Kanya MahaVidyalaya, Jalandhar
(An Autonomous College)

Proceedings of Ninth Meeting of Board of Studies
Department of Food Science Quality Control and Microbiology

Date: 18-04-2024
Time: 12:00 Noon
Via Zoom video conferencing

KANYA MAHA VIDYALAYA, JALANDHAR
(UGC Autonomous College)
Department of Food Science Quality Control and Microbiology

Proceedings of the Ninth Meeting of Board of Studies held on 18-04-2024

The Ninth meeting of the Board of Studies was held in online mode via zoom on 18th April 2024 at 12:00 noon.

Date: Thursday, 18-04-2024

Time: 12:00 Noon

Venue: Online meeting via Zoom

The following members have attended meeting and detailed minutes are listed below:

Members of BOS:

1.	Dr. Manju Sahni, Dean, Faculty of Life Sciences, K.M.V, Jalandhar **(Chairperson)**	Present
2.	Dr. Harvinder Singh Saini, Dean, Faculty of Life Sciences, Professor, Department of Microbiology, G.N.D.U Amritsar **(Special Invitee)**	Present
3.	Dr. Maninder Kaur, Professor and Head, Department of Food Science and Technology, G.N.D.U Amritsar **(University Nominee)**	Present
4.	Dr. Charanjiv Singh Saini, Professor, Department of Food Engineering and Technology, Sant Longowal Institute of Engineering and Technology, (Longowal, Distt. Sangrur) **(Outside Parent University Nominee)**	Present
5.	Dr. Kamlesh Prasad, Professor, Department of Food Engineering and Technology, Sant Longowal Institute of Engineering and Technology, (Longowal, Distt. Sangrur) **(Outside Parent University Nominee)**	Present
6.	Dr. Amritpal Kaur, Professor, Department of Food Science and Technology, G.N.D.U Amritsar (**Alumni Representative**)	Present
7.	Mr. Kartik Chabba, Assistant Manager, Verka Milk Plant, Mohali **(Industry Expert)**	Absent
8.	Dr. Archana Saini, Head, Department of Zoology, K.M.V, Jalandhar **(Member)**	Present
9.	Mrs. Shikha Vashisht, Head, Department of Botany, K.M.V, Jalandhar **(Member)**	Present

AGENDA

Item: Food Sci & Micro: 2024: 9: 1 To discuss and approve the minutes of Board of Studies VIII (dated 10-07-2023) and Action Taken Report. **(Annexure A and B)**

Item: Food Sci & Micro: 2024: 9: 2 To discuss the proposed syllabus of **Food Science** in **B.Sc.(Medical) Sem I –IV** under Credit Based Continuous Evaluation Grading System (CBCEGS) with 20% internal assessment for the session 2024-25. **(Annexure C)**

Item: Food Sci & Micro: 2024: 9: 3 To discuss the proposed syllabus of **Microbiology** in **B.Sc. (Medical) Semester I – IV** under Credit Based Continuous Evaluation Grading System (CBCEGS) with 20% internal assessment for the session 2024-25. **(Annexure D)**

Item: Food Sci & Micro: 2024: 9: 4 The syllabus of **Food Science** in **B. Sc. (Medical) Sem V –VI** for the session 2024-25 will remain the same as the session 2023-24 under Continuous Evaluation Grading System with 20% internal assessment and has already been approved. **(Annexure E)**

Item: Food Sci & Micro: 2024: 9: 5 The syllabus of **Microbiology** in **B. Sc. (Medical) Sem V –VI** for the session 2024-25 will remain the same as the session 2023-24 under Continuous Evaluation Grading System with 20% internal assessment and has already been approved. **(Annexure F)**

Item: Food Sci & Micro: 2024: 9: 6 To approve the Examiners and Evaluators for Food Science and Microbiology papers in Bachelor of Science (Medical) Semester I to VI **(Annexure G)**

Item: Food Sci & Micro: 2024: 9: 7 To discuss teaching methodologies adopted in department and inputs required to upgrade the teaching methodologies during Session 2024-25 (**Annexure H)**

Item: Food Sci & Micro: 2024: 9: 8 To analyse the results of the department for the even semester of 2022-23 and odd semester of 2023-24.

The Chairperson Dr. Manju Sahni welcomed the Members of Board of Studies. She apprised the members about the courses in the department along with teaching strengths of the department. After brief overview, she took up the agenda items for deliberation one by one with the permission of committee members.

Item: Food Sci & Micro: 2024: 9: 1 To discuss and approve the minutes of Board of Studies VIII (dated 10-07-2023) and Action Taken Report.

Proceedings: The chairperson sent the proceedings of the previous Board of Studies meeting held on 10th July 2023 through email to all the members and were approved by all the members. The Chairperson however again put up the summary of the proceedings and the action taken report for approval of the house and they approved it through Zoom meeting. **(Attached herewith as Annexure A and B)**

S. No.	Agenda Item	Decision taken in Meeting	Action Taken
Item: Food Sci & Micro 8: 2023: 2	**To discuss the proposed syllabus of Food Science in B.Sc. (Medical) Semester I –VI under Credit Based Continuous Evaluation Grading System (CBCEGS) with 30% internal assessment for the session 2023-26.**	Discussions were made regarding keeping the 20% Internal Assessment. The content of the syllabus was approved without changes.	The approved scheme and syllabus is executed.
Item: Food Sci & Micro 8: 2023: 3	**To discuss the proposed syllabus of Microbiology in B.Sc. (Medical) Semester I – VI under Credit Based Continuous Evaluation Grading System (CBCEGS) with 30% internal assessment for the session 2023-26.**	Discussions were made regarding keeping the 20% Internal Assessment. The content of the syllabus was approved without changes.	The approved scheme and syllabus is executed.
Item: Food Sci & Micro 8: 2023: 4	**The syllabus of Food Science in B.Sc. (Medical) Semester III–VI for the session 2023-25 will remain the same as the session 2022-23 under Continuous Evaluation System with 20% internal assessment and has already been approved**.	Discussions were made regarding the syllabus and were approved without changes.	The approved syllabus is executed.

Item: Food Sci & Micro 8: 2023: 5	**The syllabus of Microbiology in B.Sc. (Medical) Semester III–VI for the session 2023-25 will remain the same as the session 2022-23 under Continuous Evaluation System with 20% internal assessment and has already been approved.**	Discussions were made regarding the syllabus and were approved without changes.	The approved syllabus is executed.
Item: Food Sci & Micro 8: 2023: 6	**To approve the Examiners and Evaluators for Food Science and Microbiology papers in Bachelor of Science (Medical) Semester I to VI**	List of Paper setters and evaluators for theory and practicals has been approved.	The approved list of proposed examiners is executed.
Item: Food Sci & Micro 8: 2023: 7	**To discuss and approve the ordinances of B. Sc. (Medical) programme.**	The students were admitted according to the college ordinances of three year degree programme.	The approved ordinances of B.Sc. (Medical) programme are executed.
Item:Food Sci & Micro 7: 2023: 8	**To discuss teaching methodologies adopted in department and inputs required to upgrade the teaching methodologies during Session 2023-26**	This session the syllabus was covered through power point presentations, e-notes, case studies, assignments, remedial classes and classroom seminars. Various activities including food stalls, poster making competition, alumni talk, quiz, industrial training and industrial visit has also organized.	The approved teaching methodologies are executed.
Item: Food Sci & Micro 8: 2023: 9	**To discuss the result analysis for the session 2022-23.**	The result was 100 percent.	The board members appreciated it.

The house approved the Item: Food Sci & Micro: 2024: 9: 1

Item: Food Sci & Micro: 2024: 9: 2 To discuss the proposed syllabus of **Food Science** in **B.Sc. (Medical) Sem I –IV** under **Credit Based Continuous Evaluation Grading System (CBCEGS)** with 20% internal assessment for the session 2024-25.

Proceedings: The proposed Syllabus of **Food Science** in **B.Sc. (Medical) Sem I –IV** under **Credit Based Continuous Evaluation Grading System (CBCEGS)** with 20% internal

assessment for the session 2024-25 was discussed by Board members and they approved the syllabus without changes in the content.

The course scheme approved for B.Sc. Semester I-IV under Credit Based Continuous Evaluation Grading System for the session 2024-25 is as follows:

Bachelor of Sciences (Medical) Semester I to IV								
Course Name	**Course Code**	**Course Type**	**Hours/week**	**Credits**	**Marks**			
				L-T-P	**Total**	**Ext.**		**CA**
						L	**P**	
SEMESTER –I								
Food Science and Quality Control (Vocational) (Food Chemistry and Nutrition)	BSMM-1255	E	4+2	4-0-1	100	60	20	20
SEMESTER-II								
Food Science and Quality Control (Vocational) (Food Plant Hygiene and Sanitation)	BSMM-2255	E	4+2	4-0-1	100	60	20	20
SEMESTER-III								
Food Science and Quality Control (Vocational) (Food Processing and Packaging)	BSMM-3255	E	4+2	4-0-1	100	60	20	20
SEMESTER- IV								
Food Science and Quality Control (Vocational) (Quality Assurance)	BSMM-4255	E	4+2	4-0-1	100	60	20	20

It was suggested to mention **"Note:** All the students are required to undergo "Industrial Training" for One month." below the scheme of semester IV.

It was suggested to remove the links for online mentioned reference books in the syllabus.

Approved syllabus attached herewith as Annexure C.

The house approved the Item: Food Sci & Micro: 2024: 9: 2

Item: Food Sci & Micro: 2024: 9: 3 To discuss the proposed syllabus of **Microbiology** in **B.Sc. (Medical) Semester I – IV** under **Credit Based Continuous Evaluation Grading System (CBCEGS)** with 20% internal assessment for the session 2024-25.

Proceedings: The proposed Syllabus of **Microbiology** in **B.Sc. (Medical) Semester I – IV** under **Credit Based Continuous Evaluation Grading System (CBCEGS)** with 20% internal assessment for the session 2024-25 was discussed by Board members and they approved the syllabus with proposed changes in both the theory and practical content:

Semester	Name of the Course and Course Code	2024-25
I	Fundamentals of Microbiology (Theory) BSMM- 1343	**1. In UNIT-II,** It was suggested to **replace the topic name from** "antibiotic sensitivity test" **to** "methods of antibiotic susceptibility testing"
		2. In UNIT-IV, It was suggested to **replace the topic name from** "Effect of various factors on growth of bacteria" **to** "Effect of various factors (temperature, pH, water activity and oxygen) on growth of bacteria. **3. In UNIT-IV,** It was suggested to **replace the topic name from** "diagnosis and treatment of common bacterial and viral diseases (including COVID 19) in humans" **to** "diagnosis and treatment of common bacterial (Diphtheria, Cholera, Tuberculosis, Plague and Tetanus) and viral diseases (Hepatitis, AIDS, COVID 19) in humans.
II	Basic Food Microbiology (Practicals) BSMM- 2343(P)	**In Experiment No. 6,** It was suggested to **remove the words "spoilage causing" from** "To study the spoilage causing microorganisms present in spoiled bread and raw milk."
III	Microbial Nutrition and Metabolism (Theory) BSMM- 3343	**1. In UNIT-III,** It was suggested to **Shift the topic** "Bioenergetics; Laws of thermodynamics, entropy, enthalpy and free energy of reaction standard" **to UNIT-II** **2. In UNIT-III,** It was suggested to **rearrange the topic from "**pathways for breakdown of glucose (glycolysis, Kreb's cycle fermentation, pentose phosphate pathways,) **to** "pathways for breakdown of glucose (glycolysis, pentose phosphate pathways, Krebs cycle)"
	Microbial Nutrition and Metabolism (Practicals) BSMM- 3343(P)	**3.** It was suggested to **replace the name** of **CO1 from "**Analyze the growth of bacteria on different techniques" **to** " Analyze the growth of bacteria on different media" **4.** It was suggested to **replace the name** of **CO4 from**

		"Demonstrate the effect of various concentrations of Carbon and Nitrogen on bacteria" **to** "Demonstrate the effect of various concentrations of Carbon and Nitrogen sources on bacteria." **5. In Experiment No. 9,** It was suggested to **replace the name from "**Effect of metals on bacterial growth." **to** "Effect of metals (Ag, $Cu2^{+}$, $Ni2^{+}$) on bacterial growth." **6. In Experiment No. 10,** It was suggested to **replace the name from "**Effect of dye on bacterial growth" **to** "Effect of dye (Crystal violet-basic) on bacterial growth."
IV	Microbial Ecology (Practicals) BSMM- 4343(P)	**In Experiment No. 8,** It was suggested to **remove the word "Lethal" from "**Lethal effect of Ultra violet light on bacterial growth."

The course scheme approved for B.Sc. Semester I-IV under Credit Based Continuous Evaluation Grading System for the session 2024-25 is as follows:

Bachelor of Sciences (Medical) Semester I to IV								
Course Name	**Course Code**	**Course Type**	**Hours/week**	**Credits**	**Marks**			
				L-T-P	**Total**	**Ext.**		**CA**
						L	**P**	
SEMESTER –I								
Microbiology (Fundamentals of Microbiology)	BSMM-1343	E	4+2	4-0-1	100	60	20	20
SEMESTER-II								
Microbiology (Basic Food Microbiology)	BSMM-2343	E	4+2	4-0-1	100	60	20	20
SEMESTER-III								
Microbiology (Microbial Nutrition and Metabolism)	BSMM-3343	E	4+2	4-0-1	100	60	20	20
SEMESTER- IV								
Microbiology (Microbial Ecology)	BSMM-4343	E	4+2	4-0-1	100	60	20	20

Approved syllabus attached herewith as Annexure D.

The house approved the Item: Food Sci & Micro: 2024: 9: 3

Item: Food Sci & Micro: 2024: 9: 4 The syllabus of **Food Science** in **B. Sc. (Medical) Sem V –VI** for the session 2024-25 will remain the same as the session 2023-24 under Continuous Evaluation Grading System with 20% internal assessment and has already been approved.

Proceedings: The syllabus of **Food Science** in **B. Sc. (Medical) Sem V –VI** for the session 2024-25 will remain the same as the session 2023-24 under Continuous Evaluation Grading System with 20% internal assessment and has already been approved by Board members.

It was suggested to remove the links for online mentioned reference books in the syllabus.

Approved syllabus attached herewith as Annexure E.

The house approved the Item: Food Sci & Micro: 2024: 9: 4

Item: Food Sci & Micro: 2024: 9: 5 The syllabus of **Microbiology** in **B. Sc. (Medical) Sem V –VI** for the session 2024-25 will remain the same as the session 2023-24 under Continuous Evaluation Grading System with 20% internal assessment and has already been approved.

Proceedings: The syllabus of **Microbiology** in **B. Sc. (Medical) Sem V –VI** for the session 2024-25 will remain the same as the session 2023-24 under Continuous Evaluation Grading System with 20% internal assessment and they approved the syllabus with minor changes in both the theory and practical content:

Semester	Name of the Course and Course Code	2024-25
V	Applied Microbiology-I (Theory) BSMM- 5343	**In UNIT-IV,** It was suggested to **Shift the topic** "Fermentation economics; planning, fermentation designing, process designing, market potential and recovery costs for the industrial set up." **to UNIT-III**
	Applied Microbiology-I (Practical) BSMM- 5343	**1. In Experiment No. 2,** It was suggested to **replace the name from "**Screening of industrially important Amylase producing microorganisms." **to** "Screening and characterization of industrially important Amylase producing microorganisms." **2. In Experiment No. 3,** It was suggested to **replace the name from "**Screening of industrially important Protease producing microorganisms." **to** "Screening and characterization of industrially important Protease producing microorganisms."

Approved syllabus attached herewith as Annexure F.

The house approved the Item: Food Sci & Micro: 2024: 9: 5

Item: Food Sci & Micro: 2024: 9: 6 To approve the Examiners and Evaluators for Food Science and Microbiology papers in Bachelor of Science (Medical) Semester I to VI.

Proceedings: The chairperson discussed the Examiners and Evaluators for Food Science and Microbiology papers in Bachelor of Science (Medical) Semester I to VI with the members and they approved it. **(Lists attached herewith as Annexure G)**

The house approved the Item: Food Sci & Micro: 2024: 9: 6

Item: Food Sci & Micro: 2024: 9: 7 To discuss teaching methodologies adopted in department and inputs required to upgrade the teaching methodologies during Session 2024-25

The house approved the **Item: Food Sci & Micro: 2024: 9: 7** teaching methodologies and various activities held in the department to enhance teaching learning process **(Attached as Annexure H)**

Item: Food Sci & Micro: 2024: 9: 8 To analyse the results of the department for the even semester of 2022-23 and odd semester of 2023-24.

Proceedings: The CO attainment and PSOs were discussed with members of Board of Studies. They approved and appreciated the efforts of the Department.

Dr. Harvinder Singh Saini
(GNDU Nominee)

Dr. Maninder Kaur
(GNDU Nominee)

Dr. Charanjiv Singh Saini
(Outside GNDU Nominee)

Dr. Kamlesh Prasad
(Outside GNDU Nominee)

Dr. Amritpal Kaur
(Alumni Representative)

Dr. Manju Sahni
(Chairperson)

Dr. Archana Saini
(Member)

Mrs. Shikha Vashisht
(Member)

Annexure-A

KANYA MAHA VIDYALAYA, JALANDHAR
(UGC Autonomous College)
Department of Food Science Quality Control and Microbiology

Proceedings of the Eighth Meeting of Board of Studies held on 10-07-2023

The Eighth meeting of the Board of Studies was held in online mode via zoom on 10th July 2023 at 12:00 noon.

Date: Monday, 10-07-2023

Time: 12:00 Noon

Venue: Online meeting via Zoom

The following members have attended meeting and detailed minutes are listed below:

Members of BOS:

1.	Dr. Manju Sahni , Dean, Faculty of Life Sciences, K.M.V, Jalandhar **(Chairperson)**	Present
2.	Dr. Harvinder Singh Saini, Dean, Faculty of Life Sciences, Professor, Department of Microbiology, G.N.D.U Amritsar **(University Nominee)**	Present
3.	Dr. Maninder Kaur, Professor and Head, Department of Food Science and Technology, G.N.D.U Amritsar **(University Nominee)**	Present
4.	Dr. Charanjiv Singh Saini, Professor, Department of Food Engineering and Technology, Sant Longowal Institute of Engineering and Technology, (Longowal, Distt. Sangrur) **(Outside Parent University Nominee)**	Present
5.	Dr. Kamlesh Prasad, Professor, Department of Food Engineering and Technology, SantLongowal Institute of Engineering and Technology, (Longowal, Distt. Sangrur) **(Outside Parent University Nominee)**	Present
6.	Dr. Amritpal Kaur, Professor, Department of Food Science and Technology, G.N.D.U Amritsar (**Alumni Representative**)	Present
7.	Mr. Kartik Chabba, Assistant Manager, Verka Milk Plant, Mohali**(Industry Expert)**	Absent
8.	Dr. Archana Saini, Head, Department of Zoology, K.M.V, Jalandhar **(Member)**	Present
9.	Mrs. Shikha Vashisht, Head, Department of Botany, K.M.V, Jalandhar **(Member)**	Present

AGENDA

Item: Food Sci & Micro: 2023: 8: 1 To discuss and approve the minutes of Board of Studies VII (dated 21-04-2022) and Action Taken Report.

Item: Food Sci & Micro: 2023: 8: 2 To discuss the proposed syllabus of **Food Science** in **B. Sc. (Medical) Semester I –VI** under **Credit Based Continuous Evaluation Grading System (CBCEGS)** with 30% internal assessment for the session 2023-26.

Item: Food Sci & Micro: 2023: 8: 3 To discuss the proposed syllabus of **Microbiology** in **B.Sc. (Medical) Semester I – VI under Credit Based Continuous Evaluation Grading System (CBCEGS)** with 30% internal assessment for the session 2023-26.

Item: Food Sci & Micro: 2023: 8: 4 The syllabus of **Food Science** in **B. Sc. (Medical) Semester III–VI** for the session 2023-25 will remain the same as the session 2022-23 under **Continuous Evaluation System** with 20% internal assessment and has already been approved.

Item: Food Sci & Micro: 2023: 8: 5 The syllabus of **Microbiology** in **B. Sc. (Medical) Semester III–VI** for the session 2023-25 will remain the same as the session 2022-23 under **Continuous Evaluation System** with 20% internal assessment and has already been approved.

Item: Food Sci &Micro: 2023: 8: 6 To approve the Examiners and Evaluators for Food Science and Microbiology papers in Bachelor of Science (Medical) Semester I to VI

Item: Food Sci & Micro: 2023: 8: 7 To discuss and approve the ordinances of B. Sc. (Medical) programme.

Item: Food Sci & Micro: 2023: 8: 8 To discuss teaching methodologies adopted in department and inputs required to upgrade the teaching methodologies during Session 2023-26

Item: Food Sci & Micro: 2023: 8: 9 To discuss the result analysis for the session 2022-23.

The Chairperson Dr. Manju Sahni welcomed the Members of Board of Studies. She apprised the members about the courses in the department along with teaching strengths of the department. After brief overview, she took up the agenda items for deliberation one by one with the permission of committee members.

Item: Food Sci& Micro: 2023: 8: 1 To discuss and approve the minutes of Board of Studies VII (dated 21-04-2022) and Action Taken Report.

Proceedings: The chairperson sent the proceedings of the previous Board of Studies meeting held on 21st May 2021 through email to all the members and were approved by all the members. The Chairperson however again put up the summary of the proceedings and the action taken report for approval of the house and they approved it through Zoom meeting. **(Attached herewith as Annexure A)**

S. No.	Agenda Item	Decision taken in Meeting	Action Taken
Item: Food Sci & Micro 7: 2022: 3	**To discuss the Syllabus and Course Outcomes of Food Science in Bachelor of Science (Medical) Semester I to VI under continuous evaluation system for the session 2023-26.**	Discussions were made regarding minor changes in the practical syllabus.	The approved syllabus is executed.
Item: Food Sci & Micro 7: 2022: 4	**To discuss the Syllabus and Course Outcomes of Microbiology in Bachelor of Science (Medical) Semester I to VI under continuous evaluation system for the session 2023-26.**	Discussions were made regarding minor rearrangements and addition in the practical syllabus.	The approved syllabus is executed.

Item: Food Sci & Micro 7: 2022: 5	**To approve the Examiners and Evaluators for Food Science and Microbiology papers in Bachelor of Science (Medical) Semester I to VI**	List of Paper setters and evaluators for theory and practicals has been approved.	The approved list of proposed examiners is executed.
Item: Food Sci & Micro 7: 2022: 6	**To discuss the inputs to upgrade the teaching methodologies during Session 2023-26.**	This session the syllabus was covered through power point presentations, e-notes, assignments, remedial classes and classroom seminars. Various activities including food stalls, poster making competition, industrial trainingand industrial visit has also organized.	The approved teaching methodologies are executed.

The house approved the Item: Food Sci & Micro: 2023: 8: 1

Item: Food Sci& Micro: 2023: 8: 2 To discuss the proposed syllabus of **Food Science** in **B. Sc. (Medical) Sem I –VI** under **Credit Based Continuous Evaluation Grading System (CBCEGS)** with 30% internal assessment for the session 2023-26.

Proceedings: The proposed Syllabus of **Food Science** in **Bachelor of Science (Medical) Semester I to VI** under **Credit Based Continuous Evaluation Grading System (CBCEGS)** was discussed by Board members and they suggested that the Internal Assessment should be kept 20% only. The content of the syllabus was approved without changes. (**Approved syllabus attached herewith as Annexure C)**

The course scheme approved for B.Sc. Sem I-VI under Credit Based Continuous Evaluation Grading System for the session 2023-26 is as follows:

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Sciences (Medical) Semester I to VI									
Course Name	**Course Code**	**Course Type**	**Course Name**	**Hours/week**	**Credits**	**Marks**			
					L-T-P	**Total**	**Ext.**		**CA**
							L	**P**	
Food Science Quality Control (Vocational)	**SEMESTER –I**								
	BSMM-1255	E	Food Chemistry and Nutrition	4+2	4-0-1	100	60	20	20
	SEMESTER-II								
	BSMM-2255	E	Food Plant Hygiene and Sanitation	4+2	4-0-1	100	60	20	20
	SEMESTER-III								
	BSMM-3255	E	Food Processing and Packaging	4+2	4-0-1	100	60	20	20
	SEMESTER- IV								
	BSMM-4255	E	Quality Assurance	4+2	4-0-1	100	60	20	20
	SEMESTER- V								
	BSMM-5255	E	Food Analysis	4+2	4-0-1	100	60	20	20
	SEMESTER-VI								
	BSMM-6255	E	Food Plant Layout and Management	4+2	4-0-1	100	60	20	20

The house approved the Item: Food Sci& Micro: 2023: 8: 2

Item: Food Sci & Micro: 2023: 8: 3 To discuss the proposed syllabus of **Microbiology** in **B.Sc. (Medical) Semester I – VI** under **Credit Based Continuous Evaluation Grading System (CBCEGS)** with 30% internal assessment for the session 2023-26.

Proceedings: The proposed Syllabus of **Microbiology** in **Bachelor of Science (Medical) Semester I to VI** under **Credit Based Continuous Evaluation Grading System (CBCEGS)** was discussed by Board members and they suggested that the Internal Assessment should be kept 20% only. The content of the syllabus was approved without changes. (**Approved syllabus attached herewith as Annexure D)**

The course scheme approved for B.Sc. Sem I-VI under Credit Based Continuous Evaluation Grading System for the session 2023-26 is as follows:

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Sciences (Medical) Semester I to VI									
Course Name	**Course Code**	**Course Type**	**Course Name**	**Hours/week**	**Credits**	**Marks**			
					L-T-P	**Total**	**Ext.**		**CA**
							L	**P**	
Microbiology	**SEMESTER –I**								
	BSMM-1343	E	Fundamentals of Microbiology	4+2	4-0-1	100	60	20	20
	SEMESTER-II								
	BSMM-2343	E	Basic Food Microbiology	4+2	4-0-1	100	60	20	20
	SEMESTER-III								
	BSMM-3343	E	Microbial Nutrition and Metabolism	4+2	4-0-1	100	60	20	20
	SEMESTER- IV								
	BSMM-4343	E	Microbial Ecology	4+2	4-0-1	100	60	20	20
	SEMESTER- V								
	BSMM-5343	E	Applied Microbiology-I	4+2	4-0-1	100	60	20	20
	SEMESTER-VI								
	BSMM-6343	E	Applied Microbiology-II	4+2	4-0-1	100	60	20	20

The house approved the Item: Food Sci& Micro: 2023: 8: 3

Item: Food Sci& Micro: 2023: 8: 4 The syllabus of **Food Science** in **B. Sc. (Medical) Sem III –VI** for the session 2023-25 will remain the same as the session 2022-23 under **Continuous Evaluation System** with 20% internal assessment and has already been approved.

Proceedings: The syllabus of **Food Science** in **B. Sc. (Medical) Sem III –VI** for the session 2023-25 will remain the same as the session 2022-23 under **Continuous Evaluation System** with 20% internal assessment and has already been approved by Board members.

The house approved the Item: Food Sci & Micro: 2023: 8: 4

Item: Food Sci & Micro: 2023: 8: 5 The syllabus of **Microbiology** in **B. Sc. (Medical) Sem III –VI** for the session 2023-25 will remain the same as the session 2022-23 under **Continuous Evaluation System** with 20% internal assessment and has already been approved.

Proceedings: The syllabus of **Microbiology** in **B. Sc. (Medical) Sem III –VI** for the session 2023-25 will remain the same as the session 2022-23 under **Continuous Evaluation System** with 20% internal assessment and has already been approved by Board members.

The house approved the Item: Food Sci & Micro: 2023: 8: 5

Item: Food Sci& Micro: 2023: 8: 6 To approve the Examiners and Evaluators for Food Science and Microbiology papers in Bachelor of Science (Medical) Semester I to VI

Proceedings: The chairperson discussed the Examiners and Evaluators for Food Science and Microbiology papers in Bachelor of Science (Medical) Semester I to VI with the members and they approved it. **(Lists attached herewith as Annexure E)**

The house approved the Item: Food Sci & Micro: 2023: 8: 6

Item: Food Sci & Micro: 2023: 8: 7 To discuss and approve the ordinances of B. Sc. (Medical) programme.

Proceedings: The students were admitted according to the college ordinances of three year degree programme.

The house approved the Item: Food Sci & Micro: 2023: 8: 7

Item: Food Sci & Micro: 2023: 8: 8 To discuss teaching methodologies adopted in department and inputs required to upgrade the teaching methodologies during Session 2023-26

The house approved the (**Item: Food Sci& Micro: 2023: 8: 8**) teaching methodologies and various activities held in the department to enhance teaching learning process **(Attached as Annexure F).**

Item: Food Sci & Micro: 2023: 8: 9 To discuss the result analysis for the session 2022-23.

The result is 100 percent and the board members appreciated it.

Dr. Harvinder Singh Saini
(GNDU Nominee)

Dr. Maninder Kaur
(GNDU Nominee)

Dr. Charanjiv Singh Saini
(Outside GNDU Nominee)

Dr. Kamlesh Prasad
(Outside GNDU Nominee)

Dr. Amritpal Kaur
(Alumni Representative)

Dr. Manju Sahni
(Chairperson)

Dr. Archana Saini
(Member)

Mrs. Shikha Vashisht
(Member)

Annexure-B

Department of Food Science Quality Control and Microbiology

Departmental Activities

Session- 2023-24

S.No.	Activity	Topic	Date
1	Poster Making Competition	International Microorganism day	16 September 2023
2	Poster Making Competition	World Food day	16 October 2023
3	Food Stall at College	Diwali Extravaganza	4 November, 2023
4	Fermentology Fiesta (in Collaboration with Department of Biotechnology)	Fermentology Fiesta (competition of Fermented foods)	21 February 2024
5	Science stall on National Science Day (in Collaboration with Department of Chemistry)	Food Adulteration Tests (to check the quality of milk)	27 February 2024
6	Quiz Competition	Food Science and Microbiology	19 March 2024
7	Industrial Visit	Wave Beverages Pvt.Ltd. Jandiala Guru, Amritsar	19 April 2024
8	Alumini Talk	Career Counseling	20 April 2024

Annexure-C

FACULTY OF SCIENCES

Syllabus

Of

Food Science and Quality Control

For

B.Sc. Medical (Semester I - IV)

(Under Credit Based Continuous Evaluation Grading System)

(12+3 System of Education)

Session: 2024-25

The Heritage Institution

KANYA MAHA VIDYALAYA
JALANDHAR
(Autonomous)

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATION OF THREE YEAR DEGREE PROGRAM

Bachelor of Science (Medical)

Semester-I

Session 2024-25

Bachelor of Sciences (Medical) Semester-I												
Course Name	**Course Code**	**Paper**		**Course Type**	**Hours Per Week**	**Credits**	**Total Credits**	**Marks**				**Examination time (in hours)**
								Ext.		**CA**	**Total**	
						L-T-P		**L**	**P**			
Food Science and Quality Control (Vocational) (Food Chemistry and Nutrition)	BSMM-1255	L	Food Chemistry and Nutrition	E	4	4-0-0	5	60	-	20	100	3
		P	Food Chemistry and Nutrition (Practical)		2	0-0-1		-	20			3

Bachelor of Science (Medical)
SEMESTER–I
Session 2024-25
Course Title: Food Science and Quality Control (Vocational) (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 2024-25
Course Title: Food Science and Quality Control (Vocational) (Food Chemistry and Nutrition)
Course Code: BSMM-1255
(THEORY)

Examination Time: 3 Hours

Credits: 4-0-0
Max. Marks: 100
Theory Marks: 60
Practical Marks: 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 to nutrition: food as a source of nutrients, function of foods, definition of nutrition, nutrients, adequate, optimum and good nutrition, malnutrition.
Inter–relationship between nutrition and health: parameters of good health.
Food guide: basic five food groups – Importance, uses.
Food metabolism: digestion, absorption, transport, utilization of nutrients in the body.
Recommended dietary requirements: Nutrient requirement for adult men and women as per ICMR.
Water: function, sources, requirement, water balance, effect of deficiency on health.

UNIT-II

Carbohydrates: composition, classification, food sources, storage in body, reaction, structure, functions of monosaccharides, oligosaccharides and polysaccharides in foods.
Fats 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.
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.
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.
Minerals: function, sources, bio–availability and deficiency of macro and micro minerals.
Vitamins: classification, sources, functions and deficiency diseases of fat and water soluble vitamins.

UNIT– III

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

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

Egg and Poultry: Composition and nutrition significance.

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

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

Books Recommended:

1. Food Chemistry, 2007, 4th Edition, Owen R. Fennema**.** (Online available)
2. Food Chemistry, 2003, 2nd Edition, Connie M. Weaver, James R. Daniel.
3. Food Chemistry, 1974, 3rd Edition, Mian Hoagland Meyer.
4. Principles of Food Chemistry, 2018, 4th Edition, deMan.
5. Basic Food Chemistry, 2012, 4th Edition, Frank A. Lee.
6. Fundamentals of Foods and Nutritions, 2018, 6thEdition, Mudambi S.R., M.V. Rajgopal.
7. Advanced text book of Foods Nutrition, 1985, 2nd Edition, Swaminathan S.
8. Dairy technology: principles of milk properties and processes, 1995, 1st Edition, P. Walstra, T.J Guerts, A. Noomen, A. Jellema and M.A.J.S Van Boekel.
9. Cereal processing technology, 2001, 1st Edition, Gavin Owens.
10. Preservation of Fruit and Vegetables, GirdhariLal, G.S. Siddappaa and G.L. Tandon, ICAR, New Delhi.
11. Analysis and Quality Control for Fruit and VegetableProducts, S Ranganna, McGraw Hill Education (India) Private Limited, Chennai, India.
12. Essentials of Food Science, 2013, 4th Edition, Vickie A. Vaclavik, Elizabeth W. Christian. (Online available)
13. Food Chemistry, 2009, 4th Edition, H.-D. Belitz, W. Grosch, P. Schieberle. (Online available)

Bachelor of Science (Medical)
SEMESTER–I
Session 2024-25
Course Title: Food Science and Quality Control (Vocational) (Food Chemistry and Nutrition) (Practical)
Course Code: BSMM-1255 (P)
(PRACTICAL)

Course Outcomes:

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 2024-25
Course Title: Food Science and Quality Control (Vocational) (Food Chemistry and Nutrition) (Practical)
Course Code: BSMM-1255 (P)
(PRACTICAL)

Time: 3 hours **Credits: 0-0-1**
Max. Marks: 20

Instructions for the practical examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Copy 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.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATION OF THREE YEAR DEGREE PROGRAM

Bachelor of Science (Medical)

Semester-II

Session 2024-25

Bachelor of Sciences (Medical) Semester-II												
Course Name	**Course Code**	**Paper**		**Course Type**	**Hours Per Week**	**Credits**	**Total Credits**	**Marks**				**Examination time (in hours)**
								Ext.		**CA**	**Total**	
						L-T-P		**L**	**P**			
Food Science and Quality Control (Vocational) (Food Plant Hygiene and Sanitation)	BSMM-2255	L	Food Plant Hygiene and Sanitation	E	4	4-0-0	5	60	-	20	100	3
		P	Food Plant Hygiene and Sanitation (Practical)		2	0-0-1		-	20			3

Bachelor of Science (Medical)
SEMESTER–II
Session 2024-25
Course Title: Food Science and Quality Control (Vocational) (Food Plant Hygiene and 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 2024-25
Course Title: Food Science and Quality Control (Vocational) (Food Plant Hygiene and Sanitation)
Course Code: BSMM-2255
(THEORY)

Examination Time: 3 Hours **Credits: 4-0-0**
Max. Marks: 100
Theory Marks: 60
Practical Marks: 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), 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 sanitizer 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)
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

Bachelor of Science (Medical)
SEMESTER–II
Session 2024-25
Course Title: Food Science and Quality Control (Vocational) (Food Plant Hygiene and Sanitation) (Practical)
Course Code: BSMM-2255 (P)
(PRACTICAL)

Course Outcomes:

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 2024-25
Course Title: Food Science and Quality Control (Vocational) (Food Plant Hygiene and Sanitation) (Practical)
Course Code: BSMM-2255 (P)
(PRACTICAL)

Time: 3 hours **Credits: 0-0-1**
Max. Marks: 20

Instructions for the practical examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Copy 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.

SCHEME AND CURRICULUM OF EXAMINATION OF THREE YEAR DEGREE PROGRAM

Bachelor of Science (Medical)

Semester-III

Session 2024-25

Bachelor of Sciences (Medical) Semester-III												
Course Name	**Course Code**	**Paper**		**Course Type**	**Hours Per Week**	**Credits**	**Total Credits**	**Marks**				**Examination time (in hours)**
								Ext.		**CA**	**Total**	
						L-T-P		**L**	**P**			
Food Science and Quality Control (Vocational) (Food Processing and Packaging)	BSMM-3255	L	Food Processing and Packaging	E	4	4-0-0	5	60	-	20	100	3
		P	Food Processing and Packaging (Practical)		2	0-0-1		-	20			3

Bachelor of Science (Medical)
SEMESTER–III
Session 2024-25
Course Title: Food Science and Quality Control (Vocational) (Food Processing and Packaging)
Course Code: BSMM-3255
(THEORY)

Course Outcomes: After passing this course the student will be able to:

CO1: Learn about the methods of food preservation and processing of fats, oils and sugar.

CO2: Learn about the processing of salt, tea, coffee, chocolate and cocoa powder, extruded foods and role of enzymes in food processing.

CO3: Learn about spices and flavors, food additives and manufacturing of fermented products.

CO4: Understand types of packaging materials, their properties and machinery.

Bachelor of Science (Medical)
SEMESTER–III
Session 2024-25
Course Title: Food Science and Quality Control (Vocational) (Food Processing and Packaging)
Course Code: BSMM-3255
(THEORY)

Examination Time: 3 Hours **Credits: 4-0-0**
Max. Marks: 100
Theory Marks: 60
Practical Marks: 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

Physical principles underlying food processing operations including thermal processing, ionizing radiation, refrigeration, freezing, dehydration.
Chemical preservation in food processing.
Fats and Oils: Types and sources of fats and oils (animal and vegetable), processing, uses, storage and nutritional aspects.
Sugar and Sugar Products: Different forms of sugar (sugar, jaggery, honey syrup), manufacture, selection, storage and use.

UNIT-II

Salt: preparation of brine and pickling.
Processing of: Tea, coffee, chocolate and cocoa powder.
Extruded foods.
Enzymes: Definition, factors affecting enzyme activity, role of enzymes in food processing.

UNIT-III

Fermentation technology, manufacturing of fermented products: Wine, vinegar, beer, yoghurt.
Spices and flavors.
Food additives, classes of food additives, role in food processing.

UNIT-IV

Definition and functions of Packaging

Types of packaging materials: metal, glass, wood, paper and plastics and their importance

Types of packages and their evaluation: bottle, pouch, tetra-pack and cans

Packaging machinery

Shelf life testing

Books Recommended

1. Post Harvest Technology of Cereals, Pulses and Oilseeds, 2019, 3rdEdition, Amalendu Chakraverty.

2. Technology of Cereals, 1994, 4th Edition, Norman Leslie Kent and A.D. Evers.

3. Preservation of Fruits & Vegetables, 2009, GirdhariLal, G.S Siddappa and G.L Tandon.

4. Principles of Food Packaging, 1980, 2nd Edition, Stanley Sacharow and Roger C. Griffin.

5. Chemistry of food additives and preservatives, 2012, 1st Edition, Titus A.M. Msagati.

6. Food Preservation, 2nd Edition, M. ShafiurRahman. (Online available)

7. Food Packaging – Principles and practice, 3rd Edition, 2012, Gordon L. Robertson. (Online available)

Bachelor of Science (Medical)
SEMESTER–III
Session 2024-25
Course Title: Food Science and Quality Control (Vocational) (Food Processing and Packaging) (Practical)
Course Code: BSMM-3255 (P)
(PRACTICAL)

Course Outcomes:

CO1: Ability to identify various food packaging materials.

CO2: Assessing the physical characteristics of cereals and assessment of gluten quality in wheat flour.

CO3: Understanding of blanching as food processing technique and its importance in food preservation and quality.

CO4: Conducting strength tests on packaging materials to assess their durability.

Bachelor of Science (Medical)
SEMESTER–III
Session 2024-25
Course Title: Food Science and Quality Control (Vocational) (Food Processing and Packaging) (Practical)
Course Code: BSMM-3255 (P)
(PRACTICAL)

Time: 3 hours **Credits: 0-0-1**
Max. Marks: 20

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

List of Practicals:

1. Determination of physical characteristics of cereals.
2. Milling of wheat into flour.
3. Determination of wet and dry gluten contents.
4. Identification of packaging materials.
5. To estimate the shelf life of packaged food.
6. To determine the strength of different packaging material.
7. To find out the tin coating weight.
8. To find out the uniformity and amount of wax on wax paper.
9. To check the chemical resistance of packaging materials.
10. To check the adequecy of blanching.
11. Visit to various industries dealing with food packaging material like, paper board and metal.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATION OF THREE YEAR DEGREE PROGRAM

Bachelor of Science (Medical)

Semester-IV

Session 2024-25

Bachelor of Sciences (Medical) Semester-IV												
Course Name	**Course Code**	**Paper**		**Course Type**	**Hours Per Week**	**Credits**	**Total Credits**	**Marks**				**Examination time (in hours)**
								Ext.		**CA**	**Total**	
						L-T-P		**L**	**P**			
Food Science and Quality Control (Vocational) (Quality Assurance)	BSMM-4255	L	Quality Assurance	E	4	4-0-0	5	60	-	20	100	3
		P	Quality Assurance (Practical)		2	0-0-1		-	20			3

Note: All the students are required to undergo “Industrial Training” for One month.

Bachelor of Science (Medical)
SEMESTER–IV
Session 2024-25
Course Title: Food Science and Quality Control (Vocational) (Quality Assurance)
Course Code: BSMM-4255
(THEORY)

Course Outcomes: After passing this course the student will be able to:

CO1: Understand the quality control in food industry and quality attributes.

CO2: Learn about quality assessment methods in different food industries.

CO3: Understand the sampling techniques and sensory evaluation of food.

CO4: Understand the concept of HACCP, GMP and food laws and regulations.

Bachelor of Science (Medical)
SEMESTER–IV
Session 2024-25
Course Title: Food Science and Quality Control (Vocational) (Quality Assurance)
Course Code: BSMM-4255
(THEORY)

Examination Time: 3 Hours **Credits: 4-0-0**
Max. Marks: 100
Theory Marks: 60
Practical Marks: 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

Objectives, importance and functions of quality control

Quality attributes

Quality control in food industry-methods of evaluation and control of the various aspects of quality of raw materials, manufacturing process and the testing of finished products.

UNIT-II

Methods of quality assessment of food materials: fruits, vegetables, cereals, dairy products, meat, egg and processed products.

Color: Definition, importance, different color measuring instruments used in food industries.

Texture: Definition, importance, different texture analyzing instruments used in food industries to analyze texture.

UNIT-III

Sampling, specifications of raw materials and finished products

Sensory evaluation.

UNIT-IV

Concept of HACCP and GMP.

Food Laws and Regulations- FSSAI, AGMARK, FPO, PFA, MFPO, BIS, ISO.

Recommended Books:

1. Quality Control for Food Industry by A. Kramer and B.A. Twigg
2. Handbook of analysis and quality control for fruits and vegetable products by S. Ranganna
3. Food Science by N.N. Potter (Online Available)

Bachelor of Science (Medical)
SEMESTER–IV
Session 2024-25
Course Title: Food Science and Quality Control (Vocational) (Quality Assurance) (Practical)
Course Code: BSMM-4255 (P)
(PRACTICAL)

Course Outcomes:

CO1: Familiarity with various platform tests used for assessing milk quality.

CO2: Understanding of food adulteration through various chemical and physical tests.

CO3: Understanding of the canning process and its importance in preserving fruits and vegetables.

CO4: Understanding of the concept of food quality and the importance of various chemical and physical tests in assessing it.

Bachelor of Science (Medical)
SEMESTER–IV
Session 2024-25
Course Title: Food Science and Quality Control (Vocational) (Quality Assurance) (Practical)
Course Code: BSMM-4255 (P)
(PRACTICAL)

Time: 3 Hours **Credits: 0-0-1**
Max. Marks: 20

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

List of Practicals:

1. Determination of acidity and pH of milk.
2. Platform tests for determining the quality of milk.
3. Determination of cooking quality of rice.
4. Determination of iodine value of oil/fat.
5. Determination of saponification value of oil/fat.
6. Determination of reducing and non-reducing sugars.
7. Determination of interior and exterior quality of eggs.
8. Determination of alcoholic acidity of flour.
9. Adulterants in milk, cereals, oils and fats and their detection.
10. Cut out analysis of canned fruits and vegetables.

Annexure-D

FACULTY OF SCIENCES

Syllabus

Of

Microbiology

For

B.Sc. Medical (Semester I - IV)

(Under Credit Based Continuous Evaluation Grading System)

(12+3 System of Education)

Session: 2024-25

The Heritage Institution

KANYA MAHA VIDYALAYA
JALANDHAR
(Autonomous)

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATION OF THREE YEAR DEGREE PROGRAM

Bachelor of Science (Medical) Semester-I
(SESSION 2024-25)

Bachelor of Sciences (Medical) Semester-I												
Course Name	**Course Code**	**Paper**		**Course Type**	**Hours Per Week**	**Credits**	**Total Credits**	**Marks**				**Examination time (in hours)**
								Ext.		**CA**	**Total**	
						L-T-P		**L**	**P**			
Microbiology (Fundamentals of Microbiology)	BSMM-1343	L	Fundamentals of Microbiology	E	4	4-0-0	5	60	-	20	100	3
		P	Fundamentals of Microbiology (Practical)		2	0-0-1		-	20			3

Bachelor of Science (Medical)
SEMESTER–I
(Session 2024-25)
Course Title: Microbiology (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 2024-25
Course Title: Microbiology (Fundamentals of Microbiology)
Course Code: BSMM-1343
(THEORY)

Examination Time: 3 Hours **Credits: 4-0-0**
Max. Marks: 100
Theory Marks: 60
Practical Marks: 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 of 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 inliving world, Hackel'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, methods of antibiotic susceptibility testing.

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 (temperature, pH, water activity and oxygen) on growth of bacteria.

Clinical Microbiology: Epidemiology reservoirs and modes of transmission of infectious diseases. Pathogenesis, diagnosis and treatment of common bacterial (Diphtheria, Cholera, Tuberculosis, Plague and Tetanus) and viral diseases (Hepatitis, AIDS, COVID 19) in humans.

Books Recommended:

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

Bachelor of Science (Medical)
SEMESTER–I
Session 2024-25
Course Title: Microbiology (Fundamentals of Microbiology)
Course Code: BSMM-1343 (P)
(PRACTICAL)

COURSE OUTCOMES:

After passing the course student will be able to:

CO1: Understand the basic glassware and equipment 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

CO5: Demonstration of micrometry for measuring the size of microbial cell

Bachelor of Science (Medical)
SEMESTER–I
Session 2024-25
Course Title: Microbiology (Fundamentals of Microbiology)
Course Code: BSMM-1343 (P)
(PRACTICAL)

Time: 3 Hours **Credits: 0-0-1**
Marks: 20

Instructions for the practical examiner: Question paper is to be set on the spot jointly by theInternal and External Examiners. Copy 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 cultures media for the cultivation of various microorganisms.

5. To study various laboratory techniques for the cultivation and isolation 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 micrometer.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATION OF THREE YEAR DEGREE PROGRAM

Bachelor of Science (Medical) Semester-II

(SESSION 2024-25)

Bachelor of Sciences (Medical) Semester-II												
Course Name	**Course Code**	**Paper**		**Course Type**	**Hours Per Week**	**Credits**	**Total Credits**	**Marks**				**Examination time (in hours)**
								Ext.		**CA**	**Total**	
						L-T-P		**L**	**P**			
Microbiology (Basic Food Microbiology)	BSMM-2343	L	Basic Food Microbiology	E	4	4-0-0	5	60	-	20	100	3
		P	Basic Food Microbiology (Practical)		2	0-0-1		-	20			3

Bachelor of Science (Medical)
SEMESTER–II
Session 2024-25
Course Title: Microbiology (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 2024-25
Course Title: Microbiology (Basic Food Microbiology)
Course Code: BSMM-2343

Examination Time: 3 Hours

Credits: 4-0-0
Max. Marks: 100
Theory Marks: 60
Practical Marks: 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, 26th 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 2024-25
Course Title: Microbiology (Basic Food Microbiology)
Course Code: BSMM-2343 (P)
(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 2024-25
Course Title: Microbiology (Basic Food Microbiology)
Course Code: BSMM-2343 (P)
(PRACTICAL)

Time: 3 Hours **Credits: 0-0-1**
Marks: 20

Instructions for the practical examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Copy 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 microorganisms present in spoiled bread and raw milk.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATION OF THREE YEAR DEGREE PROGRAM

Bachelor of Science (Medical) Semester-III
(SESSION 2024-25)

Bachelor of Sciences (Medical) Semester-III													
Course Name	**Course Code**	**Paper**		**Course Type**	**Hours Per Week**	**Credits**	**Total Credits**	**Marks**				**Examination time (in hours)**
								Ext.		**CA**	**Total**	
						L-T-P		**L**	**P**			
Microbiology (Microbial Nutrition and Metabolism)	BSMM-3343	L	Microbial Nutrition and Metabolism	E	4	4-0-0	5	60	-	20	100	3
		P	Microbial Nutrition and Metabolism (Practical)		2	0-0-1		-	20			3

Bachelor of Science (Medical)
SEMESTER–III
Session 2024-25
Course Title: Microbiology (Microbial Nutrition and Metabolism)
Course Code: BSMM-3343
(THEORY)

Course Outcomes:

After passing this course the student will be able to:

CO1: Understand the nutritional requirements for growth of microorganisms and types of microorganisms on the basis of nutrition.

CO2: Understand the transport of nutrients across the cell membrane.

CO3: Learn about the metabolic pathways and electron transport chain of bacteria.

CO4: Learn about the enzyme kinetics and biosynthesis of nucleic acids.

Bachelor of Science (Medical)
SEMESTER–III
Session 2024-25
Course Code: BSMM-3343
Course Title: Microbiology (Microbial Nutrition and Metabolism)
(THEORY)

Examination Time: 3 Hours

Credits: 4-0-0
Max. Marks: 100
Theory Marks: 60
Practical Marks: 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

Nutrition, requirements for growth of microorganisms, nutrients and accessory constituents, medium designing. Nutritional types of microorganisms (photolithotrophs, photoorganotrophs, chemolithotrophs and chemoorganotrophs)

UNIT–II

Transport of nutrients across the cell membrane, diffusion, passive transport, active transport, and group translocation for the transport of nutrients across the membrane. Bioenergetics; Laws of thermodynamics, entropy, enthalpy and free energy of reaction standard.

UNIT–III

Oxidative phosphorylation, electron transport, respiratory chains of bacteria, energy metabolism in aerobic and anaerobic microorganisms, pathways for breakdown of glucose (glycolysis, pentose phosphate pathways, Krebs cycle), gluconeogenesis, metabolism of starch & cellulose by bacteria.

UNIT–IV

Assimilation of nitrogen, synthesis of purine and pyrimidine nucleotides, biosynthesis of nucleic acids, Enzyme kinetics, Michaelis-Mentenequation and allosteric enzymes.

Books Recommended:

1.Pelczar, M.I., Chan, E.C.S. and Krieg, N.R. 2023, 5th edition, Microbiology. Tata McGraw Hill Publishing Co., Ltd., New Delhi.

2.Stanier, R.Y., Ingraham, J.L., Wheelis, M.L. and Painter, P.R. 2005, 5th 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. Bacterial physiology and metabolism by Byung Hong Kim and Geoffrey Michael Gadd. **(Online available)**

Bachelor of Science (Medical)
SEMESTER–III
Session 2024-25
Course Title: Microbiology (Microbial Nutrition and Metabolism)
Course Code: BSMM-3343(P)
(PRACTICAL)

COURSE OUTCOMES

After passing the course student will be able to:

CO1: Analyze the growth of bacteria on different media

CO2: Identify the fermenting and non-fermenting bacteria

CO3: Demonstrate the effect of various concentrations of Carbon and Nitrogen sources on bacteria.

CO4: Demonstrate the effect of various parameters such as temperature, pH, salt and metal on growth of bacteria

Bachelor of Science (Medical)
SEMESTER–III
Session 2024-25
Course Title: Microbiology (Microbial Nutrition and Metabolism)
Course Code: BSMM-3343(P)
(PRACTICAL)

Time: 3 Hours **Credits: 0-0-1**
Marks: 20

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

LIST OF PRACTICALS

7. Isolation and enumeration of total bacteria from soil by pour plating and spread plating.
8. Comparison of growth on complex medium and defined or minimal medium.
9. Distinction between fermenting and non-fermenting microorganisms.
10. Effects of various concentrations of carbon sourceon bacterial growth.
11. Effects of various concentrations of nitrogen source on bacterial growth.
12. Effect of temperature on bacterial growth.
13. Effect of pH on bacterial growth.
14. Effect of salt on bacterial growth.
15. Effect of metals(Ag, $Cu2^{+}$, $Ni2^{+}$)on bacterial growth.
16. Effect of dye (Crystal violet-basic) on bacterial growth.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
SCHEME AND CURRICULUM OF EXAMINATION OF THREE YEAR DEGREE PROGRAM

Bachelor of Science (Medical) Semester-IV

(Session 2024-25)

Bachelor of Sciences (Medical) Semester-IV												
Course Name	**Course Code**	**Paper**		**Course Type**	**Hours Per Week**	**Credits**	**Total Credits**	**Marks**				**Examination time (in hours)**
								Ext.				
						L-T-P		**L**	**P**	**CA**	**Total**	
Microbiology (Microbial Ecology)	BSMM-4343	L	Microbial Ecology	E	4	4-0-0	5	60	-	20	100	3
		P	Microbial Ecology (Practical)		2	0-0-1		-	20			3

Bachelor of Science (Medical)
SEMESTER–IV
(Session 2024-25)
Course Title: Microbiology (Microbial Ecology)
Course Code: BSMM-4343
(THEORY)

Course Outcomes:

After passing this course the student will be able to:

CO1: Understand the Diversity of various microbial habitats.

CO2: Understand the various microbial interactions and competition for survival in nature.

CO3: Understand the role of microorganisms in geochemical cycles, concept of microbial toxins, biofertilizers and bioinsecticides.

CO4: Understand the effluent treatment, bioremediation and bioleaching.

Bachelor of Science (Medical)
SEMESTER–IV
(Session 2024-25)
Course Title: Microbiology (Microbial Ecology)
Course Code: BSMM-4343
(THEORY)

Examination Time: 3 Hours

Credits: 4-0-0
Max. Marks: 100
Theory Marks: 60
Practical Marks: 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

Diversity of microbial habitats: Environmental selecting factors: - physical, chemical and biological types of microbial habitats: - atmospheric, aquatic and terrestrial environments.

UNIT–II

Microbial interactions, antagonism, commensalism, symbiosis, parasitism miscellaneous associations in nature.Competition for survival in nature (for nutrients, space, oxygen).

UNIT–III

Role of microorganisms in geochemical cycles: Carbon cycle, nitrogen cycle, phosphorus cycle and sulphur cycle, microbial toxins in the environment: Types of Microbial toxins, ecological consequences of microbial toxins as insecticidal agents, bioinsecticides, biofertilizers.

UNIT–IV

Concept of BOD and COD, Sewage and effluent treatment by primary, secondary and tertiary methods.Role of microbes in bioremediation of persistent pollutants and bioleaching of metals.

Books Recommended: (Edition of books updated)

1. Powar C.B. and Danginwala, H.F., 2017, General Microbiology, Volume II, 2nd ed. Himalaya Publishing House, New Delhi.
2. Sharma, P.D., 2010, Microbiology, Rastogi Publication, Meerut.
3. Pleczar, M.J., Chan, E.C.S. and Krieg N.R., 2011 (reprint), Microbiology, 2nd ed. Tata McGraw Hill Publishing Co., Ltd., New Delhi.
4. Patel, A.H., 2011, Industrial Microbiology, 2nd ed. Macmillan India Ltd., Delhi.

Bachelor of Science (Medical)
SEMESTER–IV
Session 2024-25
Course Title: Microbiology (Microbial Ecology)
Course Code: BSMM-4343(P)
(PRACTICAL)

COURSE OUTCOMES

After passing the course student will be able to:

CO1: Learn to isolate bacteria from air and soil

CO2: Determination of BOD and COD of water samples

CO3: Analyze the quality of water by MPN

CO4: Identify rhizobia in root nodules

Bachelor of Science (Medical)
SEMESTER–IV
Session 2024-25
Course Title: Microbiology (Microbial Ecology)
Course Code: BSMM-4343(P)
(PRACTICAL)

Time: 3 Hours **Credits: 0-0-1**
Marks: 20

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

LIST OF PRACTICALS

1. Isolation and enumeration of fungi from air and soil by pour plating and spread plating.
2. Determination of dissolved oxygen content (DO) of the given water sample by Titrimetric method.
3. Determination of COD of the given water sample by Titrimetric method.
4. To conduct bacteriological examination of water sample by MPN method.
5. To isolate symbiotic nitrogen bacteria from root nodules.
6. To perform crowded plate method for studying microbial interactions.
7. Determination of B.O.D.
8. Effect of Ultra violet light on bacterial growth.

Annexure-E

FACULTY OF SCIENCES

Syllabus

Of

Food Science and Quality Control

For

B.Sc. Medical (Semester V - VI)

(Under Continuous Evaluation System)

(12+3 System of Education)

Session: 2024-25

The Heritage Institution

KANYA MAHA VIDYALAYA
JALANDHAR
(Autonomous)

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATION OF THREE YEAR DEGREE PROGRAM

Bachelor of Science (Medical)

Semester-V

Session 2024-25

Bachelor of Science (Medical) Semester V								
Course Name	**Course Code**	**Course Type**	**Marks**					**Examination time (in Hours)**
			Total	**Paper**	**Ext.**		**CA**	
					L	**P**		
Food Science and Quality Control (Vocational) (Food Analysis)	BSMM-5255	E	100	Food Analysis	60	-	20	3
				Food Analysis (Practical)	-	20		3

Bachelor of Science (Medical)
Semester-V
Session 2024-25
Course Title: Food Science and Quality Control (Vocational) (Food Analysis)
Course Code: BSMM-5255
(THEORY)

Course Outcomes: After passing this course the student will be able to:

CO1: Understand the food composition and proximate analysis of food components.

CO2: Learn the analysis of micronutrients.

CO3: Understand the physical methods of food analysis including food rheology, refractometry and polarimetry.

CO4: Learn different chromatography techniques.

Bachelor of Science (Medical)
Semester-V
Session 2024-25
Course Title: Food Science and Quality Control (Vocational) (Food Analysis)
Course Code: BSMM-5255
(THEORY)

Examination Time: 3 Hours

Max. Marks: 100
Theory Marks: 60
Practical Marks: 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

Food composition and factors effecting food composition.
Proximate composition analysis of food.

UNIT-II

Analysis of Micronutrients and minerals.

UNIT-III

General physical methods of analysis of foods: Refractometry & Polarimetry.
Introduction and principles of Food rheology, types of viscosity, equipments used to check the viscosity.

UNIT-IV

Basic principles and working of Column chromatography, Gas chromatography and High Pressure Liquid Chromatography.

Reference Books:

1. Manuals of Food Quality Control additions contaminants techniques, 1980.
2. The Chemical Analysis of Food and Food Products by Morries B Jacob, 3rd Edition.,Roberte, Krieger.
3. Food Analysis, 2019, 4th Edition, S. Suzanne Nielsen. (Online available)
4. Analysis and Quality Control for Fruit and VegetableProducts, S Ranganna, McGraw Hill Education (India) Private Limited, Chennai, India.

Bachelor of Science (Medical)
Semester-V
Session 2024-25
Course Title: Food Science and Quality Control (Vocational) (Food Analysis) (Practical)
Course Code: BSMM-5255 (P)
(PRACTICAL)

Course Outcomes:

CO1: Understanding of compositional analysis of food.

CO2: Familiarity with various instruments crucial for evaluating food product quality.

CO3: Ability to perform specific chemical tests to estimate the concentration of vitamins and minerals in food samples.

CO4: Analysis and assessment of various parameters critical for ensuring food product quality, safety and shelf life.

Bachelor of Science (Medical)
Semester-V
Session 2024-25
Course Title: Food Science and Quality Control (Vocational) (Food Analysis) (Practical)
Course Code: BSMM-5255 (P)
(PRACTICAL)

Time: 3 Hours **Max. Marks: 20**

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

List of Practicals:

1. Determination of milk quality by lactometer.
2. To find out the TSS of food sample by refractometer.
3. Determination of surface tension of food sample by using drop number method.
4. Determination of viscosity index of food sample.
5. Proximate composition of different types of food.
6. Estimation of different minerals in food.
7. Estimation of vitamins in food.
8. Determination of dry and wet gluten content in wheat flour.
9. Determination of Chlorophyll content in food sample.
10. Estimation of percent loss in weight after drying and dehydration.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATION OF THREE YEAR DEGREE PROGRAM

Bachelor of Science (Medical)

Semester-VI

Session 2024-25

Bachelor of Science (Medical) Semester VI								
Course Name	**Course Code**	**Course Type**	**Marks**					**Examination time (in Hours)**
			Total	**Paper**	**Ext.**		**CA**	
					L	**P**		
Food Science and Quality Control (Vocational) (Food Plant Layout and Management)	BSMM-6255	E	100	Food Plant Layout and Management	60	-	20	3
				Food Plant Layout and Management (Practical)	-	20		3

Bachelor of Science (Medical)
Semester-VI
Session 2024-25
Course Title: Food Science and Quality Control (Vocational) (Food Plant Layout and Management)
Course Code: BSMM-6255
(THEORY)

Course Outcomes: After passing this course the student will be able to:

CO1: Understand the importance of plant layout and learn how to set up the proper plant layout to reduce the production cost and increase the productivity.

CO2: Learn how market research helps to understand the consumers, their needs and their satisfaction level.

CO3: Understand the societal changes and their impact on food consumption trends.

CO4: Learn about product development and different types of food products.

Bachelor of Science (Medical)
Semester-VI
Session 2024-25
Course Title: Food Science and Quality Control (Vocational) (Food Plant Layout and Management)
Course Code: BSMM-6255
(THEORY)

Examination Time: 3 Hours

Max. Marks: 100
Theory Marks: 60
Practical Marks: 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 a plant layout, selection of site and layouts of different food industries, selection of equipments, machinery and building material, selection and planning of manufacturing process and service facilities, maintenance and replacement, depreciation of machinery, management set up in a plant.

UNIT-II

Market and Consumer Research. Economic, Psychological, Anthropological and Sociological dimensions of food consumption pattern. Food situation in India and outside.

UNIT-III

Needs and types of Food consumption trends. Trends in social change and its role in diet pattern using social trends as a framework in new product innovation. Trapping the unconventional post-harvest losses and prospects of food processing for export.

UNIT –IV

Traditional foods-Status and need for revival in the context of westernized non-traditional foods, urbanization and such factors. Product development: Primary Processing, Secondary Processing, Types of products e.g. Quick cooking, fast foods, fabricated food, convenience foods.

Recommended Books:

1. Principle of Food Sanitation by Marriott, 5th ed., 2006, CBS Publishers, New Delhi.
2. Food Processing Waste Management by Green JH and Kramer A, 1979, AVI Publishers, USA.
3. Food Science by Potter NN, 5th ed., 2006, CBS Publishers, New Delhi.

Bachelor of Science (Medical)
Semester-VI
Session 2024-25
Course Title: Food Science and Quality Control (Vocational) (Food Plant Layout and Management) (Practical)
Course Code: BSMM-6255 (P)
(PRACTICAL)

Course Outcomes:

CO1: Familiarity with effective facility layout and process design critical for efficient and safe food production.

CO2: Proficiency in designing efficient facility layouts taking into account factors such as workflow, safety and hygiene and regularity compliance.

CO3: Understanding of financial concepts including depreciation and cost analysis.

CO4: Gaining practical exposure to real-world food processing facilities to observe and analyze different layout designs.

Bachelor of Science (Medical)
Semester-VI
Session 2024-25
Course Title: Food Science and Quality Control (Vocational) (Food Plant Layout and Management) (Practical)
Course Code: BSMM-6255 (P)
(PRACTICAL)

Time: 3 Hours **Max. Marks: 20**

Instructions for the practical examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Copy of the same may be submitted for the record to COE office, Kanya MahaVidyalaya, Jalandhar.

List of Practicals:

1. Calculation of depreciation and processing costs.
2. Preparation of layout and Process diagram of potato chips manufacturing plant.
3. Preparation of layout and Process diagram of jam/marmalade manufacturing plant.
4. Preparation of layout and Process diagram of bread making plant.
5. Preparation of layout and Process diagram of dairy industry.
6. Preparation of layout and Process diagram of wine making unit.
7. Preparation of layout and Process diagram of modern slaughter plant.
8. Preparation of layout and Process diagram of confectionary unit.
9. Determination of sanitary status of plant equipment.
10. Visit to various food industries.

Annexure-F

FACULTY OF SCIENCES

Syllabus

Of

Microbiology

For

B.Sc. Medical (Semester V - VI)

(Under Continuous Evaluation System)

(12+3 System of Education)

Session: 2024-25

The Heritage Institution

KANYA MAHA VIDYALAYA
JALANDHAR
(Autonomous)

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATION OF THREE YEAR DEGREE PROGRAM

Bachelor of Science (Medical) Semester-V
SESSION 2024-25

Bachelor of Science (Medical) Semester V								
Course name	**Course Code**	**Course Type**	**Marks**					**Examination time (in Hours)**
			Total	**Paper**	**Ext.**		**CA**	
					L	**P**		
Microbiology (Applied Microbiology – I)	BSMM-5343	E	100	Applied Microbiology - I	60	-	20	3
				Practical- Applied Microbiology - I	-	20		3

Bachelor of Science (Medical)
SEMESTER–V
Session 2024-25
Course Title: Microbiology (Applied Microbiology-I)
Course Code: BSMM-5343
(THEORY)

Course Outcomes:

After passing this course the student will be able to:

CO1: Understand the history and scope of industrial microbiology and preservation of stock cultures.

CO2: Understand the screening of microorganisms and composition and characteristics of fermentation media.

CO3: Learn about the fermenter, types of industrial fermentation and fermentation economics.

CO4: Understand the downstream processing and patent.

Bachelor of Science (Medical)
SEMESTER–V
Session 2024-25
Course Title: Microbiology (Applied Microbiology-I)
Course Code: BSMM-5343
(THEORY)

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

Microorganisms in Industry: Historical development, definition and scope of industrial microbiology; contribution of Louis Pasteur in fermentation; sources of industrial microorganisms and their essential characteristics, natural habitats, cultural collections and preservation of stock cultures.

UNIT- II

Screening of Microorganisms: Isolation of industrially important microorganisms, primary and secondary screening methods for isolating useful Yeast, Bacteria and Fungi. Fermentation media, composition of production media, characteristics of ideal production medium, raw materials.

UNIT- III

Fermentation and Fermentation processes: Fermentation as biological activity, Types of industrial fermentations (submerged, solid state and continuous fermentation). Design of fermenter (body construction, aeration, agitation and control of aseptic conditions), Basics of batch culture, fedbatch culture and continuous culture. Fermentation economics; planning, fermentation designing, process designing, market potential and recovery costs for the industrial set up.

UNIT- IV

Downstream Processing: Recovery and Purification of Fermentation Products; General principles of separation of fermentation products, solid particles, foam separation, separation by filtration, centrifugation, cell disruption, liquid - liquid chromatography, ion exchange chromatography. Patent: Introduction, composition, subject matter, characteristics, protection of rights of inventor, cost).

Books Recommended:

1. Casida, L.E. 2016, 2nd Edition.*Industrial Microbiology*. Wiley Eastern Ltd., New Delhi.
2. Stanbury, P.F. Whittaker, A. and Hall S.J. 2016, 3rd Edition. Principles of Fermentation Technology. Elsevier Science Ltd., U.K.
3. Patel, A.H. 2011, 2nd Edition. *Industrial Microbiology,*Macmillan India Ltd., Delhi.
4. Trevan M.D., Saffey, S., Goulding, K.H. and Stanberry, P. 2007. *Biotechnology: The Biological Principles,* Tata McGraw Hill Publishing Co. Ltd., New Delhi.
5. Freifelder, D. 2006, 2nd Edition. Microbial Genetics. Jones and Barttett Publishers Inc., Boston.
6. Applied Microbiology by Corinne Whitby and Torben Lund Skovhus. **(Online available)**
7. Applied Microbiology by Perlman. **(Online available)**

Bachelor of Science (Medical)
SEMESTER–V
Session 2024-25
Course Title: Microbiology (Applied Microbiology-I)
Course Code: BSMM-5343
(PRACTICAL)

COURSE OUTCOMES

After passing the course student will be able to:

CO1: Isolation of microorganisms from different samples

CO2: Demonstrate the isolation of amylase and protease producing microorganisms

CO3: Understand the protein estimation by Lowery method

CO4: Knowledge about the different methods for preservation of microorganisms

Bachelor of Science(Medical)
SEMESTER–V
Session 2024-25
Course Title: Microbiology (Applied Microbiology-I)
Course Code: BSMM-5343
(PRACTICAL)

Time: 3 Hours **Marks: 20**

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

List of Practicals:

1. Isolation of microorganisms from (a) soil (b) fruits.
2. Screening and characterization of industrially important Amylase producing microorganisms.
3. Screening and characterization of industrially important Protease producing microorganisms
4. Protein estimation by Lowry method.
5. Preservation of industrially important microorganisms by various methods
   (a) Storage in 10% glycerol
   (b) Storage in mineral oil.
6. Determination of % viability of yeast cells by haemocytometer.

KanyaMahaVidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATION OF THREE YEAR DEGREE PROGRAM
Bachelor of Science (Medical) Semester-VI
(Session 2024-25)

Bachelor of Science (Medical) Semester VI								
Course name	**Course Code**	**Course Type**	**Marks**					**Examination time (in Hours)**
			Total	**Paper**	**Ext.**		**CA**	
					L	**P**		
Microbiology (Applied Microbiology -II)	BSMM-6343	E	100	Applied Microbiology-II	60	-	20	3
				Practical- Applied Microbiology-II	-	20		3

Bachelor of Science (Medical)
SEMESTER–VI
Session 2024-25
Course Title: Microbiology (APPLIED MICROBIOLOGY-II)
Course Code: BSMM-6343

(THEORY)

Course Outcomes:

After passing this course the student will be able to:

CO1: Understand the processing of fermented foods.

CO2: Understand the Microbial Cell as Fermentation Products and production of different industrial chemicals.

CO3: Understand the role of microorganisms in preparation of alcoholic beverages and industrial enzymes.

CO4: Understand the role of microorganisms in the production of vitamins, amino acids and antibiotics.

Bachelor of Science (Medical)
SEMESTER–VI
Session 2024-25
Course Title: Microbiology (Applied Microbiology-II)
Course Code: BSMM-6343
(THEORY)

Time: 3 Hours Max Marks: 100
Theory Marks: 60
Practical Marks: 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

Fermentation Process of Fermented Foods: Fermented cereal, legume and milk products. Microbiology of natural fermentation. Sauerkraut, Yoghurt, Soya sauce, Cheese.

UNIT-II

Microbial Cell as Fermentation Products: Baker's and brewer's yeast, single cell protein, mushroom farming. Production of industrial chemicals: Acetic acid, Citric acid, Acetone and Butanol.

UNIT-III

Production of alcoholic Beverages: Beer, wine and distilled beverages – Whisky, Brandy, Vodka, Gin production and applications of industrial enzymes: Amylases, Proteases, immobilization of enzymes.

UNIT-IV

Vitamins and Amino acids production by Microorganisms: Riboflavin (B2) and Cyanocobalamin (B12), Glutamic acid. Production of antibiotics: Penicillin and Streptomycin.

Books Recommended:

1. Prescott and Dunn 2004, 4th edition, *Industrial Microbiology*.CBS Publishers & Distributers, New Delhi.
2. Casida, L.E. 2004, 2nd edition,*Industrial Microbiology*. Wiley Eastern Ltd., New Delhi.
3. Patel, A.H. 2022, 2nd edition. *Industrial Microbiology*. Macmillan India Ltd., Delhi.
4. Trevan, M.D. Saffey, S., Goulding, K.H. and Stanberry, P. 1988. *Biotechnology: The Biological Principles*, Tata McGraw Hill Publishing Co. Ltd., New Delhi
5. Wiseman, A. 1995. *Handbook of Enzyme Biotechnology*. Ellis Harwood Ltd., London.
6. Wood, J.B.B., 2012, 2nd edition. *Microbiology of Fermented Foods*, Volumes 1 and 2, Blackie Academic and Professional, London

Bachelor of Science (Medical)
SEMESTER–VI
Session 2024-25
Course Title: Microbiology (Applied Microbiology-II)
Course Code: BSMM-6343 (P)
(PRACTICAL)

COURSE OUTCOMES

After passing the course student will be able to:

CO1: Demonstrate the crude production of amylase and protease enzymes

CO2: Preparation of wine and vinegar

CO3: Understand the submerged and solid state fermentation techniques for enzyme production

CO4: Knowledge about the kinetics of growth of yeast

Bachelor of Science (Medical)
SEMESTER–VI
Session 2024-25
Course Title: Microbiology (Applied Microbiology-II)
Course Code: BSMM-6343 (P)
(PRACTICAL)

Time: 3 Hours **Marks: 20**

Instructions for the practical examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Copyof the same may be submitted for the record to COE Office, KanyaMahaVidyalaya, Jalandhar.

LIST OF PRACTICALS

1. Production of amylases and proteases in liquid medium using the selected organisms.

2. Assay of crude enzyme preparation for Amylase.

3. Assay of crude enzyme preparation for Protease.

4. Production of alcohol from molasses and cereal grains.

5. Immobilization of microbial cells and enzyme preparations by calcium alginate entrapment method.

6. Comparison of submerged and solid state fermentation techniques for amylase production.

7. To study the production of wine and vinegar.

8. To study the kinetics of growth of yeast in batch/continuous culture.

Annexure-G

Bachelor of Science (Medical)
FOOD SCIENCE QUALITY CONTROL AND MICROBIOLOGY
Semester I, II, III, IV, V &VI
(Session 2024-25)

Paper Setters & Evaluators for Theory

SEMESTER –I, II, III, IV, V &VI					
S.No.	**Name of Subject**	**Proposed Examiners & Evaluators**	**Name of Institute**	**Contact No.**	**Email id**
1	**Food Science and Quality Control**	Dr. Sukhpreet Kaur	Food Technologist (Fruit & Vegetable), Department of Food Science and Technology, PAU, Ludhiana	9988317979	sukhpreetnagra@pau.edu
		Dr. Neha Babbar	Assistant Professor (Food Technology), Department of Food Science and Technology, PAU, Ludhiana	7508408426	nehababbar@pau.edu
		Dr. Antima Gupta	Food Technologist, Department of Food Science and Technology, PAU, Ludhiana	8360534305, 8728939827	antimagupta@pau.edu
		Ms. Manju Nehra	Assistant Professor, Department of Food Science and Technology, Chaudhary Devi Lal University (CDLU), Sirsa, Haryana	9996604977	manju.vnehra@gmail.com
		Dr. Neha Sharma	Assistant Professor, Department of Food Technology and Nutrition, School of Agriculture, Lovely Professional University, Jalandhar	7973694240	nehaatdu@gmail.com

SEMESTER –I, II, III, IV, V & VI					
S.No.	**Name of Subject**	**Proposed Examiners & Evaluators**	**Name of Institute**	**Contact No.**	**Email id**
2	**Microbiology**	Dr. Sukhraj Kaur	Associate Professor, Department of Microbiology, G.N.D.U., Amritsar	9478821899	sukhraj.micro@gndu.ac.in
		Dr. Suman Kumari	Assistant professor, Department of Microbiology, PAU, Ludhiana	9814249721	sumanverma@pau.edu
		Dr. Anu Kalia	Associate Professor, School of Agriculture, Microbiology division, PAU, Ludhiana	9914620240	kaliaanu@pau.edu
		Dr. Jupinder Kaur	Microbiologist, Department of Microbiology, PAU, Ludhiana	9592503631	jupinderkaur@pau.edu
		Dr. Satinder Kaur	Assistant Professor,Department of Biotechnology, SGGS College, Sector-26 Chandigarh	9915749136	kaursatinder5@gmail.com
		Dr. Keshani	Extension Scientist (Microbiology), Department of Microbiology, PAU, Ludhiana, Punjab	8968934869	keshani@pau.edu

Bachelor of Science (Medical)
FOOD SCIENCE QUALITY CONTROL AND MICROBIOLOGY
Semester I, II, III, IV, V & VI
(Session 2024-25)
Paper Setters & Evaluators for Practical

S.No.	Name of Subject	Proposed Examiners & Evaluators	Name of Institute	Contact No.	Email id
1	**Microbiology**	Dr. Sukhraj Kaur	Associate Professor, Department of Microbiology, G.N.D.U., Amritsar	9478821899	sukhraj.micro@gndu.ac.in
		Dr. Suman Kumari	Assistant professor, Department of Microbiology, PAU, Ludhiana	9814249721	sumanverma@pau.edu
		Dr. Anu Kalia	Associate Professor, School of Agriculture, Microbiology division, PAU, Ludhiana	9914620240	kaliaanu@pau.edu
2.	**Food Science and Quality Control**	Dr. Sukhpreet Kaur	Food Technologist (Fruit & Vegetable), Department of Food Science and Technology, PAU, Ludhiana	9988317979	sukhpreetnagra@pau.edu
		Dr. Neha Sharma	Assistant Professor, Department of Food Technology and Nutrition, School of Agriculture, Lovely Professional University, Jalandhar	7973694240	nehaatdu@gmail.com
		Dr. Antima Gupta	Food Technologist, Department of Food Science and Technology, PAU, Ludhiana	8360534305, 8728939827	antimagupta@pau.edu

Annexure-H

DEPARTMENT OF FOOD SCIENCE QUALITY CONTROL AND MICROBIOLOGY

SESSION (2024-25)

Teaching methodologies

Innovative Teaching Practices:

- Practical of Food Science and Microbiology
- Industrial Training
- Remedial Classes
- Product Development of seasonal foods and display (Food Stalls)
- Classroom Seminars
- Mentoring of Students
- Assignments and Evaluation
- Industrial Visits
- Online teaching through LMS (Learning Management System)
- Extension Lectures
- Case Studies
- Alumni Talks