

# Course FUNDAMENTALS OF FOOD AND NUTRITION

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## Basic Information

**This is a course, which contributes to MSc award in Biology**

<b>Course period</b>	From October 1st till February 1st, 1 semester (16 weeks)
<b>Study credits</b>	3 ECTS credits
<b>Duration</b>	108 hours
<b>Language of instruction</b>	English
<b>Academic requirements</b>	<ul style="list-style-type: none"><li>– BSc degree in Biology, Physics, Biophysics, Chemistry , Biochemistry, Environmental Sciences or equivalent (transcript of records),</li><li>– good command of English (certificate or other official document)</li></ul>

## Course Description

The course “Fundamentals of Food and Nutrition” aims at developing basic understanding about nutrition, its effect on human health and newer advances in food technology. This course encompasses physiological, biochemical and social aspects of food and discusses relationship between metabolites and human health. Moreover, the course is focused on the advances in the most emerging area of applied science of Nutraceuticals (where food is the medicine). The knowledge of nutrition under extreme climate conditions, space nutrition, and sports nutrition empowers students' knowledge and skills to utilize food as a powerful tool for physical, mental, and social wellbeing.

## Special Features of the Course

1. The course provides a detailed insight into understanding the composition, molecular interaction and bio-mechanisms of the food metabolites.
2. The course has a multidisciplinary emphasis providing a broad base of knowledge and understanding of the wide role of nutrition in sustaining health and preventing diseases.
3. It introduces students to most advanced aspects of food and nutrition to serve space nutrition, sports nutrition, understand genetically modified food, functional foods etc.

## Course Aims

The course “Fundamentals of Food and Nutrition” is aimed to enable students to gain knowledge about interaction between food, body and health under normal and special circumstances.

## Course Objectives

- To provide students with the knowledge of basic terminology and several aspects of nutrition and the functions of food in healthy life sustenance;
- To ensure that students are familiar with the food classification, nutrition during special conditions and role of special functional food;
- To equip students with knowledge and understanding of modern aspects of nutritional science and novel food usage.

## Learning Outcomes of the Course

A successful completion of this course will enable students to:

- summarize and critically discuss/ understand both fundamental and applied aspects of food science. They will be able to explain functions of specific nutrients in maintaining health, identifying nutrient specific foods and apply principles from the various facets of food science and related disciplines to solve practical as well as real-world problems.
- use current information technologies to locate and apply evidence-based guidelines and protocols and get imparted with critical thinking to take leadership roles in fields of health, dietetics, special nutritional needs and nutritional counseling.

## Course Outline

Week	Lectures	Practice session / Assignments	Hours <sup>1</sup>
<b>Module 1 «Basics of Food Science»</b>			
1-5	<ul style="list-style-type: none"><li>• Basic definition, function, classification and dietary sources of foods, nutrition and dietetics</li><li>• Concept of malnutrition, health, immunity by food and</li></ul>	<ul style="list-style-type: none"><li>• Pre-course test</li><li>• Self-Study Home Assignments No. 1 to 4</li><li>• Lab «To make Siberian food pyramid»</li></ul>	18

<sup>1</sup> Hours designed for Classroom sessions, Web-sessions, Home Assignments etc.

	<p>functions of food</p> <ul style="list-style-type: none"> <li>• Classification of macronutrients and micronutrients</li> <li>• Is water a nutrient?</li> </ul>	<ul style="list-style-type: none"> <li>• Lab «Qualitative assay of macronutrients on food samples»</li> </ul>	
<b>Module 2 «Effect of nutraceuticals on health»</b>			
6-9	<ul style="list-style-type: none"> <li>• Definition, classification and role of nutraceuticals</li> <li>• Introduction to chemistry of prebiotics and probiotics as functional foods</li> <li>• Effect of nutraceuticals on health and prevention of diseases</li> <li>• Beneficiary microbes and there metabolism for improving health</li> </ul>	<ul style="list-style-type: none"> <li>• Self-Study Home Assignments No. 5 to 7</li> <li>• Lab «Model of major Siberian functional foods»</li> </ul>	12
<b>Module 3 «Nutrition during extremes and novel foods»</b>			
9-15	<ul style="list-style-type: none"> <li>• Nutritional principals of adaptation during special circumstances of weather, professions and diseases</li> <li>• Nutrition for industrial</li> </ul>	<ul style="list-style-type: none"> <li>• Lab «To develop low cost nutritious drink for sportsman and assess its nutritional value»</li> <li>• Lab «To device a food</li> </ul>	28

	<p>worker: Nutrition for high physical work</p> <ul style="list-style-type: none"> <li>• Nutrition in space: Nutrition for high physical work</li> <li>• Nutrition for extreme weather conditions</li> <li>• Sports nutrition</li> <li>• Introduction to novel foods, functional foods and organic foods</li> <li>• Principles of convenience foods</li> <li>• Beneficial and harmful effects of genetically modified food</li> <li>• Textured and nano foods</li> </ul>	<p>plan for a Siberian astronaut in space for 10 days »</p> <ul style="list-style-type: none"> <li>• Lab « To devise a food plan for a industrial worker, age 45 years (male)»</li> <li>• Home assignments No. 8-10</li> </ul> <p>Final test</p>	
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## Lecturer and Contact Information



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## Assessment

- Attendance (15 marks) – 15% of total score
- Final Test (60 marks) – 60% of total score
- Lab work (20 marks) – 20% of total score
- Home assignments (5 marks) – 5% of total score

**The overall course percentage grade will be converted into a letter grade as follows:**

A = 91-100%

B = 81-90%

C = 71-80%

D = 61-70%

E = less than 61%.

## Attendance Policy

The course requires compulsory 80% attendance and only in this case a student will be allowed to take the final examination. Attendance less than 75% will lead to an explanation to the Head of the Department and only after her consent the student will be allowed to appear on the exam.

## Web page of the course

The webpage of the course "[\*Fundamentals in Food and Nutrition\*](#)" is available through E-learning SibFU web site: [www.e.sfu-kras.ru](http://www.e.sfu-kras.ru) . You must be logged in to access this course. Course Guide and all accompanying materials are also available at the course web-page.

## Core reading

### Books (link for access provided)-

1. [\*An introduction to nutrition Volume 1.0\*](#) authored by Maureen Zimmerman and Beth Snow
2. [\*Nutrition and Dietetics\*](#) by Sheila John, Sadhana Rajmohan Parimalam, S. Karthiga, B. S. Vasanthi.

### Journals (link for access provided)-

1. [\*Food security and nutrition in the Russian Federation – a health policy analysis.\*](#)
2. [\*Growth, development and differentiation: a functional food science approach.\*](#)
3. [\*New nutritional composition data on selected traditional foods consumed in Black Sea Area countries.\*](#)
4. [\*Carotenoids, vitamins \(A, B2, C and E\) and total folate of traditional foods from Black Sea Area countries\*](#)

### Additional reading materials-

[\*Essentials of Human Nutrition\*](#) authored by Jim Mann, A. Stewart Truswell