90°C

P-dichlorobenzene 52°C

Aspirin 135°C

**Determination of Boiling Point**

Ethanol 78°C

Cyclo Hexane 81.4°C,

Benzene–80°C

Toluene 110°C

**Practical Examination**

1) Inorganic Mixture	12
2) Melting Point/Boiling point of organic substance	03
3) Viva–Voce	03
4) Note Book	02

**Books suggested:**

1. Vogel's Qualitative Inorganic Analysis, revised, Svehla, Orient Longman.
2. Experimental Inorganic Chemistry, W.G. Palmer, Cambridge. Standard Methods of Chemical. Analysis, W.W. Scott: The Technical Press.
3. Laboratory Manual in Organic Chemistry, R.K. Bansal, Wiley Eastern.
4. Vogel's Textbook of Practical Organic Chemistry, B.S. Furniss, A.J. Hannaford, V. Rogers, P.W.G. Smith and A.R. Tatchell, ELBS.
5. Experiments in General Chemistry, C.N.R. Rao and U.C. Aggarwal, East-West Press.

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER I (SESSION 2023-24)**

**BOTANY**

**Course Title: Diversity of Microbes**

**Course Code: BSMM-1075 (I)**

**(THEORY)**

**Course outcome:**

After passing this course the student will be able to:

CO1: Understand the classification, characteristic features, life cycle and economic value of algae.

CO2: Understand the general features of viruses especially SARS and COVID-19, mycoplasmas, bacteria and cyanobacteria.

CO3: Develop knowledge about features, classification, life cycle and economic importance of fungi.

CO4: Understand the general characteristics of lichens.

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER I (SESSION 2023-24)**

**BOTANY**

**Course Title: Diversity of Microbes**

**Course Code: BSMM-1075 (I)**

**(THEORY)**

**Time: 3 Hrs.**

**LTP: 2-0-0**

**Max Marks: 50**

**Theory: 40**

**CA: 10**

**Instructions for the Paper Setters:**

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

Algae: General characters, classification and economic importance, range of thallus organization, important features and life history of Chlorophyceae– *Volvox*, *Oedogonium*, *Coleochaete*; Xanthophyceae– *Vaucheria*; Phaeophyceae– *Ectocarpus*, *Sargassum*; Rhodophyceae– *Polysiphonia*.

**UNIT-II**

General account of viruses and mycoplasma with special reference to SARS and Covid-19. Bacteria–structure, nutrition, reproduction and economic importance; general account of cyanobacteria.

**UNIT-III**

General account, classification and economic importance of fungi. Important features and life history of Mastigomycotina– *Pythium*, *Phytophthora*; Zygomycotina– *Mucor*, Ascomycotina– *Saccharomyces*, *Eurotium*, *Chaetomium*, *Peziza*.

**UNIT-IV**

Basidiomycotina– *Puccinia*, *Agaricus*; Deuteromycotina– *Cercospora*, *Colletotrichum*. General account of Lichens.

**Suggested Readings:**

1. Dube, H.C., 2007, A Textbook of Fungi, Bacteria and Viruses (3rd edition), Scientific Publishers, India
2. Dube, H.C., 2013, An Introduction to Fungi (4th edition), Scientific Publishers., India.
3. James W. Brown. (2015). Principles of Microbial Diversity. ASM press, USA.
4. Ogunseitan, O. (2008). Microbial Diversity: Form and function in Prokaryotes. Wiley Publishers, USA.
5. Sharma, O.P., 2004, Text Book of Thallophytes. McGraw Hill Publishing Co., India.
6. Sharma, P.D., 2004, The Fungi, (2nd Edition) Rastogi Publication, India
7. Srivastava, H.N., 2018, Diversity of Microbes and Cryptogams, Vol. I, Pradeep's Publication.

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-I (SESSION 2023-2026)**  
**BOTANY**

**Course Title: Diversity of Cryptogams**

**Course Code: BSMM-1075 (II)**  
**(THEORY)**

**Course Outcomes:**

After passing this course student will be able to:

- CO1: Demonstrate knowledge of similarities and differences between vascular and nonvascular plants.
- CO2: Build up a sound foundation in the subject of Cryptogamic Botany in general and Bryophytes so that the students may be able to apply the acquired knowledge while interacting into the other fields of Botany.
- CO3: Acquaint the students about the classification, morphology, biology and economic importance of various pteridophytic plants.
- CO4: Recognize different plants and flora that come under pteridophytes.

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-I (SESSION 2023-2026)**

**BOTANY**

**Course Title: Diversity of Cryptogams**

**Course Code: BSMM-1075 (II)**

**(THEORY)**

**Time: 3 Hrs.**

**LTP: 3-0-0**

**Max. Marks: 75**

**Theory-60**

**CA: 15**

**Instructions for the Paper Setters:**

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**

**Bryophyta:** Amphibians of plants kingdom displaying alternation of generations; structure, reproduction.

**UNIT-II**

**Classification of Hepaticopsida** (e.g. *Marchantia*); **Anthocerotopsida** (e.g. *Anthoceros*), **Bryopsida** (e.g. *Funaria*).

**UNIT-III**

**Pteridophyta:** The first vascular plant; important characteristics of Psilopsida, Lycopsida, Sphenopsida and Pteropsida; Structure, reproduction in *Rhynia*

**UNIT-IV**

Structure and reproduction in *Lycopodium*, *Selaginella*, *Equisetum*, *Pteris* and *Marsilea*.

**Suggested Readings:**

- Goffinet B. (2008). Bryophyte Biology. Cambridge University Press, UK.
- Sambamurty, S.S. (2013). A Textbook of Bryophytes, Pteridophytes, Gymnosperms and Paleobotany. I K International Publishing House Pvt Ltd., India
- Sharma, O.P. (2014). Bryophyta. McGraw Hill Education Pvt Ltd., India.
- Srivastava, H.N., 2018, Diversity of Microbes and Cryptogams, Vol. I, Pradeep's Publication.
- Vashishta, P.C, Sinha, A.K, Kumar, A., (2010). Botany for Degree Students Pteridophyta (Vascular cryptogams). S.S. Chand Publications

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-I (SESSION 2023-2026)**

**BOTANY**

**Course Title: Practical – Related to Diversity of Microbes & Diversity of Cryptogams**

**Course Code: BSMM-1075 (P)**

**(PRACTICAL)**

**Course Outcomes:**

After passing this course student will be able to:

- CO1: Ability to evaluate different sources of phylogenetic information (e.g. molecular sequence data, ultrastructure, morphology) for understanding algae and fungi.
- CO2: Knowledge of the evolutionary history and time-scale of non-vascular plants, including the development of the first terrestrial plants from green algae.
- CO3: Knowledge of the history and time-scale of land plant evolution, and evaluation of the principal types of evidence underlying.
- CO4: Basic understanding of algal and fungal diversity (incl. morphology, cell structure and level of organization) to phylum level, and their association as lichens.



**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-I (SESSION 2023-2026)**

**BOTANY**

**Course Code: BSMM-1075 (P)**

**Course Title: Practical – Related to Diversity of Microbes & Diversity of Cryptogams  
(PRACTICAL)**

**Time: 3 Hrs.**

**LTP: 0-0-2**

**Max. Marks: 50**

**Theory-40**

**CA: 10**

**Instructions for the paper setter:** question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same may be submitted for the record to COE Office, Kanya Maha Vidyalaya, Jalandhar

**Suggested Laboratory Exercises**

Teachers may select plants/material available in their locality/institution.

1. Gram staining of bacteria.
2. Observation of disease symptoms in hosts infected by fungi, viruses and mycoplasma. Section cutting of diseased material and identification of the pathogens as per the theory syllabus.
3. Study of the genera included under algae and fungi.
4. Study of morphology, reproductive structures and anatomy of the examples cited in theory under Bryophyta and Pteridophyta.
5. Types of Bacteria to be observed from temporary /permanent slides /electron micrographs.

**Suggested Readings:**

- Lee, R.E. (2018). Phycology, Fifth Edition, Cambridge University Press, USA.
- Agrios, G.N. (2005). Plant Pathology, 5th edition, Academic Press, U.K.

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-I (SESSION 2023-24)**  
**FOOD SCIENCE AND QUALITY CONTROL (VOCATIONAL)**

**Course Title: Food Chemistry and Nutrition**

**Course Code: BSMM-1255**

**(THEORY)**

**Course Outcomes:**

After passing this course the student will be able to:

**CO1:** Understand food, its functions, food groups, food metabolism, nutrition, malnutrition and nutrient requirement for adult men and women as per ICMR.

**CO2:** Understand the chemistry underlying the properties of various food components.

**CO3:** Understand the composition and nutritional significance of cereals, milk and milk products.

**CO4:** Understand the composition and nutritional significance of egg and poultry, meat and fish, fruits and vegetables.

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-I (SESSION 2023-24)**  
**FOOD SCIENCE AND QUALITY CONTROL (VOCATIONAL)**

**Course Title: Food Chemistry and Nutrition**

**Course Code: BSMM-1255**

**(THEORY)**

**Time: 3 Hrs.**

**LTP: 4-0-0**

**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**

1. **Introduction to nutrition**—food as a source of nutrients, function of foods, definition of nutrition, nutrients, adequate, optimum and good nutrition, malnutrition.
2. **Inter-relationship between nutrition and health**—parameters of good health.
3. **Food guide**—basic five food groups – Importance, uses.
4. **Food metabolism**—digestion, absorption, transport, utilization of nutrients in the body.
5. **Recommended dietary requirements**- Nutrient requirement for adult men and women as per ICMR.
6. **Water**—function, sources, requirement, water balance, effect of deficiency on health.

**UNIT-II**

7. **Carbohydrate**—composition, classification, food sources, storage in body, reaction, structure, functions of monosaccharides, oligosaccharides and polysaccharides in foods.
8. **Fat and oils**—composition, saturated, unsaturated fatty acids, food sources, functions of fats. Nomenclature and classification, emulsions and emulsifiers, role of fat and oil in food processing.
9. **Proteins**- composition, essential and non-essential amino acids, sources of protein, functions, protein deficiency diseases, physico-chemical properties, modification of food protein during processing and storage.
10. **Energy**- unit of energy, food as a source of energy, calorific value of food, need for energy, basic metabolic role, utilization of fat, energy requirement.
11. **Minerals**- function, sources, bio-availability and deficiency of macro and micro minerals.
12. **Vitamins**- classification, sources, functions and deficiency diseases of fat and water soluble vitamins.

### UNIT- III

13. **Cereals:** Composition and Nutritional aspects, breakfast cereals and cereal products: Bread and pasta.

14. **Milk and Milk Products:** Composition, classification, storage, uses, and nutritional significance of milk, curd, butter, paneer, khoa, cheese, ice-cream and various kinds of processed milk.

### UNIT -IV

15. **Egg and Poultry:** Composition and nutrition significance.

16. **Meat and Fish:** Structure, composition and nutritional significance, post mortem changes, changes in meat during cooking.

17. **Fruits and Vegetables:** Nutritive value of fruit and vegetables and their products- jam, jelly, marmalade and canned products.

#### Books Recommended:

1. Food Chemistry, 2007, 4<sup>th</sup> Edition, Owen R. Fennema. (Online available)
2. [https://edisciplinas.usp.br/pluginfile.php/4937824/mod\\_folder/content/0/Fennema%20%2099s%20Food%20Chemistry-CRC%20Press%20%282008%29%20%204th%20Edition.pdf?forcedownload=1](https://edisciplinas.usp.br/pluginfile.php/4937824/mod_folder/content/0/Fennema%20%2099s%20Food%20Chemistry-CRC%20Press%20%282008%29%20%204th%20Edition.pdf?forcedownload=1)
3. Food Chemistry, 2003, 2nd Edition, Connie M. Weaver, James R. Daniel.
4. Food Chemistry, 1974, 3rd Edition, Mian Hoagland Meyer.
5. Principles of Food Chemistry, 2018, 4th Edition, deMan.
6. Basic Food Chemistry, 2012, 4<sup>th</sup> Edition, Frank A. Lee.
7. Fundamentals of Foods and Nutritions, 2018, 6th Edition, Mudambi S.R., M.V. Rajgopal.
8. Advanced text book of Foods Nutrition, 1985, 2<sup>nd</sup> Edition, Swaminathan S.
9. Dairy technology: principles of milk properties and processes, 1995, 1<sup>st</sup> Edition, P. Walstra, T.J Guerts, A. Noomen, A. Jellema and M.A.J.S Van Boekel.
10. Cereal processing technology, 2001, 1<sup>st</sup> Edition, Gavin Owens.
11. Preservation of Fruit and Vegetables, Girdhari Lal, G.S. Siddappaa and G.L. Tandon, ICAR, New Delhi.
12. Analysis and Quality Control for Fruit and Vegetable Products, S Ranganna, McGraw Hill Education (India) Private Limited, Chennai, India.
13. Essentials of Food Science, 2013, 4<sup>th</sup> Edition, Vickie A. Vaclavik, Elizabeth W. Christian. (Online available) <https://core.ac.uk/download/pdf/326762601.pdf>

14. Food Chemistry, 2009, 4<sup>th</sup> Edition, H.-D. Belitz, W. Grosch, P. Schieberle. (**Online available**)

[https://edisciplinas.usp.br/pluginfile.php/4937824/mod\\_folder/content/0/Hans-Dieter%20Belitz%2C%20Werner%20Grosch%2C%20Peter%20Schieberle%20auth.%20Food%20Chemistry.pdf?forcedownload=1](https://edisciplinas.usp.br/pluginfile.php/4937824/mod_folder/content/0/Hans-Dieter%20Belitz%2C%20Werner%20Grosch%2C%20Peter%20Schieberle%20auth.%20Food%20Chemistry.pdf?forcedownload=1)

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-I (SESSION 2023-24)**  
**FOOD SCIENCE AND QUALITY CONTROL (VOCATIONAL)**

**Course Title: Food Chemistry and Nutrition**

**Course Code: BSMM-1255**

**(PRACTICAL)**

**Course Outcomes:**

After passing this course the student will be able to:

**CO1:** Understanding of compositional analysis of food.

**CO2:** Understanding the significance of BMI and BMR in health and their calculation.

**CO3:** Understanding the composition of egg and ability to assess its quality.

**CO4:** Understanding of the principles involved in dehydration process of fruits and vegetables.

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-I (SESSION 2023-24)**  
**FOOD SCIENCE AND QUALITY CONTROL (VOCATIONAL)**

**Course Title: Food Chemistry and Nutrition**

**Course Code: BSMM-1255**

**(PRACTICAL)**

**Time: 3 Hrs.**

**LTP: 0-0-1**

**Practical: 20**

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

**List of Practicals**

1. Determination of moisture content of wheat flour.
2. Calculation of BMI and BMR
3. Determination of ash content of food sample.
4. Qualitative tests of proteins and lipids in different foods.
5. Estimation of Vitamin C.
6. Determination of salt content in food products.
7. Estimation of volatile and nonvolatile acids in vinegar.
8. Estimation of fat in food sample by Soxhlet apparatus.
9. Grading and quality evaluation of eggs.
10. Dehydration of common fruits and vegetables.

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER I (SESSION 2023-24)**

**Course Title: Drug Abuse: Problem, Management and Prevention**

**Course Code: AECD-1161**

**Course Outcomes**

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

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

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

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

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



**BACHELOR OF SCIENCE (MEDICAL) SEMESTER I (SESSION 2023-24)**

**Course Title: Drug Abuse: Problem, Management and Prevention**

**Course Code: AECD-1161**

**Time: 3 Hrs.**  
**LTP: 2-0-0**

**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**

**Meaning of Drug Abuse:** Meaning, Nature, Types and Extent of Drug Abuse in India and Punjab.

**Consequences of Drug Abuse for:**

Individual : Education, Employment, Income.

Family : Violence.

Society : Crime , Social Disorganization

**UNIT-II**

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

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

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

**UNIT-III**

**Management of Drug Abuse**

**Medical management :** medication for treatment and to withdrawal effects.

**UNIT-IV**

**Psychiatric Management:** Counselling, Behavioural and Cognitive therapy.

**Social Management:** Family, Group therapy and Environmental Intervention.

**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.

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER II (SESSION 2023-24)**

**PUNJABI**

**Course Title: Punjabi (Compulsory)**

**Course Code: BSML -2421**

**COURSE OUTCOMES**

- CO1: 'ਦੋ ਰੰਗ' (ਕਹਾਣੀ ਭਾਗ) ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਕਹਾਣੀ ਪ੍ਰਤੀ ਦਿਲਚਸਪੀ, ਸੂਝ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ। ਇਸ ਦਾ ਹੋਰ ਮਨੋਰਥ ਕਹਾਣੀ ਦੀ ਵਿਸ਼ਲੇਸ਼ਣ ਤੇ ਮੁਲੰਕਣ ਦੀ ਪ੍ਰਕਿਰਿਆ ਤੋਂ ਜਾਣੂ ਕਰਾਉਣਾ ਵੀ ਹੈ ਤਾਂ ਕਿ ਉਹ ਸਮਕਾਲੀ ਸਮਾਜ ਦੀਆਂ ਸਮੱਸਿਆਵਾਂ ਨੂੰ ਸਮਝ ਸਕਣ ਅਤੇ ਆਲੋਚਨਾਤਮਕ ਦ੍ਰਿਸ਼ਟੀ ਬਣਾ ਸਕਣ।
- CO2: 'ਸੰਸਾਰ ਦੀਆਂ ਪ੍ਰਸਿਧ ਹਸਤੀਆਂ' ਜੀਵਨੀ ਦੀ ਵਿਧਾ ਨੂੰ ਸਿਲੇਬਸ ਵਿਚ ਸ਼ਾਮਿਲ ਕਰ ਕੇ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਜੀਵਨੀ ਨੂੰ ਪੜ੍ਹਣ ਦੀ ਰੁਚੀ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ ਅਤੇ ਜੀਵਨੀ ਜਗਤ ਨਾਲ ਜੋੜਣਾ ਹੈ।
- CO3: ਸ਼ਬਦ ਬਣਤਰ ਅਤੇ ਸ਼ਬਦ ਰਚਨਾ ਪੜ੍ਹਣ ਨਾਲ ਵਿਦਿਆਰਥੀ ਇਸਦੇ ਮੁੱਢਲੇ ਸੰਕਲਪਾਂ ਨੂੰ ਆਧਾਰ ਬਣਾ ਕੇ ਇਹਨਾਂ ਸੰਕਲਪਾਂ ਤੋਂ ਜਾਣੂ ਹੋਣਗੇ। ਸ਼ਬਦ ਸ਼੍ਰੇਣੀਆਂ ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੀ ਅਮੀਰੀ ਦਾ ਅਤੇ ਬਾਰੀਕੀਆਂ ਨੂੰ ਸਮਝਣ ਲਈ ਵੱਖਰੇ-ਵੱਖਰੇ ਸਿਧਾਂਤਾਂ ਦਾ ਵਿਕਾਸ ਕਰਨਾ ਹੈ।
- CO4: ਦਫ਼ਤਰੀ ਚਿੱਠੀ ਪੱਤਰ ਲਿਖਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਇਸ ਕਲਾ ਵਿਚ ਨਿਪੁੰਨ ਕਰਨਾ ਹੈ ਜੋ ਮੁਹਾਵਰੇਅਖਾਣ ਦੀ ਵਰਤੋਂ ਨਾਲ ਗੱਲਬਾਤ ਵਿਚ ਪਰਪੱਕਤਾ ਆਉਂਦੀ ਹੈ। ਇਹ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਗੱਲਬਾਤ ਵਿਚ ਨਿਖਾਰ ਲਿਆਉਣ ਦਾ ਕੰਮ ਕਰਨਗੇ।

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER II (SESSION 2023-24)**

**PUNJABI**

**Course Title: Punjabi (Compulsory)**

**Course Code: BSML -2421**

**Time: 3 Hrs.**

**LTP: 4-0-0**

**Max. Marks: 100**

**Theory: 80**

**CA: 20**

**ਪਾਠਕ੍ਰਮ ਅਤੇ ਪਾਠ ਪੁਸਤਕਾਂ**

**ਯੂਨਿਟ-I**

ਦੋ ਰੰਗ (ਕਹਾਣੀ ਭਾਗ) (ਸੰਪਾ.ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿਲੋਂ ਅਤੇ ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ), ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ।

(ਵਿਸ਼ਾ-ਵਸਤੂ/ ਪਾਤਰ ਚਿਤਰਨ)

16 ਅੰਕ

**ਯੂਨਿਟII**

ਸੰਸਾਰ ਦੀਆਂ ਪ੍ਰਸਿੱਧ ਹਸਤੀਆਂ (ਜੀਵਨੀ ਨੰ: 10 ਤੋਂ 18 ਤਕ) (ਸੰਪਾ.ਪ੍ਰਿੰ. ਤੇਜਾ ਸਿੰਘ, ਹਰਨਾਮ ਸਿੰਘ ਸ਼ਾਮ), ਪੰਜਾਬੀ ਸਾਹਿਤ ਪ੍ਰਕਾਸ਼ਨ, ਅੰਮ੍ਰਿਤਸਰ।

(ਵਿਸ਼ਾ-ਵਸਤੂ/ ਨਾਇਕ ਬਿੰਬ)

16ਅੰਕ

**ਯੂਨਿਟIII**

(ੳ) ਸ਼ਬਦ ਬਣਤਰ ਅਤੇ ਸ਼ਬਦ ਰਚਨਾ : ਪਰਿਭਾਸ਼ਾ, ਮੁੱਢਲੇ ਸੰਕਲਪ।

(ਅ) ਸ਼ਬਦ ਸ਼੍ਰੇਣੀਆਂ

16 ਅੰਕ

**ਯੂਨਿਟ-IV**

(ੳ) ਦਫ਼ਤਰੀ ਚਿੱਠੀ ਪੱਤਰ

(ਅ) ਮੁਹਾਵਰੇਅਖਾਣ

16ਅੰਕ

**ਅੰਕ ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ**

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਸੈਕਸ਼ਨ ਹੋਣਗੇ। ਸੈਕਸ਼ਨ ਾਣ ਤੱਕ ਦੇ ਪ੍ਰਸ਼ਨ ਯੂਨਿਟ ਜ਼ਜ਼ੜ ਵਿਚੋਂ ਪੁੱਛੇ ਜਾਣਗੇ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਕਰਨਾ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 16 ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER II (SESSION 2023-24)**

**BASIC PUNJABI**

**Course Title: Basic Punjabi  
In lieu of Punjabi (Compulsory)  
Course Code: BSML -2031**

**COURSE OUTCOMES**

- CO1: ਸ਼ਬਦ ਸ਼੍ਰੇਣੀਆਂ : ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ (ਨਾਂਵ, ਪੜਨਾਂਵ, ਕਿਰਿਆ, ਵਿਸ਼ੇਸ਼ਣ, ਕਿਰਿਆ ਵਿਸ਼ੇਸ਼ਣ, ਸਬੰਧਕ, ਯੋਜਕ ਅਤੇ ਵਿਸਮਿਕ) ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੀ ਅਮੀਰੀ ਦਾ ਅਤੇ ਬਾਰੀਕੀਆਂ ਨੂੰ ਸਮਝਣ ਲਈ ਵੱਖਰੇ-ਵੱਖਰੇ ਸਿਧਾਂਤਾਂ ਦਾ ਵਿਕਾਸ ਕਰਨਾ ਹੈ।
- CO2: ਵਿਦਿਆਰਥੀ ਪੰਜਾਬੀ ਵਾਕ ਬਣਤਰ (ਸਾਧਾਰਨ ਵਾਕ, ਸੰਯੁਕਤ ਵਾਕ, ਮਿਸ਼ਰਤ ਵਾਕ, ਬਿਆਨੀਆ ਵਾਕ, ਪ੍ਰਸ਼ਨ ਵਾਚਕ ਵਾਕ ਅਤੇ ਹੁਕਮੀ ਵਾਕ) ਦੀ ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਇਸ ਦੀ ਬਣਤਰ ਤੋਂ ਜਾਣੂ ਹੋਣਗੇ ਅਤੇ ਉਨ੍ਹਾਂ ਦੀ ਭਾਸ਼ਾ ਤੇ ਪਕੜ ਮਜ਼ਬੂਤ ਹੋਵੇਗੀ।
- CO3: ਪੈਰ੍ਹਾ ਰਚਨਾ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਬੁੱਧੀ ਨੂੰ ਤੀਖਣ ਕਰਦਿਆਂ ਉਨ੍ਹਾਂ ਦੀ ਲਿਖਣ ਪ੍ਰਤਿਭਾ ਨੂੰ ਉਜਾਗਰ ਕਰਨਾ ਹੈ। ਅਖਾਣ ਦੀ ਵਰਤੋਂ ਨਾਲ ਗੱਲਬਾਤ ਵਿਚ ਪਰਪੱਕਤਾ ਆਉਂਦੀ ਹੈ। ਇਹ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਗੱਲਬਾਤ ਵਿਚ ਨਿਖਾਰ ਲਿਆਉਣ ਦਾ ਕੰਮ ਕਰਨਗੇ।
- CO4: ਘਰੇਲੂ ਅਤੇ ਦਫ਼ਤਰੀ ਚਿੱਠੀ ਪੱਤਰ ਲਿਖਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਇਸ ਕਲਾ ਵਿਚ ਨਿਪੁੰਨ ਕਰਨਾ ਹੈ ਜਿਸ ਮੁਹਾਵਰਿਆਂ ਦੀ ਵਰਤੋਂ ਨਾਲ ਗੱਲਬਾਤ ਵਿਚ ਪਰਪੱਕਤਾ ਆਉਂਦੀ ਹੈ। ਇਹ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਗੱਲਬਾਤ ਵਿਚ ਨਿਖਾਰ ਲਿਆਉਣ ਦਾ ਕੰਮ ਕਰਨਗੇ।

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER II (SESSION 2023-24)**

**BASIC PUNJABI**

**Course Title: Basic Punjabi  
In lieu of Punjabi (Compulsory)**

**Course Code: BSML -2031**

**Time: 3 Hrs.**

**LTP: 4-0-0**

**Max. Marks: 100**

**Theory: 80**

**CA: 20**

**ਪਾਠਕ੍ਰਮ**

**ਯੂਨਿਟ I**

ਸ਼ਬਦ ਸ਼੍ਰੇਣੀਆਂ : ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ (ਨਾਂਵ, ਪੜਨਾਂਵ, ਕਿਰਿਆ, ਵਿਸ਼ੇਸ਼ਣ, ਕਿਰਿਆ ਵਿਸ਼ੇਸ਼ਣ, ਸਬੰਧਕ, ਯੋਜਕ ਅਤੇ ਵਿਸਮਿਕ) 16 ਅੰਕ

**ਯੂਨਿਟ-II**

ਪੰਜਾਬੀ ਵਾਕ ਬਣਤਰ : ਮੁੱਢਲੀ ਜਾਣ ਪਛਾਣ

(ੳ) ਸਾਧਾਰਨ ਵਾਕ, ਸੰਯੁਕਤ ਵਾਕ ਅਤੇ ਮਿਸ਼ਰਤ ਵਾਕ (ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ)

(ਅ) ਬਿਆਨੀਆ ਵਾਕ, ਪ੍ਰਸ਼ਨ ਵਾਚਕ ਵਾਕ ਅਤੇ ਹੁਕਮੀ ਵਾਕ (ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ) 16 ਅੰਕ

**ਯੂਨਿਟ III**

ਪੈਰ੍ਰਾ ਰਚਨਾ

ਅਖਾਣ ( ਅਖਾਣਾਂ ਦੀ ਲਿਸਟ ਨਾਲ ਨੱਥੀ ਹੈ) 16 ਅੰਕ

**ਯੂਨਿਟ IV**

ਚਿੱਠੀ ਪੱਤਰ (ਘਰੇਲੂ ਅਤੇ ਦਫ਼ਤਰੀ)

ਮੁਹਾਵਰੇ (ਮੁਹਾਵਰਿਆਂ ਦੀ ਲਿਸਟ ਨਾਲ ਨੱਥੀ ਹੈ) 16 ਅੰਕ

**ਅੰਕ ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ**

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਸੈਕਸ਼ਨ ਹੋਣਗੇ। ਸੈਕਸ਼ਨ ਼ੁਣ ਤੱਕ ਦੇ ਪ੍ਰਸ਼ਨ ਯੂਨਿਟ ਜ਼ਜ਼ੜ ਵਿਚੋਂ ਪੁੱਛੇ ਜਾਣਗੇ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 16 ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

## ਅਖਾਣ

ਉੱਦਮ ਅੱਗੇ ਲੱਛਮੀ ਪੱਖੇ ਅੱਗੇ ਪੈਣ ,ਉਹ ਦਿਨ ਡੁੱਬਾ ਜਦੋਂ ਘੋੜੀ ਚੜ੍ਹਿਆ ਕੁੱਬਾ ,ਉੱਚੀ ਦੁਕਾਨ ਫਿੱਕਾ ਪਕਵਾਨ ,ਉਲਟੀ ਵਾੜ ਖੇਤ ਨੂੰ ਖਾਏ ,ਉੱਚਾ ਲੰਮਾ ਗੱਭਰੂ ਪੱਲੇ ਠੀਕਰੀਆਂ ,ਅੱਖੀਂ ਵੇਖ ਕੇ ਮੱਖੀ ਨਹੀਂ ਨਿਗਲੀ ਜਾਂਦੀ ,ਅੰਦਰ ਹੋਵੇ ਸੱਚ ਤਾਂ ਕੋਠੇ ਚੜ੍ਹ ਕੇ ਨੱਚ ,ਆਪੇ ਮੈਂ ਰੱਜੀ ਪੁੱਜੀ ਆਪੇ ਮੇਰੇ ਬੱਚੇ ਜਿਉਣ ,ਆਪ ਕੁਚੱਜੀ ਵਿਹੜੇ ਨੂੰ ਦੇਸ਼ ,ਅੰਨ੍ਹਾ ਵੰਡੇ ਰਿਉੜੀਆਂ ਮੁੜ ਮੁੜ ਆਪਣਿਆਂ ਨੂੰ ,ਅਕਲ ਵੱਡੀ ਕੇ ਮੱਝ ,ਅੰਨ੍ਹਿਆਂ ਵਿੱਚ ਕਾਣਾ ਰਾਜਾ ,ਆਪਣੀ ਪੀੜ੍ਹੀ ਹੇਠ ਸੇਟਾ ਫੇਰਨਾ ,ਇਕ ਅਨਾਰ ਸੈਂ ਬਿਮਾਰ ,ਇਕ ਹੱਥ ਨਾਲ ਤਾੜੀ ਨਹੀਂ ਵੱਜਦੀ ,ਇੱਕ ਚੁੱਪ ਸੈਂ ਸੁੱਖ ਝੱਟ ਮੰਗਣੀ ਪੱਟ ਵਿਆਹ ,ਸਹਿਜ ਪੱਕੇ ਸੇ ਮੀਠਾ ਹੋਵੇ ,ਦਾਲ ਵਿੱਚ ਕਾਲਾ ਹੋਣਾ ,ਸੱਦੀ ਨਾ ਬੁਲਾਈ ਮੈਂ ਲਾੜੇ ਦੀ ਤਾਈਂ ,ਸਵੈ ਭਰੋਸਾ ਵੱਡਾ ਤੇਸਾ,ਸੈਂ ਦਿਨ ਚੋਰ ਦੇ ਇਕ ਦਿਨ ਸਾਧ ਦਾ ,ਸੱਪ ਦਾ ਬੱਚਾ ਸਪੇਲੀਆ ,ਸੱਪ ਮਰ ਜਾਵੇ ਲਾਠੀ ਵੀ ਨਾ ਟੁੱਟੇ ,ਸਾਈਆਂ ਕਿਤੇ ਵਧਾਈਆਂ ਕਿਤੇ ,ਹੰਕਾਰਿਆ ਸੇ ਮਾਰਿਆ ,ਹਾਥੀ ਲੰਘ ਗਿਆ ਪੂਛ ਰਹਿ ਗਈ ,ਕੁੱਛੜ ਕੁੜੀ ਸ਼ਹਿਰ ਢੰਡੇਰਾ ,ਕੋਲਿਆਂ ਦੀ ਦਲਾਲੀ ਵਿੱਚ ਮੂੰਹ ਕਾਲਾ ,ਕਰੇ ਕੋਈ ਭਰੇ ਕੋਈ ,ਖਵਾਜੇ ਦਾ ਗਵਾਹ ਡੱਡੂ ,ਖੇਤੀ ਖਸਮਾਂ ਸੇਤੀ ,ਖੂਹ ਪੁੱਟਦੇ ਨੂੰ ਖਾਤਾ ਤਿਆਰ ,ਘਰ ਦਾ ਭੇਤੀ ਲੰਕਾ ਢਾਹੇ ,ਘਰ ਦੀ ਕੁੱਕੜੀ ਦਾਲ ਬਰਾਬਰ ,ਚਿੰਤਾ ਚਿਖਾ ਬਰਾਬਰ , ਛੱਜ ਤਾਂ ਬੋਲੇ ਛਾਣਨੀ ਵੀ ਬੋਲੇ,ਛੋਟੀ ਮੂੰਹ ਵੱਡੀ ਗੱਲ ,ਜਾਂਦੇ ਚੋਰ ਦੀ ਲੰਗੋਟੀ ਹੀ ਸਹੀ ,ਜਿਸ ਦੀ ਕੋਠੀ ਦਾਣੇ ਉਹਦੇ ਕਮਲੇ ਵੀ ਸਿਆਣੇ ,ਜਿਹੜੇ ਗੱਜਦੇ ਨੇ ਉਹ ਵਰ੍ਹਦੇ ਨਹੀਂ , ਝੱਟ ਮੰਗਣੀ ਪੱਟ ਵਿਆਹ , ਰੱਸੀ ਸੜ ਗਈ ਵੱਟ ਨੂੰ ਗਿਆ

## ਮੁਹਾਵਰੇ

ਉਸਤਾਦੀ ਕਰਨੀ, ਉਂਗਲ ਕਰਨੀ, ਉੱਲੂ ਬਣਾਉਣਾ ,ਉੱਚਾ ਸਾਹ ਨਾ ਕੱਢਣਾ, ਉੱਡਦੇ ਫਿਰਨਾ ,ਉੱਘ ਸੁੱਘ ਮਿਲਣੀ,ਅੱਖਾਂ ਵਿੱਚ ਰੜਕਣਾ ,ਅੱਗ ਲਾਉਣਾ ,ਆਵਾ ਉਤ ਜਾਣਾ ,ਅਸਮਾਨ ਨੂੰ ਟਾਕੀਆਂ ਲਾਉਣਾ, ਅੱਖਾਂ ਵਿੱਚ ਲਾਲੀ ਉਤਰਨੀ ,ਅਕਲ ਤੇ ਪਰਦਾ ਪੈਣਾ, ਈਨ ਮੰਨਣੀ, ਈਦ ਦਾ ਚੰਨ ਹੋਣਾ, ਇੱਟ ਨਾਲ ਇੱਟ ਖੜਕਾਉਣਾ,ਸਿਰ ਫਿਰਨਾ, ਸਿਰ ਤੇ ਚੜ੍ਹਨਾ ,ਸਬਰ ਦਾ ਘੁੱਟ ਭਰਨਾ, ਸਿਰ ਪੈਰ ਨਾ ਹੋਣਾ, ਹੱਥ ਧੋ ਕੇ ਪਿੱਛੇ ਪੈਣਾ, ਹੱਥੀਂ ਛਾਂਵਾਂ ਕਰਨੀਆਂ, ਹੱਡ ਭੰਨਣੇ, ਹੱਥ ਤੰਗ ਹੋਣਾ ,ਹੱਥ ਮਲਣਾ,ਹੱਥ ਪੈਰ ਮਾਰਨਾ,ਕੰਨੀਂ ਕਤਰਾਉਣਾ, ਕੰਨ ਤੇ ਜੂੰ ਨਾ ਸਰਕਣਾ, ਕੰਨ ਘੋਸਲ ਮਾਰਨੀ, ਖਾਨਾ ਖਰਾਬ ਹੋਣਾ, ਖਾਨਿਓ ਜਾਣਾ, ਗੁੱਡੀ ਚੜ੍ਹਨੀ, ਗਲ ਪੈਣਾ ,ਗੰਗਾ ਨਹਾਉਣਾ ,ਚੜ੍ਹ ਮੱਚਣੀ, ਚੰਦ ਚਾੜ੍ਹਨਾ, ਚਾਦਰ ਵੇਖ ਕੇ ਪੈਰ ਪਸਾਰਨਾ ,ਚਕਮਾ ਦੇਣਾ ,ਛੱਕੇ ਛੜਾਉਣਾ ,ਛਾਪਾ ਮਾਰਨਾ, ਛਿੱਲ ਲਾਉਣੀ ,ਛਿੱਕੇ ਟੰਗਣਾ

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER II (SESSION 2023-24)**

**PUNJAB HISTORY AND CULTURE**

**Course Title: Punjab History and Culture (C. 320 to 1000 A.D.)**

**(Special paper in lieu of Punjabi Compulsory)**

**(For those students who are not domicile of Punjab)**

**Course Code: BSML-2431**

**COURSE OUTCOMES**

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

- CO 1:** The reasons and impact of Alexander's invasions and to comprehend various factors leading to rise and fall of empires and emergence of new dynasties and their administration specifically of Maurya rule in general and Ashok in particular
- CO 2:** Art and architecture of Gupta period and the Indo-Greek style of architecture under Gandhara School
- CO 3:** To have an insight into the socio-cultural history under Harshvardhan and Punjab under the stated period
- CO 4:** To enable students to have thorough insight into the various forms/styles of Architecture and synthesis of Indo - Greek Art and Architecture in Punjab



**BACHELOR OF SCIENCE (MEDICAL) SEMESTER II (SESSION 2023-24)**  
**PUNJAB HISTORY AND CULTURE**

**Course Title: Punjab History and Culture (C. 320 to 1000 A.D.)**

**(Special paper in lieu of Punjabi Compulsory)**

**(For those students who are not domicile of Punjab)**

**Course Code: BSML-2431**

**Time: 3 Hrs.**

**LTP: 4-0-0**

**Max. Marks: 100**

**Theory: 80**

**CA: 20**

**Instructions for the Paper Setter:**

1. Question paper shall consist of four Units
2. Examiner shall set 8 questions in all by selecting Two Questions of equal marks from each Unit.
3. Candidates shall attempt 5 questions in 1000 words, by at least selecting One Question from each Unit and the 5<sup>th</sup> question may be attempted from any of the four Units.
4. Each question will carry 16 marks

**Unit-I**

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

**Unit-II**

3. The Kushans: Gandhar School of Art
4. Gupta Empire: Golden Period-Social and cultural life, Art and Architecture)

**Unit-III**

5. The Punjab under Harshvardhana-Society and Religion During the time of Harshvardhana
6. Socio-cultural History of Punjab from 7<sup>th</sup> to 1000 A.D.

**UNIT IV**

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

**Suggested Readings**

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

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER II (SESSION 2023-24)**

**ENGLISH**

**Course Title: English (Compulsory)**

**Course Code: BSML -2212**

**COURSE OUTCOMES**

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

**CO1:** Change the narration and voice of sentences after understanding fundamental grammatical rules governing them through the study of “English Grammar in Use” by Raymond Murphy

**CO2:** Write personal letters and increase their knowledge of vocabulary by studying the synonyms and antonyms in the prescribed text *The Students’ Companion* by Wilfred D. Best

**CO3:** Comprehend the meaning of texts and answer questions related to situations, episodes, themes and characters depicted in them through the study of the stories in text “Tales of Life”.

**CO4:** Appreciate the writings of various Indian and foreign story and prose writers and relate them to their socio-cultural milieu through the study of the essays in text “Prose for Young Learners”

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER II (SESSION 2023-24)**

**ENGLISH**

**Course Title: English (Compulsory)**

**Course Code: BSML -2212**

**Time: 3 Hrs.**

**LTP: 4-0-0**

**Max. Marks: 100**

**Theory: 80**

**CA: 20**

**Instructions for the Examiner:**

The question paper will consist of 4 sections & distribution of marks will be as under:

**Section A:** The question will be set from Unit I of the syllabus. Fifteen sentences will be set and the students would be required to attempt any ten. Each sentence will carry two marks.

**(10x2=20)**

**Section B:** Two questions will be set from unit II of the syllabus. (I) Personal Letter (with internal choice). The student will write a personal letter on any of the given two topics. This question will carry 10 marks. (II) Vocabulary (Antonyms/Synonyms). 10 words will be given. The students will give the Antonyms/Synonyms of any five words. This question will carry 10 marks.

**(2x10=20)**

**Section C:** This section will be divided into two parts. Two questions will be set from Unit III of the syllabus. Part one will have one essay type question with internal choice carrying 10 marks (word limit 400 words). The students would be required to attempt any one. Part two will have three questions. The students would be required to attempt any two (word limit 150 words each). Each question in part two will carry five marks.

**(10+5+5=20)**

**Section D:** This section will be divided into two parts. Two questions will be set from Unit IV of the syllabus. Part one will have one essay type question with internal choice carrying 10 marks (word limit 400 words). The students would be required to attempt any one. Part two will have three questions. The students would be required to attempt any two (word limit 150 words each). Each question will carry five marks.

**(10+5+5=20)**

**Unit I**

*English Grammar in Use*, 4<sup>th</sup> Edition by Raymond Murphy, CUP (Units: 42-52, 69-81)

**Unit II**

Personal letter Writing and *The Students' Companion* (Section 9: Antonyms and Synonyms)

**Unit III**

*Tales of Life* (Guru Nanak Dev University, Amritsar): Stories at Sr.No. 7, 9, 10, 11, 12

## Unit IV

*Prose for Young Learners: Essays at Sr.No. 7, 8, 9, 10, 11*

### **Texts Prescribed:**

1. *English Grammar in Use* (Fourth Edition) by Raymond Murphy, CUP
2. *The Students' Companion* by Wilfred D. Best
3. *Tales of Life* (Guru Nanak Dev University, Amritsar)
4. *Prose for Young Learners* (Guru Nanak Dev University, Amritsar)

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-II (SESSION 2023-24)**

**ZOOLOGY**

**Course Title: ECOLOGY**

**Course Code: BSMM-2483 (I)  
(THEORY)**

**Course Outcomes**

After passing this course the student will be able to:

CO1: Describe the history, introduction and nature of ecosystem

CO2: Understand the biogeocycles and ecological adaptations.

CO3: Know about the characteristics of population & biotic community.

CO4: Know about the conservation of resources.

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-II (SESSION 2023-24)**

**ZOOLOGY**

**Course Title: ECOLOGY**

**Course Code: BSMM-2483 (I)**

**(THEORY)**

**Time: 3 Hrs.**

**LTP: 2-0-0**

**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**

Ecology: Definition, Subdivisions and scope of ecology.

Ecosystem: Components, ecological energetics, food web, major ecosystems of the world.

Ecological factors: Temperature, light and soil as ecological factors.

**UNIT-II**

Nutrients: Biogeochemical cycles and concept of limiting factors.

Ecological Adaptations: Morphological, physiological and behavioural adaptations in animals in different habitats.

**UNIT-III**

Population: Characteristics and regulations of population. Inter and Intra Specific relationship: Competition, Predation, Parasitism, Commensalism and Mutualism.

Biotic community: Characteristics, ecological succession, ecological niche.

**UNIT-IV**

Natural resources: Renewable and nonrenewable natural resources and their conservations.

Environmental Issues: Causes, impact and control of environmental pollution.

### **Suggested Readings:**

- Anderwartha, H.G. and Birch, L. C. (1970), The distribution and abundance of animals, University of Chicago Press, Chicago London.
- Beeby, A. (1992), Applying Ecology, Chapman and Hall Madras.
- Begon, M., Harper J. L. and Townsend, C. R. (1995), Ecology – Individuals, populations and communities, Blackwell Science, Cambridge UK.
- Brewer, R. (1994), The science of Ecology, Saunders College of Publishing, New York.
- Chapman, J. L. and Resis, M. J. (1995), Ecology- Principles and applications, Cambridge University Press, Cambridge UK.
- Kaeighs, S. C. (1974), Ecology with special references to animal and Man, Prentice Hall Inc.
- Kormondy, E.J. (1975), Concept of Ecology, Englewood Cliffs, N.J. Prentice Hall Inc.
- Krebs C.J. (1982), Ecology, Harper & Row, New York.
- Putmann, R. J. and Wratten, S. D. ( 1984 ), Principles of Ecology, Crown Helm, London.

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-II (SESSION 2023-24)**

**ZOOLOGY**

**Course Title: Biodiversity- II (Arthropoda to Hemichordata)**

**Course Code: BSMM-2483 (II)**

**(THEORY)**

**Course Outcomes:**

After passing this course the student will be able to:

CO1: Understand physiology and economic importance of cockroach and social organization of insects.

CO2: Gain knowledge about the general pattern of life history of phylum mollusca

CO3: Learn about life history and larval forms of Echinodermata

CO4: Gain knowledge about affinities of Hemichordates with Non-Chordates and Chordates



**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-II (SESSION 2023-24)**  
**ZOOLOGY**  
**Course Title: BIODIVERSITY- II (ARTHROPODA TO HEMICHAORDATA)**  
**Course Code: BSMM-2483 (II)**  
**(THEORY)**

**Time: 3 Hrs.**  
**LTP: 3-0-0**

**Max. Marks: 75**  
**Theory: 60**  
**CA: 15**

**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**

Arthropoda: Type study-*Periplaneta americana* (Cockroach),  
Social organizations in insects (Honey bee and Termite)

**UNIT-II**

Mollusca: Type study-*Pila globosa*, Tortion, Pearl formation

**UNIT-III**

Echinodermata: Type study - *Asterias* (Star fish), Study of Echinoderm larvae

**UNIT-IV**

Hemichordata: Type study - *Balanoglossus* (External characters only). Affinities of Hemichordates with Non-Chordates and Chordates

**Suggested Readings:**

- Barnes, R.D.(1999), Invertebrate Zoology. W.B. Saunder, Philadelphia.
- Dhama, P.S. & Dhama, J. K., Invertebrates, R. Chand & Co., New Delhi, 2001.
- Barth, R. H. and Broshears, R. E (1982), The Invertebrate world. Holt Saunder, Japan.
- Brusca, R. C. and Brusca, G. J. (2003), Invertebrates (2nd ed), Sinauer Associates, Inc. Publishers, Sunderland, Massachusetts.
- Engemann, J. G. and Hegner, R. W. (1981), Invertebrate Zoology (3rd ed), Macmillan, New York.

- Gardiner, M. S. (1972), *The Biology of Invertebrates*, McGraw Hill, New York.
- Meglitsch, P. A. and Schran, F. R. (1991), *Invertebrate Zoology* (3rd ed), Oxford University Press, New York.
- Pechenik, A. Jan. (2000), *Biology of the invertebrates*, (4th ed), McGraw Hill Book Co. Singapore.

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-II (SESSION 2023-24)**

**ZOOLOGY**

**Course Title: Practical- II (Related To Ecology And Biodiversity-II**

**Course Code: BSMM-2483 (P)**

**(PRACTICAL)**

**Course Outcomes:**

After passing this course the student will be able to:

CO1: Know about the morphological, physiological & behavioural adaptations of different animals in different habitats.

CO2: Familiarise with the classification & ecology of invertebrates.

CO3: Identify different zoogeographical realms with fauna.

CO4: Know about the different nest of birds.

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-II (SESSION 2023-24)**

**ZOOLOGY**

**Course Title: Practical- II (Related To Ecology And Biodiversity-II)**

**Course Code: BSMM-2483 (P)**

**(PRACTICAL)**

**Time: 3 Hrs.**

**LTP: 0-0-2**

**Max. Marks: 50**

**Theory: 40**

**CA: 10**

**Instructions for the Practical Examiners:**

Question paper is to 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

**1. Classification up to order level with ecological notes and economic importance (if any) of the following animals:**

**Arthropoda:** Peripatus, Palaemon (prawn), Lobster, Cancer (crab), Sacculina, Eupagurus (hermit Crab), Lepas, Balanus, Cyclops, Daphnia, Lepisma, Periplaneta (cockroach), Schistocerca (locust), Poecilocerous (ak grasshopper), Gryllus (cricket), Mantis (praying mantis), Cicada, Forficula (earwig), Dragonfly, Termite queen, Bug, Moth, Beetles, Polistes (wasp), Apis (honey bee), Bombyx, Pediculus (body louse) Millipede and Centipede, Palamnaeus (scorpion), Aranea (spider) and Limulus (king Crab).

**Mollusca:** Anodonta, Mytilus, Ostrea, Cardium, Pholas, Solen (razor fish), Pecten, Haliotis, Patella, Aplysia, Doris, Limax, Loligo, Sepia, Octopus, Nautilus shell (Complete and T.S.), Chiton, Dentalium.

**Echinodermata:** Asterias, Echinus Ophiothrix, Antedon.

**Hemichordata:** Balanoglossus.

**2. Study of the following permanent stained preparations:**

Trachea and mouth parts of Insects

Radula and osphradium of Pila

T.S. Star fish (Arm).

**3. Demonstration of digestive and nervous systems of *Periplaneta* (cockroach) with the help of charts/models/videos.**

#### 4. Ecology:

Study of animal adaptations with the help of specimens, charts and models.

Study of abiotic and biotic components of an ecosystem.

Study of different types of nests of birds.

Study and preparation of Zoogeographical charts.

#### 5. Assignment

Note:- Some changes can be made in the practicals depending on the availability of material.

#### Guidelines for conduct of practical Examination:-

- |    |                                                                                                                                       |   |
|----|---------------------------------------------------------------------------------------------------------------------------------------|---|
| 1. | Identify and classify the specimens upto order level. Write a note on their habit, habitat, special features and economic importance. | 8 |
| 2. | Draw a well labelled sketch of the given system of the animal & explain it to the examiner.                                           | 6 |
| 3. | Identify the slides/models and give two reasons for identification.                                                                   | 6 |
| 4. | Identify the adaptive feature/nest.                                                                                                   | 4 |
| 5. | Mark the distribution of animals of a realm on the map.                                                                               | 4 |
| 6. | Assignment                                                                                                                            | 4 |
| 7. | Viva-voce & Practical file.                                                                                                           | 8 |

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-II (SESSION 2023-24)**

**MICROBIOLOGY**

**Course Title: Basic Food Microbiology**

**Course Code: BSMM-2343**

**(THEORY)**

**Course Outcomes:**

After passing this course the student will be able to:

**CO1:** Learn about microorganisms important in food microbiology and the intrinsic and extrinsic factors affecting their growth.

**CO2:** Learn about the origin and preparation of fermented foods.

**CO3:** Understand the methods of food preservation and applications of prebiotics and probiotics.

**CO4:** Understand the spoilage in different food products.

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-II (SESSION 2023-24)**

**MICROBIOLOGY**

**Course Title: Basic Food Microbiology**

**Course Code: BSMM-2343**

**(THEORY)**

**Time: 3 Hrs.**

**LTP: 4-0-0**

**Max. Marks: 100**

**Theory: 80**

**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**

Food as a substrate for microorganisms, intrinsic and extrinsic factors affecting the growth of various microorganisms in foods. Microorganisms important in food microbiology—bacteria, yeasts and molds, sources of contamination in foods.

**UNIT-II**

Fermented foods, origin of fermentation as a method of preparing indigenous foods, bread, dosa, idli, warri, tempeh, miso

**UNIT-III**

Principles of food preservation and spoilage, asepsis, anaerobic conditions, aseptic packaging, preservation methods, high temperature, low temperature, drying, chemical preservatives. Applications of prebiotics and probiotics.

**UNIT-IV**

Spoilage of various milk and milk products, cereal and cereal products, vegetable and fruits, meat and meat products, canned foods. Food poisoning and food infection. *Staphylococcal*, *Clostridium* and *Salmonella* intoxications.

**Books Recommended:**

1. Frazier. W.C. and Westhoff, D.C. 2006, 26<sup>th</sup> edition, Food Microbiology, Tata McGraw Hill Publishing Co., Ltd., New Delhi.
2. Banwart, G.J., 2012, Basic Food Microbiology, Springer Verlag, New Delhi.
3. Powar, C.B. and Dagniwala, H.F. 2012, General Microbiology Volume II. Himalaya Publishing House, New Delhi. 128

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-II (SESSION 2023-24)**  
**MICROBIOLOGY**

**Course Title: Basic Food Microbiology**

**Course Code: BSMM-2343**

**(PRACTICAL)**

**COURSE OUTCOMES**

After passing the course student will be able to:

**CO1:** Demonstrate serial dilution technique to isolate different microorganisms

**CO2:** Understand the morphology of bacteria, yeasts and mold

**CO3:** Analyze the quality of milk by MBRT

**CO4:** Identify the microorganisms causing spoilage in bread and raw milk



**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-II (SESSION 2023-24)**  
**MICROBIOLOGY**

**Course Title: Basic Food Microbiology**

**Course Code: BSMM-2343**

**(PRACTICAL)**

**Time: 3 Hrs.**

**Practical: 20**

**LTP: 0-0-1**

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

**LIST OF PRACTICALS**

1. To enumerate the total microbial cells in a suspension by serial dilution and pour plating.
2. To enumerate the total bacteria in milk by direct microscopic count.
3. To study the morphology of bacteria, yeasts and molds.
4. To check the bacteriological quality of raw milk by methylene blue reduction test.
5. Baking of bread and making of dhokla and idli.
6. To study the spoilage causing microorganisms present in spoiled bread and raw milk.

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-II (SESSION 2023-24)**  
**CHEMISTRY**

**Course Title: Inorganic Chemistry**

**Course Code: BSMM -2084 (I)**  
**(THEORY)**

**Course outcomes:**

Students will be able to

CO1: Explains & compares the trends in atomic and physical properties of group 13, 14, 15, 16, 17 elements

CO2: Explain the atomic, physical and chemical properties of alkali metals and alkaline earth metals.

CO3: Interpret the properties of carbides, silicates, interhalogen compounds.

CO4: Exhaustive understanding of d-block elements belonging to 4th, 5th and 6th period.

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-II (SESSION 2023-24)**  
**CHEMISTRY**

**Course Title: Inorganic Chemistry**  
**Course Code: BSMM -2084 (I)**  
**(THEORY)**

**Time: 3 Hrs.**  
**LTP: 3-0-0**

**Max. Marks: 75**  
**Theory: 60**  
**CA: 15**

**Instructions for the Paper Setter**

Eight questions of equal marks (twelve 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**

**I. p-Block Elements-I (10 Hrs)**

Comparative study (including diagonal relationship) of groups 13–17 elements, compounds like hydrides, oxides, oxyacids and halides of groups 13–16, hydrides of boron–diborane and higher boranes, Borazine, borohydrides, fullerenes.

**UNIT-II**

**II. s-Block Elements (5 Hrs)**

Comparative studies, diagonal relationship, salient features of hydrides, solvation and complexation tendencies.

**III. Acids and Bases (5 Hrs)**

Arrhenius, Bronsted-Lowry, the Lux-Flood, solvent system and Lewis concepts of acids and bases.

**UNIT-III**

**IV.p-Block Elements-II (10 Hrs)**

Carbides, fluorocarbons, silicates (structural principle), tetrasulphur tetranitride, basic properties of halogens, interhalogens and polyhalide, Silicones and phosphazenes as examples of inorganic polymers, nature of bonding in triphosphazenes.

**UNIT-IV**

**V. Chemistry of Transition Elements (15 Hrs)**

Characteristic properties of *d*-block elements. Properties of the elements of the first transition series, their simple compounds and complexes illustrating relative stability of their oxidation

states, coordination number and geometry. General characteristics of elements of Second and Third Transition Series, comparative treatment with their 3d analogues in respect of ionic radii, oxidation states, magnetic behaviour.

**Books Suggested:**

1. Cotton, F.A., Wilkinson, G., Gaus, P.L., Basic Inorganic Chemistry; 2nd edition, Pubs: John Wiley and Sons, 1995.
2. Lee, J.D., Concise Inorganic Chemistry; 4th edition, Pubs: Chapman and Hall Ltd., 1991.
3. Shriver, D.E., Atkins, P.W., Inorganic Chemistry; 4th edition, Pubs: Oxford University Press, 2006.
4. Douglas, B., Medaniel, D., Atenander, J., Concepts and Models of Inorganic Chemistry; 3rd edition, Pubs: John Wiley and Sons Inc., 1994,
5. Porterfeild, W.W., Wesky, A., Inorganic Chemistry; Pubs: Addison-Wesky Publishing Company, 1984.
6. Miessler, G.L., Tarr, D.A., Inorganic Chemistry; 3rd edition, Pubs: Pearson Education Inc., 2004,
7. Jolly, W.L., Modern Inorganic Chemistry; 2nd edition, Pubs: Tata McGraw-Hill Publishing Company Limited, 1991.
8. Purcell, K.F., Kotz, J.C., Inorganic Chemistry; Pubs: W.B.Saunders Company, 1977.
9. Puri, B.R., Sharma, L.R., Kalia, K.K., Principles of Inorganic Chemistry; 30th edition, Pubs: Milestones Publisher, 2006-07.
10. Inorganic Chemistry, W.W. Porterfield Addison-Wesley.
11. Inorganic Chemistry, A.G. Sharpe, ELBS.

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-II (SESSION 2023-24)**  
**CHEMISTRY**

**Course Title: Physical Chemistry**  
**Course Code: BSMM/BSNM-2084 (II)**  
**(THEORY)**

**Course outcomes:**

Students will be able to

CO1: Explain various gaseous laws and their applications.

CO2: Acquire the knowledge of structure and intermolecular forces present between solids, liquids and gases, Discuss liquid crystals& its types.

CO3: Understand& apply the basic concepts of colloidal state of matter and applications of colloids.

CO4: Demonstrate an understanding of basic principles of colligative properties of dilute solutions.

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-II (SESSION 2023-24)  
CHEMISTRY**

**COURSE CODE: BSMM -2084 (II)  
COURSE TITLE: PHYSICAL CHEMISTRY  
(THEORY)**

**Time: 3 Hrs.  
LTP: 2-0-0**

**Max. Marks: 50  
Theory: 40  
CA: 10**

**Note: Log table and Non-Programmable calculators are allowed**

**Instructions for the Paper Setter**

Eight questions of equal marks (eight 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**

**I. Gaseous States (10 Hrs)**

Postulates of kinetic theory of gases, deviation from ideal behaviour, van der Waal's equation of state.

**Critical Phenomena:** PV isotherms of real gases, continuity of states, the isotherms of van der Waal's equation, relationship between critical constants and van der Waals constants, the law of corresponding states, reduced equation of state.

**Molecular Velocities:** Root mean square, average and most probable velocities. Qualitative discussion of the Maxwell's distribution of molecular velocities, collision number, mean free path and collision diameter. Liquefaction of gases.

**UNIT -II**

**II. Liquid State (10 Hrs)**

Intermolecular forces, structure of liquids (a qualitative description). Structural differences between solids, liquids and gases. Liquid crystals: Difference between liquids crystal, solid and liquid. Classification, structure of nematic and cholestric phases. Thermography and seven segment cell.

**UNIT -III**

**III. Colloidal State (13Hrs)**

Definition of colloids, classification of colloids. Solids in liquids (Sol): kinetic, optical and electrical properties, stability of colloids, protective action, Hardy Schulze law, gold number.

Liquids in liquids (emulsions): Types of emulsions, preparation. Emulsifiers. general applications of colloids.

#### UNIT –IV

#### IV. Solutions, Dilute Solutions and Colligative Properties

(12Hrs)

Ideal and non-ideal solutions, methods of expressing concentrations of solutions, activity and activity coefficient. Dilute solution, colligative properties, Raoult's law, relative lowering of vapour pressure, molecular weight determination. Osmosis, Law of osmotic pressure and its measurement, determination of molecular weight from osmotic pressure. Elevation of boiling point and depression of freezing point, Thermodynamic derivation of relation between molecular weight and elevation in boiling point and depression in freezing point. Experimental methods for determining various colligative properties. Abnormal molar mass, degree of dissociation and association of solutes.

#### Books suggested:

1. Atkins, P., Paula, J.de, Atkins Physical Chemistry; 8th edition, Pubs: Oxford University Press, 2008.
2. Puri, B.R., Sharma, L.R., Pathania, M.S., Principles of Physical Chemistry; 43rd edition, Pubs: Vishal Publishing Co., 2008.
3. Barrow, G.M., Physical Chemistry; 6th edition, Pubs: McGraw Hill Inc, 1996.
4. Rao, C.N.R., University General Chemistry; Pubs: Macmillan India, 1985.
5. Berry, R.S., Rice, S.A., Ross, J., Physical Chemistry; 2nd edition, Pubs: Oxford University Press, 2000.
6. Albert, R.A., Silbey, R.J., Physical Chemistry; 1st edition, Pubs: John Wiley and Sons Inc., 1992.
7. Dogra, S.K., Dogra, S., Physical Chemistry Through Problems; Pubs: Wiley Eastern Limited, 1991.
8. Levine, I.N., Physical Chemistry; 5th edition, Pubs: Tata McGraw Hill Publishing Co. Ltd., 2002.
9. Moore, W. J., Basic Physical Chemistry; Pubs: Prentice Hall of India Pvt. Ltd, 1983.
10. University General Chemistry, C.N.R. Rao, Macmillan.

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-II (SESSION 2023-24)**  
**CHEMISTRY**

**Course Title: Chemistry Practical**

**Course Code: BSMM -2084 (P)**  
**(PRACTICAL)**

**Course outcomes:**

Students will be able to

CO1: Understand & apply the technique of crystallization.

CO2: Determine the rate of the reactions

CO3: Compare & analyze the viscosity and surface tension of different liquids and solutions

CO4: Application of calorimeter in various thermochemistry experiments.



**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-II (SESSION 2023-24)**  
**CHEMISTRY**

**Course Title: Chemistry Practical**  
**Course Code: BSMM -2084 (P)**  
**(PRACTICAL)**

**Time: 3 Hrs.**  
**LTP: 0-0-2**

**Max. Marks: 50**  
**Theory: 40**  
**CA: 10**

**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.

**Crystallisation:**

Concept of indication of crystallisation. Phthalic acid from hot water (using fluted filter paper and stem less funnel)

Acetanilide from boiling water.

Naphthalene from Ethanol

Benzoic acid from water

**Physical Chemistry**

1. To determine the specific reaction rate of hydrolysis of ethyl acetate catalysed by Hydrogen ions at room temperature.
2. To study the effect of acid strength on hydrolysis of an ester.

**Viscosity, Surface Tension (Pure Liquids)**

3. To study the viscosity and surface tension of  $\text{CCl}_4$ , glycerine solution in water.
4. To determine the solubility of benzoic acid at different temperatures and to determine  $\Delta H$  of the dissolution process.
5. To 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.
6. To determine the enthalpy of dissolution of solid calcium chloride and calculate the lattice energy of calcium chloride from its enthalpy data using Born Haber cycle.

**Practical Examination:**

**Marks**

- |    |                     |    |
|----|---------------------|----|
| 1) | Crystallisation     | 05 |
| 2) | Physical Experiment | 10 |

3)	Viva-Voce	03
4)	Note Book	02

**Books suggested :**

1. Experimental Organic Chemistry, Vol. I and II, P.R. Singh, D.S. Gupta and K.S. Bajpai, Tata McGraw Hill.
2. Laboratory Manual in Organic Chemistry, R.K. Bansal, Wiley Eastern.
3. Vogel's Textbook of Practical Organic Chemistry, B.S. Furniss, A.J. Hannaford, V. Rogers, P.W.G. Smith and A.R. Tatchell, ELBS.
4. Experiments in General Chemistry, C.N.R. Rao and U.C. Aggarwal, East-West Press.
5. Experiments in Physical Chemistry, R.C. Das and B. Behra, Tata McGraw Hill.
6. Advanced Practical Physical Chemistry, J.B. Yadav, Goel Publishing House.
7. Advanced Experimental Chemistry, Vol. I, Physical, J.N. Guru and R. Kapoor, S. Chand and Co.
8. Selected Experiments in Physical Chemistry, N.G. Mukherjee, J.N. Ghosh and Sons.
9. Experiments Physical Chemistry, J.C. Ghosh, Bharati Bhavan.

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-II (SESSION 2023-24)**

**BOTANY**

**Course Title: Cell Biology**

**Course Code: BSMM-2075 (I)**

**(THEORY)**

**Course outcome:**

After passing this course the student will be able to: -

CO1: Explain the structure of cell and organelles associated with it.

CO2: Describe the intricate relationship between various cellular structures and their corresponding functions.

CO3: Describe chromosome organization and aberrations associated with it.

CO4: Understand cellular envelopes and their functions.

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-II (SESSION 2023-24)**

**BOTANY**

**Course Title: Cell Biology**

**Course Code: BSMM-2075 (I)**

**(THEORY)**

**Time: 3 Hrs.**

**LTP: 2-0-0**

**Max. Marks: 50**

**Theory: 40**

**CA: 10**

**Instructions for the Paper Setters:**

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

An Overview: prokaryotic and eukaryotic cells, cell size and shape and *Escherichia coli*. Structure and Function of Nucleus; Ultrastructure; nuclear membrane; nucleolus.

**UNIT-II**

Extranuclear Genome: Presence and function of mitochondrial and plastid DNA; plasmids. Structure and Function of other Organelles: Golgi bodies, Endoplasmic reticulum, Peroxisomes, Vacuoles.

**UNIT-III**

Chromosome Organization: Morphology; centromere and telomere; chromosome alterations; deletions, duplications, translocations, inversions; variations in chromosome number, aneuploidy, polyploidy; sex chromosomes.

**UNIT-IV**

The Cell Envelopes: Plasma membrane; bilayer lipid structure; functions; the cell wall.

**Suggested Readings:**

1. Gupta, P.K. (2017). A Text-book of Cell and Molecular Biology (5th edition). Rastogi Publications, Meerut, India
2. Johnson, A., Raff, L. and Walter, R. (2008). Molecular Biology of the Cell (5th Edition). Taylor and Francis Group, USA.
3. Karp, G. (2013). Cell and Molecular Biology: Concepts and Experiments (7th Edition). Wiley Publishers, USA.
4. Kleinsmith, L.J. and Kish, V.M. (1995). Principles of Cell and Molecular Biology (2<sup>nd</sup> edition). HarperCollinsCollege Publishers, New York, USA.
5. Lodish, H., Berk, A., Kaiser, C. A., Krieger, M., Bretscher, A. and Ploegh, H. (2016). Molecular Cell Biology (5th edition) , W.H. Freeman & Co., New York, USA.
6. Snustad, D.P. and Simmons, M.J. (2012). Principles of Genetics (8th Edition). John Wiley and Sons Inc., U.S.A.

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-II (SESSION 2023-2024)**  
**BOTANY**  
**Course Title: Genetics**  
**Course Code: BSMM-2075 (II)**  
**(THEORY)**

**Course outcome:**

After passing this course the student will be able to: -

CO1: Understand the chemical basis of hereditary material i.e., DNA.

CO2: Understand Mitosis, Meiosis and gene interactions.

CO3: Understand different methods of gene expression in prokaryotes and eukaryotes.

CO4: Understand various methods of genetic mutation and variations in living beings.

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-II (SESSION 2023-2024)**

**BOTANY**

**Course Title: Genetics**

**Course Code: BSMM-2075 (II)**

**(THEORY)**

**Time: 3 Hrs.**

**LTP: 3-0-0**

**Max. Marks: 75**

**Theory: 60**

**CA: 15**

**Instructions for the Paper Setters:**

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**

DNA the Genetic Material: DNA structure; replication; DNA–protein interaction; the nucleosome model; genetic code; satellite and repetitive DNA.

**UNIT-II**

Cell Division: Mitosis; meiosis. Genetic Inheritance: Mendelism; laws of segregation and independent assortment; linkage analysis; allelic and non–allelic interactions.

**UNIT-III**

Gene expression: Structure of gene; transfer of genetic information; transcription, translation, protein synthesis, tRNA; ribosomes; regulation of gene expression in prokaryotes and eukaryotes; proteins, 1D, 2D, and 3D structure.

**UNIT-IV**

Genetic Variations: Mutations, spontaneous and induced; transposable genetic elements; DNA damage and repair.

**Suggested Readings:**

1. Brown, T.A. (2011). Genetics: A Molecular Approach (3rd Edition). BIOS Scientific Publishers, UK.
2. Fletcher, H., Hickey, I. and Winter, P. (2010). Instant Notes on Genetics (3rd edition) Taylor and Francis Group, USA.
3. Gardner, E.J., Simmons, M.J. and Snustad, D.P. (2012). Principles of Genetics (8th Edition). Wiley Sons, USA.
4. Gupta, P.K. (2017). Cell and Molecular Biology (5th edition), Rastogi Publications, Meerut, India.

5. Kleinsmith, L.J. and Kish, V.M. (1995). Principles of Cell and Molecular Biology (2<sup>nd</sup> Edition). Harper Collins College Publishers, New York, USA.
6. Krebs, B. E., Goldstein, E.S. and Kilpatrick, S.T. (2014). Lewin's Genes XI. Jones and Bartlett Publishers, LLC, UK.
7. Lodish, H., Berk, A., Kaiser, C. A., Krieger, M., Bretscher, A. and Ploegh, H. (2016). Molecular Cell Biology (5th edition), W.H. Freeman & Co., New York, USA.
8. Singh, B.D. (2018). Molecular Genetics. Kalyani Publishers, India.
9. Snustad, D.P. and Simmons, M.J. (2012). Principles of Genetics (5th Edition). John Wiley and Sons Inc., U.S.A.

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-II (SESSION 2023-2026)**  
**BOTANY**  
**PRACTICAL – GENETICS AND CELL BIOLOGY**  
**Course Code: BSMM-2075(P)**  
**(Practical)**

**Course outcome:**

After passing this course the student will be able to:

CO1: The ability to learn study of cell structure and plastids examination.

CO2: Understand microscopic structure of cell through light microscope and electron micrograph.

CO3: The ability to evaluate methodologies in the design of genetics experimental procedures.

CO4: Demonstration of independence and originality in solving problems.



**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-II (SESSION 2023-2026)**

**BOTANY**

**Course Code: BSMM-2075 (P)**

**PRACTICAL – GENETICS AND CELL BIOLOGY**

**(PRACTICAL)**

**Time: 3 Hrs.**

**LTP: 0-0-2**

**Max. Marks: 50**

**Theory: 40**

**CA: 10**

**Instructions for the paper setter:** question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same may be submitted for the record to COE Office, Kanya Maha Vidyalaya, Jalandhar.

**Suggested Laboratory Exercises**

Teachers may select plants/material available in their locality/institutions.

1. To study cell structure from onion leaf peels; demonstration of staining and mounting methods.
2. Comparative study of cell structure in onion cells, *Hydrilla* and *Spirogyra*.
3. Study of cyclosis in *Tradescantia* Staminal Cells.
4. Study of plastids to examine pigment distribution in plants (e.g. *Cassia*, *Lycopersicon* and *Capsicum*).
5. Examination of electron micrographs of eukaryotic cells with special reference to organelles.
6. Study of electron micrographs of viruses, bacteria, cyanobacteria and eukaryotic cells for comparative cellular organization.
7. Microscopy- Theoretical knowledge of Light and Electron microscope.
8. Examination of various stages of mitosis and meiosis using appropriate plant material (e.g. onion root tips, onion flower buds).
9. Preparation of karyotypes from dividing root tip cells and pollen grains.
10. Cytological examination of special types of chromosomes: bar body, lampbrush and polytene chromosomes.
11. Working out the laws of inheritance using seed mixtures.
12. Working out the mode of inheritance of linked genes from test cross and/or F2 data.

**Suggested Readings: -**

1. Fukui, K. and Nakayama, S. 1996. Plant Chromosomes; Laboratory Methods, CRC Press, Boca Raton, Florida.
2. Gunning, B.E.S. and Steer, M.W. 1996. Plant Cell Biology; Structure and Function, Jones And Barllett Publishers, Boston, Massachusetts.

3. Harns, N. and Oparka, K.J. 1994. Plant Cell Biology, A Practical Approach. IRL Press, at Oxford University Press, Oxford, UK.
4. Sharma, A.K. and Sharma, A. 1999. Plant Chromosomes; Analysis. Manipulation and Engineering, Harwood Academic Publishers, Australia.
5. Plopper, G. (2016). Principles of Cell Biology. Jones and Barnett Learning, Boston, Massachusetts.

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-II (SESSION 2023-24)**  
**FOOD SCIENCE AND QUALITY CONTROL (VOCATIONAL)**

**Course Title: Food Plant Hygiene & Sanitation**

**Course Code: BSMM-2255**

**(THEORY)**

**Course Outcomes:**

After passing this course the student will be able to:

**CO1:** Understand hygiene, sanitation and importance of personal hygiene of food handler in food industries.

**CO2:** Learn different methods of cleaning and sanitation in food processing industries.

**CO3:** Understand basic principles and practices of cleaning and sanitation in different food processing industries.

**CO4:** Understand pest control, hygiene of water used for processing and waste product handling in food industries.

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-II (SESSION 2023-24)**  
**FOOD SCIENCE AND QUALITY CONTROL (VOCATIONAL)**

**Course Title: Food Plant Hygiene & Sanitation**

**Course Code: BSMM-2255**

**(THEORY)**

**Time: 3 Hrs.**

**LTP: 4-0-0**

**Max. Marks: 100**

**Theory: 80**

**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**

Importance of personal hygiene of food handler- habits, clothes, illness, education of handler in handling and service.

Cleaning agents and disinfectants. Uses of different cleaning and sanitizing agents.

Good Laboratory Practices (GLP) and Good Hygienic Practices (GHP)

Cleaning In Place (CIP) and Cleaning Out of Place (COP)

**UNIT - II**

Cleaning methods– sterilization, disinfection, heat & chemicals, chemical tests for sanitiser strength.

**UNIT - III**

Food sanitation- principles & methods, control and inspection, sanitation in fruits & vegetables industry, cereals industry, dairy industry, meat, egg & poultry units.

**UNIT - IV**

Control of infestation, rodent control, vector control, use of pesticides.

Hygiene of water used for processing, Analysis of total plate count and *E.coli*

Planning & implementation of training programmes for health personnel.

Waste disposal and treatment.

**Books Recommended:**

1. Principles of Food Sanitation by Norman G. Marriott (**Online Available**)

[https://ubblab.weebly.com/uploads/4/7/4/6/47469791/principles\\_of\\_food\\_sanitation,\\_5th\\_ed.pdf](https://ubblab.weebly.com/uploads/4/7/4/6/47469791/principles_of_food_sanitation,_5th_ed.pdf)

2. Food Poisoning and Food Hygiene by Hobbs, B. C. and R. J. Gilbert (**Online Available**)

3. Quantity food sanitation by Longree K

4. Environmental Sanitation in India by Kawata K

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-II (SESSION 2023-24)**  
**FOOD SCIENCE AND QUALITY CONTROL (VOCATIONAL)**

**Course Title: Food Plant Hygiene & Sanitation**

**Course Code: BSMM-2255**

**(PRACTICAL)**

**Course Outcomes:**

After passing this course the student will be able to:

**CO1:** Understanding of sterilization methods.

**CO2:** Understanding of the principles and importance of sanitation in food processing.

**CO3:** Understanding of the importance of water quality in the food industry and its impact on the food safety and hygiene.

**CO4:** Understanding of the significance of BOD and COD as key indicators of water pollution.

**BACHELOR OF SCIENCE (MEDICAL) SEMESTER-II (SESSION 2023-24)  
FOOD SCIENCE AND QUALITY CONTROL (VOCATIONAL)**

**Course Title: Food Plant Hygiene & Sanitation**

**Course Code: BSMM-2255**

**(PRACTICAL)**

**Time: 3 Hrs.**

**LTP: 0-0-1**

**Practical: 20**

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

**List of Practicals:**

1. Sterilization of equipments used in the laboratory by using heat and chemicals.
2. Determination of B.O.D & C.O.D
3. Determination of sanitary status of plant equipment.
4. Chlorination of water.
5. To study the bacteriology of water.
6. Determination of Total dissolved solids (TDS) of water.
7. Determination of Hardness of water.
8. Determination of alkalinity and acidity of water.
9. Determination of organic matter of water.
10. Determination of chlorides and sulphates in water.