## MODULE CONTENT  YEAR  TERM  CREDITS  TYPE
| BASIC COMMON KNOWLEDGE | HUMAN AND CELL PHYSIOLOGY | 2nd | 2nd | 6 ECTS  | Obligatory |

### LECTURER

- Aranda Ramírez, Pilar
- López-Jurado Romero de la Cruz, María
- Jesús Francisco Rodríguez Huertas
- Julio José Ochoa Herrera

### CONTACT INFORMATION

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### TUTORING AND MEETINGS

- Dra. Aranda: 1st semester: M y T 10.30-14.30 Faculty of Pharmacy.  
  2nd semester: M 10.30-14.30 Faculty of Pharmacy and M 9.00-11.00 Faculty of Sport Science  
- Dra. López Jurado:  
  1st semester: M y T 10.30-14.30 Faculty of Pharmacy.  
  2nd semester: M 10.30-14.30 Faculty of Pharmacy and M 9.00-11.00 Faculty of Sport Science.  
- Dr. Rodríguez Huertas: M y W 11:00-13:00 Faculty of Sport Science.  
- Dr. Ochoa Herrera: T, Th and F 9.00-11.00. Faculty of Sport Science.

### DEGREE WITHIN THE SUBJECT IS TAUGHT

- HUMAN PHYSIOLOGY
## Degree in Physical Activity and Sport Science

### PREREQUISITES and/or RECOMMENDATIONS

**Prerequisites:** those necessary to access to the degree, related with the level of formation that the student must acquire to accede to the University.

**Recommendations:** to have previous basic knowledge (background knowledge of Chemistry, Anatomy and Histology, Biochemistry, Metabolism. A good standard of English and informatics skills are also required.

### BRIEF ACCOUNT OF THE SUBJECT PROGRAMME

The programme has a **high degree of coherence and integration** and cover a diverse range of topics, while reflecting particular strengths within the biological and life sciences and there is a clear coherence between the different modules. Physiology is a study of the normal functions of cells, organs and systems of the living body, the mechanisms by which they are achieved and the regulation of functional activities to maintain the homeostasis, therefore the programme has been divided into thematic units just for didactic purposes, but during the course we will integrate all the body systems defining their links to maintain the homeostasis.

1. **Program Theory**
   - Thematic Unit I: Introduction and cell Physiology
   - Thematic Unit II: Nervous System
   - Thematic Unit III: Body Fluids and Blood.
   - Thematic Unit IV: Endocrine System
   - Thematic Unit V: Cardiovascular System
   - Thematic Unit VI: Respiratory System
   - Thematic Unit VII: Renal System
   - Thematic Unit VIII: Digestive System
   - Thematic Unit IX: Reproductive System

2. **Program Practic**
   - **Practice 1.** Detailed functional study of different organs and body systems models.
   - **Practice 2.** Blood cell count and morphology by mean of the optical microscope.
   - **Practice 3.** Determination of hemoglobin and hematocrit. Automatic counting of leukocytes and erythrocytes
   - **Practice 4.** Blood Pressure assessment. Glucemic profile.
   - **Practice 5.** Respiratory system assessment by mena of spirometry
   - **Practice 6.** Neurophysiology of nerve impulses (computer simulation)
   - **Practice 7.** Skeletal Muscle Physiology (simulated)

### GENERAL AND PARTICULAR ABILITIES

Physiology is a study of the normal functions of cells, organs and systems of the living body, the mechanisms by which they are achieved and the **regulation of functional activities**. A firm grasp of its principles is essential not only for the study of successive courses, but also for students’ future professional career after graduation. Selection of the teaching material will be in accordance with the necessity of professional education and will be laid emphasis on basic theories and knowledge of physiology as well as on the training of basic techniques.
Attention will also be paid to promote the ability of scientific thinking of the students. In order to foster the students’ ability of studying physiology, we conduct our teaching with several methods, such as self-study, exhibition in small groups and tutoring instead of to be given only by lecturer in the classroom. The lifelong learning to obtain more and better competences requires new pedagogical practices and the emergence of new scenarios for the students in where multimedia shall play a predominant role in our programme. Therefore, multimedia resources will be using our methodological teaching-learning process in the classroom. Cooperative learning networks will be built and innovative teaching-learning strategies will be used to complement the traditional classes.

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

Cognitive objectives:
- Understand and analyze the interactions between nervous system, cellular communication and its relation to human homeostasis.
- Study, understand and analyze the physiological roles of all the body systems and its integration to maintain homeostasis.

Procedural aims:
- Know properly use terms and concepts of matter and expressed in a correct and accurate.
- Deduct, identify and describe the physiological effects of body systems to maintain a stable, constant condition in the human body.
- Deduct, interpret and evaluate critically experimental results.
- Know the main documentary sources of the discipline of developing the ability to complete and update knowledge in the future.

Attitudinal objectives:
- Determine the complex interactions to maintain balance or return systems to functioning within a normal range.
- A scientific approach to the study and explanation of physiological phenomena in the domain of scientific knowledge.

DETAILED SUBJECT TOPICS

We will use several multimedia instruments during the course to enhance the teaching-learning process of the student. This programme has been designed taking into account the integration concept and cover a diverse range of physiological topics, with a clear coherence between the different modules. Physiology is a study of the normal functions of cells, organs and systems of the living body, the mechanisms by which they are achieved and the regulation of functional activities to maintain the homeostasis, therefore the programme has been divided into thematic unit just for didactic purposes, although during the course we will integrate all the body systems, to understand better how they maintain a stable, constant condition.

Program theory (with aims and time schedule)

THEMATIC UNIT I: INTRODUCTION AND CELL PHYSIOLOGY

Subject 1. - Introduction to Physiology (0,5h)
Define the concepts of physiology, internal medium and homeostasis Knowing the interest for a pharmacist involves the study of cell physiology and human
Subject 2. - Functional organization of the cell (Plasma membrane). Transport across the plasma membrane (1h)
Understanding the functional organization of the cell Describe the functions of the plasma membrane Knowing the ionic composition of the intracellular and extracellular fluids. Differentiate processes of endocytosis (pinocytosis, phagocytosis) and exocytosis Understanding the mechanisms of passive transport: simple diffusion and facilitated diffusion Knowing the characteristics and regulation of the various kinds of ion channels. Differentiate primary and secondary active transport Know the characteristics and properties of the ion pumps Knowing paracellular transport

Subject 3. – Resting membrane potential and action potential. Excitability (1,5h)
Describe and explain the resting membrane potential and ionic bases Describe the local potential and ion channels involved Describe and explain the phases, properties and ionic basis of the action potential. Knowing the excitability changes along the action potential Describe the action potential conduction and the effect of myelin

THEMATIC UNIT II: NERVOUS SYSTEM

Subject 4. - Nerve cells. Synaptic transmission (1,5 h)
To study the functions of the neuron. Describe the process of myelinogenesis. Knowing the properties of the neuron Describe the events involved in the damage and peripheral nerve repair. Describe the main morphological characteristics of the synapse Distinguish between electrical synapses and chemical synapses List the steps used in the transmission of impulses across the synapse Distinguish between excitatory and inhibitory postsynaptic potentials Define presynaptic inhibition Identify the various types of neural circuits in the nervous system Differences between spatial and temporal summation Describe the properties of the synapse List the criteria for identifying a substance as a neurotransmitter Describe the classification and functions of neurotransmitters Define and classify the neuromodulators.

Subject 5. - General structure of the nervous system (1h)
Learn the basic functions of the nervous system Knowing the functional characteristics of the cranial and spinal nerves Know the elements of the central nervous system protection Explain the formation, movement and function of cerebrospinal fluid Know the meaning of the blood brain barrier.

Subject 6. - General physiology of receptors (1h)
Differentiate the concepts of sensation and perception List the types of sensory modalities Define and classify sensory receptors Describe the sensory transduction process and differentiate between potential and receptor potential generator Adapting receptors. Differentiate between fast and slow Define the concept of receptive field Describe the process of sensory coding. Describe the location and function of receptors of tactile, thermal and pain sensations Describe the different types of pain Identify proprioceptive receptors (muscle spindles and Golgi tendon organ) and describe their functions. Describe the modes of transmission and integration somatovisceral cortical sensitivity.

Subject 7. Physiology of sensory organs (2h)
Know the functions of the structural components of the eyeball Explain the role of the refraction, accommodation and constriction in imaging Describe the functions of the photoreceptors and photopigments in vision Adapting known vision receptors to changes in light intensity Describe binocular vision and the ability to perceive the depth and three-dimensional nature of the objects Understand the concept of visual acuity Describe
the processing of visual impulses in the retina and the visual pathways and centers of integration. Describe the functions of the structures that make up the three main parts of the ear. Describe the characteristics of a sound wave. Describe the process of capture and conveyance of a sound wave. Knowing sensory transduction in fonorreceptores. Describe the coding of frequency, intensity and sound localization. Identify pathways and nuclei involved in the neural processing of auditory information. Describe the function of the macula in the static and dynamic balance (linear acceleration and deceleration). Describe the function of the ampullary crests in rotational acceleration or deceleration. Identify vestibular pathways and integration centers. Knowing the structure of gustatory and olfactory receptors. Describe the physiology of taste and smell. Describe the pathways and centers for gustatory and olfactory sensitivity.

**Subject 8. – Control Motor Activity (1h)**
Describe the motor neuron-muscle ratio. Enumerate the sequence of events and ionic power ranging from the production of an action potential in the motor nerve to the contraction of a skeletal muscle. Describe how you conducted the cross-bridge cycle and shortening the sarcomere. Knowing the function of the calcium ion in the contraction-relaxation. Explain the sum of contractions and length-tension relationships and force-velocity.

**Subject 9. – Autonomic Nervous System (1h)**
Compare the autonomic and somatic nervous systems. Describe the functions of preganglionic and postganglionic neurons in the autonomic nervous system. Describe the organization and synaptic transmission in the sympathetic and parasympathetic nervous systems. Indicate the neurotransmitters and receptors of the sympathetic and parasympathetic nervous systems and its exceptions. List the physiological effects of the autonomic nervous system. Explain the functional relationship of the hypothalamus with the autonomic nervous system. Explain the mechanisms that regulate and control the intake of water and food.

**Subject 10. – Higher functions of the nervous system (1h)**
Explain the cellular basis of sleep-wake rhythms and their possible role. Explain the cellular basis of learning and memory.

**Subject 11. – Skeletal and visceral muscle physiology (1.5 h)**
To explain the functional differences between skeletal, cardiac and smooth muscle. To explain the general concepts of neuromuscular union.

**THEMATIC UNIT III: BODY FLUIDS AND BLOOD**

**Subject 12. – Body Fluids. The blood (1 h)**
Describe the compartments that distributes water from the body. Give an overview of the components of blood. Give an estimate volume percentages and formed elements. Describe the formed elements of the blood and their functions. Describe the functions of the blood. Understand what hematocrit value and clinical utility. Describe the main plasma components and their functions. Describe the different types of plasma proteins and their functions.

**Subject 13. – Physiology of the erythrocyte and leukocyte (1h)**
Describe erythropoiesis and its regulation. Explain the production and degradation of hemoglobin. Describe the role of iron and its main metabolic aspects. Knowing the current theories of the stem cells. Explain how to determine the ABO blood groups and Rh factor. Describe leukopoiesis. List the functions of neutrophils, eosinophils and basophils.
Subject 14. Platelet physiology and hemostasis (1h)
Explain the formation of the platelet cloth. Describe the mechanisms that contribute to hemostasis. Identify the stages of blood coagulation and explain the various factors that stimulate and inhibit. List the hemostatic regulatory mechanisms

THEMATIC UNIT IV: ENDOCRINE SYSTEM

Subject 15. General organization of the endocrine system. Neuroendocrine Integration (1,5h)
Define the terms endocrine gland and hormone Identify various endocrine glands and the hormones they secrete List a number of criteria that identify a substance as a hormone Know the classification of various hormones Know the processes of synthesis, secretion and hormone transport and metabolism Describe the types of signals that can regulate the secretion of hormones Describe the general mechanisms of hormone action. Explain the functional relationship between the hypophysis and hypothalamus Describe the functional implications of hypothalamic-pituitary portal system List the hormones of the adenohypophysis and neurohypophysis and explain how its secretion is regulated by the hypothalamus

Subject 16. Thyroid physiology (1h)
Knowing thyroid hormones Describe the biological actions and mechanisms of regulation of thyroid hormone secretion

Subject 17. Hormonal regulation of protein metabolism and growth (1,5h)
Describes the mechanisms of action of the major hormones involved in protein metabolism. Describe the metabolic effects and mechanisms of regulation of GH secretion Meet other factors and hormones involved in growth

Subject 18. Hormonal regulation of both glycemic and lipid metabolism (1,5h)
Describes the mechanisms of action of the major hormones involved in lipid and glycemic metabolism

Subject 19. Hormonal regulation of water-salt balance (1h)
Knowing the role of mineralocorticoids in the regulation of water and electrolyte homeostasis Describe some of the major biological actions of aldosterone Describe the biological actions of ADH and how its secretion is regulated Describe the renin-angiotensin-aldosterone activation mechanisms and functions

Subject 20. Hormonal regulation of metabolism calcium/phosphorus (1h)
Know the different types of bone cells Describe the interaction between the plasma levels of calcium and parathyroid hormone and calcitonin Describe the biological actions and mechanisms of regulating the secretion of parathyroid hormone, vitamin D hormone and calcitonin

THEMATIC UNIT V: CARDIOVASCULAR SYSTEM

Describe the function of the heart chambers and valves. Explain the functional characteristics of the myocardium.List the properties of the myocardium. Explain the functional characteristics of the cardiac conduction system. Explain the significance of the electrocardiogram (ECG) and its diagnostic significance.
Subject 22. Cardiac cycle. Cardiac output and factors affecting it. (1,5h)
Explain the temporal sequence of contraction-relaxation in the cardiac cycle. Explain and relate the pressure changes that occur in the cardiac chambers with valves dynamics and blood movements during the cardiac cycle. Explain the origin and components that produce heart sounds. Define cardiac output and describe the factors that affect it: stroke volume and heart rate. List the factors controlling stroke volume and heart rate.

Subject 23. General circulation and microcirculation. (2h)
Describe and differentiate the function of arteries and veins. Schematize the general circulation. Explain the factors that regulate the rate and blood flow. Define the concepts of systolic, diastolic, and mean differential blood pressure. Describe the mechanisms that are implemented in the short, medium and long-term blood pressure control. Explain the main determinants of the venous circulation. Differentiate the function of arterioles, capillaries and venules. Describe the organization of the microcirculatory unit. Analyze the pressures associated with the movement of fluids and substances between capillaries and interstitial spaces. Describe the circulation of the lymphatic vessels. Describe the formation and flow of lymph. Understand the functions of lymph.

Subject 24. Cardiovascular regulation. (1h)
Explain the heart self regulation. Explain the role of baro and chemoreceptors in the control of the cardiovascular activity. Know the functioning of the nerve centers in the cardiocirculatory activity control.

THEMATIC UNIT VI: RESPIRATORY SYSTEM

Subject 25. - Morphofunctional structure of the respiratory system. Mechanical ventilation. (1,5h)
Describe the function of the respiratory tract. Describe the processes causing inspiration and expiration. Explain what is meant by surface tension and the role of alveolar surfactant. Describe and differentiate anatomic dead space and physiologic dead space. Define and quantify lung volumes and capacities. Describe the unique characteristics of the pulmonary circulation.

Subject 26. - Exchange and transport of respiratory gases. (1h)
Knowing the partial pressures of oxygen and carbon dioxide in the atmosphere, alveoli, blood and tissues, and based on that describe the diffusion of gases. Describe the different ways in which oxygen and carbon dioxide is transported by the blood. Explain the role of hemoglobin in the transport of CO2.

Subject 27. - Regulation of respiration. (1h)
Describe the areas of the central nervous system and the mechanisms involved in the nervous control of respiration. Explain peripheral mechanisms that contribute to the maintenance of normal breathing patterns. Describe the role of central and peripheral chemoreceptors on breathing control.

THEMATIC UNIT VII: RENAL SYSTEM

Subject 28. - Morphological-functional structure of the excretory system. The nephron. (1h)
Make a list of kidney functions. Describe the functional anatomy of the nephron. Know the structure and function of the juxtaglomerular apparatus.

Subject 29. - Mechanisms of urine formation. (1h)
Define glomerular filtration explaining the mechanisms that produce it. Explain the basic mechanisms of
tubular reabsorption and secretion. Explain the countercurrent mechanism. Explain the mechanisms and factors involved in the concentration and dilution of urine. Explain the concept of urine clearance and usefulness. Explain the mechanisms and stages that occur in urination. Knowing the self and endocrine regulation of glomerular filtration. Describe the role of the renin-aldosterone-angiotensine system in the reabsorption and secretion of electrolytes. Understand the role of antidiuretic hormone on water reabsorption in the renal tubules.

Subject 30. Regulation of acid-base balance. (1h)
Relate hydrogen ion secretion by the kidney in the maintenance of acid-base balance. Explain the importance of buffer systems for the acid-base balance. Define the concepts of acidosis and alkalosis. Describe the importance of the respiratory system in the regulation of acid-base balance.

THEMATIC UNIT VIII: DIGESTIVE SYSTEM

Subject 31. Functional structure of the digestive tract. Smooth muscle. Motility of the alimentary tract (1h)
To identify the organs of the digestive tract. To describe of the caps that form the wall of the alimentary tract. To describe the general functions of the alimentary tract. To describe the mechanism of contraction and the properties of the smooth muscle. To explain the mechanisms of the swallowing and transport of the food up to the stomach. To enumerate the factors that regulate the voidance of the stomach. To enumerate the different types of intestinal motility and to describe the functions of each one. To explain the mechanisms involved in the defecation reflex.

Subject 32. Digestive Secretions (1h)
To describe the composition, function and regulation of the salivary secretion. To describe the composition, function and regulation of the gastric secretion. To describe the composition, function and regulation of the pancreatic secretion. To explain the functional organization of the hepatic lobule. To describe the composition, function and regulation of the biliary secretion. To explain the enterohepatic circulation. To explain the functional organization of the intestinal hairinesses. To describe the composition, function and regulation of the intestinal secretion.

Subject 33. Digestion and absorption (1h)
To know the basic beginning of the gastrointestinal absorption. To describe the digestion and absorption of carbohydrates. To describe the digestion and absorption of proteins. To describe the digestion and absorption of fats. To explain the absorption of water and electrolytes. To explain absorption of vitamins.

THEMATIC UNIT IX: REPRODUCTIVE FUNCTION

Subject 34. Morphologic and functional structure of the reproductive system (1.5h).
Knowing the physiology of male sexual organs. Describe the stages of spermatogenesis and functions of Sertoli’s cells in this process. Function of seminal vesicles and prostate gland. Describe the hypothalamic-hypophysary-testicular control of testosterone secretion. Puberty and regulation of its beginning. Knowing the physiology of the female sexual organs. Describe the different stages of ovarian and menstrual cycles. Explain hormonal interactions involved in the control of ovulation. Describe the biological actions of testosterone, estrogen and progesterone. Describe the hypothalamic-hypophysary-ovarian control the secretion of estrogen and progesterone. Compare the various types of methods of birth control and its effectiveness.
Subject 35. Physiology of fecundation, pregnancy, childbirth and lactation (1h)
Describe the structure and functions of the placenta. Know the placenta secretes hormones and describe their actions. Describe the evolution of the plasma levels of estrogen, progesterone and chorionic gonadotropin throughout gestation. List the functional changes in the endocrine glands of women during pregnancy. Explain the mechanisms triggering hormonal birth. Describe the interactions of various hormones in the initiation and maintenance of breastfeeding

LABORATORY PRACTICE PROGRAM

Practice 1. Detailed functional study of different organs and body systems models. (3h)
Practice 2. Blood cell count and morphology by mean of the optical microscope. (3h)
Practice 3. Determination of hemoglobin and hematocrit. Automatic counting of leukocytes and erythrocytes (3h)
Practice 4. Blood Pressure assessment. Glucemic profile. (3h)
Practice 5. Respiratory system assessment by mean of spirometry (3h)
Practice 6. Neurophysiology of nerve impulses (computer simulation) (1h)
Practice 7. Skeletal Muscle Physiology (simulated) (1h)

SYSTEM FOR ASSESSING THE ACQUISITION OF THE COMPETENCES AND KNOWLEDGE

To evaluate the course content, theory examination will be performed on dates determined by the faculty in coordination with the other subjects in the 2nd year. Prior to the date of each control the teacher will expose the type of examination. There will also be an evaluation of the work performed and presented by the students in class and also of the regular attendance to classroom (focusing on class activities scheduled throughout the course). In order to pass the course will be must have passed laboratory practices and theory examinations.

The allocation of points in the evaluation system will be based on percentages:
Theory examinations: 70%
Exhibition of topics by students, papers and participation in seminars. Attendance to class and class activities: 20%
Laboratory Practices: 10%

OFFICIAL UNIQUE EVALUATION

According to the Policy Evaluation and Grading of Students of the University of Granada (Adopted by the Governing Council at its special meeting of May 20, 2013), conducting a final evaluation to only those students who may benefit contemplated they can not comply with the method of continuous assessment for work, health status, disability or any other duly justified reason that prevents you follow the regimen of continuous assessment. To qualify for the final single assessment, the student, in the first two weeks of teaching of the subject, I will ask the Director of the Department, who will transfer to the relevant faculty, alleging and proving their reasons for him not to follow the system continuous assessment. After ten days the student has received express written response of the Director of the Department, be deemed to have been rejected. In case of refusal, the student may file, within one month appeal with the Chancellor, who may delegate to the Dean or Director of the Centre, exhausting administrative way.
**BIBLIOGRAPHY**

**GENERAL BIBLIOGRAPHY:**

**Print Books:**


**Dictionary and Atlas:**


SPECIFIC BIBLIOGRAPHY


PERIODIC PUBLICATIONS

News in Physiological Sciences Physiological Review

Review Current Advances in Physiology

Annual Review of Physiology

MANUALS OF PRACTICE


Panamericana, 2009.


**RECOMMENDED WEBSITES**

http://www.dailymotion.com/video/x80ljy_cerebro-anatomia-y-fisiologia-gener_school
http://www.dailymotion.com/relevance/search/anatom%C3%ADa+y+fisiolog%C3%ADa (videos de Anatomía y fisiología)
http://www.youtube.com/results?search_query=fisiolog%C3%ADa&oq=fisiolog%C3%ADa&gs_l=yt... (vídeos de Fisiología)
http://www.youtube.com/watch?v=L5T81uMVr44 (Sistema Nervioso)
http://www.youtube.com/watch?v=dVidTJ4Wjs&feature=related (Sangre)
http://www.youtube.com/watch?v=8af1Cpustf0&feature=related (Coagulación)
http://www.youtube.com/watch?v=aQZaNXNroVY&feature=related (Sistema Renal)
http://www.youtube.com/watch?v=URHBBE3RKEs&feature=fvsr (Sistema digestivo)
http://www.youtube.com/watch?v=HiT621PrrO0&feature=related (Sistema Respiratorio)
http://www.youtube.com/results?search_query=Sistema+Cardiovascular&oq=Sistema+Cardiovascular&gs_l=yt... (Sistema Cardiovascular)

Scientific societies with educational websites and general websites

http://www.the-aps.org/ The American Physiological Society
http://physoc.org/ The Physiological Society
http://www.seccff.org/ Sociedad Española de Ciencias Fisiológicas
http://www.feps.org/ Federación Europea de Sociedades de Fisiología
**TUTORING**

Personalized and small group attention. Continuous instruction and/or orientation carried out by the lecturer. For the purpose of reviewing and discussing the materials and topics presented in lectures, seminars, readings, writing papers and of course to answer questions related with the subject. El profesor podrá encargar a los alumnos realizar trabajos sobre la asignatura de forma individual. Tutorías: reuniones periódicas en tutorías específicas donde resolver dudas planteadas por los alumnos.

**ADDITIONAL COMMENTS**

Context in the Degree:
The qualification of Graduate in Sciences of Physical Activity and Sport enables, among other things, to:
- Schedule physical and sports activities with people at different stages of life, healthy or that require special attention (over 65, athletes with physical, mental or sensory disabilities, and people with health problems among others), making the optional acts of prevention, maintenance or upgrading, improvement, rehabilitation or recovery of their being and quality of life through physical exercise.
- Training, recruitment, advising, planning, programming, management, monitoring, evaluation, monitoring and similar functions of athletes and teams in order to address the competition and during the competition of athletes.

Its general objectives include:
- Acquire adequate training in the foundations, structures and functions of the manifestations of human movement and the basics of the sport.
- Know and understand the effects of physical exercise on the structure and function of the human body, its psychological, social, physiological and mechanical aspects.

Arrangements for academic guidance. Student Affair Office. International programmes. Academic Year 2014/2015. Learning outcomes. Students will learn: editing and written self-assessment skills; mastery of essential matters of format and style in academic writing (such as with citation and documentation); and important strategies for writing effective academic prose controlled by a clear purpose and supported with sufficient, well-organized content for a particular audience. Moreover, they will improve skills in controlling tone, register, style, accuracy, vocabulary, and structure in the practical use of English in formal academic writing. Deirdre McCloskey, Economical Writing. Paul J. Silvia, How to Write a Lot: A Practical Guide to Productive Academic Writing. Howard S. Becker, Writing for Social Scientists: How to Start and Finish Your Thesis, Book, or Article, Second Edition.