

NOAKHALI SCIENCE AND TECHNOLOGY UNIVERSITY

Department of Food Technology and Nutrition Science

Syllabus

For

4 years B.Sc. (Honors) Degree

Effective from Sessions: 2011-2012

Published by

Noakhali Science and Technology University

Sonapur, Noakhali-3814, Bangladesh

www.nstu.edu.bd



B. Sc (Honor's) in Food Technology and Nutrition Science

Food Technology and Nutrition Science is the applied science devoted to the study of food, nutrients and how they affect health and well-being. It can be defined as "the discipline in which the technology, biological, and physical sciences are used to study the nature of foods, the causes of deterioration, the principles underlying food processing, and the improvement of foods for the consuming public and how it affects human health". It brings together multiple scientific disciplines. Food Technology and Nutrition Science integrates the relation between the production, distribution and consumption aspects of Food. It brings together the study of understanding the biological and chemical composition of food and how its preservation can affect the level of nutrition. The students are rendered with the knowledge of understanding the importance of hygiene, sanitation and maintenance in order to know how food can be made worthy of consumption through healthy food choices and habits.

Learning the different aspects related to healthy intake of food, the Degree throws light on the level of nutritional components of the food. The curriculum is divided between theory and practical study along with industrial visits, hospital visits, practical surveys and project work. The project work and research help students gain a deeper insight into the subject. Students are trained to conduct experiments and detect the nutritional proportion of elements. The Degree also emphasizes on to identify nutrition and dietary problems in the community so that it can be possible to devise socially, economically and technologically viable methods to control nutrition and dietary problems in the country.

Scope of Food Technology

“Food Technology is the science that compact with all technique and activities involved in preserving, processing and manufacturing the food”.

A *Food Technologist* works for the new method development for the food manufacturing and preserving for keeping the food safe and hygienic and enhance the color, flavor and resistance from the natural harms like microorganism and toxins.

Food Technology is a branch of science in which the food science is applied in manufacturing and preservations of food products. The Food Technologists study the chemical, physical and microbiological makeup of the food. The food is processed, preserved, packaged and stored according to the specifications by industry and government. The research and development in food technology has resulted into the production of safe and nutritious foods. The [food processing](#) techniques are involved in the processing, preservation, packaging, labeling development, quality management and research and development of the dairy products, food grains, confectionery products, fish products, meat & poultry products and fruit & vegetable products.

The Degree is aimed at students who want to learn more about food and who want to work with innovative future foods, for instance as a part of the solution to major health issues such as malnutrition and obesity. The Degree covers the design and production of foods with health benefits. Students will learn about subjects such as food chemistry, food processing, surface and colloid chemistry, microbiology, nutrition and food analysis.

The Degree is closely aligned to market needs and Courses feature both theoretical and practical learning, and we ensure our students understand both the ‘why’ and the ‘how’ of the subjects they study. Many projects are highly product-focused, and often include visits to local companies as well as industry advisors who help guide students through their projects.

The role of nutritionists within the food industry is increasingly important, as consumers grow more aware of the importance of healthy eating. This Degree will help students to understand the processes of food production and how these can be amended to create healthier products. It combines training in the science of nutrition with areas of food science and consumer studies.

During the first year students will study the fundamentals of human nutrition, food chemistry, food microbiology, cell biology, genetics, human physiology, sociology and psychology. Students will then be able to build upon this knowledge by exploring areas such as public health nutrition, food choices and regulation, and the development of new products. Students will also gain experience of using key technical skills through sensory evaluation, laboratory-based practicals and work in the pilot-scale food processing plant in the lab.

The later parts of study modules deepen understanding of food texture, flavour and taste. Students will be introduced to the theory behind food formulation and new product development, with an emphasis on the study of how food components affect the chemical and microbiological safety of food. Modules on food colloids and food quality assurance directly relate to the research strengths of the Dept. During this year, we introduce problem-solving activities that relate to actual research/industrial situations. The final semester of the Degree consists of a degree project in which students will use the knowledge the acquired to identify, analyse and solve a problem related to the field of study.

After completing B. Sc (Honor's) Degree students will be expected to learn:

- Have achieved a high level of broad skills in food technology and nutrition to meet the global challenges of food security
- Have improved your communication skills through discussions, debates and by practicing written and oral presentations of projects
- Be able to suggest processing conditions for the industrial manufacture of high quality food products in terms of nutritional and sensory properties and with regard to raw materials, convenience, energy and sustainability.

Scope of Nutrition Science

Nutrition is the scientific study of the nutrients in food, how they are used in the body and the relationship between diet, health and disease. The first part of the academic study of Nutrition Science introduces to the major sources of food and their history, their nutrient contents, current trends in consumption, and key industrial processing operations. Students will study food chemistry and develop laboratory and experimentation skills. In addition, they'll be introduced to microbiology, human physiology and nutrition; these modules allow to gain a practical understanding of how food affects health and wellbeing, and appreciate the role of food as a carrier of nutrients.

In the later part, students will be introduced to the concepts and methodology for studying nutrition in populations and explore how the metabolic demand for nutrients varies during the lifecycle. This allows to understand the scientific basis of nutritional recommendations for different groups of people, from infants to the elderly. Studying food analysis, students will examine how the nutritional content of food is established, the additives and contaminants in food, and the need for food analysis to comply with legal requirements. The study of Biochemistry of Food, Immunology, Sociology, Dietary, Biochemical, Clinical, Ecological & Socioeconomic assessment study would allow them to learn & determine the nutritional status of a population group, to study causes of any nutritional problem and to look for evidence-based solution. Epidemiological studies & development nutrition will help students to learn how to provide policy options to the legislators through scientific study findings.

The relationship between nutrition and physical activity will also be explored in the context of the global malnutrition & obesity problem, including the physiological, psychological and cultural barriers to dietary changes. Intra household food distribution, gender violence, women empowerment, inequality and inequities in health care service utilization, maternal and child health care study will take students into the deep rooted problems in our society which needs in-depth study and the analysis of these topics will make yourself confident to look beyond the traditional solutions our culture practices.

Being a nutritionist, dietitian, or food scientist is about more than just telling people what to eat. There are a wide variety of careers in this field. From advertising to research, if they are interested in health and nutrition, there is a

job for them in the vast field of nutrition and food science. Successful nutritionists tend to be well-organized, with good planning skills and self-discipline. In addition, they are sincerely interested in human health and well-being, and compassionate towards those with health problems. Students can gain practical knowledge through innovative coursework that addresses 21st century needs and developments by drawing on the connections between what we consume and how we live. The goals of Public Health Nutrition concentration are to prepare health and nutrition professionals to:

- Identify and assess diet-related health problems-of both under nutrition and over nutrition-among diverse population groups internationally;
- Identify the social, cultural, economic, environmental, and institutional factors that contribute to the risk of under nutrition and over nutrition among populations;
- Demonstrate the linkages between agriculture, food, nutrition, and public health;
- Develop educational, institutional, and other population-based intervention strategies to improve food security and reduce obesity;
- Develop policies to reduce barriers to food insecurity and to improve the food and activity choices and nutritional status of diverse population groups;
- Promote policies to ensure the safe production, distribution, and consumption of food, Develop effective strategies for advocating for improved nutrition and physical activity among diverse population groups, and
- Apply population-based research findings to the development and implementation of nutrition policies and programs inside the country and internationally.

B.Sc. in Nutrition essentially involves an advanced learning in ways to enhance the quality of life and overall well-being by promoting healthy diet behaviors and exploring healthier dietary modifications. The program consists of a comprehensive curriculum that combines the science of nutrition with a broader view of wellness, community and environment, delving into reasons for unhealthy eating behaviors and ways to rectify and improve the same. The curriculum includes learning about nutritional matters and food habits, and training in health care units such as clinics, hospitals and community nutrition Centre. The academic activities collaborates with different development organizations, Non-Government Organizations, Govt. health legislators, Govt. officials, civil surgeons, Govt. General hospitals, Local Schools & Colleges, Food industries so that students can get best possible set ups to carry out their study, research work and so on.

Career prospects

Your future job could be anywhere in the country & world, in a small or large multinational company, a government authority, a university or another organization. You can join Food Industry as a Food Scientist/Food Technologist/Research Scientist/Nutritionist. You can also join academic sector or research organization. You can join public sector food departments which regulate the food production, Import or Export. For those students who wish to continue as a researcher, there is the option to go on to studies at higher level.

COURSE PATTERN AND CREDIT STRUCTURE

The entire undergraduate program is covered through a set of theoretical and laboratory courses, fieldwork design and project/ thesis work.

ASSIGNMENT OF CREDITS

1. Theoretical Courses:

One lecture per week per semester will be equivalent to one credit. Thus, the courses having credit three (3) will have three lectures per week throughout the semester (13 weeks). That means 39 classes are taken in 13 weeks.

2. Laboratory/Field/Project Work:

Credit for laboratory/field work usually will be half of the class hours per week per semester. Credits are also assigned to project and thesis work taken by students.

EVALUATION PROCEDURE

Distribution of Marks:

Thirty percent of marks shall be allotted to continue assessment, i.e. class test, quizzes and homework assignment, class attendance and class participation. The total performance of a student in a given course is based on a scheme of continuous assessment. For theoretical courses this continuous assessment is made through homework assignment, attendance, quizzes etc, three (3) Class Test (CT) examination of one/two-hour duration and a semester final examination of four hours duration and among three (3) CT exam best two are being averaged. The distribution of marks for a given course is as follows:

The remaining marks will be allotted to Term final examination, which will be conducted centrally by the University. There will be two examiners for each theoretical course in the Term final examination, which will be of 3/4 hours duration for credit hours 2, 3 respectively.

The distribution of marks for given theory courses will be as follows:

| No. | Description | Marks |
|-------|--|-------|
| 1 | Class participation/ attendance | 05 |
| 2 | Homework assignment(s)/class tests/ term and quizzes | 25 |
| 3 | Final examination | 70 |
| Total | | 100 |

The distribution of marks for given thesis/project paper course will be as follows:

| No. | Description | Marks |
|-------|--------------|-------|
| 1 | Evaluation | 60 |
| 2 | Viva-Voce | 20 |
| 3 | Presentation | 20 |
| Total | | 100 |

The distribution of marks for given practical course will be as follows:

| No. | Description | Marks |
|-------|-------------|-------|
| 1 | Experiment | 40 |
| 2 | Lab | 30 |
| 3 | Viva-Voce | 20 |
| 4 | Attendance | 10 |
| Total | | 100 |

Grading Scale

Letter grades and corresponding grade points will be awarded in accordance with provisions shown below:

| Numerical grade | Letter Grade | Grade Points |
|---|--------------------------|--------------|
| 80% or above | A ⁺ (A plus) | 4.00 |
| 75% to less than 80% | A (A regular) | 3.75 |
| 70% to less than 75% | A ⁻ (A minus) | 3.50 |
| 65% to less than 70% | B ⁺ (B plus) | 3.25 |
| 60% to less than 65% | B (B regular) | 3.00 |
| 55% to less than 60% | B ⁻ (B minus) | 2.75 |
| 50% to less than 55% | C ⁺ (C plus) | 2.50 |
| 45% to less than 50% | C (C regular) | 2.25 |
| 40% to less than 45% | D | 2.00 |
| Less than 40% | F | 0.00 |
| Incomplete | I | |
| Withdrawn | W | |
| Continuation (For project and thesis/design course) | X | |

Improvement rules for the department:

1. Improvement exam is allowed only on two courses if the mark is between 40 to 49.

Condition: Improvement exam is allowed only with the immediate next session. If the sessional gap is not suitable for the improvement examinee, he will be allowed to appear at the exam with the examinees in the following session. For example: Student of the session 2012-13 will be allowed to appear at the exam with the examinees of the session 2013-14 but if the sessional gap between 2012-13 and 2013-14 is not suitable for the improvement examinee due to the absence of the required courses, he will be allowed to appear at the exam with the examinees of the session 2014-15.

2. Improvement exam is allowed only on one course if the mark is below 40. Condition: If any student fails to pass two or more courses, he shall be obliged to re-admit himself in the immediate next session.

3. If any final year (year-4, Term-1 or year-4, Term-2) student wants to appear at the improvement exam on one or more final year courses, he shall be obliged to re-admit himself in the immediate next session.

5. Course registration of the courses for improvement exam is not necessary. But it is mandatory that these courses be cited in the exam application form with fees Tk 500/= for each.

6. The new rules will be applicable from the session 2014-15 onward.

YEAR-1 TERM-1

| Course No | Course Title | | Credit | Page |
|------------------|---|--------------|---------------|-------------|
| FTNS 1101 | Introduction to Food Technology and Nutrition Science | | 3 | |
| FTNS 1103 | Inorganic & Physical Chemistry | | 3 | |
| FTNS 1105 | Organic Chemistry | | 3 | |
| FTNS 1107 | Microeconomics | | 3 | |
| BLWS 1101 | History of the Emergence of Independent Bangladesh | | 3 | |
| CSTE 1131 | Computer Fundamentals | | 2 | |
| FENG 1101 | Developing Basic English Skills | | 2 | |
| FTNS 1102 | Practical Inorganic Chemistry | | 1 | |
| | | Total | 20 | |

YEAR-1 TERM-2

| Course No | Course Title | | Credit | Page |
|------------------|---|--------------|---------------|-------------|
| BANG 1101 | Bangla | | 3 | |
| FTNS 1201 | Social Nutrition | | 3 | |
| FTNS 1203 | Introductory Microbiology | | 3 | |
| FTNS 1205 | Food Chemistry | | 3 | |
| FENG 1201 | Academic Writing | | 2 | |
| CSTE 2134 | Computer Application Lab | | 1 | |
| FTNS 1202 | Physical Chemistry Lab | | 1 | |
| FTNS 1204 | Organic chemistry Lab | | 1 | |
| FTNS 1206 | Introductory microbiology-I Lab | | 1 | |
| FTNS 1208 | Introductory microbiology (Growth measurement)-II Lab | | 1 | |
| FTNS 1207 | Viva voce | | 2 | |
| | | Total | 18 | |

YEAR-2 TERM-1

| Course No | Course Title | | Credit | Page |
|------------------|--|--------------|---------------|-------------|
| FTNS 2101 | Biochemistry (Macronutrient) | | 3 | |
| FTNS 2103 | Human Anatomy | | 3 | |
| FTNS 2105 | Human Physiology- I | | 3 | |
| FTNS 2107 | Food Microbiology- I | | 3 | |
| FTNS 2109 | Instrumental Methods and Analysis | | 3 | |
| FTNS 2102 | Practical Biochemistry (Macronutrient) | | 1 | |
| FTNS 2104 | Practical Human Physiology- I | | 1 | |
| FTNS 2106 | Practical food Microbiology- I | | 1 | |
| | | Total | 18 | |

YEAR-2 TERM-2

| Course No | Course Title | | Credit | Page |
|------------------|---------------------------------------|--------------|---------------|-------------|
| FTNS 2201 | Biochemistry (Micronutrient) | | 3 | |
| FTNS 2203 | Biostatistics | | 3 | |
| FTNS 2205 | Human physiology- II | | 3 | |
| FTNS 2207 | Food microbiology- II | | 3 | |
| FTNS 2209 | Macroeconomics | | 3 | |
| FTNS 2202 | Practical Biochemistry(Micronutrient) | | 1 | |
| FTNS 2204 | Practical Biostatistics | | 1 | |
| FTNS 2206 | Practical Human Physiology- II | | 1 | |
| FTNS 2208 | Practical Food Microbiology- II | | 1 | |
| FTNS 2211 | Viva Voce | | 2 | |
| | | Total | 21 | |

YEAR-3 TERM-1

| Course No | Course Title | | Credit | Page |
|------------------|--|--------------|---------------|-------------|
| FTNS 3101 | Nutritional Biochemistry - I | | 3 | |
| FTNS 3103 | Clinical Nutrition | | 3 | |
| FTNS 3105 | Food Microbiology- III | | 3 | |
| FTNS 3107 | Food Technology | | 3 | |
| FTNS 3109 | Assessment of Nutritional Status | | 3 | |
| FTNS 3102 | Practical Nutritional Biochemistry - I | | 1 | |
| FTNS 3104 | Practical Clinical Nutrition | | 1 | |
| FTNS 3106 | Practical Food Microbiology – III | | 1 | |
| FTNS 3108 | Practical Food Technology | | 1 | |
| FTNS 3110 | Practical Assessment of Nutritional Status | | 1 | |
| | | Total | 20 | |

YEAR-3 TERM-2

| Course No | Course Title | | Credit | Page |
|------------------|--|--------------|---------------|-------------|
| FTNS 3201 | Nutritional Problems | | 3 | |
| FTNS 3203 | Maternal and Child Nutrition | | 3 | |
| FTNS 3205 | Food Processing Technology-I | | 3 | |
| FTNS 3207 | Food Borne Infection and Intoxication | | 3 | |
| FTNS 3209 | Nutritional Planning | | 3 | |
| FTNS 3202 | Nutritional Problems Assessment | | 1 | |
| FTNS 3204 | Practical Maternal and Child Nutrition | | 1 | |
| FTNS 3206 | Practical Food Processing Technology-I | | 1 | |
| FTNS 3208 | Practical of Food Borne Infection and Intoxication | | 1 | |
| FTNS 3211 | Viva Voce | | 2 | |
| | | Total | 21 | |

YEAR-4 TERM-1

| Course No | Course Title | | Credit | Page |
|------------------|--|--------------|---------------|-------------|
| FTNS 4101 | Nutritional Biochemistry - II | | 3 | |
| FTNS 4103 | Food Laws and Quality Control of Food and Beverage | | 3 | |
| FTNS 4105 | Technology of Food Preservation | | 3 | |
| FTNS 4107 | Community Nutrition and Public Health | | 3 | |
| FTNS 4109 | Epidemiology, Survey and Surveillance | | 3 | |
| FTNS 4102 | Practical Nutritional Biochemistry - II | | 1 | |
| FTNS 4104 | Practical Quality Control in Food Processing | | 1 | |
| FTNS 4106 | Practical Food Preservation Technology | | 1 | |
| FTNS 4108 | Field Testing of Nutrition Education Materials | | 1 | |
| FTNS 4110 | Small Scale Nutrition Survey | | 2 | |
| | | Total | 21 | |

YEAR-4 TERM-2

| Course No | Course Title | | Credit | Page |
|------------------|---|--------------|---------------|-------------|
| FTNS 4201 | Food Processing Technology -II | | 3 | |
| FTNS 4203 | Nutrition in Emergencies | | 3 | |
| FTNS 4205 | Nutrition and Dietetics | | 3 | |
| FTNS 4207 | Development Nutrition | | 3 | |
| FTNS 4209 | Computing and Data Analysis | | 3 | |
| FTNS 4202 | Practical Food Processing Technology-II | | 1 | |
| FTNS 4204 | Food Groups and Exchange List Practical | | 1 | |
| FTNS 4206 | Diet Preparation Practical | | 1 | |
| FTNS 4208 | Undergraduate Research Project and Presentation | | 4 | |
| FTNS 4211 | Viva voce | | 2 | |
| | | Total | 24 | |

