

**ENTERAL AND PARENTERAL NUTRITION**

MODULE	CONTENT	YEAR	TERM	CREDITS	TYPE
Nutritional Sciences, Dietetics and Health	Enteral and parenteral nutrition	4	2	6	Elective
<b>LECTURER(S)</b>			<b>Postal address, telephone nº, e-mail address</b>		
<ul style="list-style-type: none"> <li>○ <b>M<sup>a</sup> del Carmen Bedmar Abril.</b></li> <li>○ <b>M<sup>a</sup> Dolores Contreras Claramonte</b></li> <li>○ <b>Professor from the Nutrition and Food Science Department (to be desined)</b></li> </ul>			<b>Dept:</b> <b>- Nutrition and Food Science.</b> <b>- Pharmacy and Pharmaceutical Technology.</b> (Area Pharmacy and Pharmaceutical Technology)  Building B, Floor 0 and 3rd floor, School of Pharmacy. Ships n <sup>a</sup> Y and X.  Email: <a href="mailto:mbedmar@ugr.es">mbedmar@ugr.es</a> , <a href="mailto:mdcontre@ugr.es">mdcontre@ugr.es</a> .		
<b>DEGREE WITHIN WHICH THE SUBJECT IS TAUGHT</b>					
Degree in Human Nutrition and Dietetics					
<b>PREREQUISITES and/or RECOMMENDATIONS (if necessary)</b>					
<ul style="list-style-type: none"> <li>• Biochemistry</li> <li>• Physiology</li> <li>• Physiopatology</li> <li>• Nutrition I</li> <li>• Diet Therapy and Clinical Nutrition I</li> </ul>					
<b>BRIEF ACCOUNT OF THE SUBJECT PROGRAMME (ACCORDING TO THE DEGREE)</b>					
<ul style="list-style-type: none"> <li>• Factors causing malnutrition in hospitalized patients.</li> <li>• Composition of the preparations used in enteral nutrition (EN). Features preparations. Types of formulations in NE. Criteria for the choice.</li> <li>• Composition of the preparations used in parenteral nutrition (PN). Types of preparations. Monitoring the PN. PN preparation.</li> <li>• New employee nutrients and substrate in artificial nutrition.</li> <li>• Preparations used for specific nutritional purposes.</li> </ul>					



## GENERAL AND PARTICULAR ABILITIES

### General abilities:

- Recognize the essential elements Dietitian profession, including ethical, legal responsibilities and the exercise of the profession, applying the principle of social justice to professional practice and develop it with respect for people, their habits, beliefs and cultures
- Develop the profession with respect to other health professionals, acquiring teamwork skills
- Recognize the need to maintain and update professional skills, with special emphasis on learning, independently and continuously, of new knowledge, products and techniques in food and nutrition, as well as the motivation for quality
- Know the limits of the profession and skills, identifying when necessary interdisciplinary treatment or referral to another professional
- Making effective communication, both orally and in writing with people, health professionals and industry and the media, knowing how to use information technologies and communication, particularly those related to nutrition and habits life
- Understand, critically evaluate and how to use and apply sources of information related to nutrition, food, lifestyle and health aspects
- Having the ability to produce reports and registration requirements concerning professional intervention Dietitian
- Identify and classify foods and food products. Can analyze and determine its composition, properties, nutritional value, bioavailability of nutrients, and organoleptic modifications suffered as a result of technological and culinary processes
- Know the nutrients, their function in the body, its bioavailability, requirements and recommendations, and the basis of the energy balance and nutritional
- Integrate and evaluate the relationship between food and nutrition in health and in pathological situations
- Develop and implement protocols for assessment of nutritional status, identifying nutritional risk factors
- Interpret nutritional diagnosis, assess the nutritional aspects of medical history and dietary action plan
- Understand the structure of food services and food and nutrition units hospital, identifying and developing Dietitian functions within the multidisciplinary team
- Participate in the organization, management and implementation of the different types of food and nutritional support inpatient and outpatient dietary and nutritional
- Understand and participate in the design, implementation and validation of nutritional epidemiological studies and participate in the planning, analysis and evaluation of intervention programs in food and nutrition in different areas
- Assist in the development, marketing, labeling, marketing communications and food products according to the social, scientific knowledge and current legislation
- Interpret reports and administrative records relating to a foodstuff and ingredients
- Acquire basic training for the research activity, being able to formulate hypotheses, collect and interpret information to solve problems using the scientific method and understand the importance and limitations of scientific thinking on health and nutrition

### Specific abilities:

- Acquire teamwork skills as a unit in which the structure of uni-or multidisciplinary and interdisciplinary professionals and other staff related to the diagnostic evaluation and treatment of diet and nutrition
- Knowing the chemical composition, physical and chemical properties, nutritional value, their bioavailability, their organoleptic and modifications suffered as a result of technological and culinary processes
- Interpret and manage databases and tables of food composition
- Participate in enterprise social marketing teams, advertising and health claims
- Apply the Science of Food and Nutrition dietetic practice
- Assess and nutritional requirements in health and disease status at any stage of the life cycle
- Know, early detection and assess deviations in excess or defect, quantitative and qualitative nutritional balance



- Plan, perform and interpret the assessment of nutritional status of individuals and / or groups, both healthy (in all physiological situations) as patients
- Understand the pathophysiological aspects of nutrition-related diseases
- Develop and interpret a dietary history in healthy subjects and patients. Interpret medical history. Understand and use the terminology used in health sciences
- Interpret and integrate clinical, biochemical and pharmacological patient's nutritional assessment and dietary and nutritional treatment
- Apply the basics of clinical nutrition diet therapy
- Plan, implement and evaluate therapeutic diets for individuals and / or groups
- Understand the organization and the various stages hospital foodservice
- Participate in multidisciplinary team of Hospital Nutrition Unit
- Know the different techniques and products for nutritional support basic and advanced. Develop and implement transition plans dietary and nutritional
- Plan and carry out education programs and nutritional diet in healthy subjects and patients
- Handle basic ICT tools used in the field of Food, Nutrition and Dietetics
- Understand the legal and ethical boundaries of dietetic practice
- Prescribe specific treatment for the competence of the dietitian
- Be able to substantiate the scientific principles underlying intervention dietitian, subordinating their performance on scientific evidence

**OBJECTIVES (EXPRESSED IN TERMS OF EXPECTED RESULTS OF THE TEACHING PROGRAMME)**

- Study the energy needs of the patient in outpatient means or in the hospital.
- Know the methods to assess nutritional status and how to interpret the results of these explorations.
- Analyze the various existing artificial nutrition techniques, indications, contraindications and complications
- Investigate the substrates used in the preparation of the formulas used as nutritional support.
- Identify strategies to follow in the nutrition of patients with various disease processes.

**DETAILED SUBJECT SYLLABUS**

**THEORETICAL:**

- Item 1. INTRODUCTION. History of enteral and parenteral nutrition: Past, present and future.
- Item 2. MALNUTRITION IN THE PATIENT. Introduction. Definition. Classification. Triggers of malnutrition in hospitalized patients. Consequences of malnutrition. Preventive measures and control methods.
- Item 3: ADVANCES IN THE ASSESSMENT OF NUTRITIONAL STATUS. Introduction. Compartment model. Multicompartmental model. Choice of the technique for monitoring the effectiveness of nutritional support.
- Item 4. ORGANIC RESPONSE AGAINST AGGRESSION. Metabolism and phases of the response to aggression. Mediators of the response to aggression. Using substrates in aggression.
- Item 5. ENERGY REQUIREMENTS IN PATIENTS REQUIRING NUTRITIONAL SUPPORT. Introduction. Energy needs and factors that modify them. Calculation of the energy needs in terms of pathology. Using the calorimetric technique in determining the energy requirements: direct calorimetry; indirect calorimetry. Using indirect calorimetry for calculating energy requirements in critically ill patients.

Firma (1): MIGUEL MARISCAL ARCAS  
En calidad de: Secretario/a de Departamento



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- Item 6. GENERAL REMARKS ON THE ARTIFICIAL NUTRITION. Introduction. When initiating nutritional support. Candidates nutritional support. Time to be maintained nutritional support
- Item 7. ENTERAL NUTRITION (EN). Concept. Material. Methods of administration.
- Item 8. ENTERAL FORMULATIONS. Classification. Components. Technological requirements. Development. Stability. Controls. Special enteral formulations.
- Item 9. NUTRITION ENTERAL AND MEDICINES. Selection of the dosage form. Incompatibilities. Conditioning factors. Drug stability. Absorption level interactions.
- Item 10. PARENTERAL NUTRITION (PN). Concept. Routes of administration. Devices. Complications associated with PN.
- Item 11. PARENTERAL FORMULATIONS. Classification. Components. Technological requirements. Development. Stability. Controls. Special parenteral formulations.
- Item 12. PARENTERAL NUTRITION AND DRUGS. Incompatibilities. Conditioning factors.
- Item 13. HOME-BASED ARTIFICIAL NUTRITION. Introduction. Patient selection. Treatment Plan. Training. Management, and conservation of the formulas used in home nutritional support. Tracking.
- Item 14. NEW NUTRIENTS AND SUBSTRATE USED IN ARTIFICIAL NUTRITION. Introduction. Classification of nutrients in function of action taken. Amino acids with therapeutic interest. Interest fats in clinical practice. Beneficial aspects of the use of fiber. Nucleotides. Nutrients with antioxidant capacity.
- Item 15 NUTRITIONAL FORMULAS USED FOR SPECIFIC PURPOSES. Introduction. Specific formulations for renal failure. Formulations for treatment liver. Formulas useful in respiratory failure. Formulations used in patients with stress hyperglycemia. Specific formulas for patients in critical condition.
- Item 16 ENTERAL FORMULAS EMPLOYMENT AS SOMO DIET NUTRITIONAL SUPPLEMENT FOR CONVENTIONAL. Introduction. Criteria for proper prescription. Criteria for selection of the formula. Features supplements used in various pathologies.

## PRACTICAL

Seminars / Workshops / Laboratory Practices

Practice 1. Calculation of the energy needs of a sick individual. Analysis of the influence that the type of disease and degree of aggression has on energy expenditure in a patient. Interpreting data obtained by indirect calorimetry. Studies of clinical cases.

Practice 2. Assessment of nutritional status of patients clinical case study. Nutritional screening techniques for early detection of patients at nutritional risk.

Practice 3. Search and analysis of special formulas for pediatric use.

Practice 4. Techniques Enteral Nutrition approach: Approach nasoenteric, gastrostomy and jejunostomies. Case Studies.

Practice 5. Management systems in enteral nutrition management: Using the gravity system and nutripumps.



Practice 6. Techniques parenteral nutrition approach: Case Studies. Patient monitoring.  
Practice 7. Refeeding syndrome: Clinical Manifestations. Pathogenesis. Prevention. Diagnosis. Treatment and practical management of patients susceptible to suffer.

Practice 8. Clinical sessions: Application of artificial nutrition specific pathological situations.

## READING

- Arenas Márquez, H. 2007: Nutrición enteral y parenteral. McGraw-Hill, México DF.
- Casanueva, E.; Horwiiz, M.; Pérez-Lizaur, ; Arrollo,P. 2000: Nutrología Médica. Tª Ed Ed Médica. Madrid
- Dupin,H; Cuq, L.; Malewiak, M.I; Rouaud, C:L.; Berthier, M. 1997: La alimentación humana. Ed. Bellaterra. Barcelona.
- García Luna, P. 1990: Introducción a la nutrición clínica y dietética. Consejería de Salud. Junta de Andalucía.
- Gibney, N.J.2007: Nutrición Clínica. Ed. Acribia. Zaragoza.
- Gil, A. 2005: Tratado de Nutrición, vol. IV. Acción Médica, Madrid.
- Linder,M.C. 1988: Nutrición. Aspectos bioquímicos, metabólicos y clínicos. Ed EUNSA. Pamplona.
- Mahan,L.K. 2005: Nutrición y dietoterapia de Krause. Lo. Edic. Ed. McGraw-Hill-Interamericana. México DF.
- Matarese, L.E. 2004: Nutrición Clínica Práctica. Ed. Elsevier. Madrid.
- Mora, R. 2002: Soporte nutricional especial. Ed. Médica Panamericana. Bogotá.
- Muñoz, M.; Aranceta, J.; García-Jalón, I. 2004: Nutrición aplicada y dietoterapia. Ed EUNSA Pamplona.
- Nelson, 1.K.; Moxnss, K.E.; Jensen, M:D.; Gastineau, C.F~ 1996. Dietética y nutrición. Manual de la clínica Mayo. Ed. Mosby/Doyma. Madrid.
- Rombeau,J.L~; Rolandelli, RH. 1998: Nutrición Clínica. Nutrición Enteral. 3-ª ed. Ed McGraw-Hill Interamericana. Madrid.
- Rombeau).L.; Rolandelli, RH. 2002: Nutrición Clínica. Nutrición Parenteral. 3ª Edic. Ed. McGraw-Hill Interamericana. Madrid
- Tojo, R 2001. Tratado de Nutrición Pediátrica. Ed. Doyma S.L. Barcelona

## RECOMMENDED INTERNET LINKS

- Journal of parenteral and enteral nutrition
- Clinical Nutrition
- Nutrition
- Nutrition and clinical practice
- Nutrición Hospitalaria
- Journal of Nutrition
- Nutrition reviews
- Nutrition & metabolism

