



**UNIVERSITY OF SARGODHA
OFFICE OF THE REGISTRAR
(ACAD BRANCH)**

NOTIFICATION

On the recommendations of Academic Council made in its 14th (1/2022) meeting held on 22.02.2022, the Syndicate in its 59th (1/2022) meeting held on 27.09.2022 approved the revised curricula of following programs for implementation w.e.f. Fall 2021:

- | | | |
|-----|---|-------------|
| i. | B.Sc (Hons.) in Human Nutrition and Dietetics | (Annex-'A') |
| ii. | B.Sc (Hons.) in Home Economics | (Annex-'B') |


(WAQAR AHMAD)
Additional/Registrar (General)

No. SU/Acad/24/770

Dated: 03.10.2024

Distribution:

- Director, Institute of Food & Nutrition
- Controller of Examinations
- Director Academics

C.C.:

- Dean, Faculty of Agriculture
- Principal, College of Agriculture
- Director, QEC
- Additional Registrar (Affiliation & Registration)
- Secretary to the Vice-Chancellor
- PA to Registrar
- Notification File

SCHEME OF STUDIES AND CURRICULUM

for

B. Sc. (Hons). Human Nutrition and Dietetics (HND)

(4 Years Degree Program)

w.e.f. Fall Admissions 2021



**INSTITUTE OF FOOD SCIENCE AND
NUTRITION (IFSN) UNIVERSITY OF
SARGODHA, SARGODHA**


DIRECTOR
INSTITUTE OF FOOD SCIENCE & NUTRITION
UNIVERSITY OF SARGODHA, SARGODHA

B.Sc. (Hons.) Human Nutrition and Dietetics

Eligibility: At least 45% marks in F.Sc. (Pre-Medical/Pre-Engineering) or A Level

Duration: 04 Years Program (08 Semesters)

Degree Requirements: 138 Credit Hours

Course Code	Course Title	Credit Hours
SEMESTER-I		
URCE-5102	Language Comprehension & Presentation Skills	3(3+0)
URCI-5109	Introduction to Information & Communication Technologies	3(2+1)
URCP-5106	Pakistan Studies	2(2+0)
ZOOL-6141 / MATH-5128	Introduction to Biology I (for Pre-Engineering students) / Mathematics (for Pre-Medical students)	3(3+0)
FSAT-5101	Introduction to Food Science and Technology	3(2+1)
HNAD-5101	Fundamentals of Human Nutrition	3(3+0)
HNAD-5102	Metabolism of Basic Nutrients	3(3+0)
Total Credit Hours		20(18+2)
SEMESTER-II		
URCE-5103	Academic Writing	3(3+0)
URCI-5105	Islamic Studies	2(2+0)
HNAD-5103	Human Anatomy	3(2+1)
HNAD-5104	Human Physiology-I	3(2+1)
HNAD-5105	Macronutrients in Human Nutrition	3(3+0)
FSAT-5106	Food Safety and Laws	3(3+0)
Total Credit Hours		17(15+2)
SEMESTER-III		
STAT-5101	Introductory Statistics	3(3+0)
HNAD-5106	Human Physiology-II	3(2+1)
CHEM-6111	Biochemistry	4(3-1)
HNAD-5107	Micronutrients in Human Nutrition	3(3+0)
HNAD-5108	Food and the Allergic Reaction	3(3+0)
FSAT-6125	Food Microbiology	3(2+1)
Total Credit Hours		19(16+3)
SEMESTER-IV		
STAT-5102	Introduction to probability distribution	3(3+0)
HNAD-5109	General Pathology	3(2+1)
FSAT-6121	Food Product Development and Service Management	3(1+2)
HNAD-5110	Assessment of Nutritional Status	3(1+2)
HNAD-5111	Nutrition and Drug Laws	3(3+0)
HNAD-5112	Nutrition in Emergencies	3(3+0)
Total Credit Hours		18(15+3)
SEMESTER-V		
FSAT-6111	Food Analysis and Sensory Evaluation	3(0+3)
HNAD-6113	Dietetics-I	3(2+1)
HNAD-6114	Fundamentals of Industrial Nutrition	3(2+1)
HNAD-6115	Global Food Issues	3(3+0)
HNAD-6116	Nutritional Education and Awareness	3(2+1)


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HNAD-6117	Nutrition Through Social Protection	3(3+0)
Total Credit Hours		18 (12+6)
SEMESTER-VI		
HNAD-6118	Dietetics-II	3(2+1)
HNAD-6119	Drug-Nutrient Interactions	3(3+0)
HNAD-6120	Preventive Nutrition	3(3+0)
HNAD-6121	Functional Foods and Nutraceutical	3(3+0)
HNAD-6122	Research Methods and Scientific Writing in Nutrition	3(1+2)
HNAD-6123	Infant and Young Child Feeding	3(2+1)
Total Credit Hours		18 (14+4)
SEMESTER-VII		
HNAD-6124	Clinical Biochemistry	3(3+0)
HNAD-6125	Nutrition Policies and Programs	3(3+0)
HNAD-6126	Meal Planning and Management	3(3+0)
HNAD-6127	Dietetics-III	3(2+1)
HNAD-6128	Nutritional Practices in Clinical Care	3(2+1)
HNAD-6129	Nutrition and Psychology	3(3+0)
Total Credit Hours		18(13+5)
SEMESTER-VIII		
HNAD-6130	Internship and Report Writing	10 (0+10)
Total Credit Hours		10 (0+10)
Grand Total Credit Hours		138 (104+34)



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The course aims at developing linguistic competence by focusing on basic language skills in integration to make the use of language in context. It also aims at developing students' skills in reading and reading comprehension of written texts in various contexts. The course also provides assistance in developing students' vocabulary building skills as well as their critical thinking skills. The contents of the course are designed on the basis of these language skills: listening skills, pronunciation skills, comprehension skills and presentation skills. The course provides practice in accurate pronunciation, stress and intonation patterns and critical listening skills for different contexts. The students require a grasp of English language to comprehend texts as organic whole, to interact with reasonable ease in structured situations, and to comprehend and construct academic discourse. The course objectives are to enhance students' language skill management capacity, to comprehend text(s) in context, to respond to language in context, and to write structured response(s).

Contents

- 1 Listening skills
- 2 Listening to isolated sentences and speech extracts
- 3 Managing listening and overcoming barriers to listening
- 4 Expressing opinions (debating current events) and oral synthesis of thoughts and ideas
- 5 Pronunciation skills
- 6 Recognizing phonemes, phonemic symbols and syllables, pronouncing words correctly
- 7 Understanding and practicing stress patterns and intonation patterns in simple sentences
- 8 Comprehension skills
- 9 Reading strategies, summarizing, sequencing, inferencing, comparing and contrasting
- 10 Drawing conclusions, self-questioning, problem-solving, relating background knowledge
- 11 Distinguishing between fact and opinion, finding the main idea, and supporting details
- 12 Text organizational patterns, investigating implied ideas, purpose and tone of the text
- 13 Critical reading, SQ3R method
- 14 Presentation skills, features of good presentations, different types of presentations
- 15 Different patterns of introducing a presentation, organizing arguments in a presentation
- 16 Tactics of maintaining interest of the audience, dealing with the questions of audience
- 17 Concluding a presentation, giving suggestions and recommendations

Recommended Texts

- 1 Mikulecky, B. S., & Jeffries, L. (2007). *Advanced reading power: Extensive reading, vocabulary building, comprehension skills, reading faster*. New York: Pearson.
- 2 Helgesen, M., & Brown, S. (2004). *Active listening: Building skills for understanding*. Cambridge: Cambridge University Press.

Suggested Readings

- 1 Roach, C. A., & Wyatt, N. (1988). *Successful listening*. New York: Harper & Row.
- 2 Horowitz, R., & Samuels, S. J. (1987). *Comprehending oral and written language*. San Diego: Academic Press.



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INSTITUTE OF FOREIGN STUDIES
UNIVERSITY OF SARGODHA - SARGODHA

The course introduces students to information and communication technologies and their current applications in their respective areas. Objectives include basic understanding of computer software, hardware, and associated technologies. They can make use of technology to get maximum benefit related to their study domain. Students can learn how the Information and Communications systems can improve their work ability and productivity. How Internet technologies, E-Commerce applications and Mobile Computing can influence the businesses and workplace. At the end of semester students will get basic understanding of Computer Systems, Storage Devices, Operating systems, E-commerce, Data Networks, Databases, and associated technologies. They will also learn Microsoft Office tools that includes Word, Power Point, Excel. They will also learn Open office being used on other operating systems and platforms. Specific software's related to specialization areas are also part of course. Course will also cover Computer Ethics and related Social media norms and cyber laws.

Contents

1. Introduction, Overview and its types.
2. Hardware: Computer Systems & Components, Storage Devices and Cloud Computing.
3. Software: Operating Systems, Programming and Application Software,
4. Introduction to Programming Language
5. Databases and Information Systems Networks
6. The Hierarchy of Data and Maintaining Data,
7. File Processing Versus Database Management Systems
8. Data Communication and Networks.
9. Physical Transmission Media & Wireless Transmission Media
10. Applications of smart phone and usage
11. The Internet, Browsers and Search Engines.
12. Websites Concepts, Mobile Computing and their applications.
13. Collaborative Computing and Social Networking
14. E-Commerce & Applications.
15. IT Security and other issues
16. Cyber Laws and Ethics of using Social media
17. Use of Microsoft Office tools (Word, Power Point, Excel), mobile apps or other similar tools depending on the operating system.
18. Other IT tools/software specific to field of study of the students if any

Recommended Texts

1. Vermaat, M. E. (2018). *Discovering computers: digital technology, data and devices*. Boston: Course Technology Press.

Suggested Readings

1. Timothy J. O'Leary & Linda I. (2017). *Computing essentials*, (26th ed.). San Francisco: McGraw Hill Higher Education.
2. Schneider, G. M., & Gersting, J. (2018). *Invitation to computer science*. Boston: Cengage Learning.



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INSTITUTE OF FOOD SCIENCE & DIETITRY
UNIVERSITY OF SARGODHA, SARGODHA

The course is designed to acquaint the students of BS Programs with the rationale of the creation of Pakistan. The students would be apprised of the emergence, growth and development of Muslim nationalism in South Asia and the struggle for freedom, which eventually led to the establishment of Pakistan. While highlighting the main objectives of national life, the course explains further the socio-economic, political and cultural aspects of Pakistan's endeavours to develop and progress in the contemporary world. For this purpose, the foreign policy objectives and Pakistan's foreign relations with neighbouring and other countries are also included. This curriculum has been developed to help students analyse the socio-political problems of Pakistan while highlighting various phases of its history before and after the partition and to develop a vision in them to become knowledgeable citizens of their homeland.

Contents

1. Contextualizing Pakistan Studies
2. Geography of Pakistan: Geo-Strategic Importance of Pakistan
3. Freedom Movement (1857-1947)
4. Pakistan Movement (1940-47)
5. Muslim Nationalism in South Asia
6. Two Nations Theory
7. Ideology of Pakistan
8. Initial Problems of Pakistan
9. Political and Constitutional Developments in Pakistan
10. Economy of Pakistan: Problems and Prospects
11. Society and Culture of Pakistan
12. Foreign Policy Objectives of Pakistan and Diplomatic Relations
13. Current and Contemporary Issues of Pakistan
14. Human Rights: Issues of Human Rights in Pakistan

Recommended Texts

1. Kazimi, M. R. (2007). *Pakistan studies*. Karachi: Oxford University Press.
2. Sheikh, J. A. (2004). *Pakistan's political economic and diplomatic dynamics*. Lahore: Kitabistan Paper Products.

Suggested Readings

1. Hayat, S. (2016). *Aspects of Pakistan movement*. Islamabad: National Institute of Historical and Cultural Research.
2. Kazimi, M. R (2009). *A concise history of Pakistan*. Karachi: Oxford University Press.
3. Talbot, I. (1998). *Pakistan: A modern history*. London: Hurst and Company.



DIRECTOR
INSTITUTE OF POLITICAL STUDIES
UNIVERSITY OF SARGODHA - SAKHRI

This subject aims to yield students with a sense of practical relevance of biology to everyday life. This will make students comprehend life by understanding some of the molecular processes that occur in and around cells, to make students cognizant of biologic phenomenon (nature, body, etc.) on an evolutionary, ecological, behavioral, physiologic, tissue, cellular, and molecular level. In this subject students will examine how life is organized into hierarchical levels; how living organisms use and produce energy; how life grows, develops, and reproduces; how life responds to the environment to maintain internal stability; and how life evolves and adapts to the environment. Moreover, it will also enable them to investigate the biological molecules, homeostasis in vertebrates, and the influence of hormones on coordination and control systems of animal body. Upon completion of this subject students will have an enhanced knowledge and appreciation of the basics of growth and development plans of animals and can develop cogent and critical arguments based on the course material.

Contents

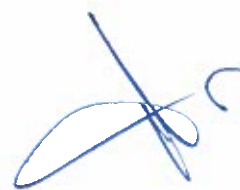
1. Introduction: Nature and scope of biology
2. Branches of biology
3. Relationship between biology and psychology
4. Biological molecules: Carbohydrates, Proteins, Fats, Nucleic acids, Water
5. The cell: Structure and function of cell
6. Cell organelles
7. Different types of cells
8. Homeostasis: Osmoregulation
9. Structure and functions of Nephron
10. Thermoregulation
11. Coordination and control: Structure and physiology of Neuron
12. Introduction to central and peripheral nervous system
13. Hormones
14. Basics of growth and development
15. Embryonic and post embryonic development

Recommended Texts

1. Michael, J., & Lenardo. (2013). *Immune Homeoststis: Methods and protocols*. New Jersey: Humama press.
2. Paradise, C. J., & Campbell, A. M. (2016). *Organismal Homeostasis*. New York: Momentum Press.

Suggested Readings

1. Lisa A. U., Michael L. C., Steven A. W., Peter V. M., Jane B. R., & Neil A. C. (2016). *Campbell biology*. (11th ed.) London: Pearson.
2. Cambell, N. A. Mitchell, I. G., & Reece, J. B. (2009). *Biology: Concepts and connections*. (6th ed.) San Francisco: Addison Wesley, Longman
3. Anna A. S., Richard B. P. (2019). *An Introduction to Conservation Biology* (2nd ed.) Oxford: Oxford University Press.



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To prepare the students, not majoring in mathematics, with the essential tools of algebra to apply the concepts and the techniques in their respective disciplines. Mathematics, as a study of patterns, both practical and abstract, involves analytical thought, logical reasoning, problem solving skills, and precise communication. Because of its power and versatility, mathematics has often been called the "Queen of the Sciences." There is no field of scientific inquiry that does not express itself through the language of mathematics. An undergraduate degree in mathematics provides an excellent foundation for students who are interested in pursuing an advanced degree in mathematics or in a related specialized profession. Mathematics can also provide an excellent foundation for students considering professional degrees in such allied fields such as Law, Business Administration, or Medicine. The kinds of analytical and logical thinking skills that one develops while studying mathematics are precisely the skills that recruiters look for in potential employees. Jobs involving significant mathematical background also consistently rank near the top of the list in annual career surveys.

Contents

- 1 Real Numbers
- 2 Relations and Functions
- 3 Inequalities
- 4 Quadratic Functions and Complex Numbers
- 1 Linear Equations and Quadratic Equations: Formation of Linear equation
- 2 Solving Linear equation involving one variable
- 3 Solution of Quadratic equation by factorization method
- 4 Solution of quadratic equation by square completion methods
- 5 Solution of quadratic equation by quadratic formula
- 5 Application of quadratic equation
- 6 Sequence and Series
- 7 Types of Sequences; A. P, A. M., G. P., H. P
- 8 Trigonometric Functions
- 9 Trigonometric Applications
- 10 Graph of Functions and Modelling
- 11 Limits and Continuity
- 12 Derivatives
- 13 Integration
- 14 Probability and Binomial Theorem.

Recommended Texts

1. Gantert, A. X. (2009). *Algebra 2 and trigonometry*. New York: AMCOS School Publication INC.
2. Kaufmann, J. E. (1994). *College algebra and trigonometry* (3th ed.) Boston: PWS-Kent Pub. Co.

Suggested Readings

1. Swokowski, E. W. (1993). *Fundamentals of algebra and trigonometry* (8th ed.) Boston: PWS-Kent Pub. Co.
2. Nauman, K. (2019). *Basic mathematics-I: algebra and trigonometry* (2nd ed.) Lahore: Al-Hassan Pub.
3. Anton, H. (1999). *Calculus: A new horizon* (6th ed.). New York: John Wiley.
4. Stewart, J. (2012). *Calculus* (7th ed.). Belmont: Brooks/Cole.



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This is an introductory course which enables the students to understand the basics of food science and technology. Students will explore and gain an understanding into the history of Food Science and the factors that have shaped Food Science in Pakistan, the organizations involved in Food manufacturing, food regulatory processes, Food composition, its classification depending on sources, consumption pattern and basic analysis of food components. The course is the study of the physical, biological, and chemical makeup of food; the causes of food deterioration; and the concepts underlying food processing. Food scientists and technologists apply scientific disciplines including chemistry, engineering, microbiology, and nutrition to the study of food to improve the safety, nutrition, wholesomeness and availability of food. Depending on their area of specialization, food scientists may develop ways to process, preserve, package, and/or store food according to industry and government specifications and regulations. It could involve enhancing the taste, making it last longer, making sure it's safe to eat, or even boosting its nutritional content.

Contents (Theory)

- 1 Introduction to food science, food technology, relationship with other disciplines
- 2 Career opportunities.
- 3 Significance of food science and technology
- 4 Food industry: history, developments
- 5 Important food industries in Pakistan
- 6 Food sources: plants, animals and marine
- 7 Food constituents and their functions: water, carbohydrates, lipids, proteins, vitamins, minerals.
- 8 Classification of foods on the basis of perishability and pH
- 9 Food spoilage agents: enzymes, microorganisms, pests, physical factors
- 10 Principles of food preservation
- 11 Prevention or delay of autolysis, microorganisms and pests

Contents (Practical)

- 1 Use of basic food laboratory equipment.
- 2 Estimation of Moisture, Fat, Protein, Carbohydrates, Fiber and Ash content in food samples.
- 3 Determination of soluble solids, total solids, pH, Acidity, total sugars, Specific gravity and Refractive index.

Recommended Texts

- 1 Awan, J. A. (2018). *Food science and technology*. Faisalabad: Unitech Communications.
- 2 Robert, L. S., Ramirez, A. O., & Clarke, A. D. (2015). *Introducing food science*. (2nd ed.) Florida: CRC Press.

Suggested Readings

- 1 Stewart, G. F., & Amerine, M. A. (2012). *Introduction to food science and technology*. Amsterdam: Elsevier.
- 2 Potter, N. N., & Hotchkiss, J. H. (2012). *Food science*. Berlin: Springer Science & Business Media.



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The course aims to familiarize with the role of macro and micronutrients in human nutrition, to understand the absorption, digestion and metabolism of nutrients in the human, and to abreast knowledge about the health disorders due to consumption of non-optimal quantities of the nutrients

Contents

1. Introduction: food, nutrients, nutrition, malnutrition - global and local scenario, diet, balanced diet, food groups, foundations of healthy diet, meal planning
2. Water: functions, regulation in body, dietary requirements, electrolytes and acid-base balance
3. Carbohydrates: types, role in body, dietary fiber, bulk and alternative sweeteners, recommended intake and energy value
4. Fats and oils: types, functions, recommendations concerning fat intake, fat substitutes; Proteins: amino acids, protein synthesis and degradation, classification, functions, quality of proteins, dietary requirements
5. Vitamins: classification, types, sources, role in body; Mineral elements: types, requirements, sources, role in body
6. Digestion: alimentary tract, digestive juices, secretions; Absorption and metabolism of nutrients: carbohydrates, protein, lipids; Nutrient and dietary deficiency disorders and special nutrient requirements.

Recommended Texts

1. Awan, J.A. (2011). Elements of Food and Nutrition. Unitech Communications, Faisalabad, Pakistan
2. Bamji, M.S., Krishnaswamy, K. & Brahmam, G.N.V. (2009). Textbook of Human Nutrition. 3rd Ed. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi, India
3. Eastwood, M. (2003). Principles of Human Nutrition. 2nd Ed. John Wiley & Sons, Inc., New York, USA
4. Geissler, C. & Powers, H. (2011). Human Nutrition. 12th Ed. Churchill Livingstone, London, UK



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UNIVERSITY OF SARGODHA

The course aims to understand the metabolic roles of carbohydrates, fats, proteins, vitamins and minerals, to generalize the way in which nutrients are processed through major metabolic fates in order to perform various energetic and structural functions in the body, to establish the role of enzymes and hormones in metabolism of nutrients.

Contents (Theory)

7. Metabolic pathways: objectives, chemical reactions, enzymes, co-enzymes and prosthetic groups, metabolic pathways
8. Role of ATP in metabolism: objectives, functions, phosphorylation of ADP to ATP
9. Digestion and absorption: gastrointestinal tract, digestion and absorption of carbohydrates, fats and proteins
10. Absorption of vitamins and minerals
11. Metabolism of carbohydrates and fats
12. Protein nutrition and metabolism
13. Nitrogen balance and protein requirements
14. Protein synthesis and metabolism of amino acids
15. Integration and control of metabolism: pattern of metabolic regulation, intracellular regulation of enzyme activity, responses to fast acting hormone by covalent modification of enzyme proteins, slow acting hormones, changes in enzymes synthesis.

Recommended Texts

1. Bender, D.A. (2014). Introduction to Nutrition and Metabolism, 5th ed. CRC Press, Taylor & Francis, Boca Raton, FL, USA.
2. Davidson, S., Passmore, R., & Eastwood, M.A. (1986). Human Nutrition and Dietetics. Churchill Livingstone, New York, U.S.A.
3. Gropper, S.S. & Smith, J.L. (2013). Advanced Nutrition and Human Metabolism, 6th Ed. Wadsworth Cengage Learning, Belmont, CA, USA.
4. Kohlmeier, M. (2015). Nutrient Metabolism: Structures, Functions, and Genes, 2nd Ed. Academic Press, San Diego, CA, USA.
5. Lanham-New, S.A., Macdonald, I.A. & Roche, H.M. (2011). Nutrition and Metabolism, 2nd Ed. Blackwell Publishing, Jones & Wiley Sons Ltd., Chester, West Sussex, UK.
6. Whitney, E.N. & Rolfes, S.R. (2016). Understanding Nutrition, 14th ed. Cengage Learning, Belmont, CA, USA.

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INSTITUTE OF FOOD SCIENCE & DIETETICS
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Academic writing is a formal, structured and sophisticated writing to fulfill the requirements for a particular field of study. The course aims at providing understanding of writer's goal of writing (i.e. clear, organized and effective content) and to use that understanding and awareness for academic reading and writing. The objectives of the course are to make the students acquire and master the academic writing skills. The course would enable the students to develop argumentative writing techniques. The students would be able to the content logically to add specific details on the topics such as facts, examples and statistical or numerical values. The course will also provide insight to convey the knowledge and ideas in objective and persuasive manner. Furthermore, the course will also enhance the students' understanding of ethical considerations in writing academic assignments and topics including citation, plagiarism, formatting and referencing the sources as well as the technical aspects involved in referencing.

Contents

- 1 Academic vocabulary
- 2 Quoting, summarizing and paraphrasing texts
- 3 Process of academic writing
- 4 Developing argument
- 5 Rhetoric: persuasion and identification
- 6 Elements of rhetoric: Text, author, audience, purposes, setting
- 7 Sentence structure: Accuracy, variation, appropriateness, and conciseness
- 8 Appropriate use of active and passive voice
- 9 Paragraph and essay writing
- 10 Organization and structure of paragraph and essay
- 11 Logical reasoning
- 12 Transitional devices (word, phrase and expressions)
- 13 Development of ideas in writing
- 14 Styles of documentation (MLA and APA)
- 15 In-text citations
- 16 Plagiarism and strategies for avoiding it

Recommended Texts

- 1 Swales, J. M., & Feak, C. B. (2012). *Academic writing for graduate students: Essential tasks and skills* (3rd ed.). Ann Arbor: The University of Michigan Press.
- 2 Bailey, S. (2011). *Academic writing: A handbook for international students* (3rd ed.). New York: Routledge.

Suggested Readings

- 1 Craswell, G. (2004). *Writing for academic success*. London: SAGE.
- 2 Johnson-Sheehan, R. (2019). *Writing today*. Don Mills: Pearson.
- 3 Silvia, P. J. (2019). *How to write a lot: A practical guide to productive academic writing*. Washington: American Psychological Association.

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INSTITUTE OF FOREIGN STUDIES
UNIVERSITY OF SARGODHA, SARGODHA

The course aims to provide basic information about Islamic studies, to enhance understanding of the students regarding Islamic civilization, to improve students skill to perform prayers and other worships, to enhance the skill of the students for understanding of issues related to faith and religious life.

Contents

1. Introduction to Quranic Studies: Basic concepts of Quran.
2. History of Quran. Uloom-ul-Quran.
3. Study of selected text of Holly Quran-I.
4. Verses of Surah Al-Baqra related to faith (VerseNo-284-286).
5. Verses of Surah Al-Hujrat related to Adab Al-Nabi (VerseNo-1-18).
6. Verses of Surah Al-Mumanoon related to characteristics of faithful (VerseNo-1-11). Verses of Surah al-Furqan related to social ethics (VerseNo.63-77). Verses of Surah Al-Inam related to ihkam (Verse No-152-154). Study of Selected Text of Holly Quran-II: Verses of Surah Al-Ihzab related to Adab al-Nabi (VerseNo.6,21,40,56,57,58).
7. Verses of Surah Al-Hashar (18,19,20) related to thinking, Day of Judgment.
8. Verses of Surah Al-Saf related to Tafakar,Tadabar (Verse No-1,14). Seerat of Holy Prophet (S.A.W)-I: Life of Muhammad Bin Abdullah (Before Prophet Hood).
9. Life of Holy Prophet (S.A.W) inMakkah. Important lessons derived from the life of Holy Prophet in Makkah. Seerat of Holy Prophet (S.A.W)-II: Life of Holy Prophet (S.A.W) inMadina. Important events of life Holy Prophet in Madina. Important lessons derived from the life of Holy Prophet in Madina. Introduction To Sunnah: Basic concepts ofHadith. History ofHadith.Kinds of Hadith.Uloomul Hadith.
10. Sunnah and Hadith. Legal position of Sunnah. Selected Study from text of Hadith. Introduction To Islamic Law and Jurisprudence: Basic concepts of Islamic Law andJurisprudence. History and importance of Islamic Law and Jurisprudence. Sources of Islamic Law andJurisprudence.Nature of differences in Islamic Law.
11. Islam and sectarianism. Islamic Culture and Civilization: Basic concepts of Islamic Culture and civilization. Historical development of Islamic Culture and civilization. Characteristics of Islamic Culture and civilization.
12. Islamic Culture and civilization and contemporary issues. Islam and Science: Basic concepts of Islam and Science. Contributions of Muslims in the development of Science. Quranic and Science. Islamic EconomicSystem: Basic concepts of Islamic economic system.
13. Means of distribution of wealth in Islamic economics. Islamic concept of Riba.Islamic ways of trade and commerce. Political System of Islam: Basic concepts of Islamic political system. Islamic concept of sovereignty.Basic institutions of Govt. inIslam. Islamic History: Period of Khlaft-E-Rashida. Period of Ummayyads. Period ofAbbasids.
14. Social System of Islam: Basic concepts of cocial system of Islam. Elements of family. Ethical values of Islam.

Recommended Texts

1. HameedUllahMuhammad, —EmergenceofIslaml,IRI,Islamabad
2. HameedUllahMuhammad, —Muslim Conduct of Statel
3. HameedUllah Muhammad, _Introduction to Islam
4. Hussain Hamid Hassan, —An Introduction to the Study of Islamic Lawlleaf Publication Islamabad, Pakistan.
5. Ahmad, H. (1993). Principles of Islamic Jurisprudence. Islamic Research Institute, International Islamic University, Islamabad.
6. Mir, W. (1982). Muslim Jurisprudence and the Quranic Law of Crimes. Islamic Book Service.
7. Bhatia, H.S. (1989). Studies in Islamic Law, Religion and Society. Deep and Deep Publications, NewDelhi.
8. Dr. Muhammad Zia-ul-Haq, (2001). Introduction to Al Sharia Al-Islamia. Allama Iqbal Open University, Islamabad.


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The course aims to acquaint knowledge about structural components of body. To know about histology and blood composition for the identification of diseases

Contents (Theory):

1. Introduction
2. Gross anatomy
3. Histology
4. Terminology: bones and joints, muscles, cartilage, body structure, tissue, cell, organs
5. Digestive system: oral cavity, stomach, small & large intestine
6. Urinary system/ excretory: kidneys, ureter, bladder, urethra
7. Cardio-vascular system: heart and Pericardium, Arteries system, venous system / Major arteries and veins
8. Respiratory system: Upper respiratory-Pharynx, Larynx, Trachea sinuses; Lower respiratory- Bronchus, Lungs, Diaphragm
9. Reproduction system: Male-Testis, Spermatic cord, Penis, Prostate, Bulbourethral gland/ other glands; Female: Ovaries, Fallopian tubes, Uterus, Vagina, Vulva, Breast
10. Endocrinology: Pituitary, Thyroid, Parathyroid, Thymus, Adrenal, Renal, super renal
11. Lymphatic system: Lymph, Lymph vessel, lymph node
12. Nervous system: Brain, Spinal cord, Cranial nerves, Brachial plexus, Sciatic nerve
13. Sensory organs: Eyes, Ears, Taste buds, Smell, Touch.

Contents (Practical)

1. Four primary tissues of body - Epithelium tissues
2. Introduction, types, epithelial glands - endocrine and exocrine, connective tissues: loose connective tissue, collagenous, elastic and reticular fiber
3. T-cell of loose cartilage (fibroblast, fat cell, plasma cell, macrophages, mast cell)
4. Blood: leukocytes, WBC, RBC and Platelets
5. Cartilage and its types; Muscle and its types; Histology in: GIT, respiratory, urinary systems, breast, uterus. Microscopy and preparation of histological slides.

Recommended Texts

1. Agur, A. M., & Dalley, A. F. (2009). *Grant's atlas of anatomy*. Lippincott Williams & Wilkins.
2. Coulter, D. (2004). *Anatomy of hatha yoga: A manual for students, teachers, and practitioners*. Motilal Banarsidass Publ..

Suggested Readings

1. Tortora, G. J., & Petti, K. (2002). *Principles of human anatomy*. John Wiley & Sons.



DIRECTOR
INSTITUTE OF FOOD SCIENCE & TECHNOLOGY
UNIVERSITY OF SARGODHA, SARGODHA

The course aims to familiarize about the functions of different body organs and to understand risk parameters related to assessment and prognosis of different diseases.

Contents (Theory):

1. Introduction to human physiology
2. Organization level and cell physiology
3. Digestive system: oral cavity, salivary glands, teeth, tongue; oesophagus, pharynx, larynx, stomach, small intestine, large intestine, accessory glands associated with GIT (liver, gallbladder and pancreas)
4. Urinary system: introduction, functions of kidney and nephron, Glomerular filtration, tubular reabsorption, tubular secretion, urine excretion and plasma clearance, fluid and acid base balance
5. Cardiovascular system: functions of heart and blood vessels, electrical activity of heart, mechanical events of heart, cardiac output and its control.

Contents (Practical)

1. Blood grouping
2. Hb estimation; Counting of blood cells; complete blood count (CBC)
3. Electrolyte estimation; Hydration test
4. Determination of coagulation time, blood pressure, pulse recording
5. Heart activity – electrocardiography; Test for saliva
6. Respiratory movement, maximum breathing capacity, pulmonary function test
7. Intestinal motility; Renal function tests and urine analysis

Recommended Texts

3. Higgins, V. (2006). Human physiology: the basis of medicine.
4. Guyton A.C. and J.E. Hall. 2006. Textbook of Medical Physiology. 11th Ed. J.F. Kennedy Blvd., Philadelphia, USA.
5. Rahman, Z.U., B. Aslam, Khan, J.A. and T. Khaliq. 2007. Manual of Physiology-II. 2nd Ed. MAS Computers, Faisalabad, Pakistan.

Suggested Readings

1. Tortora, G. J., & Derrickson, B. H. (2018). Principles of anatomy and physiology. John Wiley & Sons.

DIRECTOR
INSTITUTE OF FOOD SCIENCE & TECHNOLOGY
UNIVERSITY OF SARGODHA, SARGODHA

- The course aims to abreast knowledge about the normal nutrient metabolism in healthy human and to understand interactions between the intake, absorption, transport, processing, storage, catabolism and excretion of nutrients and the regulation of metabolic homeostasis in the intact organism

Contents

1. Carbohydrates: nature, structures; Classification and functions of carbohydrates: monosaccharides, disaccharides, oligosaccharides, polysaccharides
2. Digestion and absorption of carbohydrates: glycolytic pathway, glycolysis, glycogenesis, glycogen catabolism, tricarboxylic acid cycle and pentose phosphate pathway
3. Biosynthesis of carbohydrates: gluconeogenesis; Regulation of carbohydrate metabolism pathways; CHO metabolism in diabetes
4. Proteins: structural features, characteristics, functions; Amino acids: biosynthesis and degradation, food sources (on the basis of their functions in human body)
5. Digestion and absorption; Metabolic fates of amino acids: deamination, transamination, Urea cycle, Ketogenic amino acids, Glucogenic amino acids, Protein metabolism in liver and kidney diseases, Protein energy malnutrition
6. Lipids-nature, classification; Fatty acids: saturated, unsaturated, polysaturated, glycerol, cholesterol, sterol; Lipoprotein systems (blood lipids)
7. Fats biosynthesis: lipids, phospholipids and sphingolipids; Lipid biosynthesis: cholesterol, sterol; Lipid oxidation; Essential fatty acids: sources, health benefits; Adipose tissues
8. Digestion, absorption, metabolism and transportation of lipids; Oxidation of fatty acids(beta oxidation)
9. Ketone bodies

Recommended Texts

1. Berdanier, C.D. & J. Zempleni. 2009. Advances Nutrition: Macronutrients, Micronutrients and Metabolism. CRC Press, Taylor & Francis Group, Boca Raton, FL, USA.
2. Byrd-Bredbenner, C., G. Moe, D. Beshgetoor & J. Berning. 2015. Wardlaw's Perspectives in Nutrition. 10th Ed. McGraw-Hill Education, Columbus, OH, USA.
3. David L.N., A.L. Lehninger & M.M. Cox. 2013. Lehninger Principles of Biochemistry. 6th Ed. W.H.Freeman and Company, New York.

Suggested Readings

1. Gropper, S.S. & Smith JL. 2013. Advanced Nutrition and Human Metabolism. 6th Ed. Cengage Learning, Belmont, CA, USA



DIRECTOR
INSTITUTE OF FOOD SCIENCE & TECHNOLOGY
UNIVERSITY OF SARGODHA, SARGODHA

The course aims to teach food safety as a scientific discipline describing handling, preparation, and storage of food in ways that prevent food-borne illness. Food can transmit pathogens which can result in the illness or death of the person or other animals. Objective of course is to give concepts of food safety and risk assessments and to provide knowledge about of food safety systems and food laws. The quality and safety of food is an important task, not only for the food industry. The issue of quality and safety of food is highly vital for each person. The way we eat affects our health, working capacity, quality of life, and the health and life of future generations. Food contamination can occur at any stage in the supply chain, and the primary responsibility for ensuring safety lies on food producers. Nevertheless, in many cases, incidents related to foodborne diseases are the result of non-compliance with the rules for handling food at home, catering, and marketing.

Contents

- 1 What is Food Safety?
- 2 Characterization of food hazards, biological, chemical and physical
- 3 Hazards from natural origin
- 4 Hazards produced during food processing, storage and preparation
- 5 Hazards associated with nutrient fortification
- 6 Food Safety systems, GMP, TQM
- 7 HACCP
- 8 Pakistan Standards and Quality Control Authority
- 9 Pure Food Rules
- 10 Punjab Food Authority
- 11 International Organization for Standardization
- 12 National Standard for Drinking Water Quality
- 13 Food labeling
- 14 Concept of Halal, Islamic food laws and regulations
- 15 Consumer laws in Pakistan
- 16 The World Trade Organization (WTO)
- 17 Codex Alimentarius.

Recommended Texts

- 1 Rai, V. R., & Bai, J. A. (2017). *Food safety and protection*. London: CRC Press, Taylor & Francis Group.
- 2 Gabriela, S., & Kiran, P. (2016). *International food law and policy*. Switzerland: Springer International Publishing.
- 3 Awan, J. A., & Anjum, F. M. (2010). *Food toxicology*. Faisalabad: Unitech Communications.

Suggested Readings

- 1 Schmidt, R. H., & Rodrick, G. E. (2003). *Food safety handbook*. New York: Wiley-Interscience, A John Wiley & Sons Publications.
- 2 PSQCA. (2010). *Standards for different food items*. Karachi: Pakistan Standards and Quality Control Authority.



DIRECTOR
INSTITUTE OF FOOD STUDIES
UNIVERSITY OF SAHIBWAL

The course aims to provide basic information of learning basics of Statistics and its application in sciences and research.

Contents

1. Definition and importance of statistics in agriculture.
2. Data different types of data and variables.
3. Classification and tabulation of data. Frequency, distribution, stem and leaf diagram.
4. Graphical representation of data Histogram, Frequency polygon, Frequency curve.
5. Measure of Central tendency.
6. Definition and calculation of Arithmetic mean.
7. Geometric mean, Harmonic mean, Median quintiles and Mode in grouped and ungrouped data.
8. Measure of dispersion. Definition and calculation of Range, quartile deviation, Mean deviation, Standard deviation and variance, coefficient of variation.
9. Frequency distribution. Stem and leaf diagram.
10. Various types of graphs. Mean: Geometric mean Harmonic Mean.
11. Median, Quartiles Deviation, Mean deviation. Standard deviation, Variance, Coefficient of variation. Skewness and kenosis

Recommended Texts

1. Muhammad, S., & Kamal, S. Introduction to Statistical Theory Part- I (Latest Edition).
2. Muhammad F., Statistical Methods and Data Analysis
3. Crawshaw J. & Chambers J. (1994). Concise Course in A. Level Statistic with world examples.
4. Dietrich-II, F., & Thomes, J.K. (1986). Basic Statistics an Inferential Approach 2nd Ed.

DIRECTOR
INSTITUTE OF FOOD SCIENCE & NUTRITION
UNIVERSITY OF SARGODHA, SARGODHA

- The course aims to understand the functions of respiratory, endocrine, nervous, immune and reproductive systems and to acquaint knowledge about hormonal and neural interactions on metabolism.

Contents

1. Respiratory system: respiratory mechanics, gas transport and exchange mechanisms, control of respiration, respiratory capacities and volumes, non-respiratory functions of lungs
2. Immune system and lymphatic system: body defense system and regulation
3. Endocrinology and reproduction: reproductive physiology, role of hormones in spermatogenesis, menstrual cycles and pregnancy, energy balance and temperature regulation
4. Nervous system: principles of neuronal and hormonal communication systems, functional organization of nervous system, central, peripheral and autonomic nervous system, action potentials, types of neurotransmitters and their role in pathophysiological integration in body
5. Musculoskeletal system: principles of neuromuscular physiology.

Recommended Texts

1. Brar, R.S., H.S. Sandhu & A. Singh. (2002). Veterinary Clinical Diagnosis by Laboratory Methods. Kalyani Publishers Ludhiana, New Delhi, India.
2. Gillian, P. & C.D. Richards. (2006). Human Physiology: The Basis of Medicine, 3rd Ed. Oxford University Press, London.
3. Guyton A.C. & J.E. Hall. (2006). Textbook of Medical Physiology, 11th Ed. J.F. Kennedy Blvd., Philadelphia, USA.
4. Rahman, Z.U., B. Aslam, J.A. Khan & T. Khaliq. (2007). Manual of Physiology- I&II, 2nd Ed. MAS Computers, Faisalabad, Pakistan.

Suggested Readings

1. Tortora, G.J. (2008). Principles of Anatomy and Physiology, 12th Ed. John Wiley & Sons, Inc., New York, USA.



DIRECTOR
INSTITUTE OF FOOD SCIENCE & TECHNOLOGY
UNIVERSITY OF SARGODHA SARGODHA

The course aims to acquaint knowledge about the nomenclature, structures and properties of chemical constituents and to grasp the knowledge about the energy yielding cycle like glycolysis, Kerbs cycle, β -oxidation etc.

Contents (Theory)

1. Introduction, scope and importance of biochemistry
2. Brief introduction of prokaryotic and eukaryotic cells
3. Bio-macromolecules: composition and organization
4. Energy and Principles of bioenergetics
5. Water: Properties of water, acid/base properties, dissociation of water and pH value, pH buffering capacity, transportation mechanisms across bio-membranes and osmosis
6. Proteins: Amino acids - structure, nomenclature, classification, Primary structure of proteins - peptide bond, sequencing, synthesis, Secondary structure - α -helices, β -sheets, Three dimensional structure of proteins, methods for protein structural determination - X-ray, NMR and homology modeling, tertiary and quaternary structures of proteins, protein denaturation
7. Methods for purifying and studying proteins; Enzymes: functions, mode of action, specificity and inhibition, classification and nomenclature, factors affecting enzymes activity
8. Introduction to carbohydrates (Glycobiology): biosynthesis, metabolism, glycolysis, Kerbs cycle, Mitochondrial electron transport chain and ATP synthesis
9. Lipids: introduction, lipogenesis, lipids and lipoproteins in relation to lipid storage diseases, sterol and steroids
10. Overview of nucleic acids.

Content (Practical)

1. Model visualization of prokaryotic and eukaryotic cells
2. Solution preparation
3. Preparation of different buffers and their pH adjustment
4. Activity of different enzymes like amylase in saliva
5. Enzyme purification
6. DNA extraction
7. Gel electrophoresis; Determination of amino acid profile using HPLC/Amino acid Analyzer
8. Energy estimation through Bomb Calorimeter.

Recommended Texts

1. Ahmad, M. (2000). Essentials of Medical Biochemistry, 7th Ed. Ilmi Book House, Urdu Bazar, Lahore.
2. Nelson, D.L. & Cox, M.M. (2013). Lehninger Principles of Biochemistry, 6th Ed. W.H. Freeman & Co Ltd., New York, USA.
3. Rodwell, V.W., Bender D.A., Botham, K.M., Kennelly, P.J. & Weil, P.A. (2012). Harper's Illustrated Biochemistry, 30th Ed. The McGraw-Hill Education, New York, USA.

DIRECTOR
INSTITUTE OF FOOD SCIENCE & NUTRITION
UNIVERSITY OF SARGODHA SARGODHA

The course aims to understand the functional roles of vitamins and minerals in human nutrition with special reference to metabolism and to familiarize with the deficiency symptoms and health disorders associated with improper intake of vitamins and minerals, and to analyze losses of micronutrients during food processing.

Contents

1. Vitamins: nomenclature, history, development of the vitamins concept.
2. Fat and water soluble vitamins: sources, chemistry, absorption, transport and storage, metabolism, function, deficiency, bioassay, interaction with other nutrients, recommended daily allowances and toxicities
3. Diagnosis, treatments and prevention of vitamin deficiencies in human
4. Stability of vitamins under different storage conditions
5. Vitamin like compounds
6. Losses of vitamin during food processing
7. Minerals: types, history and developments of the minerals concept
8. Criteria of essentiality of minerals and their classification
9. Minerals distribution in human body
10. Macro- and micro- minerals: dietary sources, absorption, metabolism, metabolic function, deficiency symptoms and disorders, recommended daily allowances, diagnosis, treatments and prevention of mineral deficiencies in human
11. Water and electrolytes.

Recommended Texts

1. Allen, L. (2006). Guidelines on Food Fortification with Micronutrients. World Health Organization, Geneva, Switzerland.
2. Bender, D.A. (2009). Nutritional Biochemistry of Vitamins, 2th Ed. Cambridge University Press, Cambridge, UK.
3. DiSilvestro, R.A. (2004). Handbook of Minerals as Nutritional Supplements. CRC Press, Taylor & Francis Group, Boca Raton, FL, USA.

Suggested Readings

1. Gropper, S.S., & Smith, J.K. (2012). Advanced Nutrition and Human Metabolism, 6thEd. Wadsworth Cengage Learning, Belmont, CA, USA.


DIRECTOR
INSTITUTE OF FOOD SCIENCE & NUTRITION
UNIVERSITY OF SARGODHA, SARGODHA

The course aims to acquire an in-depth understanding of toxicology related to food and health, to understand various types of toxins from plant, animal and plant origins as well induced by extraneous chemicals and to familiarize with food allergens, their health implications and management

Contents

1. Toxicology: introduction, dose-response, absorption, translocation, storage, excretion
2. Natural toxins of plant origin: goitrogens, cyanogenic glycosides, favism, lathyrogens, lecithins (hemagglutinins), mutagens in natural plant, caffeine, flavonoids and some others
3. Natural toxins of animal origin: animal liver, marine animals
4. Toxicity by extraneous chemicals: agricultural chemicals, food processing, packaging, additives, adulterants
5. Toxicity from water
6. Microbial toxins: mycotoxins— molds, mushrooms
7. Bacterial food intoxication; Bacterial food infection
8. Food allergies: introduction, incidence of food allergy, food allergens of protein families, animal origin and plant origin
9. Adverse allergic reaction, diagnosis, prevention, legislation and labeling, allergen management, food intolerances, emergency treatment of food-induced allergic reactions.

Recommended Texts

1. Awan, J.A. & F.M. Anjum. (2010). Food Toxicology. Unitech Communications, Faisalabad, Pakistan.
2. Coutts, J. & R. Fielder. (2009). Management of Food Allergens. John Wiley & Sons Ltd., Chichester, West Sussex, UK.
3. Jedrychowski, L. & Wichers, H.J. (2009). Chemical and Biological Properties of Food Allergens. CRC Press, Taylor & Francis Group, Boca Raton, FL, USA.
4. Metcalfe, D., H.A. Sampson, R.A. Simon & Lack, G. (2014). Food Allergy: Adverse Reaction to Foods and Food Additives, 5th Ed. Wiley-Blackwell, John Wiley & Sons Ltd., Chichester, West Sussex, UK.

Suggested Readings

1. Shibamoto, T & Bjeldanes, L. (2009). Introduction to Food Toxicology, 2nd Ed. Academic Press, London.

DIRECTOR
INSTITUTE OF FOOD SCIENCE & NUTRITION
UP, RAJIV GANDHI SARGODHA

The course aims to identify various types of microorganisms on the basis of morphological, cultural and physiological characteristics, to grasp knowledge about the microbial contamination of foods and factors affecting the growth of microorganisms and to familiarize students about food borne infections, intoxications and role of probiotics in our daily life.

Contents (Theory)

1. Food microbiology: introduction and scope
2. Important microbial genera in foods: bacteria, mold, yeast and yeast like fungi, viruses - general, morphological, cultural and physiological characteristics
3. Factors affecting the growth and survival of microorganisms in food: intrinsic, extrinsic and implicit
4. Contamination and spoilage of perishable, semi perishable and stable foods: sources, transmission, microorganisms
5. Food microbiology and public health: food-borne infections: intoxications
6. Microbiological risk assessment
7. Microbiology in food sanitation: food sanitizers and pathogen reduction - a case study
8. Food fermentation; Probiotics in human health

Contents (Practical)

1. Isolation, identification and characterization of microorganisms: morphology, biochemical;
2. Enumeration of microorganisms in food and water samples (total count, viable count, MPN)
3. Examination of foods for pathogenic organisms (*Escherichia coli*, Coliform, *Salmonella* and *Listeria monocytogenes*)
4. Preparation of fermented and probiotic enriched food products.

Recommended Texts

1. Adams, M.R. & Moss, M.O. (2006). Food Microbiology. The Royal Society of Chemistry, Cambridge, UK.
2. Adams, M.R., Moss, M.O., & McClure, P. (2016). Food Microbiology, 4th Ed. Royal Society of Chemistry, Cambridge, UK.
3. Brown, M. & Stringer, M. (2002). Microbiological risk assessment in food processing. Woodhead Publishing Ltd. Cambridge, UK.
4. Frazier, W.C., Westhoff, D.C. & Vanitha. K.N. (2013). Food Microbiology, 5th Ed. McGraw Hill Book Co., New York, USA.
5. Montville, T.J., Mathews, K.R., & Kniel, K.E. (2012). Food microbiology: an introduction, 3rd Ed. ASM Press, Washington DC, USA.
6. Ray, B. & Bhunia, A. (2013). Fundamentals of Food microbiology, 5th Ed. CRC Press, Taylor & Francis Group, Boca Raton, FL, USA.


DIRECTOR
INSTITUTE OF FOOD SCIENCE & NUTRITION
UNIVERSITY OF SARGODHA, SARGODHA

The course aims at application of statistical designs.

Contents (Theory)


1. Sampling probability and non-probability sampling.
2. Simple random sampling stratified random sampling systematic sampling error
3. Sampling distribution of mean and difference between two means.
4. Interference Theory: Estimation and testing of hypothesis. Type I and type II error.
5. Testing of hypothesis about mean and difference between two means using Z test and T test, Paired T test.
6. Test of association of attributes using X² (chi-square) Testing hypothesis about variance.

Content (Practical)

1. Sampling random sampling.
2. Stratified random sampling.
3. Sampling distribution of mean.
4. Testing of hypotheses regarding population mean.
5. Testing of hypotheses about the difference between population means.
6. Chi square test.
7. Testing of Correlation Coefficient.
8. Fitting of simple linear regression.
9. One-way ANOVA.
10. Two-way ANOVA.

Recommended Texts

1. Muhammad, S., & Kamal, S. Introduction to Statistical Theory Part-II (Latest Edition)
2. Muhammad F. Statistical Methods and Data Analysis
3. Steal R.G.D. & Tarrie, J.H. (1980). Principles and Procedures of Statistics A Bio-metrial approach, 2nd Edition
4. Gomez, K.A. & Gomez, A.A. (1980). Statistical Procedures for Agricultural Research 2nd Edition



DIRECTOR
INSTITUTE OF FOOD SCIENCE & TECHNOLOGY
UNIVERSITY OF SARGODHA, SARGODHA

The course aims to understand the basic terminologies in different pathological states and to elaborate the cell injuries, necrosis, their types and practical applications of pathology.

Contents (Theory)

1. Scope of pathology and concept of diseases
2. Definition and terminology
3. Ischemia, Hypoxia, Necrosis, Infarction, Atrophy, Hypertrophy, Hyperplasia, Metaplasia
4. Plasia, Anaplasia; Response of body to injury and infection, growth disturbance, circulatory disturbances
5. Wound healing and repair, neoplasia, fever, disturbance of mineral deposits and pigmentation, anaemia, diarrhoea, burn injury, infectious diseases, hypertension, acute & chronic inflammation, immunity, allergy, hypersensitivity, ulcer (peptic, duodenal)
6. Leukemia or blood cancer, environmental and nutritional diseases
7. Diagnosis and treatment of Cancer in general, fate, survival and prognosis with tumor.

Contents (Practical)

1. Selection, collection, preservation and dispatch of morbid material for laboratory examination
2. Study of pathological slides of various pathological conditions
3. Demonstration of blood sampling; Basic concepts of anemia
4. Demonstration of routine urinalysis, fecal examination and skin scraping
5. Blood smears, staining and examination; Hematology report interpretation, basic concepts of contents and interpretation of pathology report (serum enzymes and other markers of disease).

Recommended Texts

1. Carton, J. (2012). Oxford Handbook of Clinical Pathology, 1st Ed. Oxford University Press, New York, U.S.A.
2. Kierszenbaum, A.L. & L. Tres, L. (2015). Histology and Cell Biology: Introduction to Pathology, 4th Ed. Elsevier Saunders, Philadelphia, PA, USA.
3. Kumar, V., A.K. Abbas, N. Fausto, & Aster, J.C. (2015). Robbins and Cotran Pathologic Basis of Disease, 9th Ed. Saunders Elsevier, USA.
4. McPhee, S.J. & Ganong, W.F. (2014). Pathophysiology of Disease: An Introduction to Clinical Medicine, 7th Ed. McGraw-Hill Education, New York, USA.



DIRECTOR
Inst. of Health Science & Nutrition
University of Sarawak, Sarawak

The course aims to describe the key milestones of food service industry, to relate the current trends in food service operations and evolution through the business lifecycle, to explain the art underlying menu development and method for recipe standardization, to understand the planning considerations vital for creating a successful food service operation.

Contents (Theory)

1. Food service management: introduction; position, manage and leverage a successful food service operation, The compilation of management practices: tools and techniques, essential approaches. Food service industry: history, segmentation and managerial implication, menu planning and development, recipe standardization, costing and analysis, food supply chain management, distribution channels, supplier selection, purchasing, equipment selection, forecasting, storage management, product inventory management, human resource management, customer services, marketing
2. Food safety: GMP, HACCP. Food product development: process, strategy, design, development, commercialization, evaluation. Key to new product success and failure. Consumer in food product development: consumer behavior, food choices, sensory needs consumer role.
3. Preference mapping and food product development: conducting trials, analyzing, recent developments. Case study of consumer-oriented food product development: reduced-calorie foods - Consumer trends and healthy eating, marketing and technological challenges, success factors. Case study: reduced-calorie on-the-go beverages. The ethics of food production and consumption.
4. Principles of menu development. Food storage: preservation concepts, sanitary food handling procedures, elementary nutrition. Kitchen equipment: selection layout, purchasing. The fabrication of chicken, beef, lamb, and fish, Proper cuts and their uses , recognition of the quality of meat.
5. Cake and pastry: design and decoration. Control for dining rooms, banquets (responsibilities of banquet server, roll call, table setting, serving and clearing, safety and sanitation) and catering events. Human resource management: recruitment and selection, training and development, employee relations, principles of supervision, customer relations, Fundamentals of marketing in the hotel industry.

Contents (Practical)

1. Food product development projects - strategy, design, development, commercialization, launch and evaluation
2. Practical aspects and sensory evaluation techniques
3. Chemical and instrumental quality analysis
4. Production and service of food in volume: Chinese dishes, salads, sandwiches, bakery goods, doughnuts, waffles and desserts. Evaluation of items prepared in class
5. Visit of hotels.

Recommended Texts

1. Barron, C.W., T. Power and D.R. Reynolds. 2012. Introduction to Management in the Hospitality Industry, 10th Ed. John Wiley Sons Inc., Hoboken, New Jersey, USA.
2. Reynolds, D.R. 2014. Foodservice Management Fundamentals. John Wiley Sons Inc., Hoboken, New Jersey, USA.
3. Reynolds, D.R. and K.W. McClusky. 2014. Study Guide to Accompany Foodservice Management Fundamentals. John Wiley Sons Inc., Hoboken, New Jersey, USA.
4. Dennis Lillicaep, John Cousins and Robert Smith 1998. Food and Beverage Services, Great Britain for Hodder and Stoughton Education, London



DIRECTOR
MINISTRY OF HIGHER EDUCATION & SCIENCE
JERUSALEM

The course aims to impart hands-on training in nutritional assessment techniques to diagnose health problems, to understand and apply dietary guidelines for standard nutrient intake and to select an appropriate method for measuring dietary needs of hospitalized patients.

Contents (Theory)

1. Nutritional assessment systems: nutrition surveys, nutrition surveillance, nutrition screening. Nutritional assessment methods: anthropometrics, biochemical, clinical, dietary
2. Measuring food consumption at national level: food balance sheets, total diet consumptions. Food consumption at the household levels: food account, household food records, household 24-hour food record.
3. Measuring food consumption at individual levels: 24-hour recall, repeated 24-hour recall, weighed food records, diet history, food frequency questionnaire.
4. Selecting an appropriate method: determining the mean nutrient intake, calculating the population at risk, ranking individuals by food and nutrient intake.

Contents (Practical)

1. Practicing methods of nutritional assessment (ABCD of Nutritional assessment)
2. Comparison of the data with reference values for drawing conclusions

Recommended Texts

1. Driskell, J.A. & Wolinsky, I. (2011). Nutritional Assessment of Athletes, 2nd Ed. CRC Press, Taylor & Francis Group, New York, USA.
2. Gibson, R.S. (2005). Principles of Nutrition Assessment. Oxford University Press Inc., New York, USA.
3. Lee, R.D. & Nieman, D.C. (2012). Nutritional Assessment, 6th ed. The McGraw Hill Companies Inc., New York, USA.

Suggested Readings

1. McGuire, M. & Beerman, K.A. (2011). Nutritional Sciences: From Fundamentals to Food. Cengage Learning, Belmont, CA, USA.


DIRECTOR
INSTITUTE OF FOOD SCIENCE & NUTRITION
UNIVERSITY OF SAHARUN, SAHARUN

The course aims to get know how about the existing food and drug laws prevailing in the country, to understand duties and authorities of food safety officers and drug inspectors, to familiarize with food and drug laws enforcement agencies in Pakistan.

Contents

12. Punjab Pure Food Rules 2011: legal terms and definitions from the food industry
13. Rules for food additives, categories, permissible limits; Food packaging: rules, criteria for packaging material, labelling requirements
14. Duties and responsibilities of public analysts and food safety officer
15. The Drug Regulatory Authority of Pakistan Act,2012; DRAP Alternative Medicines and Health Products Enlistment Rules 2014
16. Halal food dietary laws. Consumer protections laws in Pakistan
17. The Punjab Consumer Protection Rules 2009; The Punjab Consumer Protection Act 2005
18. The Pakistan Hotels and Restaurants Act, 1976; The Punjab Food Authority Act 2011
19. The Pakistan Halal Authority Act 2015; Pakistan National Accreditation Council
20. Punjab Halal Development Agency; Pakistan Standards and Quality Control Authority (PSQCA)
21. Role of electronic and print media in public awareness and empowerment.

Recommended Texts

1. GOP. (2005). The Punjab Consumer Protection Act 2005. Government of the Punjab, Lahore, Pakistan.
2. GOP. (2011). Punjab Pure Food Rules 2011. Health Department, Government of the Punjab, Lahore, Pakistan.
3. GOP. (2012). Drug Regulatory Authority of Pakistan Act, 2012 The Drug Regulatory Authority of Pakistan, Government of the Pakistan Islamabad.
4. GOP. (2015). Pakistan Halal Authority Act, 2015. Minister for Science and Technology, Government of the Pakistan, Islamabad.
5. Independent topics for readings.


DIRECTOR
INSTITUTE OF FOOD SCIENCE & NUTRITION
UNIVERSITY OF SARGODHA, SARGODHA

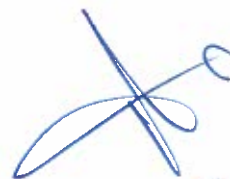
The course aims to get know how about the existing food and drug laws prevailing in the country, to understand duties and authorities of food safety officers and drug inspectors, to familiarize with food and drug laws enforcement agencies in Pakistan.

Contents

1. Introduction and concepts: understanding malnutrition, micronutrient malnutrition, causes of malnutrition
2. Nutrition needs assessment and analysis: individual and population assessment, health assessment and the link with nutrition, food security assessment and the link with nutrition, nutrition information and surveillance systems
3. Interventions to prevent and treat malnutrition: general food distribution, supplementary feeding, therapeutic care, micronutrient interventions, health and livelihood interventions, infant and young child feeding, HIV and AIDS nutrition
4. Nutrition information, education and communication
5. Monitoring and evaluation, standards and accountability
6. Role of national and international agencies
7. UNHCR, WFP, NDMA (National disaster management authority), Civil defense
8. Hygiene and sanitation
9. Emergency foods

Recommended Texts

9. ENN (Emergency Nutrition Network). 2011. The harmonized training package (HTP): resource material for training on nutrition in emergencies, version 2. Nutrition Works, Emergency Nutrition Network, Global Nutrition Cluster. Oxford, U.K.
10. FAO. 2005. Protecting and Promoting Good Nutrition in Crisis and Recovery: Resource Guide. Food and Agriculture Organization of the United Nations, Rome, Italy.
11. SC (Save the Children Fund UK). 2004. Emergency nutrition assessment: guidelines for field workers. Save the Children, Westport, U.K.
12. WHO (World Health Organization). 2000. The management of nutrition in major emergencies. World Health Organization, Geneva, Switzerland.



DIRECTOR
INSTITUTE OF FOOD SCIENCE & NUTRITION
F-93, I/F, SAADSI, KARACHI

The course aims to highlight the significance of food analysis in product development and overall quality, to comprehend commonly employed types of analysis for product characterization, and to prepare and standardize commonly used lab solutions.

Contents (Theory)

1. Food analysis: significance
2. Sampling: techniques, preparation, preservation
3. Physical properties and analysis of foods and food products: appearance, texture, specific gravity, refractive index, rheology
4. Chemical analysis: significance
5. Proximate analysis: moisture, ash, proteins, lipids, carbohydrates, fiber, NFE, acidity, pH, sugars, mineral elements, vitamins – significance, methods
6. Chromatography: paper, thin layer
7. Spectroscopy: atomic emission, atomic absorption
8. Sensory evaluation of foods: attributes, difference and preference tests, consumer acceptance
9. Overview of the commonly employed statistical methods.

Contents (Practical)

1. Lab safety requirements
2. Preparation and standardization of laboratory solutions
3. Sampling; Determination of specific gravity, refractive index, moisture, ash, crude protein, crude fat, crude fiber, NFE, pH and acidity
4. Estimation of vitamin C
5. Determination of mineral elements through flame photometer and atomic absorption spectrophotometer
6. Paper and thin layer chromatography
7. Identification of toxins by TLC
8. Sensory evaluation of foods

Recommended Texts

1. AOAC. (2016). Official Methods of Analysis of AOAC International, 20th Ed. Association of Official Analytical Chemists, Arlington, USA.
2. Awan, J.A. & Rehman, S.U. (2015). Food Analysis Manual. Unitech Communications, Faisalabad, Pakistan.
3. Cruz, R.M.S., Khmelinskii, I. & Vieira, M. (2014). Methods in Food Analysis. CRC Press. Taylor & Francis Group, Boca Raton, F.L, USA.
4. Pomeranz, Y. & Meloan, C.E. (2000). Food Analysis: Theory and Practice, 3rd Ed. Chapman & Hall, New York, USA.
5. Winton, A. & Winton, K.B. (2006). Techniques of Food Analysis. Agrobios Publishing Co., Jodhpur, India.



DIRECTOR
INSTITUTE OF FOOD SCIENCE & TECHNOLOGY
UNIVERSITY OF SARGODHA, SARGODHA

The course aims to understand the discipline of dietetics and its role in human well being, to familiarize with the foundations of healthy diets and their role in disease prevention and management, to acquaint hands-on training for calorie calculation and menu planning using food composition table and databases and to assess BMI and energy expenditures in relation to overweight and obesity.

Contents (Theory)

1. Dietetics: definitions, history, importance
2. Dietitian: role in food service and clinical practice, responsibilities in multidisciplinary team, code of ethics
3. Foundations of healthy diet
4. Dietary Reference Intakes, Recommended Dietary Allowance, Food Guide Pyramid and allied approaches, Dietary Guidelines, Exchange system and menu planning
5. Energy expenditure and basal metabolism
6. Body mass index
7. Role of diet in disease conditions
8. Diet therapy and its principles
9. Food selection and factors affecting its acceptance
10. Nutrient density; Alternative patterns of food consumption
11. Nutritional counseling in clinical practice. Critical diet assessment
12. Nutrition and diet clinics.

Contents (Practical)

1. Interpretation of food guide pyramid, My Pyramid, My plate, Eat well Plate
2. Energy value of different foods: carbohydrates, fats, proteins
3. Calculating energy requirements
4. BMI in relation to obesity and overweight, energy and calorie requirements
5. Balanced diet and menu planning using exchange lists, food composition tables & data bases
6. Food intake analysis: Dietary Recall, Food Frequency
7. Questionnaires, Food Surveys

Recommended Texts

1. Mahan, L.K., Escott-Stump, S., & Raymond, J.L. (2012). Krause's Food, Nutrition & Diet Therapy, 13th Ed. Elsevier Saunders, St. Louis, Missouri, USA.
2. Mudambi, S.R. & Rajagopal, M.V. (2007). Fundamentals of Foods, Nutrition & Diet Therapy, 5th ed. New Age International Pvt. Ltd. Publishers, New Delhi.
3. Punekar, M. & D'Souza, J. (2010). Handbook of Applied Nutrition, Diet therapy and Diet Management. SBS Publishers & Distributors Pvt. Ltd., New Delhi.
4. Rawat, S. (2015). Applied Nutrition. Random Publication, New Delhi.
5. Schlenker, E. & Gilbert, J.A. (2015). Williams' Essentials of Nutrition and Diet Therapy, 11th Ed. Elsevier/Mosby Inc., Louis, Missouri.
6. Singh, J. (2008). Handbook of Nutrition and Dietetics. Lotus Press, India.


DIRECTOR
INSTITUTE OF FOOD SCIENCE & NUTRITION
AN EPISODE OF SANSODH: SANSODH

The course aims to identify the current trends in the use of dietary supplement and analysis of their global market, to demonstrate the impact of dietary supplements on health and disease prevention, to discuss safety issues and global legislations on food supplements.

Contents (Theory)

1. An overview of dietary supplements and their market
2. Forms of food supplements
3. Vitamins and mineral supplements
4. Essential fatty acids
5. Enzymes as supplements
6. Natural products and extracts
7. Probiotics and prebiotics in Health
8. Fish oil supplements
9. Non-essential nutrients as dietary supplements
10. Caffeine in food and dietary supplements
11. Medicinal plants as food supplements
12. Codex Alimentarius standards for food supplements
13. Safety of vitamins and minerals added to foods
14. Implications of mega doses
15. Global legislation on food supplements
16. DRAP Alternative Medicines and Health Products Enlistment Rules 2014

Recommended Texts

1. Caballero, B. (2009). Guide to Nutritional Supplements. Elsevier Ltd., Oxford, UK.
2. Ottaway, P.B. (2008). Food Fortification and Supplementation: Technological, Safety and Regulatory Aspects. Woodhead Publishing Limited, Cambridge, England.
3. Pray, L., Yaktine, A.L. & Pankevich, D. (2014). Caffeine in Food and Dietary Supplements. The National Academes Press, Washington, DC, USA.
4. Ransley, J.K., Donnelly, J.K. & Read, N.W. (2001). Food and Nutritional Supplements: Their Role in Health and Disease. Springer-Verlag Berlin Heidelberg, Germany.
5. Webb, G.P. (2011). Dietary Supplements and Functional Foods, 2nd Ed. Blackwell Publishing Ltd., Oxford, UK.



DIRECTOR
INSTITUTE OF FOOD SCIENCE & TECHNOLOGY
UNIVERSITY OF SAHARADPUR, SAHARADPUR

The course aims to acquaint knowledge about global food issues having impact on food and nutrition security. To understand the role of global organizations in food production, consumption and trade and to study the impact of climate change and other threats on global food availability

Contents

- 1 World food situation
- 2 Food and nutrition security
- 3 The green revolution
- 4 Worldwide post-harvest losses
- 5 Global malnutrition: protein energy malnutrition and hidden hunger
- 6 Overweight and obesity; Worldwide food price fluctuations
- 7 Importance of per capita earning, consumption and purchase power
- 8 Irrational food consumption behavior; Contribution of cereals, legumes, roots, tubers and animal products
- 9 World food policy
- 10 WTO's trade regulations
- 11 Food bioterrorism
- 12 International food laws: European and American
- 13 Potentials of modern biotechnology to combat food insecurity
- 14 Genetically modified foods
- 15 Organic, Kosher and Halal Foods
- 16 Millennium development goals to sustainable development goals
- 17 Global Trends.
- 18 Climate change.

Recommended Texts

1. Barbosa-Canovas, G. V., Mortimer, A., Lineback, D., Spiess, W., Buckle, K., & Colonna, P. (Eds.). (2009). *Global issues in food science and technology*. Academic Press.
2. Barrientos, S., & Dolan, C. (2006). Transformation of global food: opportunities and challenges for fair and ethical trade. *Ethical sourcing in the global food system*, 1-33.

Suggested Readings

- 2 Hanjra, M. A. (2013). *Global food security: emerging issues and economic implications*. Nova Science Publishers.
- 3 Oosterveer, P. (2007). Global governance of food production and consumption: issues and challenges.

Phoenix, L. E., & Walter, L. (2009). *Critical Food Issues: Problems and State-of-the-Art Solutions Worldwide*. ABC-CLIO.

DIRECTOR
INSTITUTE OF FOOD SCIENCE & NUTRITION
J-1065014 SARGODHA

The course aims to learn the techniques of creating awareness about health issues in masses, to acquire information about different modes of communication and their effective use, to understand the ethical responsibilities for dissemination of knowledge.

Contents (Theory)

1. Nutrition education: introduction, history, need, competencies and skills, framework, training needs, new development
2. Nutrition education programs: scope and challenges of educating people about eating well
3. Biological influences, cultural and social preferences
4. Education and communication strategies for different groups and settings
5. Evaluation of nutrition education programs
6. Family and psychological factors
7. Expectancy-value theories of motivation, social and cognitive theory
8. Behavior change as a process, phases of change
9. Addressing multiple and overlapping influences on behavior
10. A logical model approach for planning a framework of nutrition education
11. Understanding communication model, preparing/organizing oral presentations, delivering oral presentation, delivering nutrition education workshops, types of supporting visual aids, nutrition mass media communication campaigns, social marketing
12. Ethics in nutrition education, conflicts, participating process in community coalition
13. Non-government and public health organizations and their current programs

Contents (Practical)

1. Nutritional counseling
2. Program designing for specific diseases like anemia, neural tube defects, rickets, etc.
3. Surveys and seminars in different educational institutions
4. Individual presentations by students on different nutrition topics
5. Visits of public places for nutrition awareness
6. Independent student projects.

Recommended Texts

1. Contento, I.R. (2007). Nutrition Education: Linking Research, Theory and Practice. Jones and Bartlett Publishers, Ontario, Canada.
2. FAO. (1997). Nutrition Education for the Public: Discussion Papers of the FAO Expert Consultation. Food and Agriculture Organization of the United Nations, Rome, Italy.
3. Semba, A.D. & Bloem, M.W. (2008). Nutrition and Health in Developing Countries, 2nd Ed. Humana Press, New York, USA.
4. Walter, W. (2013). Nutritional Epidemiology, 3rd Ed. Oxford University Press, New York, USA.



DIRECTOR
INSTITUTE OF FOOD SCIENCE & NUTRITION
GATEWAY TO KNOWLEDGE

The course aims to comprehend the principles of diet therapy and therapeutic nutrition, to understand the role of dietary management in various health disorders related to upper and lower gastrointestinal tract, hepatic, pancreas and coronary heart diseases, to acquaint hands-on training for the dietary modification of normal diets aligned with various health disorders and to prepare pre- and post-operative diets.

Contents (Theory)

1. Introduction to diet therapy
2. Principles of diet therapy and therapeutic nutrition
3. Therapeutic modifications of normal diets
4. Dietary management in various health disorders (objective, physiology, food choices, diet plans)
5. Diet in the diseases of the upper gastrointestinal tract – mouth, dental disease, pharynx, esophagitis; hiatal hernia; gastritis; peptic ulcer
6. Diet in the diseases of the lower gastrointestinal tract - constipation, diarrhea, mal-absorption syndrome, lactose Intolerance, celiac disease, inflammatory bowel disease, Crohn's disease, ulcerative colitis, irritable bowel syndrome, diverticular disease, gastric surgery, dumping syndrome, small bowel resections, short bowel syndromes, blind loop syndrome, ileostomy or colostomy
7. Diet in the diseases of liver and accessory organs - hepatitis, hepatic steatosis, non- alcoholic hepatic steatosis, alcoholic liver disease, cirrhosis, hepatic encephalopathy; cholelithiasis, cholecystitis, cholangitis
8. Pancreatitis
9. Nutrition education and primary health care camp

Contents (Practical)

1. Steps in nutrition care
2. Types of diets: regular diet, clear liquid diet, full liquid diet, soft diet, bland diet
3. Dietary modification for texture, energy, nutrients and fluids
4. Planning of energy modified diets: high calorie diet, restricted calorie diet, high fiber diet, low residue diet, modified carbohydrates diet, moderate carbohydrate diet, modified fat diet, restricted fats diet
5. Planning and preparation of diets for various pathological conditions
6. Nutrition in surgical conditions: pre-operative and post- operative diets
7. Enteral and parenteral feeding; Hospital visits and nutrition camps

Recommended Texts

1. Mahan, L.K., Escott-Stump, S., & Raymond, J.L. (2012). Krause's Food, Nutrition & Diet Therapy, 13th Ed. Elsevier Saunders, St. Louis, Missouri, USA.
2. Mudambi, S.R. & Rajagopal, M.V. (2007). Fundamentals of Foods, Nutrition & Diet Therapy, 5th Ed. New Age International Pvt. Ltd. Publishers, New Delhi.
3. Puneekar, M. & D'Souza, J. (2010). Handbook of Applied Nutrition, Diet therapy and Diet Management. SBS Publishers & Distributors Pvt. Ltd., New Delhi.
4. Rawat, S. 2015. Applied Nutrition. Random Publication, New Delhi.
5. Schlenker, E. & Gilbert, J.A. (2015). Williams' Essentials of Nutrition and Diet Therapy, 11th Ed. Elsevier/Mosby Inc., Louis, Missouri.
6. Singh, J. (2008). Handbook of Nutrition and Dietetics. Lotus Press, India.



DIRECTOR
INSTITUTE OF FOOD SCIENCE & NUTRITION
SANSI, DELHI

The course aims to raise the awareness of potential drug-nutrient interactions and influence on clinical outcomes, to understand complex underlying mechanisms responsible for drug-nutrient interactions, to identify factors that can promote drug-nutrient interactions and contribute to nutrition and/or therapeutic failure, to integrate knowledge of pharmacology, nutrient-nutrient and drug-nutrient interactions into the nutrition care process.

Contents (Theory)

1. Basic definitions and concepts
2. Role of nutrition therapy in pharmacotherapy
3. Pharmacologic aspects of food and drug interactions
4. Routes of drug administration
5. Pharmacodynamics
6. Pharmacokinetics, absorption, distribution, metabolism, elimination
7. Effects of food on drug therapy, drug absorption, drug distribution, drug metabolism and drug excretion
8. Effects of drugs on food and nutrition, nutrient absorption, metabolism and excretion
9. Effects of drugs on the nutritional status of patients e.g. taste, smell and type of intake
10. Enteral feeding: drug/nutrient interaction
11. Gastrointestinal effects, appetite changes; Nutrient assessment of drug-nutrient interactions
12. Dietary counselling for the prevention of food drug interactions.

Recommended Texts

1. Boullata, J.I. & Armenti, V.T. (2010). Handbook of Drug-Nutrient Interactions, 2nd Ed. Humana Press, New York, USA.
2. Mahan, L.K. & Escott-Stump, S. (2007). Krause's Food & Nutrition Therapy. Elsevier – Health Sciences Division. Philadelphia, USA.
3. McCabe-Sellers, B., Frankel, E.H. & Wolfe, J.J. (2003). Handbook of Food-Drug Interactions, CRC Press, Taylor & Francis Group, Boca Raton, FL., USA.
4. Nelms, M.N. & Sucher, K.P. (2016). Nutrition Therapy and Pathophysiology, 3rd Ed. Cengage Learning, Belmont, CA, USA.



DIRECTOR
INSTITUTE OF FOOD SCIENCE & NUTRITION
UNIVERSITY OF SAUDI ARABIA

The course aims to acquaint knowledge about the preventive nutrition with special reference to historical perspective, public health benefits, ethnic and socioeconomic issues and its role throughout the lifecycle, to understand the role of dietary components in the prevention and management of various health disorders.

Contents (Theory)

1. Preventive nutrition: a historical perspective, public health benefits, ethnic and socioeconomic issues, nutrition in the age of polypharmacy, preventive nutrition throughout the life cycle
2. Cancer prevention: upper GIT cancer, prostate cancer, dietary supplements and cancer risks, soy and cancer prevention, micronutrients as intermediate biomarkers in chemotherapy
3. Cardiovascular disease prevention: omega-3 fatty acids from fish and plants, cardiovascular effects of trans fatty acids, antioxidants and B-vitamins and atherosclerosis, Prevention and nutritional management - TLC dietary patterns, AHA dietary patterns, DASH dietary patterns, weight reduction, increased dietary fiber, Omega-3 fatty acids, soy proteins, fruits and vegetables as antioxidant role, reduce dietary cholesterol
4. Diabetes and obesity: role of nutrition in pathophysiology, prevention and treatment, Adipokines, nutrition and obesity, obesity and insulin resistance in childhood and adolescence, obesity and chronic disease, meal replacement products and fat substitutes, prevention and treatment (dietary changes, calories restricted diet and other dietary regimens, exercise, behavioural modification)
5. Growth, Immunity and Infection: Role of long chain fatty acids, polyunsaturated fatty acids and autoimmune diseases
6. Prevention and treatment for hypertension: weight reduction, adaptation of DASH diet, nutrition education for behavioural modification
7. Bone density: Osteoarthritis - role of nutrition and dietary supplements, calcium requirement during treatment of osteoporosis, Prevention and treatment - adequate calcium intake, adequate vitamin D intake, avoidance of excess phosphorous, lifestyle dietary modifications, exercise
8. Role of dietary fiber in preventing diseases (colon cancer, diabetes, constipation, diverticular disease, obesity, cardiovascular diseases)
9. Health claims for foods and dietary supplements, micronutrient and immunity in older people.

Recommended Texts

1. Bendich, A. & Deckelbaum, R.J. (2001). Primary and Secondary Preventive Nutrition. Springer Science+Business Media, New York, USA.
2. Bendich, A. & Deckelbaum, R.J. (2010). Preventive Nutrition: The Comprehensive Guide for Health Professional, 4th Ed. Humana Press, New York, USA.
3. Coulston, A.M. & Boushey, C.J. (2008). Nutrition in the Prevention and Treatment of Diseases, 2nd Ed. Academic Press, Elsevier Inc., San Diego, CA, USA.
4. Gerber, J.M. (2007). Handbook of Preventive and Therapeutic Nutrition. Aspen Publications, Silver Spring, MD, USA.
5. Thomson, C. (1996). Preventive and Therapeutic Nutrition Handbook. Chapman & Hall, UK.


DIRECTOR
INSTITUTE OF FOOD SCIENCE & NUTRITION
UNIVERSITY OF SARAJEVO - SARAJEVO

The course aims to find out sources of Functional foods and Nutraceutical and their impact on nutrition and health, to familiarize with the standards and regulations used globally regarding regulatory issues and usage of functional foods, and to assess international trade and marketability of functional foods.

Contents (Theory)

1. Functional foods and Nutraceutical: past, present, future and health claims; functional foods and their impact on nutrition and health - obesity, diabetes, cardiovascular diseases, hypertension and cancer
2. Functional ingredients and bioactive molecules
3. Isoflavins, lycopene, polyphenols, dietary fiber, omega-3 & -6 fatty acids, conjugated linoleic acid, antioxidants, prebiotic and probiotic
4. Functional foods from different food groups: cereals, dairy, meat, fruits and vegetables
5. Regulatory systems governing the production and distribution of functional food - national and international
6. Standard and regulations of various agencies: FDA, EC, FAO/WHO, Health Canada; Guidelines for the assessment of functional foods
7. Marketing and regulatory issues
8. Conventional and emerging food processing technologies for functional food production
9. Toxicological and safety aspects of functional foods
10. Asian functional foods
11. Functional foods in international market and growth in Pakistan.

Recommended Texts

1. FAO (Food and Agriculture Organization of the United Nations). (2007). Report on Functional Foods. Food and Agriculture Organization of the United Nations, Rome, Italy.
2. Shi, J., Ho, C.T., & Shahidi, F. (2005). Asian Functional Foods. Marcel Dekker/CRC Press, New York, U.S.A.
3. Shi, J., Mazza, G., & Maguer, M.L. (2002). Functional Foods: Biochemical and Processing Aspects, Vol. 2. CRC Press, Traylor & Francis Group, Boca Raton, New York, USA.
4. Wildman, R.E.C. (2006). Handbook of Nutraceuticals and Functional Foods, 2nd Ed. CRC Press, Traylor & Francis Group, Boca Raton, New York, USA.



DIRECTOR
INSTITUTE OF FOOD SCIENCE & TECHNOLOGY
UNIVERSITY OF SARGODHA, SARGODHA

The course aims to apply tools and skills required to understand published research, to identify the types of methods best suited for investigating different types of problems and questions, to get hands-on training of writing successful research proposals for thesis and projects, and to abreast ethical consideration in research and publications.

Contents (Theory)

1. Research methods in nutrition
2. Introduction, objectives, types of research: basic and applied, quantitative and qualitative, clinical and diagnostic
3. Types of sampling: probability and non-probability
4. Collection of literature: printed and electronic sources, managing literature
5. Methods of data collection
6. Writing scientific documents: synopsis, research proposal, articles, references, internship report
7. Research designs: observational studies, cross-sectional, case-control, cohort (prospective, retrospective, time-series)
8. Experimental studies: observational studies, clinical studies
9. Experimental data analysis: incidence/ prevalence rate
10. Research ethics.
11. Types of scientific presentations. Collection of literature: printed and electronic sources.
12. Managing literature. Initiating writeup. Writing scientific documents: synopsis, research proposal, articles, references, internship report.
13. Oral presentations

Contents (Practical)

1. Exercises in collecting literature from different sources on assigned topics.
2. Organizing and analysis of collected material.
3. Writing synopsis/proposal, short communication
4. Delivering oral presentation.

Recommended Texts

1. Awan, J.A. (2015). Scientific Presentations. Unitech Communications, Faisalabad, Pakistan.
2. Lovegrove, J.A., Hodson, L., Sharma, S., & Lanham-New, S.A. (2015). Nutrition Research Methodologies. Wiley-Blackwell, John Wiley & Sons Ltd., Chichester, West Sussex, UK.
3. Lowe, M. (2007). Beginning Research: A Guide for Foundation Degree Students, 1st ed. Routledge Publications, New York, USA.
4. Starks, T.P. (2006). Trends in Nutrition Research. Nova Science Publishers, Inc., New York, USA.
5. Walliman, N. (2005). Your Research Project, A Step by Step Guide for The First-time Researcher, 2nd ed. Sage Publications, Thousand Oaks, CA, USA.
6. Awan, J.A. (2009). Scientific presentations. Unitech Communications, Faisalabad, Pakistan.
7. Khalil, S.K. & Shah, P. (2007). Scientific writing and presentation for crop sciences. Higher Education Commission, Islamabad, Pakistan.
8. Anderson, J., Durston, B.H., & Poole, M. (1992). Thesis and assignment writing. Wiley Eastern Ltd., New Delhi, India.


DIRECTOR
INSTITUTE OF FOOD SCIENCE & NUTRITION
University of Agriculture, Faisalabad

The course aims to identify problems affecting infant and young child feeding and provide a framework of essential interventions, to create an environment that will enable mothers, families and other caregivers to implement optimal feeding practices.

Contents (Theory)

1. Infant young child feeding: introduction, global strategy, importance of breastfeeding, local and international scenario, breastfeeding working
2. Breastfeeding practices: assessing a breastfeed, taking a feeding history, common breastfeeding difficulties, expressed breast milk
3. Breastfeeding counselling: listening and learning, building confidence and giving support, counselling for infant feeding decisions, counselling cards tools
4. Complementary feeding practices: importance, cup-feeding and hygienic preparation of food, replacement feeding in the first 6 months, foods to fill energy and micronutrients gap, quantity and frequency of feeding, feeding techniques, food demonstration
5. Breastfeeding related topics: growth charts, maternal illnesses and breast feeding, breast conditions, health care practices, International code of marketing of breast milk substitutes, checking understanding and arranging follow-up, feeding during illness and low-birth-weight babies; Feeding guidelines of various global agencies – WHO etc.
6. Complex challenges to implementing the global strategy for infant and young child feeding.

Contents (Practical)

1. Breastfeeding counseling
2. Preparation of indigenous complementary foods
3. Therapeutic foods
4. Infant formulas for various needs
5. Growth monitoring: APGAR (Appearance, Pulse rate, Grimace, Activity and Respiration) score, Growth charts.
6. Visits of hospitals and day care centers.

Recommended Texts

1. Behan, E. (2008). The baby Food Bible – A Complete Guide to Feeding Your Child from Infancy On, 1st Ed. Random House Publishing Group, New York, USA.
2. Dykes, F. & Moran, V.H. (2009). Infant and Young Child Feeding: Challenges to Implementing a Global Strategy. Wiley-Blackwell, John Wiley & Sons Ltd., Chichester, West Sussex, UK.
3. Samour, P.Q. & King, K. (2010). Pediatric Nutrition, 4th Ed. Jones & Bartlett Learning, Mississauga, Canada.
4. WHO. (2003). Global Strategy for Infant and Young Child Feeding. World Health Organization, Geneva, Switzerland.
5. WHO/UNICEF/GOP (World Health Organization/United Nation's Children Fund/Government of Pakistan). (2008). Infant and young child feeding counselling: an integrated course. Nutrition Wing, Ministry of Health, Government of the Pakistan, Islamabad



DIRECTOR
INSTITUTE OF FOOD SCIENCE & NUTRITION
UNIVERSITY OF SARGODHA, SARGODHA

The course aims to understand the role and requirements of clinical laboratory and how chemical and biochemical analysis are applied to the study of disease, to discuss the function, structure, laboratory investigation and diseases of the different body systems and to correlate laboratory findings in clinical samples with various pathological processes.

Contents (Theory)

1. Clinical laboratory: organization and management, safety, good lab practices, quality control and assurance, reference range and normal values, laboratory data processing
2. Handling and processing of clinical samples
3. Effect of storage on composition of samples
4. Commonly used instruments in clinical laboratory: Microscope, Minilab apparatus, X-ray, ECG, MRI, ELISA reader, CT scan etc.
5. Symptomology and case histories of various diseases. Forensic science, Molecular basis of diagnosis.

Contents (Practical)

1. Blood sampling techniques
2. Complete blood picture (CBP) like Hb, PCV, ESR, TLC, DLC, bleeding time, clotting time, prothrombin time and blood groups
3. Pregnancy test
4. Liver function tests
5. Kidney function test
6. Cardiac enzymes
7. Lipid profile, total proteins, albumin and serum minerals
8. Urine analysis for bile pigments, protein, urea, pH, ketone bodies, sugars, creatinine, pus cells, RBCs and uric acid
9. Sero-diagnosis of infectious diseases
10. Visit to clinical laboratory/concerned organization.

Recommended Texts

1. Ahmed, N. (2011). Clinical Biochemistry. Oxford University Press, Oxford, UK.
2. Bain, B.J., Bates, I., Laffanand, M.A, Lewis, S.M. (2012). Practical Haematology, 11th Ed. Churchill Livingstone, Elsevier Ltd., New York, USA.
3. Burtis, C., Ashwood, E., & Burns, D. (2006). Tietz Text Book of Clinical Chemistry and Molecular Diagnostics, 4th Ed. Elsevier Saunders Company, Philadelphia, USA.
4. Chawala, R. (2014). Practical Clinical Biochemistry: Methods and Interpretations, 4th Ed. Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, India.
5. Devlin, T. M. (2005). Textbook of biochemistry with clinical correlations, 6th ed. Wiley- Liss, Inc., U.S.A.


DIRECTOR
INSTITUTE OF FOOD SCIENCES & TECHNOLOGY
L-112-517 JF-SARAJOUR- SAHIBPUR

The course aims to familiarize with global and local nutrition policies and programs in the domain of public health nutrition, to prevent and control specific micronutrient deficiencies through diet based approaches among the vulnerable and to promote appropriate diets and healthy lifestyles and access, analyze and monitor nutrition situations.

Contents

1. History and importance of nutrition intervention planning
2. World declaration on nutrition
3. Nutrition development partners; Policy guidelines
4. Community nutrition programs: national and international, supplementary feeding programs
5. Food fortification, supplementation and diet diversification
6. School feeding programs: interventions and impacts
7. Improving household food security; Protecting consumers through improved food quality and safety; Preventing and managing infectious diseases
8. Promoting breast feeding
9. Caring for socio-economically deprived and vulnerable
10. Preventing and controlling specific micronutrient deficiencies
11. Promoting appropriate diets and healthy lifestyle
12. Improving health care; Five years plan for Pakistan (Nutrition)
13. Nutrition intervention: counselling for change
14. SUN movement; One health concept; National nutrition programs: food & nutrition program, Tawana Pakistan, school health program
15. Developing effective food and nutrition policies and programs.

Recommended Texts

1. Edelstein, S. 2011. Nutrition in Public Health: A Handbook for Developing Programs and Services. 3rd Ed. Jones & Bartlett Learning, Sudbury, M.A, USA.
2. IFPRI. 2016. Taking Actions: Progress and Challenges in Implementing Nutrition Policies and Programs. International Food Policy Research Institute, Washington, DC, USA.
3. Nnakwe, N.E. 2009. Community Nutrition: Planning Health Promotion and Disease Prevention. Jones and Bartlett Learning International, London, UK.
4. Semba, R.D. & M.W. Bloem. 2008. Nutrition and Health in Developing Countries. 2nd Ed. Humana Press, New York, USA.

Suggested Readings

1. Spark, A. 2007. Nutrition in Public Health: Principles, Policies and Practice. CRC Press, Taylor & Francis Group, Boca Raton, FL, USA



DIRECTOR
INSTITUTE OF FOOD SCIENCE & TECHNOLOGY
UNIVERSITY OF SARGODHA SARGODHA

The course aims to understand the importance of meal planning and its role in everyday life, to apply the principles of meal planning in the planning of balanced and appropriate meals keeping in mind the nutritional requirements, family budget and food requirements choices of different age groups, to identify market trends and conditions while purchasing food keeping in mind food costs and quality.

Contents (Theory)

1. Importance and principles of meal planning for family and occasions
2. Nutritional value of meal
3. Family meal budgeting
4. Rules for good menu planning
5. Menu planning for families
6. Selection of various foods in relation to season and market conditions
7. Composition and storage of food
8. Selection, use and care of table appointments
9. Study of different types of table settings, table manners and etiquettes
10. Kitchen safety and settings
11. Basics of food hygiene and sanitation
12. Food labeling; Menus for schools, geriatric and healthcare centers.

Contents (Practical)

1. Survey and record keeping of market prices (retail & wholesale)
2. Types of foods available in the market from different food groups. e.g. retail cuts of meat and types of milk
3. Comparison of weight, volume and effect of cooking on color, taste and texture of different foods
4. Planning, preparation and service of meals for different occasions at different income levels
5. Understanding food labels; Market visits for cost and quality and food marketing regulations. Food service visits (Restaurants, School, Colleges, and Hospitals).

Recommended Texts

1. Brown, A. (2015). Understanding Food Principles & Preparation, 5th Ed. Cengage Learning, Belmont, CA, USA.
2. McWilliams, M. (2012). Fundamentals of Meal Management, 5th Ed. Dorling Kindersley India Pvt. Ltd., New Delhi, India.
3. Narvaez-Soriano, S. (2004). A Guide to Meal Management and Table Services. Rex Book Store, Manilla, Philippine.

Suggested Readings

1. Sethi, M. (2008). Institutional Food Management. New Age International Pvt. Ltd. New Delhi, India.



DIRECTOR
INSTITUTE OF FOOD SCIENCE & TECHNOLOGY
UNIVERSITY OF SARGODHA, SARGODHA

The course aims to understand the role of nutrition and dietetics in managing disease and preventing complications, to get hands-on training for the dietary modification of normal diets aligned with various health disorders, to comprehend the role of nutrition education and policies towards nutrition security.

Contents (Theory)

1. Diet based regimen to improve the public health
2. Diet supplementation for diseased patients
3. Malabsorption and mineral deficiency
4. Health diets and lifestyles
5. Preventing diet related diseases
6. Nutritional implications of various diets
7. Managing disease and avoiding complications through diet diversification
8. Dietary management in various health disorders (objective, physiology, food choices, diet plans): obesity, leanness and underweight; coronary heart disease: dyslipidemia, hypertension, ischemic heart disease, heart failure; fevers and infections; diabetes mellitus; diseases of respiratory system: cystic fibrosis, asthma; rheumatic diseases: rheumatoid arthritis, osteoarthritis & gout; inborn errors of metabolism
9. Phenylketonuria, Maple syrup urine disease, galactosemia, glycogen storage disease; renal diseases; burn; surgical conditions; bacterial overgrowth; infections
10. AIDS; food allergy; protein energy malnutrition; micronutrient deficiencies
11. Policy principles for promotion of healthy diets
12. Incorporating nutrition objectives into development policies
13. Strategic actions and for promoting healthy diets
14. Drawing up of nutrition education programs
15. Role of specialist in dietetics and diseases.

Contents (Practical)

1. Planning of modified diet: consistent carbohydrate diet, moderate carbohydrate diet
2. Modified proteins diet: high protein diet, restricted protein diet
3. Modified fats diet: restricted fats diet
4. Modified micronutrients diet
5. Controlled sodium, potassium and phosphorus diet
6. Dietary management in various health disorders
7. Hospital visits and nutrition camps.

Recommended Texts

1. Mahan, L.K., Escott-Stump, S., & Raymond, J.L. (2012). Krause's Food, Nutrition & Diet Therapy, 13th Ed. Elsevier Saunders, St. Louis, Missouri, USA.
2. Mudambi, S.R. & Rajagopal, M.V. (2007). Fundamentals of Foods, Nutrition & Diet Therapy, 5th ed. New Age International Pvt. Ltd. Publishers, New Delhi.
3. Punekar, M. & D'Souza, J. (2010). Handbook of Applied Nutrition, Diet therapy and Diet Management. SBS Publishers & Distributors Pvt. Ltd., New Delhi.
4. Rawat, S. (2015). Applied Nutrition. Random Publication, New Delhi.
5. Schlenker, E. & Gilbert, J.A. (2015). Williams' Essentials of Nutrition and Diet Therapy, 11th Ed. Elsevier/Mosby Inc., Louis, Missouri.
6. Singh, J. (2008). Handbook of Nutrition and Dietetics. Lotus Press, India.



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The course aims to understand and create a patient-centered nutrition care plan based on sound nutrition principles, scientific evidence and biomedical reasoning, to assess various physiological conditions and prepare diet plans accordingly, to acquaint hands on training in the field of enteral and parenteral nutrition.

Contents (Theory)

1. Importance of clinical care nutrition support; Nutritional screening and assessment
2. The therapeutic process, stress of the therapeutic encounter, focus of care, phases of the care process
3. Quality patient care and collaborative roles of nutritionists and nurses
4. Modified diets for various physiological needs
5. Enteral nutritional: composition, nutritional prescription (dose), strategies to optimize delivery and minimize risks, pediatric enteral feeding
6. Total parenteral nutrition; composition, intravenous nutritional prescription (dose) for specific conditions
7. Percutaneous endoscopic gastrostomy and radiologically inserted gastrostomy
8. Complications in enteral and parenteral nutrition
9. Nutritional therapy in diseases of infancy and childhood; Drug-nutrient interactions: drug effects on food and nutrients, food effects on drug absorption, food effects on drug
10. Dietary supplements.

Contents (Practical)

1. Nutritional assessment of patients: selection, nutritional requirements
2. Tube feeding: types, feeding equipment, preparation and application of enteral/nasogastric diets, monitoring the tube-fed patient
3. Total parenteral nutrition: basic rules, techniques, prescription, preparation of total parenteral solution
4. Preparation of pre-and postoperative diets; Case studies and logbooks; Hospital visits.

Recommended Texts

1. Block, A.S., Maillet, J., Howell, W.H., Winkler, M.F. (2007). Issues and Choices in Clinical Nutrition Practice. Lippincott Williams & Wilkins, Philadelphia, PA, USA.
2. Katsilambros, N., Dimosthenopoulos, C., Kontogianni, M.D., Manglara, E., & Poulia, K.A. (2010). Clinical Nutrition in Practice, 1st Ed. Wiley-Blackwell, John Wiley & Sons Ltd., Chichester, West Sussex, UK.
3. Katz, D.L. (2008). Nutrition in Clinical Practice, 2nd Ed. Lippincott Williams & Wilkins, Philadelphia, PA, USA.
4. Rolandelli, R.H., Bankhead, R., Boullate, J. I., & Compher, C.W. (2005). Clinical Nutrition; Enteral and Tube Feeding, 4th Ed. Elsevier Saunders Publishers, USA.
5. Rolfes, S.R., Pinna, K., & Whitney, E. (2015). Understanding Normal and Clinical Nutrition, 10th ed. Thomson and Wadsworth Publishers, USA.

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The course aims to understand psychology, its types and importance in nutrition, to abreast the impact of psychological influences on appetite and attitude behavior relationship

Contents (Theory)

1. Psychology: introduction, types, classification
2. Psychology and nutrition adherence
3. Attitude and eating patterns and the field of cognitive psychology
4. Perception, visualization and eating patterns, errors in perception process
5. Eating disorders: diagnosis, assessment and treatment
6. Face perception; Conceptual model of food choice
7. Psychological influences on appetite
8. Process over the life course, integration of biological, social, cultural and psychological influences on food choice
9. Understanding behavior: sensation, sense organs/special organs, attention and concentration, memory and its stages, methods for improvement, types and theories of thinking, cognition and levels of cognition, problem solving and decision making strategies, attitude behavior relationship
10. Measurement issues, indirect effects of attitude on behavior
11. The theory of reason education; Additional variables within the theory of planned behavior
12. Personality and intelligence; Stress management.

Recommended Texts

1. Blackman, M.C. & Kvaska, C.A. (2011). Nutrition Psychology: Improving Dietary Adherence. Jones and Bartlett Learning Publishers, Ontario, Canada.
2. Booth, D.A. (1994). The Psychology of Nutrition. Taylor & Francis Inc., Bristol, PA, USA.
3. Elmes, D.G., Kantowitz, B.H., & Roediger, H.L. Research Methods in Psychology, 9th Ed. Wadsworth Cengage Learning, Belmont, CA, USA.
4. Jane O. (2010). The Psychology of Eating: From Healthy to Disorders Behavior, 2nd Ed. Wiley Blackwell, John Wiley & Sons Ltd., Chichester, West Sussex, UK.



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On completion of the degree program the students should have provided evidence of being able to: understand and demonstrate coherent and detailed subject knowledge and professional competencies innutrition work effectively in an appropriate workplace environment in either the hospital, health care system, food industry (Nutraceutical/Food Supplements) or other professions related to nutrition deploy accurately standard techniques of analysis and enquiry innutrition demonstrate a conceptual understanding which enables the development and sustaining of argument; describe and comment on particular aspects of recent research and/or scholarship; appreciate the uncertainty, ambiguity and limitations of knowledge innutrition. Make appropriate use of scholarly reviews and primary sources; apply their knowledge and understanding in order to initiate and carry out an extended piece of work or project conform to professional boundaries and norms where applicable

Contents (Theory & Practical)

The students will have had the opportunity to acquire, as defined in the modules (theoretical & practical) specified for the program: the transferable/key/generic skills necessary for employment related to nutrition the ability to exercise of initiative and personal responsibility the ability to identify objectives, and negotiate the strategy and tactics to be employed working within a team the ability to deploy decision making skills in complex and unpredictable situations the ability to communicate information, ideas, problems and solutions in a variety of ways to a variety of audiences the ability to undertake appropriate further training of a professional or equivalent nature

Assessment

Achievement of the students will be assessed by a variety of methods in accordance with the learning outcomes of the modules specified for the program and will include:

- Effective written and verbal communication of the essential features of nutrition as involved in the placement
- Demonstrating the ability to apply a broad range of aspects of nutrition in the workplace
- Work that draws on a wide variety of material
- The ability to evaluate and criticize received opinion
- Evidence of an ability to conduct independent, in depth enquiry within subject areas of nutrition
- Completing work that is typically both evaluative and creative demonstrating an ability to carry out independent study using distance learning material

Readings

- The required books/literatures/materials will be suggested by the internship management


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