SEC- : Basics of Food Science and Nutrition

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
Basics of Food Science and Nutrition	**2**			**2**	XIIth pass	NIL

Learning Objectives

1. The primary objective of this course is to provide an understanding to the students of the types and biological importance of macro and micronutrients found in the dietary sources.
2. The students will get an opportunity to understand the integrated learning between the areas of Food science and Nutrition.
3. The course will also provide hands-on experience of different methods used to estimate different types of nutrients that will help the students learn the concept nutrition and health.

Learning Outcomes

Learners will be able to:

1. Analyse and evaluate concepts in human nutrition and its relation with food and health
2. Understand the concept of food exchange and meal planning
3. Understand the essentiality of macro and micronutrients in food items
4. Assess the quality and nutritive value of food.

Skill development and job opportunities:

Students will be able to take up jobs in public and community health schemes where food assessment is done. They can also as serve as assistants in program where meal planning is done like home care facilities, schools, hostels, old age homes. It will provide them the training to apply for jobs in any business establishments concerning food processing, packaging and production. After completion of the entire series, students will be able to take up job opportunities in any business involved with advanced food processing. They would also be eligible to get placements in food and drug assessment centres. The course will also enable student to apply to advance food science and tech courses.

SYLLABUS OF SEC- :

Unit I **4 weeks**

Introduction to nutrition and food science: Defining nutrition, nutrients and role of nutrients. Food groups- Grouping of foods based on composition. Classification of nutrients: Macronutrients and Micronutrients. Food Energy and the concept of Energy Balance. Principals of meal planning, food exchanges and Balanced diet.

Practical Exercises:

- Determination of calorie content and nutritive value of different food items.
- Estimation of Total moisture and ash content in the food items.
- Meal planning for healthy individuals depending on adult men and women.

Unit II: Macronutrients in food **5 weeks**

Introduction to Dietary Carbohydrates, Proteins and Fats and their roles in body functions, dietary sources and RDA

Practical Exercises:

- Estimation of Total Carbohydrate content in food by Molisch's test, Hanes method or Folin and Wu
- Estimation of Total lipid content in food by Soxhlet extraction or Bligh and Dyer method
- Estimation of Total protein content in food by modified Lowry's method.

Unit III: Micronutrients **6 weeks**

Introduction to water- and fat-soluble vitamins, brief overview of functions, dietary sources and RDA. Introduction to minerals, brief overview of functions, dietary sources and RDA

Practical Exercises:

- Quantitative estimation of Vitamin C in foods by titration
- Quantitative estimation of Vitamin A/E in oils by spectrophotometric methods
- Quantitative of Estimation of mineral content in food. (Ca, P/ Na/K and Fe)

Essential Reading

- Plummer, D. T. (1998) *An Introduction to Practical Biochemistry* (3rd ed.), Tata McGraw Hill Education Pvt. Ltd. (New Delhi); ISBN: 13: 978-0-07-099487-4 / ISBN:10: 0-07-099487-0.
- Cooper, T. G. (2011) *The Tools of Biochemistry* (2nd ed.), Wiley-Interscience Publication (New Delhi); ISBN: 13:9788126530168.
- Raymond, J. L., & Morrow, K. (2020). *Krause's food & the nutrition care process* (15th ed.). Saunders.

- Vasudevan, D. M., & Das, K. S. (2020). *Practical textbook of biochemistry for medical students* (3rd ed.). Jaypee Brothers Medical.
- Manay, N. S. O. (2001). Food: facts and principles. New Age International.

Suggested Readings

- Practical Biochemistry, Damodaran Geetha K, Jaypee Brothers Medical Publishers Private Limited; 1st edition (1 January 2011), ISBN: 9789350251416
- Mahan, L. K., & Raymond, J. L. (2016). Krause's food & the nutrition care process. Elsevier Health Sciences.
- Malik, D., Narayanasamy, N., Vavilala, P., Takur, J., Sinha, N., (2022). Textbook of Nutritional Biochemistry. Springer Singapore, ISBN978-981-19-4149-8.

Examination scheme and mode:

Total Marks: 50
Internal Assessment (Practical): 25 marks
End Semester Practical Exam*: 25 marks

The Internal Assessment for the course may include Class participation, Assignments, Class tests, Projects, Field Work, Presentations, amongst others as decided by the faculty.