

**Institute for Excellence in Higher Education (IEHE),
Bhopal (MP)**



**NAAC Re-accredited (Third Cycle) Autonomous College
Under the UGC Scheme with 'A' Grade (CGPA-3.10)**

**Program Outcomes (POs),
Program Specific Outcome (PSOs)
&
Course Outcomes (COs)
of
Department of Food Science & Quality Control**

**Food Science and Quality Control
as
Minor/Subsidiary Course
(Session: 2022-23)**

Program Outcomes (PO) of the Under-Graduate Courses Offered

- PO1: Domain Knowledge:** Capable of demonstrating comprehensive knowledge & understanding of one or more other disciplines that form a part of an undergraduate programme of study.
- PO2: Critical Thinking:** Critically evaluate practices, policies and theories by following scientific approach to knowledge development. Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.
- PO3: Problem Solving and Analytical Skills:** Ability to think rationally, analyse situations and solve problems adequately.
- PO4: Information and Digital Literacy:** Capability to use ICT in a variety of learning situations. Demonstrate ability to access, evaluate and use a variety of relevant information sources; and use appropriate software for analysis of data.
- PO5: Communication Skills:** The capacity to communicate effectively using appropriate media, to present complex information in a clear & concise manner. Acquire the learning abilities by focusing on LSRW (Listening, Speaking, Reading & Writing skill, which provide a stage to the students to sharpen their capacity to learn more.
- PO6: Social Interaction and sensitivity towards the societal issues:** Work effectively and respectfully with diverse teams; facilitate cooperative or coordinated effort on the part of a group and act together as a group or a team in the interests of a common cause. Elicit views of others, mediate disagreements and help reach conclusions in group settings.
- PO7: Self-directed & Life-long Learning:** Acquire the potential to engage in independent & life-long learning in the broadest context socio-technological changes. Critical sensibility to live experiences, with self-awareness and reflexivity of both and society.
- PO8: Environment and Sustainability:** Understand the issues of environmental contexts & sustainable development.
- PO9: Moral and Ethical Awareness:** Ability to embrace moral/ ethical values in conducting one's life, possess knowledge of the values and beliefs of multiple cultures and a global perspective; and capability to effectively engage in a multicultural society and interact respectfully with diverse groups.
- PO10: Effective Citizenship:** Demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.
- PO11: Research-related skills:** A sense of inquiry and capability for asking relevant/appropriate questions, problematizing, synthesizing and articulating; Ability to recognize cause and effective relationships, define problems, formulate hypotheses, interpret and draw conclusions from data, ability to plan, execute and report the results of an experiment or investigation. Efficiency to apply one's learning to real life situations or in interdisciplinary areas.
- PO12: Leadership and Management Skills:** Competence to use skills in organizing for people to reach a shared goal. During leading a project, ability to motivate others to complete a series of tasks, often according to a schedule.
- PO13: Employability and Entrepreneurial Skill:** Ability to develop employability skills such as, positive attitude, good business sense, willingness to learn, resilience, ability to work under pressure, optimism, adaptability, perseverance and motivation, and a host of similar skills.

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PROGRAMME OUTCOMES (PO): B.Sc. Honours

Predefined Programme Outcomes	<i>Students taking admission to this program of B.Sc. get equipped with following outcomes:</i>
PO1	Domain Knowledge: Acquiring knowledge of fundamentals, basic Mathematics, domain knowledge of proper scientific models and Computing Specialization from defined problems and explaining the basic scientific principles and methods.
PO2	Scientific thinking: Inculcating scientific thinking and awareness, getting an ability to use necessary current techniques, skills, and modern tools.
PO3	Problem Analysis: Identifying, formulating, & analysing complex problems, reaching substantiated conclusions using first principles of Mathematics, natural sciences and electronic sciences.
PO4	Communication: Communicate concepts, designs, and solutions of scientific activities effectively and professionally with society at large.
PO5	Information & Digital Literacy: Capability to use ICT in a variety of learning situations. Demonstrate ability to access, evaluate and use a variety of relevant information sources; and use appropriate software for analysis of data.
PO6	Ethical Awareness: Ability to embrace moral/ ethical values in conducting one's life, possess knowledge of the values and beliefs of multiple cultures and a global perspective; and capability to support the values required for collaborative work such as mutual trust & fairness.
PO7	Environment & Sustainability: Understanding the impact of scientific solutions on societal and environmental contexts and demonstrate knowledge of and need for sustainable development.
PO8	Self-directed and Life-long Learning: Acquire the ability to engage in independent and life- long learning in the broadest context socio-technological changes. Critical sensibility to live experiences, with self-awareness and reflexivity of both and society.
PO9	Research-related skills: <ul style="list-style-type: none"> • Acquiring familiarity with emerging areas of different subjects in science and their applications in various spheres of sciences and getting appraise of its relevance in future studies. • Getting ability to apply various statistical tools to research problems and ability to build statistical knowledge and knowing the statistical organization in India and abroad. • Developing scientific intuition, ability and techniques to tackle problems either theoretical or experimental in nature.
PO10	Employability Skill: Ability to develop employability skills such as, positive attitude, good business sense, willingness to learn, resilience, ability to work under pressure, optimism, adaptability, perseverance and motivation, and a host of similar skills.

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Programme Specific Outcomes (PSO): **Food Science and Quality Control**

(As Minor/Generic Elective/Subsidiary Course)

Programme Specific Outcomes	<i>The students taking up this program of Food Science & Quality Control (BSc) with Chemistry (Honours/Major) as a special subject of study, receive the following outcomes:</i>
PSO-1	Domain Knowledge: Acquiring knowledge of fundamentals of Food & Nutrition domain, knowledge of proper scientific methods, problems and explaining the basic scientific principles and procedure regarding Food-products.
PSO-2	Scientific thinking: Inculcating scientific thinking and awareness, getting an ability to use necessary current techniques, skills, and modern tools in food sector.
PSO-3	Communication: Communicate concepts, designs, and solutions of scientific activities effectively and professionally with society at large scale.
PSO-4	Ethical Awareness: Ability to embrace moral/ ethical values in conducting one's life, possess knowledge of the values and beliefs of multiple cultures and a global perspective; and capability to support the values required for collaborative work such as mutual trust & concern regarding health, fitness, food security and feeding programmes for vulnerable groups of society.
PSO-5	Environment & Sustainability: Understanding the impact of scientific solutions on social and environmental contexts and demonstrate knowledge of and need for sustainable development in various sector related to food industries. Impact of pollution, adulteration, pesticides, chemical fertilizers and non-permitted food additives on the health of people consuming processed food.
PSO-6	Self-directed and Life-long Learning: Acquire the ability to engage in independent and life- long learning in the broadest context socio-technological changes. Critical sensibility to live experiences, with self-awareness and reflexivity of both in society.
PSO-7	Employability Skill: Ability to develop employability skills such as, positive attitude, good business sense, willingness to learn, resilience, ability to work under pressure, optimism, adaptability, perseverance and motivation, and a host of similar skills in the field of food related industries, agriculture sector, packaging, adulteration testing, laboratories, hospitals, gym, sports nutrition, food plant sanitation, preservation etc.

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Course Outcomes (CO)s

Semester: I

Food Chemistry Basic & Applied Nutrition (Paper Code: MNS-184 (TH)) (Minor)

Course Outcomes	<i>The students taking up this course of (BSc) Food Science & Quality Control (Minor) with Chemistry (Major) as a special subject of study receive the following outcomes:</i>
CO-1	Students will understand the composition of food
CO-2	Students will learn the effect of processing on various components.
CO-3	They will be able to understand about proteins, carbohydrates, lipids, vitamins and minerals.
CO-4	Students will identify structure, function, RDA, deficiency diseases of nutrients.
CO-5	They will learn to find out alkalinity of water, types of water for industrial purpose.

Semester: I

Course: Nutrition & Fitness (Paper Code: GES-184) (Generic Elective)

Course Outcomes	<i>The students taking up this course of Nutrition & Fitness (BA/BSc/BCom) with (Generic Elective) as a special subject of study receive the following outcomes:</i>
CO-1	Students will be able to understand the importance of fitness.
CO-2	Role of nutrition for maintaining health and fitness.
CO-3	Create importance of nutrition for sports person.
CO-4	Calculate diet for sports person, Height / Weight and BMI for sports person.
CO-5	Evaluate healthy food and energy expenditure in sports person for various sports.

Semester: I

Food Chemistry Basic & Applied Nutrition (Paper Code: MNS-184 (PR)) (Practical)

Course Outcomes	<i>The students taking up this course of (BSc) Food Science & Quality Control (Minor) with Chemistry (Major) as a special subject of study receive the following outcomes:</i>
CO-1	They will learn to analyse water for industrial purpose.
CO-2	They will learn to analyse the effect of various pH on food commodities.
CO-3	They will learn the analysis of milk on quality parameters.
CO-4	Students will understand recrystallization of sugar which will be beneficial in confectionery industry.
CO-5	They will learn to compare pigments present in fruits and vegetables and the effect of acid and alkali on them

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Semester: II

Sensory Evaluation and Food Preservation Techniques (Paper Code: MNS- 284) (Minor)

Course Outcomes	<i>The students taking up this course of (BSc) Food Science & Quality Control (Minor) with Chemistry (Major) as a special subject of study receive the following outcomes:</i>
CO-1	Students will assemble the sensory responses for food.
CO-2	Identify various Sense organs, their anatomy & physiology
CO-3	Various tests to assess their response
CO-4	Evaluate basic and practical knowledge regarding food processing
CO-5	Principles and application

Semester: II

Nutrition - A Lifespan Approach (Paper Code: GES-284) (Generic Elective)

Course Outcomes	<i>The students taking up this course of Nutrition A Lifespan Approach (BA/BSc/BCom) with (Generic Elective) as a special subject of study receive the following outcomes:</i>
CO-1	Describe importance of nutrition during life span.
CO-2	Analyze growth & Development of infants to adulthood.
CO-3	Develop meal Planning for each age group
CO-4	Recognize workmanship of Sedentary, Moderate & hard work
CO-5	Assess nutrition during pregnancy, lactation.

Semester: II

Sensory Evaluation & Food Preservation Techniques (Paper Code: MNS-284 (PR)) (Practical)

Course Outcomes	<i>The students taking up this course of (BSc) with Minor II as a special subject of study receive the following outcomes:</i>
CO-1	Students will learn to evaluate sensory quality of various food commodities.
CO-2	They will understand how to preserve food by various methods and principles.
CO-3	Students will examine to increase shelf life of different food in various seasons.
CO-4	They will evaluate to find out cost of processed food.
CO-5	They will experiment to procure, process and store of food commodities in house hold and commercial level

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Semester: III

Post-harvest Technology, Processing and Manufacture (Paper Code: MNS-384(TH))(Minor)

Course Outcomes	<i>The students taking up this course of BSc with Chemistry (Honours) as a special subject of study receive the following outcomes:</i>
CO-1	Students will list the important of various food commodities.
CO-2	They will understand the technical knowledge regarding processing.
CO-3	Students will analyse post-harvest losses
CO-4	Students will understand techniques of processing.
CO-5	Students will illustrate value added food commodities

Semester: III

Therapeutic Nutrition (Paper Code: GES-384) (Generic Elective)

Course Outcomes	<i>The students taking up this course of Therapeutic Nutrition (BA/BSc/BCom) with (Generic Elective) as a special subject of study receive the following outcomes:</i>
CO-1	Understand difference between normal therapeutic nutrition.
CO-2	Therapeutic modification of the normal diet.
CO-3	Understand the dietary management of different disease
CO-4	Understand lifestyle diseases.
CO-5	Recognize social influences on food intake.

Semester: III

Nutrition and Dietetics (HE) (Paper Code: Voc/SEC- XXX) (Voc/SEC)

Course Outcomes	<i>The students taking up this course of Nutrition and Dietetics (BA/BSc/BCom) with (Voc/SEC) as a special subject of study receive the following outcomes:</i>
CO-1	Understand the relationship between food nutrition & health.
CO-2	List various functions of food & food groups.
CO-3	Understand digestion, absorption & functions of various nutrients & their sources.
CO-4	Determine importance of balanced diet to reduce risk of deficiency diseases.
CO-5	Understand role & responsibilities of dietitian.

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Semester: IV

Food Quality Management, Packaging Act and Regulations (Paper Code: MNS-384) (Minor)

Course Outcomes	<i>The students taking up this course of Subsidiary (BSc) with Chemistry (Honours) as a special subject of study receive the following outcomes:</i>
CO-1	To understand various food technology updates.
CO-2	To understand about food laws & regulations.
CO-3	To Evaluate food safety & quality management.
CO-4	To Experiment packaging technology.
CO-5	To Create importance of labelling on different food commodities.

Semester: IV

Public Nutrition (Paper Code: GES-484) (Generic Elective)

Course Outcomes	<i>The students taking up this course of Public Nutrition (BA/BSc/BCom) with (Generic Elective) as a special subject of study receive the following outcomes:</i>
CO-1	To understand social trends, the media & peer pressure influence on food intake.
CO-2	To evaluated social effect on various communicable diseases.
CO-3	To analyse body changes from infancy to old age.
CO-4	To modify different meal pattern.
CO-5	To understand role of public nutrition.

Semester: IV

Dairy Management (HE) (Paper Code: Voc/SEC-XXX) (Voc/SEC)

Course Outcomes	<i>The students taking up this course of Public Nutrition (BA/BSc/BCom) with (Voc/SEC) as a special subject of study receive the following outcomes:</i>
CO-1	To state knowledge about production & management of dairy.
CO-2	Modify processing of milk & dairy products.
CO-3	Develop technician level human resources for the dairy industries.
CO-4	To develop the technical proficiency of workers/ technicians working in the dairy and allied sectors.
CO-5	Create Develop young entrepreneurs for self-employment through dairy tech & associated sectors.

Semester: V

Food Industry Management (Paper Code: S-584(TH)) (Subsidiary)

Course Outcomes	<i>The students taking up this course of Subsidiary (BSc) with Chemistry (Honours) as a special subject of study receive the following outcomes:</i>
CO-1	Students will understand the unit operations in food industries.
CO-2	They will acquaint with fundamentals of food engineering.
CO-3	Students will know the safety rules, prevention of accidents.
CO-4	Students will know about the various policies for welfare of commercial personnel.
CO-5	They will learn work simplification and work operations of food industries.

Semester: V

Food Industry Management (Paper Code: S-584(PR)) (Practical)

Course Outcomes	<i>The students taking up this course of Subsidiary (BSc) with Chemistry (Honours) as a special subject of study receive the following outcomes:</i>
CO-1	Students will learn to make hand sanitizers, floor cleaner, hand wash, liquid soap.
CO-2	students can become entrepreneur.
CO-3	Students will understand the water purification methods on commercial level.
CO-4	They will learn about food plant sanitation.
CO-5	They will learn about food engineering.

Semester: VI

Food Quality Management Packaging Acts and Regulations (Paper Code: S-684) (Subsidiary)

Course Outcomes	<i>The students taking up this course of Subsidiary (BSc) with Chemistry (Honours) as a special subject of study receive the following outcomes:</i>
CO-1	Students will understand about different food packaging materials.
CO-2	Students will list packaging designs and techniques
CO-3	Assess & evaluate food adulteration testing techniques.
CO-4	They will experiment qualitative and quantitative techniques to detect food adulteration.
CO-5	They will develop sanitizers, detergents, floor cleaners etc.

Semester: VI

Food Quality Management Packaging Acts and Regulations (Paper Code: S-684) (Practical)

Course Outcomes	<i>The students taking up this course of Subsidiary (BSc) with Chemistry (Honours) as a special subject of study receive the following outcomes:</i>
CO-1	Students will understand about rules and regulations regarding food safety.
CO-2	Students will understand the importance of food packaging techniques in food industries
CO-3	Students will learn about the types of packaging materials, their merits and demerits.
CO-4	Students will learn to develop packaging materials for food packaging.
CO-5	They will know about the national and international agencies/ organisation in the field of food safety, marketing

A brief note on Bloom's Taxonomy:

According to the revised version of Bloom's Taxonomy there are six levels of cognitive learning. Each level is conceptually different. The six levels are (1) remembering, (2) understanding, (3) applying, (4) analyzing, (5) evaluating, and (6) creating. We follow the Bloom's Taxonomy in deciding the course outcome & the levels (1/2/3/4/5/6) are displayed in the mapping table of COs with the PSOs of each program of NEP-2020. Details of the terms used in the levels are as follows:

Level-1: **REMEMBER** - this level include:

cite, define, describe, identify, label, list, match, name, outline, quote, recall, report, reproduce, retrieve, show, state, tabulate, and tell.

Level-2: **UNDERSTAND** - this level include:

abstract, arrange, articulate, associate, categorize, clarify, classify, compare, compute, conclude, contrast, defend, diagram, differentiate, discuss, distinguish, estimate, exemplify, explain, extend, extrapolate, generalize, give examples of, illustrate, infer, interpolate, interpret, match, outline, paraphrase, predict, rearrange, reorder, rephrase, represent, restate, summarize, transform, and translate.

Level-3: **APPLY** - this level include:

apply, calculate, carry out, classify, complete, compute, demonstrate, dramatize, employ, examine, execute, experiment, generalize, illustrate, implement, infer, interpret, manipulate, modify, operate, organize, outline, predict, solve, transfer, and use.

Level-4: **ANALYZE** - this level include:

analyze, arrange, break down, categorize, classify, compare, contrast, deconstruct, detect, diagram, differentiate, discriminate, distinguish, divide, explain, identify, integrate, inventory, order, organize, relate, separate, and structure.

Level-5: **EVALUATE** - this level include:

appraise, apprise, argue, assess, compare, conclude, consider, contrast, convince, criticize, critique, decide, determine, discriminate, evaluate, grade, judge, justify, measure, rank, rate, recommend, review, score, select, standardize, support, test, and validate.

Level-6: (highest level): **CREATE** - this level include:

arrange, assemble, build, collect, combine, compile, compose, constitute, construct, create, design, develop, devise, formulate, generate, hypothesize, integrate, invent, make, manage, modify, organize, perform, plan, prepare, produce, propose, rearrange, reconstruct, reorganize, revise, rewrite, specify, synthesize, and write.

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Programme: BSc - Subject-Food Science & Quality Control (Minor/Generic Elective)

Mapping of COs with PSOs for Semester-I (Minor)

Course		PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
Paper Title: Food Chemistry Basic & Applied Nutrition Paper Code: MNS-184	CO1	1,2									
	CO2				4						
	CO3		2								
	CO4				4						
	CO5					5					

Mapping of COs and PSOs for Semester-I (Generic Elective)

Paper Title: Nutrition and Fitness Paper Code: GES-184	CO1		2								
	CO2			3							
	CO3						6				
	CO4			3							
	CO5						6				

Mapping of COs with PSOs for Semester-I (Minor) Practical

Paper Title: Food Chemistry Basic & Applied Nutrition Paper Code: MNS-184 (PR)	CO1			3							
	CO2			3							
	CO3			3							
	CO4		2								
	CO5						6				

Mapping of COs and PSOs for Semester-II (Minor)

Paper Title: Sensory Evaluation and Food Preservation Paper Code: MNS-284	CO1						6				
	CO2			3							
	CO3			3							
	CO4					5					
	CO5			3							

Mapping of COs and PSOs for Semester-II (Generic Elective)

Paper Title: Nutrition- A Lifespan Approach Paper Code: GES-284	CO1				4						
	CO2				4						
	CO3						6				
	CO4						6				
	CO5					5					

Mapping of COs and PSOs for Semester-II (Minor) Practical

Paper Title: Sensory Evaluation and Food Preservation Paper Code: MNS-284 (PR)	CO1					5					
	CO2		2								
	CO3			3							
	CO4					5					
	CO5			3							

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Mapping of COs and PSOs for Semester-III (Minor)

Paper Title: Post-Harvest Technology, Processing and Manufacture Paper Code: MNS-384	CO1	1									
	CO2		2								
	CO3			4							
	CO4		2								
	CO5			3							

Mapping of COs and PSOs for Semester-III (Generic Elective)

Paper Title: Therapeutic Nutrition Paper Code: GES-384	CO1		2								
	CO2		3								
	CO3		2								
	CO4		2								
	CO5						6				

Mapping of COs and PSOs for Semester-III (Voc/SEC)

Course		PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
Paper Title: Nutrition & Dietetics (HE) Paper Code: Voc/SEC-XXX	CO1		2								
	CO2	1									
	CO3		2								
	CO4					5					
	CO5		2								

Mapping of COs and PSOs for Semester-IV (Minor)

Paper Title: Food Quality Management, Packaging Act & Regulations Paper Code: MNS-384	CO1		2								
	CO2	1									
	CO3					5					
	CO4			3							
	CO5						6				

Mapping of COs and PSOs for Semester-IV (Generic Elective)

Paper Title: Public Nutrition Paper Code: GES-484	CO1		2								
	CO2					5					
	CO3				4						
	CO4			3							
	CO5		2								

Mapping of COs and PSOs for Semester-IV (Voc/SEC)

Paper Title: Dairy Management (HE) Paper Code: Voc/SEC-XXX	CO1		2								
	CO2						6				
	CO3						6				
	CO4						6				
	CO5						6				


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Mapping of COs with PSOs for Semester-V (Subsidiary)

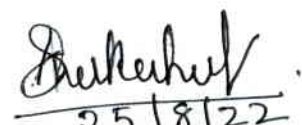
Paper Title: Food Industry Management Paper Code: S-584	CO1		2								
	CO2					6					
	CO3			3							
	CO4		2								
	CO5				4						

Mapping of COs and PSOs for Semester-VI (Subsidiary)


Course		PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
Paper Title: Food Quality Management Packaging Acts & Regulations Paper Code: S- 684	CO1		2								
	CO2	1									
	CO3					5					
	CO4			3							
	CO5						6				


 (IQAC Coordinator)


 (Convenor, Academic Committee)
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 अकादमिक समिति
 उच्चशिक्षा उत्कृष्टता संस्थान
 भोपाल


 (HOD, Food Science & Quality Control)

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