

MGM UNIVERSITY, AURANGABAD INSTITUTE OF BIOSCIENCES AND TECHNOLOGY

CHOICE-BASED CREDIT SYSTEM (CBCS) SEMESTER PATTERN

Faculty of Basic and Applied Sciences Graduate (UG) Program

Food Nutrition and Dietetics-CURRICULUM W.e.f .Academic Year2023-24

B.Sc., B.Sc. (Hons.), B.Sc. (Hons.) with Research of Food Nutrition and Dietetics

SEMESTER (I, II)

Prepared By Mrs. D. A. Thoke Submitted By Dr. S. V. Maske

Approved By Board of Studies

MGM University

Vision

- To ensure sustainable human development which encourages self-reliant and selfcontent society.
- To promote activities related to community services, social welfare and also Indian heritage and culture.
- To inculcate the culture of non-violence and truthfulness through vipassanna meditation and Gandhian Philosophy.
- To develop the culture of simple living and high thinking

Mi<mark>ssi</mark>on

- To impart state of art education and technical expertise to students and give necessary training to teachers to create self-reliant society for future.
- To encourage students to participate in Indian and International activities in sports, literature, etc. so that future generation becomes base for free and liberal society
- To educate students in areas like Management, Finance, Human relations to inculcate philosophy of simple living and high thinking value of simple economic society.
- To inculcate culture of non-violence and truthfulness through Vipassana.

To sustain activities of Indian culture (viz. classical dance, music and fine arts) through establishing institutes like Mahagami, Naturopathy, etc.

<u>विद्यापीठ गीत</u>

अत्त दिप भव भव प्रदिप भव, स्वरूप रूप भव हो ज्ञान सब्ब विज्ञान सब्ब भव, सब्ब दिप भव हो अत्ताहि अत्त नो नाथो, अत्ताहि अत्त नो गति अत्त मार्गपर अप्रमादसे है तुझे चलना सब्ब का कल्याण हो, वो कार्यकुशल करना सब्ब का उत्तम मंगल , पथप्रदर्शक हो अत्त दिप भव भव प्रदिप भव, स्वरूप रूप भव हो ज्ञान सब्ब विज्ञान सब्ब भव, सब्ब दिप भव हो बुद्धमं शरनं गच्छामि: धम्मं शरनं गच्छामि : संघं शरनं गच्छामि -

INSTITUTE OF BIOSCIENCE AND TECHNOLOGY

We are contributor in Medical and Advances in Agriculture sciences by studying living systems and organisms for development and research purpose. We shape our student for their bright future in thin field by proving knowledge and best practical facilities.

The Mahatma Gandhi Mission's Institute of Biosciences and Technology is promoted by Mahatma Gandhi Mission (MGM) Trust. The Mahatma Gandhi Mission Trust was founded with a vision to address the educational, health and other social needs of the public since 1983. MGM visualized the density of the field of life science resources and possible careers which will be helpful in the area of research. Through this keen interest MGM established the department of Biotechnology and Bioinformatics in 2001-2002.

Then in the year 2002-2003, with the affiliation of Dr. Babasaheb Ambedkar Marathwada University, the course of M.Sc. Biotechnology was started – a very large ambition and a great milestone in the area of Biotechnology. In the year 2004-05 MGM's IBT launched a course of B.Sc. Agricultural Biotechnology under the affiliation of Marathwada Krishi Vidyapeeth, Parbhani. With the launch of this course the department of biotechnology and Bioinformatics became the crowning glories of Marathwada region.

A tiny seedling turned into a huge tree with multiple branches. In the year 2005-2006 MGM's IBT visualized the importance informatics. Consistent with the attitude to excel in the field of biotechnology, the course of M.Sc. Bioinformatics was launched under the affiliation of Dr. Babasaheb Ambedkar Marathwada University, Aurangabad, in 2005-2006.

Now MGM's IBT is well established in the field of research focusing on the areas of Biotechnology and Bioinformatics with well-equipped R&D laboratory encouraging and supporting extensive research.

Vision

"To achieve academic excellence through research, teaching and training in biosciences disciplines which will eventually serve and benefits the society"

Mission

- To Generate necessary and intellectually qualified biological work force.
- Strive to provide services and solutions through biologic knowledge forecasting the welfare and benefit of the society

Programs offered at IBT

Undergradua te Programmes	Postgraduate Programmes	PhD Programmes	PG Diploma Programm es	Certificate Programm es	
B.Sc. Biotechnology Honours / Honours with Research	M.Sc. Biotechnology	Ph.D. Biotechnology			
B.Sc. Microbiology Honours/ Honours with Research	M.Sc.Microbiology/ Virology	Ph.D. Microbiology			
B.Sc. Bioinformatics Honours / Honours with Research	M.Sc. Bioinformatics	Ph.D. Bioinformatics			
B.Sc. Food Technology and Processing Honours / Honours with Research	M.Sc. Food Technology	Ph.D. Food Technology	EK	SII	Y
B.Sc. Food nutrition and Ditetics Honours / Honours with Research	M.Sc. Plant Breeding & Molecular Genetics	Ph.D. Plant Breeding & Molecular Genetics			
		Ph.D. Plant Biotechnology			

Name of Program - B.Sc. (Food Technology and Processing) Hons. / Hons. with Research

Duration – Four Years

Eligibility –

1. Maharashtra State Candidate.

(i) The Candidate should be an Indian National and having domicile of Maharashtra state and/or born in Maharashtra state.

(ii) Passed HSC or its equivalent examination with Physics and Mathematics as compulsory subjects along with one of the Chemistry or Biotechnology or Biology or Technical Vocational subject or Computer Science or Information Technology or Informatics Practices or Agriculture or Engineering Graphics or Business Studies, and obtained at least 45% marks (at least 40% marks, in case of Backward class categories and Persons with Disability candidates belonging to Maharashtra State only) in the above subjects taken together and the candidate should have appeared in MGMU-CET / MHT-CET / PERA CET should obtain non zero score in MGMU-CET / MHT-CET / PERA CET. However, preference shall be given to the candidate obtaining non-zero positive score in MGMU-CET over the candidates who obtained non-zero score in MHT-CET / PERA CET.

2. All India Candidates -

(i) The Candidate should be an Indian National.

(ii) Passed HSC or its equivalent examination with Physics and Mathematics as compulsory subjects along with one of the Chemistry or Biotechnology or Biology or Technical Vocational subject or Computer Science or Information Technology or Informatics Practices or Agriculture or Engineering Graphics or Business Studies , and obtained at least 45% marks (at least 40% marks, in case of Backward class categories and Persons with Disability candidates belonging to Maharashtra State only) in the above subjects taken together and candidate should have appeared in MGMU-CET / MHT-CET / PERA CET should obtain non-zero score in MGMU-CET / MHT-CET / PERA CET. However, preference shall be given to the candidate obtaining non-zero positive score in over the candidates who obtained non-zero score in MGMU-CET / MHT-CET / PERA CET.

Name of Faculty: Basic and Applied SciencesGraduate (UG) Program Name of the College/Institute/Department/School: Institute of Bioscience and Technology

Semeste	er I											
Cours e Categ ory	Course Code	Course Title	Natu re of Cour se	No. of Cre dits	Tea n (Co ct l we	ichi g onta irs/ ek)	Evalu: (ation Sch Marks)	eme	Minin (num Pas Marks)	sing
					L	Р	Inter nal	Exter nal	Tot al	Inter nal	Exter nal	Tot al
MM	FND42M ML101	Principles of Human Nutrition-I	Lect ure	2	2		30	20	50		8	20
MM	FND42M ML102	Human Anatomy & Physiology-I	Lect ure	3	3	-	60	40	100		16	40
IKS	FND42IK L101	Holistic medicine and wellness	Lect ure	2	2	-	30	20	50		8	20
AEC	MGM54A EL104	Functional Marathi	Lect ure	2	2	-	30	20	50		8	20
OE		Open Elective I	Lect ure	2	2	-	30	20	50		8	20
OE		Open Elective II	Lect ure	2	2	-	30	20	50		8	20
VEC	MGM21V EL101	Environmental Studies	Lect ure	2	2	-	30	20	50		8	20
VSC	FND42VS P101	Practical Techniques In Human Nutrition	Pract ical	2		4	30	20	50		8	20
SEC	FND42SE P101	Nutrition Lab-I	Pract ical	2		4	30	20	50		8	20
MM	FND42M MP101	Key Skills for Nutrition and Dietetics I	Pract ical	1	-	2	30	20	50		8	20
CC	MGM62C CP101	Cultural Activities	Pract ical	2		4	30	20	50		8	20
		Total		22	1 5	1 4	360	240	60 0		96	24 0

Name of the Programme: B.Sc./B.Sc. Hons. /B.Sc. Hons with Research

Programme Type (UG/PG): UG/ B.Sc./B.Sc. Hons./B.Sc. Hons with Research of Food Nutrition and Dietetics **Duration: 04 Years (08 Semesters)**

Note:

Nature of Course : L- Lecture, P-Practical, S-Seminar, J-Project, I-Internship, D-Dissertation,

Course Category: MM-Major Mandatory, ME-Major Elective, MI-Minor, OE-Generic / Open electives, VSC-Vocational skill course, SEC-Skill Enhancement course, AEC-Ability Enhancement course, IKS-Indian Knowledge system, VEC-Value Education course, OJT-On Job Training / Internship / Apprenticeship, FP-Field project, CEP-Community engagement and service, CC-Co – curricular course, RM-Research methodology, RP-Research project

Semeste	r II											
Cours e Categ ory	Course Code	Course Title	Natur e of Cours e	No. of Cred its	Tea n (Co ct h we	ichi g nta irs/ ek)	Evalu	ation Sch (Marks)	eme	Minii	num Pass (Marks)	ing
					L	Р	Inter nal	Exter nal	Tot al	Inter nal	Exter nal	Tot al
MM	FND42MML 103	Principles of Human Nutrition-II	Lectu re	2	2		30	20	50		8	20
MM	FND42MML 104	Human Anatomy & Physiology-II	Lectu re	3	3	-	60	40	100		16	40
MI		Minor Course	Lectu re	2	2	-	30	20	50		8	20
AEC	MGM54AEL 101	Communicative English	Lectu re	2	2	-	30	20	50		8	20
OE		Open Elective I	Lectu re	2	2	-	30	20	50		8	20
OE		Open Elective II	Lectu re	2	2	-	30	20	50		8	20
VEC	MGM21VEL 102	Universal Human Values	Lectu re	2	2	-	30	20	50		8	20
VSC	FND42VSP10 2	Techniques In Dietetics and Nutritional Research	Practi cal	2		4	30	20	50		8	20
SEC	FND42SEP10 2	Nutrition Lab-II	Practi cal	2		4	30	20	50		8	20
ММ	FND42MMP1 02	Key Skills for Nutrition and Dietetics II	Practi cal	1		2	30	20	50		8	20
CC	MGM82CCP 103	Sports	Practi cal	2		4	30	20	50		8	20
	T	otal		22	15	1 4	360	240	600		96	240

Nature of Course : L- Lecture, P-Practical, S-Seminar, J-Project, I-Internship, D-Dissertation,

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Level 4.5 Award of UG certificate with 40 credits and an additional 4-credits core NSQF course / internship OR continue with major and minor

Semest	er III											
Cour se Categ ory	Course Code	Course Title	Natu re of Cour se	No. of Cre	Tea n (Co ct I we	achi g onta Hrs/ ek)	Evalu: (ation Scl Marks)	ieme	Minin (num Pas Marks)	sing
				ans	L	Р	Inter nal	Exter nal	To tal	Inter nal	Exter nal	To tal
MM	FND42MM L201	Nutrition through the life cycle- I	Lectu re	3	3	-	60	40	10 0	-	16	40
MM	FND42MM L202	Food Safety Preservation and Legislation	Lectu re	2	2	-	30	20	50	-	08	20
MM	FND42MM L203	Fundamentals of Food Science-I	Lectu re	2	2	-	30	20	50	-	08	20
OE		Open Elective V	Lectu re	2	2	-	30	20	50	-	08	20
MI		Minor Course	Lectu re	3	3	-	60	40	10 0	-	16	40
AEC	MGM54AE L103	Functional Hindi	Lectu re	2	2	-	30	20	50	-	08	20
MI		Minor Course	Pract ical	1	Ē	2	30	20	50		08	20
VSC	FND42VSP 201	Practical of Nutrition through Life cycle	Pract ical	2	-	4	30	20	50	5	08	20
MM	FND42MM P201	Practical of Food preservation	Pract ical	1	-	2	30	20	50	-	08	20
FP	FND42FPJ2 01	Filed Project	Proje ct	2	-	4	30	20	50	-	08	20
СС	MGM82CC P201	Health and Wellness	Pract ical	2	-	4	30	20	50	-	08	20
Total				22	1 4	1 6	390	260	65 0	0	104	26 0

Nature of Course : L- Lecture, P-Practical, S-Seminar, J-Project, I-Internship, D-Dissertation,

Course Category: MM-Major Mandatory, ME-Major Elective, MI-Minor, OE-Generic / Open electives, VSC-Vocational skill course, SEC-Skill Enhancement course, AEC-Ability Enhancement course, IKS-Indian Knowledge system, VEC-Value Education course, OJT-On Job Training / Internship / Apprenticeship, FP-Field project, CEP-Community engagement and service, CC-Co – curricular course, RM-Research methodology, RP-Research project

Level 5.0Award of UG Diploma in major and minor with (44+44)= 88 credits and an additional 4credits core NSQF course / internship OR continue with major and minor

Semeste	er IV											
Course Catego ry	Course Code	Course Title	Natu re of Cour se	No. of Credi ts	Tead ng (Col ct H wee	chi nta 'rs/ k)	Eval Sche	uation me (Ma	rks)	Minii Passii	mum ng (Mar	:ks)
					L	Р	Intern al	Extern al	Tot al	Intern al	Extern al	Tot al
MM	FND42MML 204	Nutrition Diagnosis and intervention	Lecture	2	2		30	20	50	-	08	20
MM	FND42MML 205	Nutrition through the life cycle II	Lecture	3	3	-	60	40	100	-	16	40
MM	FND42MML 206	Fundamentals of Food Science-II	Lecture	2	2	-	30	20	50	-	08	20
OE		Open Elective VI	Lecture	2	2	-	30	20	50	-	08	20
MI		Minor Course	Lecture	3	3	-	60	40	100	-	16	40
AEC	MGM54AEL 203	Communication Skills	Lecture	2	2	-	30	20	50	-	08	20
SEC	FND42SEP20 1	Clinical Nutrition and Dietetics (Case Study)	Practical	2	-	4	30	20	50	-	08	20
MI		Minor Course	Practical	1	- \	2	30	20	5 <mark>0</mark>	-	08	20
ММ	FND42MMP 202	Dietary Assess ment Techni ques for Dieticia ns	Practical	1		2	30	20	50		08	20
CEP	FND42CEP2 01	Community Engagement Programs	Project	2	-	4	30	20	50	-	08	20
CC	MGM73CCP 105	Fine Arts	Practical	2	-	4	30	20	50	-	08	20
Total				22	14	16	390	260	650	⊢	104	260

Nature of Course : L- Lecture, P-Practical, S-Seminar, J-Project, I-Internship, D-Dissertation,

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Semeste	er VI											
Cours e Categ ory	Course Code	Course Title	Natu re of Cour se	No. of Cred its	Tea n (Co ct l we	nchi g onta hrs/ ek)	Evalu (ation Sch (Marks)	eme	Minir (num Pass Marks)	sing
					L	Р	Inter nal	Exter nal	Tot al	Inter nal	Exter nal	Tot al
MM	FND42M ML304	Global Issues in Nutrition	Lectu re	2	2		30	20	50		8	20
MM	FND42M ML305	Food Microbiology and toxication-II	Lectu re	3	3		60	40	100		16	40
MM	FND42M ML306	Medical Nutrition Therapy-II	Lectu re	3	3		60	40	100		16	40
ME	FND42ME L202	Family Meal Management	Lectu re	3	3		60	40	100		16	40
MI		Minor Course	Lectu re	3	3		60	40	100		16	40
MI		Minor Course	Practi cal	2		4	30	20	50		8	20
OJT	FND42JTP 301	On Job Training	Practi cal	4		8	60	40	100		16	40
MM	FND42M MP302	Biostatistics and scientific writing	Practi cal	1		2	30	20	50		8	20
MM	FND42M MP303	Diet Therapy (Case Study)	Practi cal	1		2	30	20	50		8	20
ME	FND42ME P202	Family Meal Management Survey	Practi cal	1		2	30	20	50		8	20
	Λ			22	1 4	1 6	450	300	750		120	300

Nature of Course : L- Lecture, P-Practical, S-Seminar, J-Project, I-Internship, D-Dissertation,

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Level 5.5 Award of UG degree in major and minor (44+44+44)=132 credits OR continue with major and minor

Semest	ter VII											
Cour se Cate gory	Course Code	Course Title	Nat ure of Cou rse	No. of Cre dits	Te: ir (C) a hi we	ach ng ont ct rs/ ek)	Ev Sche	valuation me (Man	n rks)	Minin (num Pas Marks)	sing
					L	Р	Inte rnal	Exte rnal	To tal	Inte rnal	Exte rnal	To tal
MM	FND42M ML401	Space Nutrition & Planning	Lect ure	3	3		60	40	10 0		16	40
MM	FND42M ML402	Diabetes Management	Lect ure	3	3		60	40	10 0		16	40
MM	FND42M ML403	Sports And Exercise Nutrition	Lect ure	3	3		60	40	10 0		16	40
MM	FND42M ML404	Entrepreneurship Development	Lect ure	2	2		30	20	50		8	20
ME	FND42M EL301	Community Nutrition	Lect ure	3	3		60	40	10 0		16	40
RM	FND42R ML401	Research Methodology	Lect ure	3	3		60	40	10 0		16	40
RM	FND42R MP401	Seminar (Research Paper Based)	Pract ical	1		2	30	20	50		8	20
ME	FND42M EP301	Community Nutrition	Pract ical	1		2	30	20	50		8	20
ММ	FND42M MP401	Industrial Food Manufacture And Product Development	Pract ical	1		2	30	20	50		8	20
ММ	FND42M MP402	Nutritional Lab	Pract ical	1		2	30	20	50		8	20
MM	FND42M MP403	Entrepreneurship Development Lab	Pract ical	1	V	2	30	20	50		8	20
				22	17	1	480	320	800		128	$32 \\ 0$

Nature of Course : L- Lecture, P-Practical, S-Seminar, J-Project, I-Internship, D-Dissertation,

Course Category: MM-Major Mandatory, ME-Major Elective, MI-Minor, OE-Generic / Open electives, VSC-Vocational skill course, SEC-Skill Enhancement course, AEC-Ability Enhancement course, IKS-Indian Knowledge system, VEC-Value Education course, OJT-On Job Training / Internship / Apprenticeship, FP-Field project, CEP-Community engagement and service, CC-Co – curricular course, RM-Research methodology, RP-Research project

Semeste	er VIII											
Cours e Categ ory	Course Code	Course Title	Nat ure of Cou rse	No. of Cre dits	Tea n (Co ct l we	achi 1g onta hrs/ ek)	Evalu: (ation Sch Marks)	ieme	Minin (num Pas Marks)	sing
					L	Р	Inter nal	Exter nal	Tot al	Inter nal	Exter nal	Tot al
MM	FND42M ML405	3 Months Internship (Hospital internship)	Lect ure	3	3		60	40	100		16	40
MM	FND42M ML406	Internship Report Writing	Lect ure	3	3		60	40	100		16	40
MM	FND42M ML407	Community Nutrition	Lect ure	3	3		60	40	100		16	40
MM	FND42M ML408	Geriatric Nutrition	Lect ure	2	2		30	20	50		8	20
ME	FND42ME L302	Diet counselling and Patient Care	Lect ure	3	3		60	40	100		16	40
OJT	FND42JTP 401	On Job Training	Train ing	4		8	60	40	100		16	40
ME	FND42ME P302	Food Sanitation and Hygiene	Practi cal	1		2	30	20	50		8	20
MM	FND42M MP404	Food Safety and Quality Control	Practi cal	1		2	30	20	50		8	20
MM	FND42M MP405	Big Idea	Practi cal	1		2	30	20	50		8	20
MM	FND42M MP406	Seminar (Research Paper Based)	Practi cal	1		2	30	20	50		8	20
		-1/1		22	1 4	1 6	450	300	750		120	300

Note: Nature of Course : L- Lecture, P-Practical, S-Seminar, J-Project, I-Internship, D-Dissertation,

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Level 6.0 Four year UG Honours Degree in major and minor (44+44+44+44) = 176 credits

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	s)		Total	20	40	20	20	20	20	20	20	20	20	20	
	g (Mark	li I	PR			1				08	08		08	08	
	um Passin _i	Extern:	ESE	08	16	08	08	08	08			08			
	Minimu	lal	SE/TW												
		Intern	CA/M												
			Total	50	100	50	50	50	50	50	50	50	50	50	
	_	al	PR			•			•	20	20		20	20	
	e (Marks)	Extern:	ESE	20	40	20	20	20	20			20	-		
	Scheme		тş						-	30	30		30	30	
	Valuation		CA-II	10	20	10	10	10	10			10			
	Ξ		MSE	10	20	10	10	10	10			10	-	•	
(1		Internal	CA-I	10	20	10	10	10	10			10			
ar (Semester	Duration of exam														
First Ye	Credits			2	3	2	2	2	2	2	2		1	2	22
	riod		4							4	4	- 2	2	4	14
	hing per er week	rs /weel	F												
	Teac	Ξ	Г	2	3	2	2	2	2			2			15
		Type		Theory	Theory	Theory	Theory	Theory	Theory	Practical	Practical	Theory	Practical	Practical	
	Course Title			Principles of Human Nutrition-I	Human Anatomy & Physiology-I	Annexure I	Communicative English I	Open Elective	Open Elective	Nutrition Lab-I	Practical Techniques In Human Nutrition	Annexure I	Key Skills for Nutrition and Dietetics I	Co-Curricular Course) Hrs / week = 29
	Course code			BNMML101	BNMML102			BNOEL103	BNOEL104	BNVSP105	BNSEP106		BNMMP107		Total (L-T-P)
	Course Type			Core	Core	IKS	AEC	OE**	OE	VSC*	SEC*	VEC	Core	СС	
Level			4.5												

BNMML101PRINCIPLES OF HUMAN NUTRITION-I2+0

University: MGM University, Aurangabad Faculty: Basic and Applied Science

Institute: Institute of Biosciences and Technology

Degree: Food Nutrition and Dietetics (UG)

Course Unit Code: BNMML101

Course Unit Title: Principles of Human Nutrition-I

Credits allocated: 2+0(2Theory) Level of Study: UG

Mode of delivery, planned learning activities and teaching method: Theory 2hrs/weekly

Recommended Year/Semester: Food Nutrition and Dietetics, Year I/ Semester I

Learning Outcomes: After completing this course students will be able to understand the importance of Nutrition for optimal health

Objectives: To promote awareness and importance about optimal health among students

COURSECONTENTS (Total Lecture – 30)

UNIT I (8 Lecture)

Definition of Food: Nutrition, nutrient, nutritional status, dietetics, balanced diet, Malnutrition, Energy (unit of energy-joule, kilocalorie) **B.M.R**: definition, factors affecting B.M.R and total Energy requirement (calculation of energy of individual)

UNIT II (7 Lecture)

Recommended dietary allowances- principles, determination, requirement, factors affecting RDA, Indian standards of height and weights, reference man and woman, practical applications of RDA, My healthy plate

UNIT III (8 Lecture)

Carbohydrates-Definition, classification, structure and properties, Monosaccharide's-glucose, fructose, galactose, Disaccharides-Maltose, Lactose, sucrose Polysaccharides-Dextrin, starch, glycogen, resistant starch Carbohydrates-sources, daily requirements, functions, Effects of too high and too low carbohydrates on health. Digestion and absorption of carbohydrates

UNIT IV (7 Lecture)

Lipids- Definitions, classification and properties Fatty acid compositions, properties, types. Lipids sources, daily requirements, functions, digestion and absorption of nutrients, Role and nutritional significances of PUFA, MUFA, SFA, OMEGA-3 and OMEGA-6 fatty acids

Text Book:

Sr. No.	Name of Book	Publisher
1	Food Science by B. Shrilakshmi	New age International Publishers
2	Fundamentals of Foods, Nutrition and Diet Therapy	New age International Publishers

BNMML102 HUMAN ANATOMY & PHYSIOLOGY-I 3+0

University: MGM University, Aurangabad Faculty: Basic and Applied Science

Institute: Institute of Biosciences and Technology Degree: Food Nutrition and Dietetics (UG)

Course Unit Code: BNMML102

Course Unit Title: Human Anatomy & Physiology-I

Credits allocated: 3+0 (3Theory) Level of Study: UG

Mode of delivery, planned learning activities and teaching method: Theory 3hrs/weekly

Recommended Year/Semester: Food Nutrition and Dietetics, Year I/ Semester I

Learning Outcomes: After completing this course students will be able to understand about Human Anatomy & Physiology

Objectives: To promote awareness and importance about Human Anatomy & Physiology among students

COURSE CONTENTS (Total Lecture – 45)

UNIT I (9 Lecture)

Unit of life - Structure and functions of cell with reference to Plasma membrane (Fluid Mosaic Model), Mitochondria, Ribosomes, Endoplasmic reticulum, Nucleus (Nuclear membrane, nuclear chromatin and nucleolus), nucleotide, Homeostasis, positive and negative feedback mechanism.

The Skeleton–General account, Definition, classification, Gross Structure, Blood Supply, Medico legal and Anthropological Aspects, Cartilage and Applied Anatomy.

UNIT II (9 Lecture)

The Muscular System–General Account Types of muscles, characteristics of each, Similarities and Differences, structure of Skeletal Muscles, composition of muscles, Neuromuscular Junction- Definition, structure, transmission, Neuromuscular Blockers, Drugs stimulating Neuromuscular Junction, Motor Unit, Applied Physiology: Disorders of Neuromuscular Junction

UNIT III (10 Lecture)

Blood and Circulatory System – Blood and its composition, Functions of each constituent of blood, RBC-Definition, Structure, Properties, Lifespan, Fate, Functions and Pathological Variations, Erythropoiesis-Definition, sites, Process, Changes during Erythropoiesis, Stages of Erythropoiesis, Factors necessary forerythropoiesis(Stimulating,MaturationandHbformation),ESR,PCV,BloodindicesandAnaemia,WBC(Classifica tion,Morphology,normalcount,Lifespan,properties,functions,LeukopoiesisandAppliedPhysiology) Platelets, Clotting Factors and Coagulation of blood, Blood groups and Blood transfusion and its importance and Precautions.

UNIT IV (10 Lecture)

Cardiovascular System -Over view of Cardiovascular System (Structure and functions of heart), Cardiac Output(Definition and Normal Values, Stroke Volume, Minute volume, Cardiac Index, Ejection Fraction, Cardiac Reserve, Physiological and Pathological Variations,FactorsMaintainingCardiacOutput),Heartrate-NormalHeartRate,Tachycardia,Bradycardia,RegulationofHeartRate,Bloodpressure-

DefinitionandNormalValues,Variations, Renal, Hormonal and Local Mechanism for Regulation of Arterial Blood Pressure,MeasurementofArterialBloodPressureandit'sAppliedPhysiology,Haemorrhage,Circulatoryshock,andHe artFailure, Cardiovascular Adjustments during Exercise.

UNIT V (7 Lecture)

Lymphatic System – Lymph, Lymph glands and functions, Spleen – Structure and Functions Reticule endothelial system, Tissue Macrophage and Spleen, Tissue Fluid and Edema, Their Applied Physiology. Respiratory System– Organs, Structure and Functions, Mechanism of Respiration, Chemical Respiration.

Text Book:

Sr. No.	Name of Book	Publisher
1	Human Physiology vol 1	CBS Publishers
2	Human Physiology vol 2	CBS Publishers
3	Essentials of medical physiology	Jaypee Publishers

Nutrition Lab-I (0+2)

BNVSP105

University: MGM University, Aurangabad Faculty: Basic and Applied Science

Institute: Institute of Biosciences and Technology Degree: Food Nutrition and Dietetics (UG)

Course unit code: BNVSP105

Course Unit Title: Nutrition Lab-I

Credits allocated: 0+2(4 Practical) Level of Study: UG

Mode of delivery, planned learning activities and teaching method: 4 Practical's/weekly **Recommended Year/ Semester:** Food Nutrition and Dietetics, Year I/ Semester I

Prerequisites for registration: Registration of a student in various courses in consultation with the respective course teacher and Adviser and acceptance by the principal. The approved courses must be mentioned in the roster form.

Learning Outcomes:

Students will gain the knowledge about new techniques also they will invent new ideas. They can handle all the equipment which are in laboratory.

Objective:

While doing Lab students will understand new techniques.

COURSE CONTENTS

Synopsis, Lab work, Thesis Writing, Presentation

Ideas of Lab:

Defining Lab ideas is crucial for setting realistic expectations and laying out a clear vision for a Lab life cycle. Lab-based learning not only provides opportunities for students to collaborate or drive their own learning, but it also teaches them skills such as problem solving, and helps to develop additional skills integral to their future, such as critical thinking and time management.

Literature survey:

A literature review establishes familiarity with and understanding of current research in a particular field before carrying out a new investigation. Conducting a literature review should enable you to find out what research has already been done and identify what is unknown within your topic.

Performance:

Performance measurement during a Lab is to know how things are going so that we can have early warning of problems that might get in the way of achieving Lab objectives and so that we can manage expectations. The criteria of it as given below.

1. Implementation:

Follows closely the design, uses appropriate techniques with skill and understanding to produce a good solution.

2. Evaluation:

Clearly relates to the problem. Shows a good understanding and appreciation of the solution. Objectives of what has been done.

- 3. Lab Log:
- a. The individual student's effort and commitment.
- b. The quality of the work produced by the individual student.
- c. The student's integration and co-operation with the rest of the group.
- d. The completeness of the logbook & time to time signature of guide

Objective: To elaborate the procedure for Guiding Student Labs

Responsibility:

- All the Lab Guide.
- All Semester B.Sc. students
- Lab Heads

BNSEP106 PRACTICAL TECHNIQUES IN HUMAN NUTRITION 0+2

University: MGM University, Aurangabad Faculty: Basic and Applied Science Institute: Institute of Biosciences and Tech. Degree: Food Nutrition and Dietetics (UG) Course Unit Code: BNSEP106 Course Unit Title: Practical Techniques in Human Nutrition Credits allocated: 0+2 (Practical) Level of Study: UG Mode of delivery, planned learning activities and teaching method: 4 Practical's/weekly Recommended Year /Semester: Food Nutrition and Dietetics, Year I/ Semester I Learning Outcomes: Upon successful completion, students will have the practical knowledge and skills about Human Physiology, CBC etc

Objective: To familiarize the students with basic techniques in human nutrition

Practical:

- 1. Estimation of RBC count by hemocyte meter.(3hours)
- 2. Estimation of hemoglobin in mammalian blood using Sahli's Haemometer. (3hours)
- 3. Estimation of bleeding and clotting time and blood groups. (4hours)
- 4. Determination of blood pressure by Sphygmomanometer
- 5. (Auscultatory method) Its variation with exercise. (1Hour)
- 6. Measurement of Body temperature. (1Hour)
- 7. Demonstration/EstimationRespiratoryquotient,InspirationandExpiration.(3Hour)
- Demonstration&identifyingdifferentorgansandskeletalsysteminhumanbo dy.(5hour)

BNMMP107 KEY SKILLS FOR NUTRITION AND DIETETICS- I 0+1

University: MGM University, Aurangabad Faculty: Basic and Applied
Science
Institute: Institute of Biosciences and Tech.
Degree: Food Nutrition and Dietetics (UG)
Course Unit Code: BNMMP107
Course Unit Title: Key Skills for Nutrition and Dietetics-I
Credits allocated: 0+1(Practical) Level of Study: UG
Mode of delivery, planned learning activities and teaching method: 2 Practical/weekly
Recommended Year/Semester: Food Nutrition and Dietetics, Year I /Semester I
Learning Outcomes: Upon successful completion, students will have
the practical knowledge and skills for Biochemistry subject.
Objective: To familiarize the students with basic key skills for nutrition and dietetics

Practical:

- 1. Laboratory conduct and responsibilities; knowledge of different food stuffs in English, Hindi and local language
- 2. Terms used in cookery, weights and measures; identification and use of different kitchen items and equipment.
- 3. Identification and listing of various food groups (Food Guide Pyramid). Preparation of food from different food groups and their significance in relation to health.
- 4. Market survey of processed, preserved foods, Packaged and organic foods available in the market and critically evaluate the labeling on the Food Product
- 5. Planning and preparation flow-costdiets (Atleast5recipesandcalculatethecostofeachrecipe.
- 6. To prepare recipes asper different food preparation like boiling, roasting, frying, sautéing and baking.

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BNMML108 PRINCIPLES OF HUMAN NUTRITION-II

University: MGM University, Aurangabad Faculty: Basic and Applied Science

Institute: Institute of Biosciences and Technology

Degree: Food Nutrition and Dietetics (UG) Course Unit Code: BNMML108

Course Unit Title: Principles of Human Nutrition-II

Credits allocated: 2+0 (2Theory) Level of Study: UG

Mode of delivery, planned learning activities and teaching method: Theory 2hrs/weekly

Recommended Year/Semester: Food Nutrition and Dietetics, Year I/ Semester II

Learning Outcomes: Upon successful completion, students will have the knowledge about principles of human nutrition.

Objective: To familiarizer the students with basic key skills for nutrition.

COURSECONTENTS (Total Lecture – 30)

UNIT I (10 Lecture)

Proteins – definitions, classifications, structure and properties. Amino acids- classifications, types, functions, Proteins- sources, daily requirements, functions. Effects of too high or too low proteins on health. Digestion and absorption. Assessment of protein quality (BV, PER,NPU).Factorsaffectingproteinbio-availabilityincludinganti-nutritionalfactors.

UNIT II (5 Lecture)

Dietary fibre-classifications, sources, composition, properties and nutritional significance

UNIT III (10 Lecture)

Minerals and trace elements: Bio-chemical and physiologicalrole, bio-availability and requirements, sources, deficiencies and excess (calcium, sodium, potassium, phosphorus, iron,fluoride,zinc, selenium, iodine, chromium)**Vitamins**- Bio-chemical and physiological role, bio-availability and requirements, sources,deficienciesandexcess

UNIT IV (5 Lecture)

Water-Functions, daily requirements, water balance

Text Book:

Sr. No.	Name of Book	Publisher
1	NutritionandDietetics5 th edition	McGraw Hill
2	Nutritional Guidelines for Sports person	NIN
3	Nutritive value of Indian Foods & Dietary Guidelines for Indians	NIN

BNMML109 HUMAN ANATOMY&PHYSIOLOGY-II

University: MGM University, Aurangabad

Faculty: Basic and Applied Science

Institute: Institute of Biosciences and Tech.

Degree: Food Nutr ition and Dietetics (UG)

Course Unit Code: BNMML109

Course Unit Title: Human Anatomy & Physiology-

IICreditsallocated:3+0(3Theory) Level of Study: UG

Mode of delivery, planned learning activities and teaching method: Theory3hrs/weekly Recommended Year/Semester: Food Nutrition and Dietetics, Year I/Semester II Learning Outcomes:

Upon successful completion, students will have the knowledge about functioning of human physiology.

Objective: To familiarize the students with Human anatomy and physiology

COURSECONTENTS (Total Lecture – 45)

UNIT I (8 Lecture)

DigestiveSystem–StructureandFunctionsofAlimentarytract.Functionsofvarioussecretions and juices – Saliva, Gastric, Bile, Intestinal, and Pancreatic. Functions of enzyme, digestion. Digestion of nutrients–Proteins, Fats, Carbohydrates. Common problems of Digestive tract–Vomiting, Constipation, Diarrhea

UNIT II (7 Lecture)

Excretory System – Structure and Functions of (a) Kidney (b) Ureter (c) Bladder (d) Skin. Urine -Formation of urine, Composition of normal and abnormal urine. Role of excretory system in homeostasis, fluid balance, Regulation of body temperature

UNIT III (10 Lecture)

Nervous System – Structure of Nerve Cell, Fibre, Classification of Nervous System, Central Nervous System–Brain, Lobes of brain, Cerebrum, Cerebellum, Medullaoblongata, Hypothalamus. Pituitary Gland – structure, Functions, Spinal Cord – structure and functions, Autonomic and Sympathetic nervous system

UNIT IV (10 Lecture)

Reproductive System – Female reproductive system – organs, structure and functions Male reproductive system–structure and functions, Menstruation, menstrual cycle, Puberty, Menarche, Menopause, Fertilization of ovum, Conception, Implantation **Sense Organs** – Eye – structure and function, Ear – structure and function, Skin -structure and function

UNIT V (10 Lecture)

Glands and Endocrine System–Liver–structure and function, Gall Bladder–structure and function, Enterohepatic circulation, Pancreas – structure and function, Endocrine system-Endocrine glands–structure and function. Hormone–types and functions, role in metabolism. Endocrine disorders, Regulation of Hormone Secretion

Text Book:

Sr. No.	Books Name	Publishers
1	HumanPhysiologyVol1	CBS Publishers
2	HumanPhysiologyVol2	CBS Publishers
3	Essentials of Medical physiology	Jaypee

BNMIL110 PERSONAL AND PROFESSIONAL SKILL FOR NUTRITION

University: MGM University, Aurangabad Faculty: Basic and Applied Science

Institute: Institute of Biosciences and Tech.

Degree: Food Nutrition and Dietetics (UG)

Course Unit Code: BNMIL110

Course Unit Title: Personal and Professional Skill for

Nutrition Credits allocated:2+0(Theory) Level of study: UG

Mode of delivery, planned learning activities and teaching method: Theory 2 lectures weekly

Recommended Year/Semester: Food Nutrition and Dietetics, Year I/ Semester II

Learning Outcomes: Upon successful completion, students will have the knowledge and skills about professional skills for nutrition

Objective: To familiarize the students with basics of personal and professional skill for nutrition

COURSECONTENTS

UNIT I (7 Lecture)

The Dietician- Classification and role of Dietician, Code of ethics, Responsibilities, Assessment and diet planning

UNIT II (7 Lecture)

Anthropometric Cut offs- Calculation of IBW, BMI classifications, Waist – Hip ratio (WHR) and waist circumference, MUAC for ADULT

UNIT III (10 Lecture)

Menu Planning-Explanation of Term, Dietary Goals, Nutrient requirement, Dietary standards, Balanced Diet, Food groups suggested by ICMR, Food Exchange List, Food Composition Database, Principles of Planning Diets, Point to be considered in planning a diet, Steps Involved in planning a diet

UNIT IV (6 Lecture)

Recommended Dietary Allowances- Explain Summary of RDA, Portion size for Menu planning

Text Book:

Sr. No.	Name of Book	Publisher
1	Nutrition and Dietetics5 th edition	McGraw Hill
2	Nutritional Guidelines for Sports person	NIN
3	Nutritive value of Indian Foods & Dietary Guidelines for Indians	NIN

BNVSP113

NUTRITIONAL LAB-II

University: MGM University, Aurangabad Faculty: Basic and Applied Science Institute: Institute of Biosciences and Technology

Degree: Food Nutrition and Dietetics (UG)

Course Unit Code: BNVSP113

Course Unit Title: Nutritional Lab-II

Credits allocated: 0+2 (Practical) Level of Study: UG

Mode of delivery, plannedlearningactivitiesandteachingmethod:4Practicals/weekly **Recommended Year/Semester:** Food Nutrition and Dietetics, Year I / Semester II

Prerequisites for registration: Registration of a student in various courses in consultation with the respective course teacher and Adviser and acceptance by the principal. The approved courses must be mentioned in the roster form.

Learning Outcomes:

Students will gain the knowledge about new techniques also they will invent new ideas. They can handle all the equipment which are in laboratory.

Objective:

While doing Lab students will understand new techniques.

COURSE CONTENTS

Synopsis, Lab work, Thesis Writing, Presentation

Ideas of Lab:

Defining Lab ideas is crucial for setting realistic expectations and laying out a clear vision for a Lab life cycle. Lab-based learning not only provides opportunities for students to collaborate or drive their own learning, but it also teaches them skills such as problem solving, and helps to develop additional skills integral to their future, such as critical thinking and time management.

Literature survey:

A literature review establishes familiarity with and understanding of current research in a particular field before carrying out a new investigation. Conducting a literature review should enable you to find out what research has already been done and identify what is unknown within your topic. Performance:

Performance measurement during a Lab is to know how things are going so that we can have early warning of problems that might get in the way of achieving Lab objectives and so that we can manage expectations. The criteria of it as given below.

0+2

1. Implementation:

Follows closely the design, uses appropriate techniques with skill and understanding to produce a good solution.

2. Evaluation:

Clearly relates to the problem. Shows a good understanding and appreciation of the solution. Objectives of what has been done.

3. Lab Log:

- a. The individual student's effort and commitment.
- b. The quality of the work produced by the individual student.
- c. The student's integration and co-operation with the rest of the group.
- d. The completeness of the logbook & time to time signature of guide

Objective: To elaborate the procedure for Guiding Student Labs

Responsibility:

- All the Lab Guide.
- All Semester B.Sc. students
- Lab Heads

BNSEP114 TECHNIQUES IN DIETETICS AND NUTRITIONAL RESEARCH 0+2

University: MGM University, Aurangabad Faculty: Basic and Applied Science Institute: Institute of Biosciences and Tech. Degree: Food Nutrition and Dietetics (UG) Course Unit Code: BNSEP114

Course Unit Title: Techniques in Dietetics and Nutritional Research Credits allocated: 0+2 (Practical) Level of Study: UG Mode of delivery, planned learning activities and teaching method: 4Practicals/weekly Recommended Year /Semester: Food Nutrition and Dietetics, Year I/ Semester II

Learning Outcomes: Upon successful completion, students will have the practical knowledge and skills about Human Physiology, CBC etc

Objective: To familiarize the students with basic techniques in dietetics and nutritional research

Practical:

- 1. Handling of equipment and instruments
- 2. Qualitative and quantitative tests of carbohydrates-Identification of Mono, Di and polysaccharides
- 3. Qualitative analysis of amino acids
- 4. Qualitative analysis of proteins
- 5. Determination of acid values
- 6. Saponification and iodine numbers
- 7. Paper chromatography of amino acids or carbohydrates ascending and descending
- 8. Estimation of nitrogen by Kjeldhal method
- 9. Estimation of fat by Soxhlet method
- 10. Quantitative estimation of Sugars (Glucose, lactose, starch)
- 11. Estimation of acid value, iodine value, Saponification value of fats
- 12. Estimation of blood Glucose
- 13.Estimation of serum cholesterol

BNMMP115 KEY SKILLS FOR NUTRITION AND DIETETICS II 0+1

University: MGM University, Aurangabad Faculty: Basic and Applied Science Institute: Institute of Biosciences and Tech. Degree: Food Nutrition and Dietetics (UG)

Course Unit Code: BNMMP115

Course Unit Title: Key Skills for Nutrition and Dietetics II

Credits allocated: 0+1 (Practical) Level of Study: UG

Mode of delivery, planned learning activities and teaching method: 2 Practicals/weekly

Recommended Year /Semester: Food Nutrition and Dietetics, Year I/ Semester II

Learning Outcomes: Upon successful completion, students will have the practical knowledge and skills for nutrition and dietetics subject.

Objective: To familiarize the students with basic Dietetics skills

Practical:

- 1. IntroductionofexchangelistDiscussiononexchangelistandfoodcompositio ntableandhowto use them in diet planning
- 2. Introduction to energy requirement and expenditure and factors which influence energy expenditure
- 3. Calculating the Energy balance
- 4. Calculating the percent energy supplied by carbohydrate in the diet
- 5. Survey of high fiber products available in the market
- 6. Evaluation of protein quality an overview

Syllabus <u>Semester-III</u>

Course code: FND42MML201 Course category: Major Mandatory **Course name:** Nutrition through the life cycle I

Credits: 3 Teaching scheme: L-3

Evaluation scheme: CA-60, ESE-40

Exam Duration: 02 Hrs

Pre-requisites: The student should have basic knowledge of biological and applied sciences, and successfully completed the first year of the Degree Program.

Course Objectives:

1. To introduce students with the basic concepts and principles of menu planning.

2. To make students understand the application of concepts & principles in pregnancy

3. To develop the ability to integrate various food for lactating mother.

4. Critical comments on the scenario of health and the nutrition situation of women and men to various levels

5. Menu planning for adults, pregnancy and lactation and elderly people

Course Outcomes: At the end of the course, the students will be able to -

CO1: Student will be able to apply the acquired knowledge in various fields of study.

CO2: Students will be able to develop enhanced skills for identification of issues in the field of food and nutrition

CO3: Students will be able to develop and practically applicable strategies for research projects

CO4: Students will be able to use the acquired knowledge in Dietetics field.

Contents -

Unit	Content	Teaching hours	
Ι	Steps of Menu Planning, Nutrition and food Requirement for Adults, Nutritional requirements, Food Requirements		
II	Nutrition for reproductive health and lactation, Preconception and fertility and conception, Pregnancy – Physiological changes, Periconceptional Nutrition, Nutritional Requirements, Food requirements, General Dietary Problems complication, Indian Pregnant women	9	
III	 Nutritional and Food equipment's of Lactating Women, Role of Hormones in Milk Production, Nutritional Requirements, Food Requirements, Food requirements, Indian Nursing Mother 		
IV	Nutritional and food requirements During old Age, Processing of age Nutritional Requirements, Food Reequipments, Nutritional Related Problems of old age, Degenerative Diseases, Exercise and Old Age, Drugs, and old Age		
v	Introduction to Nutrition and Life Stages - Understanding the importance of nutrition from prenatal to geriatric stages. Prenatal Nutrition - Addressing specific dietary needs during pregnancy for maternal and fetal health	9	

Text E	Books:
1.	Principles of Nutrition - Eva D. Wilson, Catherine H Fisher, Eastern Pvt Ltd.
2.	Public Health & Nutritional care - Bhavana Shabarwala, Common wealth publisher
3.	Nutrition in the Community-The Art of Delivering Services - Owen, A.Y & Fracle, R.T
4.	Nutrition, principles and application in health promotion - Carol west suitor merrily forbes, Crowley, Lippincot companay Ltd.
5.	Text Book of Human Nutrition - Bamji MS, Rao NP, and Reddy V.; 2009; Oxford & IBH Publishing Co. Pvt Ltd.
6.	Park's Textbook of Preventive and Social Medicine - Park K (2011), 21st Edition. M/s Banarasidas Bhanot Publishers, Jabalpur, India.
7.	Principles of Food Sanitation, 1st Edition, Wiley-BlackJay JM, Loessner DA, Martin J. (2005)
8.	Modern Food Microbiology. 7th ed. Springer. Graw Hill Publishing Co. Ltd Marriott N G (1985). A VI publication USA.
	Reference Books:
	1. Dietetics – Shrilakshmi
	2. Krause & Mahans - Krause's Food & the Nutrition Care Process, Janice L. Raymond and Kelly Morrow

Course code: FND42MML202 Course category: Major Mandatory Course name: Food Safety Preservation and Legislation

Credits: 2 Teaching scheme: L-2

Evaluation scheme: CA–30, ESE–20

Exam Duration: 01 Hrs

Pre-requisites: The student should have basic knowledge of biological and applied sciences, and successfully completed the first year of the Degree Program.

Course Objectives:

1. Ensure Food Safety: Implement measures to prevent foodborne illnesses and ensure the safety of food products throughout the supply chain.

2. Preserve Food Quality: Employ preservation techniques to maintain the nutritional value, flavor, and appearance of food items.

3. Compliance with Regulations: Understand and adhere to food safety regulations and legislation to meet legal requirements and ensure consumer protection.

4. Promote Public Health: Educate individuals and communities about the importance of food safety practices to safeguard public health.

Course Outcomes: At the end of the course, the students will be able to -

CO1: Knowledge of Food Safety Regulations: Students will demonstrate an understanding of relevant food safety laws, regulations, and standards.

CO2: Application of Preservation Techniques: Students will be able to apply various preservation methods such as canning, freezing, and drying to maintain food quality and safety.

CO3: Risk Assessment Skills: Students will develop the ability to assess potential hazards in food production and distribution and implement appropriate control measures.

CO4: Communication and Collaboration: Students will effectively communicate food safety information and collaborate with stakeholders to address food safety issues.

Contents –

Unit	Content	Teaching hours
1	Introduction to concepts & definitions of food spoilage, safety and preservation. Microbes used in biotechnology, fermented foods and their benefitsFood Safety – Basic Concepts- Introduction and Key Terms, Food safetyand importance of safe food, Factors affecting food safety – Physical Hazards, Biological Hazards, Chemical Hazards 	
2	Evaluation of Food Quality- Sensory Evaluation, Sensory Tests, Types of Tests, Objective Evaluation, Instruments used for Texture Evaluation Over view of food additives with respect to their technological functions. Over view of anti- nutritional factors and their removal from foods. Over view of enzymes as food processing aids. Over view of nutraceuticals and functions foods. Overview of food contaminants and adulterants and their effects on human health. Food allergens and allergenicity. Importance of diet in alleviating health risks, especially non- communicable diseases Principles of food safety and preservation, methods of food preservation.	7

	Food fortification and food additives	
3	Tools and general principles and techniques in microbiological examination of foods. Food Preservation- Food Spoilage, Methods of food preservation, preservation by low temperature, preservation by high temperature, preservation by preservatives, preservation by osmosis, preservation by dehydration, preservation by fermentation. Public Health hazards due to contaminated foods: food borne infections and intoxications- symptoms, mode and sources of transmission and methods of preservation.	8
	Investigation and detection of food borne diseases outbreak.	
4	Food Adulteration, Types of Adulterants, and methods of detection, Nutrition Enhancement Methods - Food Fortification, Enrichment, Supplementation, Fermentation, Germination, Pre- and Probiotics and Organic Foods. Food Safety Measures in a Food Service Establishment & Premises, Equipment and Utensils, Kitchen Layout, Storage, Transportation, Sanitary Facilities, Street Foods – Food Safety Measures, Temporary Food Service, Food Safety on Wheels,	8

Text Books:		
1. Mahindra N. S, 2008, Food Additives, Characteristics, Detection and		
Estimation, APH Publishing Corporation, New Delhi.		
 Ward law G.M, Hamp J S, 2007, Perspectives in Nutrition, 7th edition, Mc Graw Hill 		
3. The Food Safety and Standards Act along with Rules and Regulations, 2011,		
Delhi, Commercial Law Publishers (India) Pvt Ltd.		
4. Khanna K et al, 2013, Text Book of Nutrition and Dietetics, Phoenix		
publications		
5. FSSAI Regulations book		
Reference Books:		
1. Sethi P and Lakra P, Aahaarvigyaan, Poshanevam suraksha, 2015, Elite		
Publishing House. 6.		
2. Sharma S, Wadhwa A, 2003, Nutrition in the Community- a text book, Elite		
publishing house.		
3. Fellows, P. J. (2016). Food Processing Technology: Principles and Practice,		
Fourth Edition, Woodhead Publishing		
4. Kiron Prabhakar (2016). A Practical Guide to Food Laws and Regulations,		
Bloomsbury Professional, India.		

Course code: FND42MML203 Course name: Fundamentals of Food Science-I Course category: Major Mandatory **Credits: 2 Teaching scheme:** L-2 Evaluation scheme: CA-30, ESE-20 **Exam Duration: 01 Hrs Pre-requisites:** The student should have basic knowledge of biological and applied sciences, and successfully completed the first year of the Degree Program. **Course Objectives:** 1. Understanding Food Composition: To comprehend the basic components of food, including macronutrients, micronutrients, water content, and additives. 2. Exploring Food Processing Techniques: To learn about various methods used in food processing such as preservation, packaging, and thermal processing. 3. Grasping Food Safety Principles: To understand the importance of food safety and hygiene practices to prevent foodborne illnesses. 4. Studying Food Microbiology: To gain knowledge about microorganisms relevant to food science, including their roles in food spoilage, fermentation, and foodborne pathogens. Course Outcomes: At the end of the course, the students will be able to -CO1: The students understand the principles and fundamental concepts of food science. **CO2:** The students will be able apply the integrated acquired knowledge of food science concepts in health and nutrition **CO3:** The students gain the knowledge and learn the in-depth knowledge of various food groups.

CO4: The students understand and gain practical insights of the effect of various techniques & methods on different food groups.

Contents -	_

Unit	Content	Teaching hours
1	Food, Types of foods. Functional food groups-energy yielding, body building	
	and protective foods (only sources and not properties and functions). Food	
	Pyramid, My Plate. Study of various cooking methods - Boiling, steaming,	7
	stewing, frying, baking, roasting, broiling, cooking under pressure. Texturized	
	foods, space foods, novel foods, organic foods, nano food, convenience foods	
2	Introduction to Food Science. Effect of cooking and processing techniques	
	on nutrients, Sensory evaluation of food Cereals, Millets and Pulses:	
	Composition and nutritive value of wheat, rice and maize, Cereal cookery,	
	Effect of cooking on parboiled and raw rice, principles of starch cookery,	7
	gelatinization, processing and storage in nutritive value. Methods for	
	improving nutritional quality of foods-fermentation, germination,	
	supplementation, fortification.	
3	Vegetables and Fruits- Type, Composition, Nutritive value, Effect of	
	cooking, processing and storage on pigments and nutritive value, Post	8

	harvest changes Milk and milk products- Nutritional composition,	
	Properties, Processing, Storage and Packaging. Effects of heat, acid and enzyme on its quality, Milk Cookery. Sugar: Type, Function and Nutritional	
	composition of sugar. Sugar cookery.	
4	Egg- Structure and Nutritional composition of egg, Evaluation of egg quality, Egg cookery Flesh Food- Type, Structure and Nutritional composition, Effect of cooking, processing and storage in nutritive value. Ageing, Tenderization, Curing	8

Textbooks/Suggested Reading

- 1. Gisslen, W. (2017). Professional baking. John Wiley & Sons.
- 2. Edwards, W. P., & Magee, T. R. (2008). Bakery technology and engineering. Springer Science & Business Media.
- 3. Stauffer, C. E. (2015). Technology of biscuits, crackers and cookies (2nd ed.). Woodhead Publishing.
- 4. Cauvain, S. P. (2013). Baking problems solved. Elsevier.
- 5. Shamsuzzoha, A. H. M., & Hossain, M. (2016). Bakery products science and technology. CRC Press.
- 6. Rao, P. H., & Ananthanarayanan, V. S. (2009). Bakery products: Science and technology. Blackwell Publishing.
- 7. Rao, P. H., & Ananthanarayanan, V. S. (2011). Handbook of food products manufacturing: Principles, bakery, beverages, cereals, cheese, confectionery, fats, fruits, and functional foods. John Wiley & Sons

Reference Books :

- 1. Meyer, .L.H (1987). Food Chemistry. CBS Publishers
- 2. "Cereal Grains: Properties, Processing, and Nutritional Attributes" by Sergio O. Serna-Saldivar
- 3. "Bakery Products: Science and Technology" by Y. H. Hui
- 4. "Milk and Dairy Products in Human Nutrition" edited by R. Gibson and J. Kurpad

Course code: FND42VSP201	Course name: Practical of Nutrition through life cycle – I	
Course category: Vocational skill course		
Credits: 2 Teaching scheme: P-4	Evaluation scheme: CA–30, ESE–20	
Exam Duration: 02 Hrs		
Pre-requisites: The student should have	basic knowledge of biological and applied sciences, and	
successfully completed the first year of	the Degree Program.	
Course Objectives:		
1. Understanding Life-Cycle	Nutritional Needs: To comprehend the nutritional	
requirements at various sta	ges of life, including infancy, childhood, adolescence,	
adulthood, and old age.		
2. Assessing Nutritional Ade	quacy: To learn methods for assessing the adequacy of	
nutritional intake across dif	fferent life stages and demographic groups.	
3. Analyzing Dietary Pattern	is: To analyze dietary patterns and habits prevalent in	
different age groups and de	emographic backgrounds.	
4. Evaluating Nutritional Int	erventions: To evaluate the effectiveness of nutritional	
life evaluations and recomm	endations in improving health outcomes throughout the	
5 Promoting Ontimal Nutritie	on: To douglon strategies for promoting optimal putrition	
and healthy eating behavior	rs tailored to specific life stages and population groups.	
Lab Outcomes: At the end of the course, t	he students will be able to -	
LO1: Application of Nutritional Principles	: Students will be able to apply principles of nutrition to assess	
and address the nutritional needs of i	ndividuals at various life stages.	
LO2: Data Collection and Analysis: Stud	ents will gain proficiency in collecting and analyzing dietary	
data to assess nutritional status and develop	o dietary recommendations.	
LO3: Nutritional Counseling Skills: Students will develop skills in providing nutritional counseling and		
education to individuals and groups	s across the life span.	
LO4: Critical Thinking in Nutrition: Stud	ents will enhance critical thinking skills to evaluate nutrition-	

related research and interventions for their applicability to different life stages.

Contents -

Sr. No.	Title of the Experiment
1	Calculation of energy requirements (RDA) for adult male .
2	Exchange list for the Adults.
3	Calculate of energy requirements for adult female .
4	Prepare Menu planning for Adults Male .
5	Exchange list for the Female
6	Prepare Menu planning for Adults Female
7	Case study – take one adult male and calculate his protein requirements
8	Case study – take one adult female and calculate her protein requirements.
9	Calculate RDA for pregnancy 1 st and 2 nd trimester.

10	Prepare Exchange list for Pregnant lady.
11	Make a menu planning for pregnant women.
12	Actual preparation of menu planning (Cooking) for pregnant women.
13	Prepare Exchange list for lactating mothers.
14	Make a menu planning for lactating mothers
15	Actual preparation of menu planning (Cooking) for Lactating women.
16	Make a Guidelines for breastfeeding impotence .
17	Planning of Some recipes of Iron calcium folic acid rich.
18	Preparation of above recipes.
19	Calculation of above recipes.
20	Visit to Nursing home maternity home (HOSPITTAL)

Reference Books :		
1. Nutrition Through the Life Cycle, 4th Edition - Author: Judith E. Brown -		
Publication: Cengage Learning - Year: 2010		
2. Life Cycle Nutrition for Public Health Professionals - Author: Judith E. Brown -		
Publication: Springer Publishing Company - Year: 2020		

Course code: FND42MMP201

Course name: Practical of Food Preservation

Course category: Major Mandatory Credits: 1 Teaching scheme: P-4

Evaluation scheme: CA–30, ESE–20

Exam Duration: 02 Hrs

Pre-requisites: The student should have basic knowledge of biological and applied sciences, and successfully completed the first year of the Degree Program.

Course Objectives:

- 1. Understand the fundamental principles of food processing techniques such as fermentation, concentration, drying, dehydration, and chemical preservation.
- 2. Gain hands-on experience in food preservation methods and packaging technologies to enhance food shelf life and safety.
- 3. Learn the importance of quality control measures in food processing and preservation to ensure product integrity and consumer satisfaction.
- 4. Explore the role of regulatory guidelines and standards in governing food processing and preservation practices.
- 5. Develop practical skills in the production of a variety of preserved foods through different techniques and technologies.

Lab Outcomes: At the end of the course, the students will be able to -

LO1: Demonstrate proficiency in applying various food processing techniques for preservation, including fermentation, concentration, drying, dehydration, and chemical agents.

LO2: Analyze the effectiveness of different preservation methods in maintaining food quality, nutritional value, and safety.

LO3: Evaluate packaging materials and technologies suitable for different types of food products and processing methods.

Contents -

Sr. No.	Title of the Experiment	
1	Lab rules	
2	Adulteration of Milk	
3	Adulteration of Pulses	
4	Adulteration of spices	
5	Adulteration of spices Adulteration of Honey	
6		
7	Food preservation method. by drying	
8	Asepsis handling of food.	
9	Used of different drying methods (sun drying and machine drying)	
10	10 Preparation of Jam	

LO4: Implement quality assurance protocols to monitor and control critical points in the food processing and preservation process.

11	Preparation of Jelly
12	Preparation of sauces
13	Preparation of ketchups
14	Preparation of deafferents Chutneys
15	Visit to Food canning industry.
16	Visit to milk processing industry
17	Preparation of pineapple squash. Preparation go Syrup
18	Preparation 9 RTS (Ready to serve beverage)
19	Preparation of Mango Baz
20	Preparation of Lemon Pickel.

Textbo	poks/Suggested Reading
1.	Mahindra N. S, 2008, Food Additives, Characteristics, Detection and Estimation, APH
	Publishing Corporation, New Delhi
2.	Ward law G.M, Hamp J S, 2007, Perspectives in Nutrition, 7th edition, Mc Graw Hill
3.	The Food Safety and Standards Act along with Rules and Regulations, 2011, Delhi,
	Commercial Law Publishers (India) Pvt Ltd.
4.	Khanna K et al, 2013, Text Book of Nutrition and Dietetics, Phoenix publications FSSAI
	Regulations booklets
5.	Catering Management An Integrated Approaches – Mohini Sethi, New Age International
	Publishers
6.	Fundamentals of Foods, Nutrition and Diet Therapy - New Age International Publish

Course code: FND42FPJ201

Course name: Field Project

Course category: Field Project Credits: 2 Teaching scheme: J-4

Evaluation scheme: CA–30, ESE–20

Exam Duration: 02 Hrs

Pre-requisites: The student should have basic knowledge of biological and applied sciences, and successfully completed the first year of the Degree Program.

Course Objectives:

- 1. Conduct comprehensive research on specific topics related to food nutrition and dietetics, aiming to deepen understanding and knowledge in the field.
- 2. Apply theoretical concepts learned in coursework to real-world scenarios, promoting practical skills development and problem-solving abilities.

Lab Outcomes: At the end of the course, the students will be able to -

LO1: Demonstrate proficiency in conducting literature reviews, critically evaluating information sources, and synthesizing findings relevant to food nutrition and dietetics projects.

LO2: Apply research methodologies and data collection techniques to investigate specific issues or trends in food nutrition and dietetics.

Contents -

	Sr.No.	Title of the Experiment	
	1	Physiology and Promotion of Health	
V	2	Community Nutrition	
	3	Clinical Nutrition	
	4	Food Safety and Quality	
	5	Nutritional Assessment	

Ideas of project:

Defining project ideas is crucial for setting realistic expectations and laying out a clear vision for a project life cycle. Project-based learning not only provides opportunities for students to collaborate or drive their own learning, but it also teaches them skills such as problem solving, and helps to develop additional skills integral to their future, such as critical thinking and time management.

Literature survey:

A literature review establishes familiarity with and understanding of current research in a particular field before carrying out a new investigation. Conducting a literature review should

enable you to find out what research has already been done and identify what is unknown within your topic.

Performance:

Performance measurement during a project is to know how things are going so that we can have early warning of problems that might get in the way of achieving project objectives and so that we can manage expectations. The criteria of it as given below.

Implementation:

Follows closely the design, uses appropriate techniques with skill and understanding to produce a good solution.

Evaluation:

Clearly relates to the problem. Shows a good understanding and appreciation of the solution. Objectives of what has been done.

Project Log:

a. The individual student's effort and commitment.

b. The quality of the work produced by the individual student.

c. The student's integration and co-operation with the rest of the group.

d. The completeness of the logbook & amp; time to time signature of guide

Objective: To elaborate the procedure for Guiding Student projects

Responsibility:

- 1. All the Project Guide.
- 2. All Semester B.Sc. students
- 3. Project Heads

PROCEDURE

SN	Activities	Responsibilities
1	PG students are deciding on their team members for their semester project with their proposed project domain and title	Project head, PG students
2	Director shall allocate the project guide based on their area of expertise (ot more than 3 batches to a guide)	Director
3	Ensuring that students have regular discussion meetings with their project guides.	Project guide Project head
4	Synopsis preparation and submission	Project head
5	Verification of student project log book	Project guide Project head
6	Approval of PPT: Abstract, existing, proposed system. 30% of proposed work. 80% of proposed work. 100% of	Project guide

	proposed work.	
7	Preparation and submission of progress report during project	Students Project head
8	Preparing list for Redo students (insufficient content, plagiarism, poor presentation, genuine absentees.	Project head
9	Submission of hard copy of project report	Project head
10	Evaluation of project report	External examiner
11	Organizing final project viva-voce	Project heads
12	Ensuring that if a candidate fails to submit the project report on	Project head Project
	or before the specified deadline, he/she is deemed to have	guide Director
	failed in the project work and shall re – enroll for the	
	same	

MGMUNIVERSITY

Syllabus <u>Semester-IV</u>

Course code: FND42MML204 Course category: Major Mandatory Course name: Nutrition Diagnosis and intervention

Credits: 2 Teaching scheme: L-2

Evaluation scheme: CA–30, ESE–20

Exam Duration: 01 Hrs

Pre-requisites: The student should have basic knowledge of biological and applied sciences, and successfully completed the first year of the Degree Program.

Course Objectives:

Develop Assessment Skills: Enhance the ability to conduct thorough nutrition assessments, including gathering and analyzing relevant data on dietary intake, health status, and lifestyle factors.

Formulate Nutrition Diagnoses: Learn to identify and prioritize nutrition-related problems based on assessment findings, using standardized terminology and diagnostic criteria.

Design Tailored Interventions: Acquire the skills to develop evidence-based nutrition interventions that address identified nutrition diagnoses and individual client needs.

Implement Intervention Plans: Gain proficiency in executing nutrition intervention strategies effectively, considering client preferences, cultural factors, and available resources.

Evaluate Intervention Outcomes: Learn to assess the effectiveness of nutrition interventions, monitor progress, and adjust plans as necessary to achieve desired health outcomes.

Course Outcomes: At the end of the course, the students will be able to -

CO1: Demonstrate Competency in Nutrition Assessment: Students will be able to conduct comprehensive nutrition assessments, including anthropometric measurements, dietary analysis, and biochemical evaluations.

CO2: Apply Nutrition Diagnosis Skills: Students will proficiently identify and articulate nutrition-related problems using standardized terminology and diagnostic criteria.

CO3: Develop Effective Intervention Plans: Students will design evidence-based nutrition intervention plans tailored to individual client needs, preferences, and cultural backgrounds.

CO4: Implement Intervention Strategies: Students will demonstrate the ability to implement nutrition intervention strategies in various settings, such as clinical, community, and food service environments.

Contents -

Unit	Content	Teaching hours
1	Nutrition Care Process and Model Article, definition, importance of	
	NCP, steps involved NCP	
	Purpose, Tools for (kids and adults) & Examples Nutritional Risk	7
	Screening 2002 (NRS- 2002)	/
	Malnutrition Universal Screening Tool (MUST) Mini Nutritional Assessment	
	(MNA), Nutrition assessment Tools	
	Nutrition Diagnosis Terminology.	
	Nutrition Diagnosis Terms and Definitions., Nutrition Diagnosis Statements	
	(or PES) for Caloric Energy Balance —Actual or estimated changes in	7
2	energy (kcal). Oral or Nutrition Support Intake —Actual or estimated food	/
	and beverage intake from oral diet or nutrition support compared with	
	patient/client's goal.	
3	Fluid Intake Balance — Actual or estimated fluid intake compared	
	with patient/client's goal.	8
	Nutrient Balance — Actual or estimated intake of specific nutrient	

	groups or single nutrients as compared with desired levels.	
	Fat and Cholesterol Balance, Protein Balance, Carbohydrate and Fiber	
	Balance, Vitamin Balance, Mineral Balance Diagnosis Reference Sheets	
	Nutrition Intervention Terms and Definitions.	
	Introduction of the two phases of Nutrition Intervention: Planning and	
	Implementing	
	The organization of domains and classes of Nutrition Intervention	
4	The two phases of Nutrition Intervention: Planning and Implementing	8
	The organization of domains and classes of Nutrition Intervention	
	Planning the Nutrition Intervention.	
	Food And /Or Nutrient Delivery (ND Nutrition Education (E) Tools	
	Nutrition counselling	

Textbooks/Suggested Reading
1. Principles of Nutrition - Eva D. Wilson, Catherine H Fisher, Eastern Pvt Ltd.
2. Public Health & Nutritional care - Bhavana Shabarwala, Common wealth publisher
3. Nutrition in the Community-The Art of Delivering Services - Owen, A.Y & Fracle,
R.T
4. Nutrition, principles and application in health promotion - Carol west suitor merrily
forbes, Crowley, Lippincot companay Ltd.
5. Text Book of Human Nutrition - Bamji MS, Rao NP, and Reddy V.; 2009; Oxford &
IBH Publishing Co. Pvt Ltd.
6. Park's Textbook of Preventive and Social Medicine - Park K (2011), 21st Edition. M/s
Banarasidas Bhanot Publishers, Jabalpur, India.
7. Principles of Food Sanitation, 1st Edition, Wiley-BlackJay JM, Loessner DA, Martin
J. (2005) Modern Food Microbiology. 7th ed. Springer. Graw Hill Publishing Co. Ltd
Marriott N G (1985). A VI publication USA.
8. Principles of Nutrition - Eva D. Wilson, Catherine H Fisher, Eastern Pvt Ltd.
9. Public Health & Nutritional care - Bhavana Shabarwala, Common wealth publisher
10. Nutrition in the Community-The Art of Delivering Services - Owen, A.Y & Fracle,
R.T
11. Nutrition, principles and application in health promotion - Carol west suitor merrily
forbes, Crowley, Lippincot companay Ltd.
12. Text Book of Human Nutrition - Bamji MS, Rao NP, and Reddy V.; 2009; Oxford &
IBH Publishing Co. Pvt Ltd.
13. Park's Textbook of Preventive and Social Medicine - Park K (2011), 21st Edition. M/s
Banarasidas Bhanot Publishers, Jabalpur, India.
14. Principles of Food Sanitation, 1st Edition, Wiley-BlackJay JM, Loessner DA, Martin
J. (2005) Modern Food Microbiology. 7th ed. Springer. Graw Hill Publishing Co. Ltd
Marriott N G (1985). A VI publication USA.
Reference Books :
1. Nutrition, Monitoring & Assessment - Tara Gopala Das & Subadra Seshadari, Oxford
Uni. Press
2. Perspectives in Nutrition - Wardlaw GM, Hampl JS.; Seventh Ed; 2007; McGraw
Hill.

Course	code: FND42MML205 Course name: Nutrition through Life cycle II	
Course category: Major Mandatory		
Credits	s: 3 Teaching scheme: L-3 Evaluation scheme: CA–60,	ESE-40
Exam I	Duration: 02 Hrs	
Pre-rec success	quisites: The student should have basic knowledge of biological and applied science sfully completed the first year of the Degree Program.	ces, and
Carrier	Objectives	
	Objectives:	tuitional
need need adol	ds during various stages of the human life cycle, including infancy, childhood, lescence, adulthood, and old age.	tritional
2. Exp influ psyc	lore Nutritional Challenges: Identify and analyze nutritional challenges and factor uencing dietary habits and choices across different life stages, considering physiol chological, and socio-economic factors.	s ogical,
3. Exa dise and	mine Health Implications: Investigate the impact of nutrition on health outcomes a ase prevention throughout the life cycle, emphasizing the importance of balanced healthy eating behaviors.	and diets
4. Lean inter cons	rn Lifespan Nutrition Planning: Acquire skills in planning and developing nutritio rventions and dietary recommendations tailored to specific age groups and life sta- sidering diverse nutritional needs and preferences.	n ges,
5. Pror beha	mote Optimal Health: Explore strategies to promote optimal nutrition and healthy aviors across the life cycle, aiming to enhance overall health and well-being.	lifestyle
Cour se	Outcomes: At the end of the course, the students will be able to -	
CO1:	Students will gain better & integrated understanding of the principles and basic co opulation and principles of nutritional assessment	ncept <mark>s</mark> of
CO2: \$	Students will develop the deeper insight for the principles of nutritional assessment in hea	lthcare.
CO3: 8	Students will be familiarizing with various assessment technology and methods and the individual & public health	ir use for
CO4: Students will learn the application nutritional assessment principles techniques of public health and quality monitoring & surveillance system.		lic health
Contents –		
Unit	Content	Teaching hours
1	Geriatric Nutrition - Covers nutrition considerations for older adults, including addressing age-related changes, preventing malnutrition, and promoting independence and quality of life.	9
	Nutritional and Food Requirements of Infants	
2	Growth and Development during Infancy, Nutritional Requirements, Food Requirements, Artificial Feeding, Low Birth Weight, Preterm Baby, Weaning	9
3	Nutritional and food Requirements of Preschool Children Nutritional and food Requirements of Preschool Children (1 to 6 Years) – Nutritional Requirements, Food Requirements, Nutrition Related Problems of Preschoolers, Feeding Programs	9
4	Nutritional and food Requirements of School Children(7to12Years)- NutritionalandfoodRequirementsofSchoolChildren(7to12Years)- NutritionalRequirements, Food Requirements, Diet Related Problems, Packed	9

	Lunches, School Lunch Programs	
5	RDA For Adolescent Nutritional and food Requirements of Adolescents-Nutritional Requirements, Food Requirements, Nutritional Problems, Physical Activity	9

Textb	Textbooks/Suggested Reading	
1.	Kaufman M (2007) Nutrition in promoting the public health strategies,	
	principles and practices. Jones and Barlett Publishers	
2.	Park K (24th ed) (2017) Park's Textbook of Preventive and Social Medicine,	
	Jabalpur M/s. Banarsidas Bhanot	
3.	ICMR (NIN) Dietary Guidelines for Indians (2nd ed) (2011) Dietary	
	Guidelines for Indians: A manual	
4.	IFCT (2017) Indian food composition table, NIN 56	
5.	Ross A C (Eds) (2012) Nutrition in health and disease, Lippincott Williams &	
	Wilkins	
6.	Shils M E (Eds) (1998) Nutrition in health and disease, Lippincott Williams &	
	Wilkins	
7.	NNM: http://www.icds-wcd.nic.in/nnm/home.html Vir S (2011) Public health	
	nutrition in developing countries, Woodhead Publishing India limited	
8.	Bonita, R., Beaglehole, R., Kjellström T. (2006) Basic Epidemiology, 2nd Edition,	
	WHO,2006 http://whqlibdoc.who.int/publications/2006/9241547073 eng.pdf	
9.	Moon, G., Gould, M. (2000). Epidemiology: An Introduction. Philadelphia,	
	Open University Press	
Refer	ence Books:	
1.	Dietetics – shrilakshmi	
2.	Advance Nutrition -IGNOU	
3.	Krause & Mahans - Krause's Food & the Nutrition Care Process, Janice L.	
	Raymond and Kelly Morrow	
4.	Gibney M J, Margetts B M, Kearney J M Arab (IstEds) (2004) Public Health	
	Nutrition NS Blackwell Publishing	
5.	Gopalan C (Ed) (1987) Combating Under nutrition- Basic Issues and Practical	
	Approaches, Nutrition Foundation of India	
6.	Langseth L. (1996). Nutritional Epidemiology: Possibilities and Limitations.	
	Washington DC, ILSI Press	
7.	Gordis L. Epidemiology. 5th ed. Philadelphia, PA: Saunders Elsevier, 2013	
8.	Aschengrau A., Seage G.R. (2014) Essentials of Epidemiology in Public Health.	
	3rd ed. Sudbury, MA: Jones & Bartlett	
9.	Willett, W. (2013) Monographs in Epidemiology and Biostatistics, Third Edition,	
	Oxford University Press.	
10	Achaya, K.T. (Ed) (1984) Interface Between Agriculture, Nutrition and Food	
	Science, The United National University.	
11	. Beaton, G. H and Bengoa, J. M. (Eds) (1996) Nutrition in Preventive Medicine,	
	WHO	

Course	Course code: FND42MML206Course name: Fundamentals of Food Science – II		
Cours	e category: Major Mandatory		
Credits	s: 2 Teaching scheme: L-2 Evaluation scheme: CA-3	0, ESE-20	
Exam l	Duration: 01 Hrs		
Pre-rec	quisites: The student should have basic knowledge of biological and applied sci	ences, and	
succes	stully completed the first year of the Degree Program.		
Carrie	Objectioner		
1 Und	lorstanding Food Composition: To comprehend the basic components of food	noluding	
n. One mac	pronutrients, micronutrients, water content, and additives.	including	
2. Exp	loring Food Processing Techniques: To learn about various methods used in foo	od	
process	sing such as preservation, packaging, and thermal processing.		
3.Grasp	food Safety Principles: To understand the importance of food safety and hygiene foodborne illnesses.	practices to	
4.Study	ring Food Microbiology: To gain knowledge about microorganisms relevant to food sc age their roles in food spoilage, fermentation, and foodborne pathogens	ience,	
5.Analy	zing Food Quality and Nutrition: To develop skills in evaluating food quality paramet	ers.	
nutritio	nal content, sensory attributes, and factors affecting food stability	,	
Course	Outcomes: At the end of the course, the students will be able to -		
CO1: S	Students understand the principles and fundamental concepts of food science.		
CO2:	Students will be able apply the integrated acquired knowledge of food science conce	pts in health	
and nut	rition.	$T \setminus /$	
CO3: S	their key constituents.	d groups and	
CO4:	Students will gain the insights of practical aspects of food groups in various fields.		
Conten	ts –		
Unit	Content	Teaching hours	
	Nuts and Oilseeds- Type, Nutritive value and Function, its role and		
	importance		
1	Beverages and Spices-Classification and Importance.	7	
	Overview of Food toxins, Food Additives, Adulterants, Preservatives,		
	Packaging.		
	properties of foods: Physical properties(solutions, vapor pressure,		
	interfacial tensions specific gravity) Dispersion systems in of foods-		
	Sol Gel Foam Emulsion: Food preparation: Objective and method of		
	cooking cooking media changes during cooking Food nigments and		
2	colors: Some common pigments used in food industry (chlorophylls.	8	
	myoglobin, anthocyanin, betalain, carotenoids, synthetic colors & lake		
	/dye colors and other colorants); Flavours: types of flavour, flavour		
	compounds, extraction principles of flavour, Sensation- smell sensation,		
	texture sensation, visual appearance and sensation of taste.		
	Food additives: definition, need and classification of food additives		
	preservatives-Natural and Artificial, antioxidants, chelating agents, coloring	_	
3	agents, curing agents, Emulsions, flavours and flavour enhancers, leavening	7	
	agents, nutritional supplements, non-nutritive sweeteners, pH control		

	agents, stabilizer and thickeners, humectants anti-caking agents, firming agent, clarifying agent, flour bleaching agents	
4	An overview of digestion and absorption of food, Role of enzymes in digestion, regulators of gastrointestinal activity and hormonal mechanisms. Digestive process, absorptive mechanisms, digestion and absorption of nutrients. Factors affecting digestion of various foods and nutrients	8

Textbooks/Suggested Reading
1. Gisslen, W. (2017). Professional baking. John Wiley & Sons.
2. Edwards, W. P., & Magee, T. R. (2008). Bakery technology and engineering. Springer Science & Business Media.
3. Stauffer, C. E. (2015). Technology of biscuits, crackers and cookies (2nd ed.). Woodhead Publishing.
4. Cauvain, S. P. (2013). Baking problems solved. Elsevier.
5. Shamsuzzoha, A. H. M., & Hossain, M. (2016). Bakery products science and technology. CRC Press.
6. Rao, P. H., & Ananthanarayanan, V. S. (2009). Bakery products: Science and technology. Blackwell Publishing.
7. Rao, P. H., & Ananthanarayanan, V. S. (2011). Handbook of food products manufacturing: Principles, bakery, beverages, cereals, cheese, confectionery, fats, fruits, and functional foods. John Wiley & Sons
Reference Books :
1. Meyer, .L.H (1987). Food Chemistry. CBS Publishers
2. "Cereal Grains: Properties, Processing, and Nutritional Attributes" by Sergio O. Serna-Saldivar
3. "Bakery Products: Science and Technology" by Y. H. Hui
4. "Milk and Dairy Products in Human Nutrition" edited by R. Gibson and J. Kurpad
5. "Egg Science and Technology" by William J. Stadelman and Debbie Newkirk
6. "Cereal Chemistry and Technology" by Samuel A. Matz

Course code: FND42SEP201 Course name: Clinical Nutrition and Dietetics (Case Study)

Course category: Skill Enhancement course

Evaluation scheme: CA–30, ESE–20

Exam Duration: 02 Hrs

Credits: 2 Teaching scheme: P-4

Pre-requisites: The student should have basic knowledge of biological and applied sciences, and successfully completed the first year of the Degree Program.

Course Objectives:

- 1. Apply Theoretical Knowledge: Integrate theoretical knowledge of clinical nutrition and dietetics into practical case studies, fostering critical thinking and problem-solving skills.
- 2. Develop Assessment Skills: Enhance proficiency in conducting comprehensive nutritional assessments, including dietary intake analysis, anthropometric measurements, and biochemical evaluations.
- 3. Formulate Nutrition Plans: Practice formulating evidence-based nutrition intervention plans tailored to specific clinical conditions and patient needs, considering factors like age, medical history, and dietary preferences.
- 4. Implement Dietary Modifications: Gain experience in implementing dietary modifications and counseling strategies to address nutritional deficiencies, manage chronic diseases, and optimize patient outcomes.
- 5. Evaluate Outcomes: Learn to assess the effectiveness of nutrition interventions through monitoring and evaluating patient progress and adjusting treatment plans as necessary.

Lab Outcomes: At the end of the course, the students will be able to -

LO1: Student will be able to apply the acquired knowledge in various fields of study.

LO2: Students will be able to identify various assessment tools & methods.

LO3: Students will be able to develop enhanced skills for identification & diagnosis of various diseases.

LO4: Students will be able to do assessment of cases in both IPD and in community and plan effective therapy and interventions.

Contents -

Sr.No.	Title of the Experiment
1.	Standard operating procedure of lab
2.	Used different screening and assessments form for kids
3.	Used different screening and assessments form for Adults
4.	Used different screening and assessments form for Elderly
5.	Making a mini nutritional assessment short form.(For Diabetes, Heart disease and other Non – Communicable disease)
6.	Developing a food frequency questionnaire for collecting the diet history.
7.	Setting up a dummy unit for nutrition counselling in the class.

8.	Role play exercise for counselling.
9.	Enlist 5-8 simple message you would use for counselling adults about a healthy diet for them.
10.	Make a Assessment form, dietary guidelines and prepare nutritious recipes for a Pregnant women an exchange list for pregnant women.
11.	Plan a diet based on regional (Marathwada, Vidarbha, north Maharashtra) background for pregnant women.
12.	Make a diet chart for major religions patients in Maharashtra, India. (Maharashtrian, Marwadi, Gujrati, Jain, Muslim, Punjabi, Sindhi) case study – given by faculty
13.	Design and develop following population health and nutritional status assessment tools for investigation purpose
14.	Demonstrate anthropometric tools for infant and investigate a normal infant (male/ female) for the health and nutritional status and record the assessment. Investigate the infant for breastfeeding status and frequency.
15.	Demonstrate anthropometric tools for assessment of PEM and investigate children under 5 years for PEM cases.
16.	Investigate & diagnose the clinical signs & symptoms of following nutritional deficiencies & toxicities -PEM ,Anemia Diabetes , PCOD/PCOS
17.	Make a assessment form for adolescent girls
18.	Demonstrate anthropometric tools for adolescents visit schools and do assessment of adolescent boys and girls
19.	Plan few recipes for adolescent age group boys and girls (for tiffin)
20.	Preparation of recipes suggested for adolescent and calculation of recipes .

Reference Book / Hand Books/ Lab Manual	
1.	Applied Nutrition - Rajalakshmi R, Oxford and JBH Publishers
2.	Nutrition and the community - Mc.Laren S, John Wiley & Sons
3.	Extension Education - Reddy AA, Srilakshmi Press, Baptla
4.	Education and Communication for development – OP Dahama and OP
	Bhatnagar, Oxford IBH Publishing Co.
5.	Extension in rural communities - Savile AH, Oxford University Press

Course code: FND42MMP202	Course name: Dietary Assessment Techniques for Dieticians
Course category: Major Mandatory	
Credits: 1 Teaching scheme: P-2	Evaluation scheme: CA–30, ESE–20
Exam Duration: 02 Hrs	
Pre-requisites: The student should have successfully completed the first year of	e basic knowledge of biological and applied sciences, and f the Degree Program.
Course Objectives:	
1. Hands-on Training: Provid dietary assessment techniq questionnaires.	le practical experience to dieticians in conducting various ues, including food records, recalls, and frequency
2. Skill Development: Enhar through direct observation,	nce skills in collecting accurate and reliable dietary data , participant interviews, and food weighing methods.
3. Understanding Data Interp interpretation, including pattern recognition.	retation: Foster comprehension of dietary assessment data nutrient analysis, portion size estimation, and dietary
4. Quality Assurance: Ensur quality assurance measures and bias.	e proficiency in adhering to standardized protocols and s during dietary assessment procedures to minimize errors
5. Integration of Technology: software for dietary assess software, to streamline data	: Incorporate the use of technology-based tools and ment, such as digital food diaries and nutrition analysis a collection and analysis processes.
Lab Outcomes: At the end of the course, t	the students will be able to -
LO1: Students will be able to design asses	sment form.
LO2: Students will be able for patient cour	nseling.
LO3: Develop food frequency questionnai	ire for collecting the diet history skills among dietetics students.
LO4: Students will be able to make a diet	chart for adult pregnant women and lactating mother.

Sr.No.	Title of the Experiment
1.	Standard operating Procedure of laboratory
2.	Calculate RDA For Child 6 to 12 months and prepare a recipe of weaning food.
3.	Plan and prepare iron rich recipes and calculate their nutrients
4.	Make a food exchange list, diet chart and prepare a diet for 1-6 years old child.
5.	Calculate RDA, make food exchange list and prepare a diet chart and recipe menu for a 7- 12 years old child.
6.	Calculate RDA, make food exchange list and prepare a diet chart and recipe menu for a 12-18 and above years old
7.	Calculate RDA for adolescent

8.	Make exchange list and prepare a diet chart & recipe menu for an adolescent.
9.	Dietary Assessment- Multi-pass review and Practice
10.	Pediatric Assessment of Human Milk
11.	Infant formula calculations Pediatric Malnutrition
12.	Medical Record/Medical Terminology/Basic Skill
13.	Anthropometrics Assessment & Assessing the Prevalence of PEM
14.	Assessing Energy Needs/Energy Expenditure
15.	Biochemical Assessment of Nutritional Status
16.	Clinical and Dietary Assessment Malnutrition
17.	Nutrition Screening for Pediatric patients.
18.	To Make Ready to Eat Recipes.
19.	Market Survey for weaning food Formula.
20.	Visit a Anganwadi center or preschool and assess the nutritional problems in a child of 1 to 6 years.

Course code:	FND42CEP201	Course name: Community Engagement Programme		
Course categ	ory: Community Engagement Progra	amme		
Credits: 2 Te	eaching scheme: P-4	Evaluation scheme: CA-30, ESE-20		
Exam Duration: 02 Hrs				
Pre-requisites: The student should have basic knowledge of biological and applied sciences, and				
successfully completed the first year of the Degree Program.				
Course Objectives:				
1.	Promoting Health Literacy: Enhan	ice understanding of nutrition and dietetics		
]	principles within the community t	hrough interactive workshops, seminars, and		
	educational campaigns.			
2.	Empowering Individuals: Empow	er individuals to make informed food choices by		
]	providing evidence-based nutritio	n information tailored to diverse cultural and		
2	Addressing Nutritional Made Ide	ntify and address specific putritional people and		
3.	Addressing Nutritional Needs: Ide	such as food insecurity malnutrition and dist		
	related chronic diseases	such as food insecurity, manufation, and diet-		
1	Building Sustainable Practices: A	dvocate for sustainable food practices and		
4.	community food systems includi	a promoting local agriculture food preservation		
	and waste reduction initiatives	ig promoting local agriculture, lood preservation,		
5	Fostering Collaboration: Foster	collaboration between nutrition professionals		
	community organizations, and p	olicymakers to develop and implement effective		
	nutrition programs and policies.			
		N HN /F F)C 'F F \/ I		
Lab Outcom	es: At the end of the course, the stud	ents will be able to -		
LO1: Increas	sed Health Awareness: Participants	demonstrate increased awareness and knowledge of		
nutritio	n and dietetics concepts, leading to it	nproved health behaviors and outcomes.		
LO2: Behavioral Change: Participants exhibit positive changes in dietary habits and lifestyle behaviors,				
incorporating nutrition recommendations into their daily lives.				
LO3: Skill Development: Students acquire communication, counseling, and leadership skills necessary				
for effective community engagement and nutrition education delivery.				
LO4: Community Impact: Community members experience improved access to nutritious foods,				
enhance	ed food security, and reduced prevale	ence of diet-related health conditions.		

Sr.No.	Title of the Experiment
1	Physiology and Promotion of Health
2	Community Nutrition
3	Clinical Nutrition
4	Food Safety and Quality
5	Nutritional Assessment

Ideas of project:

Defining project ideas is crucial for setting realistic expectations and laying out a clear vision for a project life cycle. Project-based learning not only provides opportunities for students to collaborate or drive their own learning, but it also teaches them skills such as problem solving, and helps to develop additional skills integral to their future, such as critical thinking and time management.

Literature survey:

A literature review establishes familiarity with and understanding of current research in a particular field before carrying out a new investigation. Conducting a literature review should enable you to find out what research has already been done and identify what is unknown within your topic.

Performance:

Performance measurement during a project is to know how things are going so that we can have early warning of problems that might get in the way of achieving project objectives and so that we can manage expectations. The criteria of it as given below.

Implementation:

Follows closely the design, uses appropriate techniques with skill and understanding to produce a good solution.

Evaluation:

Clearly relates to the problem. Shows a good understanding and appreciation of the solution. Objectives of what has been done.

Project Log:

a. The individual student's effort and commitment.

b. The quality of the work produced by the individual student.

c. The student's integration and co-operation with the rest of the group.

d. The completeness of the logbook & amp; time to time signature of guide

Objective: To elaborate the procedure for Guiding Student projects

Responsibility:

- 1. All the Project Guide.
- 2. All Semester B.Sc. students
- 3. Project Heads

SN	Activities	Responsibilities
1	PG students are deciding on their team members for their semester project with their proposed project domain and title	Project head, PG students
2	Director shall allocate the project guide based on their area of expertise (ot more than 3 batches to a guide)	Director
3	Ensuring that students have regular discussion meetings with their project guides.	Project guide Project head
4	Synopsis preparation and submission	Project head
5	Verification of student project log book	Project guide Project head
6	Approval of PPT: Abstract, existing, proposed system. 30% of proposed work. 80% of proposed work. 100% of proposed work.	Project guide
7	Preparation and submission of progress report during project	Students Project head
8	Preparing list for Redo students (insufficient content, plagiarism, poor presentation, genuine absentees.	Project head
9	Submission of hard copy of project report	Project head
10	Evaluation of project report	External examiner
11	Organizing final project viva-voce	Project heads
12	Ensuring that if a candidate fails to submit the project report on or before the specified deadline, he/she is deemed to have failed in the project work and shall re – enroll for the same	Project head Project guide Director

PROCEDURE