



FACOLTÀ DI
MEDICINA E CHIRURGIA

SAN RAFFAELE INTERNATIONAL MD PROGRAM

Student Guide

Academic Year 2015/2016

SAN RAFFAELE INTERNATIONAL MD PROGRAM

YEAR 1

Academic Year 2015/2016

- Statistics and Bioinformatics
- Medical Physics
- Medical Humanities
- Chemistry and Biochemistry
- Cell and Molecular Biology
- Genetics and Developmental Biology

SAN RAFFAELE INTERNATIONAL MD PROGRAM - 1st YEAR

sept-2015		oct-2015		nov-15		dec-2015		jan-2016		feb-16		mar-16		apr-16		may-2016		jun-2016		jul-2016		aug-2016		sep-2016	
1		1		1		1		1	Holidays	1	Study Leave	1	EXAMS	1		1		1	13.	1	Study Leave	1	Holidays	1	EXAMS
2		2		2		2		2		2	Study Leave	2	EXAMS	2		2		2	BANK HOLIDAY	2		2	Holidays	2	EXAMS
3		3		3		3		3		3	Study Leave	3	EXAMS	3		3		3		3		3	Holidays	3	EXAMS
4		4		4		4	10.	4	Holidays	4	Study Leave	4	EXAMS	4		4		4		4	Study Leave	4	Holidays	4	EXAMS
5		5		5		5		5		5	Study Leave	5	EXAMS	5		5		5		5		5	Holidays	5	EXAMS
6		6		6	6.	6		6	EPHAPHARY	6		6	Beginning Sem.2	6		6	9.	6		6		6	Holidays	6	EXAMS
7		7		7		7	S. AMBROGIO	7		7	EXAMS	7	Beginning Sem.2	7		7		7		7	Study Leave	7	Holidays	7	EXAMS
8		8		8		8	IMMACOLATA	8	13.	8	EXAMS	8		8	5.	8		8		8	Study Leave	8	Holidays	8	EXAMS
9		9		9		9		9		9	EXAMS	9		9		9		9		9		9	Holidays	9	EXAMS
10		10		10		10		10		10	EXAMS	10		10		10		10	14.	10		10	Holidays	10	EXAMS
11		11		11		11		11		11	EXAMS	11	1.	11		11		11		11	EXAMS	11	Holidays	11	EXAMS
12		12		12		12		12		12	EXAMS	12		12		12		12		12	EXAMS	12	Holidays	12	EXAMS
13		13		13	7.	13		13		13	EXAMS	13		13		13	10.	13		13	EXAMS	13	Holidays	13	EXAMS
14		14		14		14		14		14	EXAMS	14		14		14		14		14	EXAMS	14	Holidays	14	EXAMS
15		15		15		15		15	14.	15	EXAMS	15		15	6.	15		15		15	EXAMS	15	ASSUMPTION	15	EXAMS
16		16		16		16		16		16	EXAMS	16		16		16		16		16	EXAMS	16	Holidays	16	EXAMS
17		17		17		17		17		17	EXAMS	17		17		17		17	15.	17		17	Holidays	17	EXAMS
18		18		18		18		18		18	EXAMS	18	2.	18		18		18		18	EXAMS	18	Holidays	18	EXAMS
19		19		19		19		19		19	EXAMS	19		19		19		19		19	EXAMS	19	Holidays	19	EXAMS
20		20		20	8.	20		20		20	EXAMS	20		20		20	11.	20		20	EXAMS	20	Holidays	20	EXAMS
21	Orientation Week	21		21		21		21		21	EXAMS	21		21		21		21		21	EXAMS	21	Holidays	21	EXAMS
22		22		22		22		22	15 . END SEM1	22	EXAMS	22		22		22		22		22	EXAMS	22	Holidays	22	EXAMS
23		23	4.	23		23		23		23	EXAMS	23	3.	23		23		23		23	EXAMS	23	Holidays	23	EXAMS
24		24		24		24		24		24	EXAMS	24	Easter Holiday	24		24		24	16. END SEM 2	24		24	Holidays	24	EXAMS
25		25		25		25		25	Study Leave	25	EXAMS	25	Easter Holiday	25	BANK HOLIDAY	25		25		25	EXAMS	25	Holidays	25	EXAMS
26		26		26		26		26	Study Leave	26	EXAMS	26	Easter Holiday	26		26		26		26	EXAMS	26	Holidays	26	EXAMS
27		27		27	9.	27		27	Study Leave	27	EXAMS	27	Easter	27		27	12.	27	Study Leave	27	EXAMS	27	Holidays	27	EXAMS
28		28		28		28		28	Study Leave	28	EXAMS	28	Easter Holiday	28		28		28		28	EXAMS	28	Holidays	28	EXAMS
29	Beginning Sem.1	29		29		29		29	Study Leave	29	EXAMS	29	Easter Holiday	29		29		29	Study Leave	29	EXAMS	29	Holidays	29	EXAMS
30		30		30		30		30		30	EXAMS	30	Easter Holiday	30		30		30	Study Leave	30	EXAMS	30	Holidays	30	EXAMS
31		31		31		31		31		31	EXAMS	31		31		31		31		31	EXAMS	31	Holidays	31	EXAMS

STATISTICS AND BIOINFORMATICS

Total Credits: 6

Lectures: 42

Practicals: 24

Scientific Discipline Sector: MED/01 – INF/01

Course Instructors:

Prof. Clelia Di Serio Email: diserio.clelia@univr.it (**Coordinator**)

Prof. Elia Biganzoli Email: elia.biganzoli@unimi.it

Dr. Paola Rancoita Email: rancoita.paolamaria@univr.it

Dr. Federica Cugnata Email: cugnata.federica@hsr.it

Receiving Hour to be requested by email writing to the single Professor

Course Description

The course provides an introduction to statistical concepts and quantitative methods used in the Health Sciences. Fundamental concepts in the following fields will be presented: clinical epidemiology, probability, exploratory data analysis, statistical inference. Basic knowledge and tools for data management and data analysis are also provided in the course.

Course Objectives

By the end of the course, students will be able to:

- 1) understand and perform basic statistical data analysis by means of graphical methods and of descriptive statistics for univariate and bivariate variables;
- 2) understand the difference between causality and statistical association, compute association measures between variables, calculate least squares regression and interpret the results,
- 3) perform simple calculations based on the rules of probability (Bayes' Theorem) to interpret diagnostic tests;
- 4) recognize different study designs used in clinical epidemiology and compute measures of treatment efficacy and risk factors impact;
- 5) use statistical models (Binomial, Poisson, Exponential and Normal distribution) to calculate probabilities of events;
- 6) construct and interpret confidence intervals and one-sample hypothesis tests for population means;
- 7) construct and interpret two-sample hypothesis tests and confidence intervals for difference of means;
- 8) understand and use simple statistical methods for analyzing censored survival data;
- 9) read clinical epidemiological papers and interpret the statistical analyses;
- 10) use SPSS statistical software to perform basic statistical analyses.

Practicals:

The practicals will be usually structured in the following way: 1) some exercises will be solved and discussed by the teaching assistant; 2) in-class problems will be assigned and asked to be solved in small groups; 3) the solution of the in-class problems will be discussed. The in-class exercises will allow an active learning and discussion of the related statistical and epidemiological concepts. At the end of each lesson, similar homework exercises will be assigned to provide an opportunity for independent practice. The corresponding complete solutions will be given subsequently for auto-correction. Depending on the topic, also the statistical analysis of some examples of published scientific papers will be discussed.

Readings

Main material:

- Textbook: Biostatistics. Basic Concepts and Methodology for the Health Sciences (9th edition). Author: Wayne W. Daniel. Wiley
- Supplementary Online Material.

Additional material (one of the following):

- Discovering Statistics Using SPSS (Introducing Statistical Methods), 3rd edition, by Andy P. Field (2009)- Sage Publications

- SPSS Survival Manual: A step by step guide to data analysis using SPSS, 4th edition, by Julie Pallant (2010)-Allen & Unwin
- SPSS Programming and Data Management, 4th Edition, by Raynald Levesque; SPSS Inc.

Schedule of the Lectures

Session	Topics	SPSS LAB/ Practicals
1	Introduction, graphical methods for representing data	
2	Univariate analysis: measures of location and dispersion	
	Introduction to SPSS	SPSS LAB
		SPSS LAB 1
		Practical 1
3	Bivariate analysis: covariance and correlation	
4	Bivariate analysis: regression and R-squared	
		SPSS LAB2
		Practical 2
5	Probability, Bayes' Theorem and conditional probability	
6	Independency and contingency table (chi-square statistic)	
		SPSS LAB 3
		Practical 3
7	Introduction to discrete probability distributions, Binomial distribution	
8	Poisson distribution	
		Practical 4
9	Introduction to continuous probability distributions, Normal distribution	
		Practical 5
	Screening test, ROC curve	SPSS LAB
10	Sampling distribution for the mean and for the difference of means, Central Limit Theorem	

		Practical 6
11	Confidence intervals for the means (variance known and unknown), Student's t-distribution	
12	Confidence intervals for the for the difference of means	
		Practical 7
13	Hypothesis testing: basic concepts and hypothesis test for the mean (with variance known)	
14	Hypothesis testing: hypothesis test for the mean (with variance known and unknown) and for the difference of means	
		Practical 8
		SPSS LAB 4
15	Introduction to Evidence Based Medicine reasoning based on quantitative statistical evidence Diagnostic tests: screening and diagnosis Test with dichotomous variables: sensibility and specificity, PPV, NPV	
16	Diagnostic test Test with continuous and ordinal variables, ROC curves Fagan nomogram and practical application in diagnostic testing Information and medical decision making in screening test: examples of early diagnosis	
17	Introduction to clinical epidemiology Evaluating risk factors Probability and disease risk Measures of prevalence, incidence and association Basic concepts of survival analysis	
18	Observational vs. experimental studies. Cross-sectional and case-control studies Cohort studies (prospective/retrospective) Inference on odds ratio and relative risks	
19	Experimental design in clinical research Clinical trial vs. observational studies Phase I, II, III, IV clinical trials Randomized Controlled Trials Ethical issues Inclusion criteria Measures of treatment efficacy Interaction and confounders	

MEDICAL PHYSICS
Total Credits: 5
Lectures: 48 hours
Practicals: 20 hours

Scientific Discipline Sector: FIS/07 – MED/36

Teaching staff

Prof. Tommaso Tabarelli de Fatis (Coordinator)
Prof. Giovanni Mauro Cattaneo
Prof. Antonio Esposito
Prof. Samuel Zambrano

Email: tommaso.tabarellidefatis@unimib.it
Email: cattaneo.mauro@hsr.it
Email: esposito.antonio@univr.it
Email: zambrano.samuel@hsr.it

The course covers the basic principles of Physics, with emphasis on topics useful for understanding biological phenomena and biomedical instrumentation.

Prerequisites

Basic high-school mathematics. Some basic notion of calculus will be introduced as needed during the lectures.

Textbooks

“Physics” or “General Physics”, by Morton Sternheim and Joseph Kane, Wiley;
Notes on the specific topics covered during the lectures will be made available as additional material.

Other books with coverage of the topics presented :

“Physics Principles with Applications”, by Douglas Giancoli, Pearson/Prentice Hall;
“Fundamentals of Physics Extended”, by David Halliday, Robert Resnick, Jearl Walker, Wiley.
“Serway’s Essentials of College Physics”, by Raymond A. Serway and Chris Vuille, Brooks/Cole.

Other books oriented to Life Science, but less comprehensive

“Physics of Life Science” by Jay Newmann, Springer
“Physics for Life Science”, by Morton Sternheim and Joseph Kane, Wiley, 1978 (not anymore available, but some copies around on amazon, and some pdf versions around over the net - beware “SI version” would be needed)

Course Syllabus

The course is organized in five parts, of four lectures each (2 h) followed by one problem/review session (2 h):

Part. I and II - Mechanics, rigid body and fluids (TTdF)

- Motion and fundamental quantities, unit of measure, scalar and vector quantities. Examples.
- The principles of dynamics. Mass and force. Example of forces. “Laws of force”.
- Energy and momentum. Conservation laws. Applications.
- Rigid bodies, elements of statics, levers. Application to the human body.
- Deformable bodies: elasticity, stress and strain and applications.
- Fluids (i.e. fully deformable bodies): pressure, density, compressibility. Static of fluids and applications.
- Ideal fluids. Flow rate. Equation of continuity. Work of a fluid. Conservation of energy and Bernoulli’s equation.
- Real fluid (blood): viscosity, hydraulic resistance, laminar and turbulent motion. The human circulatory system.

Part.III - Gases and Thermodynamics (SZ)

- Temperature and equation of state. Ideal gas and kinetic theory. Real gases, vapour, and saturated vapour.
- Diffusion and osmosis. Solutions, solubility, dissociation. Matter transport and exchange in the human body.
- Energy transport in gases (and matter). Mechanical waves. Reflection and acoustic impedance.
- Thermodynamics. The first principle (and the second principle) of thermodynamics. Metabolic rate
- Specific heat capacity, heat capacity. Latent heats. Thermal conductivity. Thermoregulation of the human body.

Part.IV - Electrical phenomena and optics (MC)

- Electric charge, the "law of force", electric field, electrostatic potential energy, relation between field and potential difference. Case studies (relevant to physiology). Conductor and insulators. Capacitors.
- Electric current. Drift velocity of the charge carriers. Electric resistance; resistivity. Ohm's law. Resistors in series and parallel. Electrical representation of a cell's membrane: response of RC circuits
- Elements of electrophysiology. Charge transport through the membrane. Nernst equilibrium. The Na-K pump. Action potential. Propagation of pulses in the nerves.
- Optics. Physical and geometrical optics. Lenses. The eye: cornea and lens, defects in vision. Colour vision and photoelectric effect.

Part V - Physics principles of medical imaging (AE)

- Introduction to medical imaging
- Physical principles of image formation: radiography and CT
- Physical principles of image formation: ultrasound
- Physical principles of image formation: magnetic resonance

CHEMISTRY AND BIOCHEMISTRY
Total Credits: 12
Lectures: 120 hours
Practicals: 96 hours (divided in groups)
Scientific Discipline Sector: BIO/10- BIO/11

Course Coordinator: Prof. Andrea Graziani
Email: graziani.andrea@hsr.it
50 hours

Prof. Massimo Degano
Email: degano.massimo@hsr.it
50 hours

Prof. Angelo Corti
Email: corti.angelo@hsr.it
20 hours

Tutorials: 96 hours to be divided in groups/tutors
Dr. Barbara Corsi - Dr. Claudia Minici - Dr. Francesca Giannese – Dr. Marco Patrone

Type of subject: Traditional medical discipline

Field: General discipline for the preparation of a doctor: Structure, function and metabolism of molecules of medical interest.

Course objectives:

The Chemistry and Biochemistry course is one of fundamental importance, in which students are presented with the notions of the chemical and biochemical mechanisms necessary to understand the regulation of biological processes of the cell and of the organism.

This course covers classical aspects of molecular and cellular biochemistry, and molecular physiology. Metabolic interrelationships as they occur in the individual will be stressed and related to disturbances in disease states.

The knowledge and understandings provided by the course constitute the foundations for the following semesters both for the molecular analysis of physiological processes and those of pathogenetic mechanisms in disease. The initial part of the course will focus on the principles of general and organic chemistry with a description of the fundamental chemical reactions for the understanding of biological processes, the structure and function of organic molecules that constitute the building blocks of living matter, and the analysis and structure and function of principle biological polymers, with particular emphasis on the processes of catalytic enzymes. The second part will provide a description at the molecular level of the structures and processes that are essential for cellular life, in particular how energy is obtained from nutrients and is then used in specific processes. A strong focus will be maintained on the relationship between dysfunctionalities in metabolism and human disease.

The students will be also involved in practical activities, carrying out typical biochemical experiments using the techniques encountered during the course.

Course attendance

Students are required to attend more than 70% of the scheduled classes in order to sit at exams. Students who are unable to attend part of the classes (e.g., plan to leave the room before the end of the two hours) must make prior arrangements with the lecturer. Clocking in for other students is not tolerated, and random checks of attendance will be carried out. Violation of the honor code will be sanctioned.

How to follow the course and study for the exam

Experience from the previous years has shown a strong correlation between active attendance and the final result of the exam. It is thus strongly recommended to review the material presented during the lectures, and also to read in advance the topics to be presented.

At the end of this course, students should be able to:

- Solve problems in diagnosis and treatment of human disease by application of biochemical principles.
- Use primary medical and scientific literature as a resource for learning and problem-solving.
- Define, describe and contrast functions of genes and macromolecules in normal and pathologic contexts.
- Define and describe systemic metabolic biochemistry in terms of genes and molecules.
- Deduce therapeutic mechanisms from established molecular mechanisms.
- Interpret new medical discoveries in terms of fundamental principles of biochemistry
- Explain the molecular basis of diseases that affect cellular function or development.

Textbooks

Chemistry:

Timberlake – General, Organic and Biological Chemistry, Pearson eds.

Biochemistry, one of the following:

Berg, Tymoczko, Gatto, Stryer – Biochemistry (8th ed., 2015), Palgrave MacMillan eds.

ISBN 9781137563453

Nelson & Cox - Lehninger Principles of Biochemistry, (6th ed., 2013), Palgrave McMillan eds.

ISBN-13: 9781429234146

Voet & Voet - Biochemistry, Wiley eds. (at least 2nd edition)

The course is a prerequisite for:

Foundation for “Cellular and Molecular Biology” and “Genetics and Developmental Biology”.

Evaluation of acquired knowledge

The exam is structured as a **multiple choice written test**, with one correct answer out of four possible. The test will contain 100 questions on the Biochemistry section and 30 questions on the Chemistry section. A correct answer corresponds to 1 (one) point, a wrong answer -0.25 points, a blank answer 0 (zero) points. **A score of at least 54/100 in the Biochemistry section AND 16/30 in the Chemistry section is required to pass the exam.** In order to pass, sufficient knowledge in both Chemistry and Biochemistry must be demonstrated on a single exam date. **Hence, for instance, a positive result in Biochemistry cannot compensate for a poor result in Chemistry, and cannot be “saved” from one date to the other.** The final grade is computed considering 30/30 as 90% of the maximum score attainable.

Given the complexity of the course, **a mid-term test concerning the Chemistry part will be administered on November/December and in February** (the precise dates will be made public during the course). Students are **strongly encouraged to take this test**, since a “pass” mark will allow to be tested only on the Biochemistry section at the end of the year (**and all future exam dates**). The mid-term can be taken in either date (or both, in case of a “fail” mark on the first attempt).

No. Theme

- 1 Introduction to the course. Tips and suggestions for a proficient C&B course. Chemistry and biochemistry in human physiology
- 2 Atomic Structure. Electron Configuration and the Aufbau Principle. Atomic and Molecular Orbitals. Chemical Bonding - Covalent, Ionic and Metallic Bonds.
- 3 Intermolecular Forces - Dipole-Dipole Forces, Hydrogen Bond, London Forces. Periodic System of Elements. Trends in the Periodic Table. Nomenclature of Inorganic Compounds. Characterization of sp-, d- and f-Elements and their Compounds.
- 4 Classification of Chemical Reactions. Chemical Thermodynamics -the Laws of Thermodynamics, Enthalpy, Entropy, Free Energy. Spontaneity of Chemical Change. Chemical Equilibrium. Equilibrium Constant. Le Chatelier's Principle.
- 5 Chemical Kinetics. Reaction Rates and Factors that Influence them. Activation Energy and the Activated Complex. Catalysts and Mechanism of their Effect.
- 6 Solutions and their Properties. Solubility, Concentration of Solutions. Solutions of Electrolytes, Ionization Constant. Activity (effective concentration). Acids and Bases. The Dissociation of Water. The pH Scale. Salts, Hydrolysis of Salts, Solubility Product. Buffers, Characterization, pH, Capacity. Buffers of the Blood.
- 7 Oxidation-Reduction Processes. Hydrogen and Oxygen in these Processes. Standard Reduction Potentials. Osmosis. Osmotic Pressure. Colligative properties. Importance in Medicine.
- 8 Scope of Organic Chemistry. Formulas, Naming and Classification of Organic Compounds. Resonance, delocalization, conjugation, and aromaticity
- 9 Hydrocarbons and their Derivatives. Alkanes, Alkenes, Alkynes, Cycloalkanes.
- 10 Alcohols
- 11 Ethers, epoxides, and sulfides
- 12 Amines
- 13 Ketones and aldehydes
- 14 Carboxylic acids, esters, amides
- 15 Amino Acids and their Properties. Important Peptides.
- 16 Lactones, lactames and antibiotics
- 17 Phosphoric acids, inorganic and organic phosphates
- 18 Aromatic compounds
- 19 Alpha substitution and condensation of enols and enolate ions
- 20 Synthetic reactions in bioorganic chemistry
- 21 Monosaccharides - Classification, Configuration, Optical Activity, Anomers, Epimers. The Haworth Formulas. Reactions of Monosaccharides. Glycosidic Linkage, Reducing and non-Reducing Disaccharides. Polysaccharides and Glycosaminoglycans, Composition, Properties.
- 22 Proteins - Amino Acid Composition, Conformation of Proteins.
- 23 Types of Bonds and Interactions. Physical and Chemical Properties. Classification of Proteins.
- 24 Enzymatic catalysis
- 25 Enzymatic regulation
- 26 Protein purification and characterization
- 27 Myoglobin and Hemoglobin. Allosteric proteins.
- 28 Protein folding
- 29 Antibodies
- 30 Lipids and Steroids. Classification, Structure, Properties, Chemical Reactions.
- 31 Nucleosides and nucleotides. DNA and RNA structure and properties.
- 32 Introduction to the cell, compartments and cellular biochemistry.
- 33 Cell membranes. Lipid digestion, resorption, and transport. Lipoproteins and pathologies
- 31 Transport across membranes. Passive and active transport.
- 32 Introduction to metabolism. Synthesis and breakdown of biomolecules.
- 33 Glycolysis. Metabolism of glucose and other monosaccharides.
- 34 The Pentose Phosphate Pathway. Gluconeogenesis.
- 35 Synthesis and breakdown of glycogen. Regulation through hormonal signaling.
- 36 The pyruvate dehydrogenase complex. The citric acid cycle.
- 37 The mitochondrial electron transport chain. Oxidative phosphorylation. ATP synthesis through the mitochondrial ATPase.
- 38 Metabolism of lipids. Fatty acid oxidation in the mitochondrion and peroxisomes. Fatty acid synthesis.

- 39** Cholesterol and steroid hormones. Arachidonate metabolism. Glycolipids and storage diseases.
- 40** Amino acids. Removal of the amino group. The urea cycle. Ammonia in health and disease.
- 42** Degradation of the carbon skeleton of amino acids. Heme synthesis and degradation.
- 43** Nucleotide metabolism. Purine and pyrimidine nucleotide synthesis and regulation.
- 44** Nucleotide degradation and diseases associated with dysregulation. Uric acid, gout, and immunodeficiencies.
- 44** Integrated and organ-specialized metabolism. Extracellular and Intracellular Communication.
- 45** Molecular physiology 1. Blood clotting. The immune response
- 46** Molecular physiology 2. Muscle contraction.
- 47** Hormones and neurotransmission
- 48** Connective Tissue Proteins, Proteoglycans.

MEDICAL HUMANITIES

Total Credits: 13

Total Hours: 130

Scientific Discipline Sector: MED/02 – M-FIL/33 – M-FIL/03 – L-LIN/01 – L-LIN/12

Teaching staff

Prof. Michael John john.michael@univr.it
(Coordinator - Receiving Hour: Wednesday from 13:00 to 14:00 – Room 52R- Dabit 1)

Prof. Mariagrazia Strepparava mariagrazia.strepparava@unimib.it
Prof. William Cooke william@maptraining.it
Prof. Massimo Reichlin reichlin.massimo@hsr.it
Prof. Antonio Siccardi siccardi.antonio@hsr.it

Aim

The aim of the course is to help students understand that patients are people, and not just a mass of molecules, that not only have an illness, but are also suffering fear and anguish. Doctors must therefore strive to empathize with individuals and not simply distribute medication and drugs to faceless and nameless numbers.

Discussion and active student participation will be paramount to the overall success of the course.

Topics dealt with will include

- *empathy and patient-centered communication*
- *use of language*
- *withdrawal of treatment*
- *euthanasia and assisted suicide*
- *ethics committees*
- *chronic illness*
- *old age, death and bereavement*
- *cross-cultural conflicts*
- *alternative and complementary health practices*
- *re-pro ethics and new reproductive technologies*
- *history of science and science education*
- *how to read and write a paper for publication in a peer journal*
- *how to communicate with a peer audience at international congresses*

Final evaluation

The students will receive a final mark based upon two **compulsory** end-of-term written tests. The three-section test at the end of the first semester will be multiple-choice based, and will comprise Historical topics in molecular genetics (Siccardi), Doctor-patient communication skills (Strepparava part 1, John part 1). The three-section multiple-choice test at the end of semester two will comprise Doctor-patient communication skills (Strepparava part 2), Bioethics (Reichlin), and Peer-to-peer communication skills (John part 2).

As will be clearly explained during lesson 1 of the Humanities Course, **the result of the final examination** will be based on the total of the above-mentioned multiple-choice written exercises, together with the marks obtained for group-based classwork exercises (i.e. oral presentation: John part 2, abstract writing: Cooke).

All of these exercises are **compulsory**, and the mark obtained is to be considered **final**. Only those students that fail to reach a positive overall result (18/30) will have the chance to re-sit the entire examination (multiple-choice sections **ONLY**, as group-exercise results will be maintained) on a single date during the September examination session.

Students that achieve a positive result will not be permitted to re-sit any part or all of the examination *merely to 'up the mark'*.

The dates for the mid-term tests and the September re-sit are as follows:

1. Part-one mid-term: 9th March 2016 at 09:00
2. Part-two mid-term: 15th June 2016at 09:00
3. September re-sit: 14th September 2016

Course objectives

In today's frenetic, high-tech world, where medicine is evidence based and focuses on specialties of all possible kinds, doctors generally have little time to ponder the multifaceted problems of their patients. Indeed, there are innumerable horror stories told by sick people that stem from the uncaring attitudes and the lack of sensitivity shown by many health professionals. Yet medicine should be seen as a caring profession that requires doctors not only to provide valid clinical assistance but, above all, to empathize with patients and their families when they are at their most vulnerable and in need of understanding.

Nowadays, medical school students are encouraged to interact with patients virtually from the beginning of their training and an increasing amount of emphasis is being placed on the teaching of social sciences, ethics and communication skills to help create a new kind of doctor. One way of doing this is by introducing the study of the *Medical Humanities* (literature, music, visual arts, psychology, sociology, philosophy, ethics, history, language, religion etc.) into the medical curriculum. These subjects require imagination, close observation and understanding, which are all fundamental characteristics of a successful and caring doctor.

How otherwise might a 20-year-old medical or nursing student learn about the complexities of the human condition? How would they be able to understand the reactions and feelings of someone with a terminal illness or a crippling disability, let alone a parent who has just lost a child? They certainly will not learn these skills from standard clinical textbooks, where the words fear and anguish do not appear in the index. Yet fear and anguish are at the very center of how a patient faces up to and lives with an illness.

CELL AND MOLECULAR BIOLOGY

Total Credits: 11

Total Hours: 88+15

Scientific Discipline Sector: BIO/11 – BIO/12 – INF/01

Course Coordinator: Prof. Roberto Sitia (Receiving Hour: Thursday ore 14,30, Dabit1, A2, 4th Floor, room 36)

Email: sitia.roberto@hsr.it

18 hours

Collaborators:

Prof. Anna Rubartelli

Email: anna.rubartelli@hsanmartino.it

10 hours

Prof. Eelco Van Anken

Email: vananken.eelco@hsr.it

40 hours

Prof. Simone Cenci

Email: cenci.simone@hsr.it

10 hours

Prof. Tiziana Anelli

Email: anelli.tiziana@hsr.it

10 hours

Tutorials: 6 different groups (15 hours each).

Tutors: Drs. Maurizio D'Antonio, Andrea Orsi, Celine Schaeffer, Thierry Touvier, Edgar Yoboue, Samuel Zambrano.

Each group will be given a scientific paper to read, understand, put in context, summarize and present to the whole class. The interactive lectures cover essential parts of the programme. Student will be asked about their content and significance in the final exam.

This part of the programme is meant also to show how scientific knowledge is created and disseminated, and to stimulate a critical attitude in our students.

Attending lectures and tutorials

We encourage students to attend to all lectures, as teachers will cover aspects that are absent or hard to find in textbooks. However, attending a lecture means much more than the mere physical presence in the class.

Students are encouraged to read about the topics that will be covered in class **before** attending lectures, so that they can raise questions and focus onto the most relevant or controversial issues. Topics are often tackled in a transversal, multidisciplinary manner.

Unfair behaviour, such as for example clocking for others or having others clocking for you, will not be tolerated. Students found to do so will not be admitted to the exam.

Attending tutorials is mandatory. Those failing to do so will be admitted to the exam only in exceptional cases and their final grade will be $\leq 20/30$.

Type of subject: Biomedical discipline

Field: General discipline: Structure, function and regulation of cells and organisms, and the molecular bases of disease.

Course objectives:

Proceeding in parallel with Chemistry & Biochemistry and Genetics & Developmental Biology, the Cell and Molecular Biology course addresses the basic mechanisms of life, providing students with essential knowledge to understand the molecular bases of disease. The Course is in part systematic and in part problem oriented. Lectures cover the basic principles of cell architecture and function (molecular motors, organelles, mitosis and meiosis, apoptosis etc. see below) whilst in tutorials students are asked to read and present to the whole class scientific papers on topics that are essential part of the course.

Lectures and tutorials tackle problems of the past (origin of life and evolution), present (how novel imaging and 'omics' technologies impact our understanding of cells and living molecules) and future (new therapeutic strategies; socio-economic implications of novel biotechnologies) and are frequently connected to pathogenic mechanisms. The course aims also at explaining the processes of scientific proof, publication and divulgation and fostering the communication skills of our students.

At the end of this course, students should be able to:

- Know the basic mechanisms that control the functions of molecules and cells in multicellular organisms
- Understand the bases of some human disease
- Design the principles of novel therapies to restore faulty cellular and molecular mechanisms
- Interpret new medical discoveries in terms of fundamental principles of cell and molecular biology
- Explain the molecular bases of diseases that affect cellular function or interactions
- Read, understand and evaluate a scientific paper
- Prepare and deliver a scientific presentation

Introduction to the Course of Molecular and Cell Biology

What is life? Where do we come from?

What are genes and how do they work?

How cells divide

How cells die

How cells know where they are and where to go

How they interact with the environment

How cells differentiate

Molecular bases of disease

Evolution, Darwin and the adaptable cell structure

Prokaryotes, eukaryotes, multicellular organisms

Mitochondria and other successful symbioses

The evolution of specialized tissues

Homeostasis

Membrane structure

Basic structure of cells

Architecture, composition, membrane proteins

Cytoskeleton and adhesion molecules

Adhesion molecules

Integrins

Tissue organization

Molecular motors and cell movements

Microtubules, microfilaments, molecular motors

Polarity

Axonal transport

Cytoskeleton

Muscular contraction

Cilia and flagella

Microvilli

Cell compartmentalization and intracellular transport

Specific signals target macromolecules to different organelles.

To and from the nucleus
Membrane translocation
Vesicular transport
Exo, endo, pino, phagocytosis
Transcytosis
Mechanisms of cell polarity

Proteostasis as a signal and pathogenetic mechanism

Protein folding, the second genetic code
Anfinsen's demonstration of the central dogma
Chaperones and protein evolution
Protein quality control
Protein degradation: Proteasomes, lysosomes and autophagy
Stress responses in development and disease
Mechanisms of proteotoxicity
Molecular and cellular aging
Conformational diseases: Prions, Amyloidoses, Alzheimer & Parkinson

Nuclear structure

Nuclear pores and transport
Nuclear subcompartments
Chromosome territories
Nuclear membrane and lamins

Chromatin

Nucleosomes
Histones and histone variants
Histone post-translational modifications, and enzymes that affect them.

Studying gene function & expression

Function prediction, genetic screens, tagged libraries, reporter genes
Reverse genetics, knock-out libraries, RNAi, complementation, epistasis & EMAP, microarray

Transcription in eukaryotes

RNA polymerases
Promoters & enhancers
General transcription factors
Specific transcription factors
Coactivators and corepressors
How nucleosome position and histone modifications affect gene expression

Gene expression decisions: Examples of transcriptional regulation and signal transduction

The NF- κ B system
Liver specification

Retroviruses, the genome and RNAi

Retroviruses
miRNA, siRNA, heterochromatin and centromeres

Energy conversion

Mitochondria
Chloroplasts, genetics of mitochondria & plastids, evolution of electron transport chains

Cell signaling

Principles of cell communication
G protein coupled cell surface receptors
Enzyme coupled cell surface receptors

Unfolded Protein Response, determining cell shape.

Visualizing cells

Standard microscopy techniques
Advanced microscopy techniques

Manipulating proteins & DNA

Cloning, cDNA libraries, tagging, PCR.

Cell cycle 1

Phases and logics of the cell cycle
Experimental approaches
The Cell Cycle Control System
Engineering checkpoints
Significance of G phases
Molecular players: cyclins, cyclin-dependent kinases, Cdk inhibitors

Cell cycle 2

Regulatory strategies: cyclic degradation, post-translational modifications, de novo synthesis
Checkpoints in G1 and G2. Preventing DNA re-replication
Cdc25 and regulation of M-Cdk activity
Rb and E2F: the restriction point and the Skp2 autoinduction loop
The DNA damage checkpoints. p53 and p14/19ARF
Cancer as a cell cycle disease.

Mitosis

Phases and mechanics
Cohesins and condensins
Centrosome, microtubules and the mitotic spindle
Role of motor proteins
Mechanisms of high-fidelity segregation: centromere and kinetochore
Mechanics of anaphase. Functions of chromokinesins. Cytokinesis
Drugs targeting mitosis and their clinical relevance.

Apoptosis - I

Functional significance: apoptosis vs. necrosis
Methods to study and monitor apoptosis and its functions in physiology and disease
Mechanisms: extrinsic vs. intrinsic apoptosis
Caspases: redundancy, efficiency, velocity
Death receptors and the Death-Inducing Signaling Complex (DISC)
Mitochondria as signal integrators and death executors
The Apoptosome
Mitochondrial Outer Membrane Permeabilization (MOMP)
The Bcl2 family: sensors/transducers, brakes, and effectors. Inhibitors of Apoptosis (IAPs).

Apoptosis - II

Apoptosis and the integrated stress response
Stress specificity of BH3-onlies
The other functions of Bcl2 proteins: daily jobs of night killers
Mitochondria and ER cross-talk. ER calcium homeostasis and apoptosis
Regulation by the unfolded protein response and heat shock proteins
Proteotoxic apoptosis.

Apoptosis- III

Integrating Cell Cycle, Apoptosis, and Cancer
Apoptotic escapes from the cell cycle
Apoptosis from cytotoxic vs. genotoxic stress

Maladaptive thresholds: implications for cancer pathogenesis and therapy
Alternative forms of eukaryotic cell death: autophagy, paraptosis, pyroptosis.
Autophagy in physiology and disease.

Intercellular communication

How cells interact and talk to each other

Mechanisms of secretion

Release of proteins outside the conventional exocytic pathway: mechanisms and pathophysiology

Cytokine networks and inflammation

Damage and pathogen associated molecular patterns (DAMPs and PAMPs). The inflammasome and the origin of many chronic inflammatory disorders.

A historical perspective

The Luria-Delbrück experiment

Science and the future of human society

Towards a DNA driven world

COURSEBOOKS:

Textbooks

Alberts, Bray, et al. *Molecular biology of the cell*

Alberts, Bray, et al. *Essential cell biology* www.garlandscience.com/textbooks/081533480X.asp

Karp, *Cell Biology* ED. John Wiley & Sons ISBN 978-0470505762

Lewin, Cassimeris et al. *Cells*

Lodish et al. *Molecular cell biology* www.whfreeman.com/lodish4

Pollard & Earnshaw *Cell Biology* www.us.elsevierhealth.com/.../book/.../Cell-Biology/

As the above books contain all the essential notions, differing primarily in the style of presentation, we do not recommend one in particular and leave the choice to the students' tastes and opportunities.

Suggested readings

We encourage our students to read on science, medicine and society. Below are a few tips.

M. Perutz. *Is science necessary? and/or I wish I made you angry before*. Two lovely collections of essays on science and scientists.

J. Diamond. *Germs, guns and steel*. A brief summary of the last 13000 years of humans... Why did some civilisations prevail?

J. Monod *Chance and necessity*. A Nobel Prize winner in Medicine tackles fundamental philosophical issues

J.D. Watson. *The double helix*. Watson tells how DNA structure was solved, with the pace of a crime fiction novel.

P. Medawar. *Advice to a young scientist*. Some tips for those tempted to become a physician scientist.

USMLE REQUIREMENTS

Biology of cells

- adaptive cell responses and cellular homeostasis
- intracellular accumulations
- mechanisms of injury and necrosis
- apoptosis
- mechanisms of dysregulation
- cell biology of cancer, including genetics of cancer
- general principles of invasion and metastasis, including cancer staging
- cell/tissue structure, regulation, and function, including cytoskeleton, organelles, glycolipids, channels, gap junctions, extracellular matrix, and receptors

Molecular biology

- gene expression: DNA structure, replication, exchange, and epigenetics
- gene expression: transcription
- gene expression: translation, post-translational processing, modifications, and disposition of proteins (degradation), including protein/glycoprotein synthesis, intra/extracellular sorting, and processes/functions related to Golgi complex and rough endoplasmic reticulum
- structure and function of proteins and enzymes
- energy metabolism

GENETICS AND DEVELOPMENTAL BIOLOGY

Total Credits: 12

Total Hours: 96

Scientific Discipline Sector: BIO/13 – MED/03

Course Coordinator: Prof. Giorgio Casari

Email: casari.giorgio@hsr.it (Receiving Hour to be scheduled by email)

32 hours

Collaborators:

Prof. Giangiacomo Consalez

Email: consalez.giangiacomo@hsr.it

32 hours

Prof. Luca Rampoldi

Email: rampoldi.luca@hsr.it

32 hours

Tutorials: 5 groups for 15 hrs tutorials each.

Tutors: Drs. Maltecca Francesca, Croci Laura, Cassina Laura.

Topics covered by the course

Mendelian and non-Mendelian genetics

Course introduction_ The Human Genome Project.

Mendelian Inheritance (I)_ Definition of gene, locus, allele. The first Mendel's law.

Mendelian Inheritance (II)_ The second and third Mendel's laws. Segregation and independent assortment.

Exceptions to Mendelian inheritance_ Incomplete dominance, co-dominance. Penetrance and expressivity.

Exceptions to Mendelian inheritance_ Sex-related effects. Pleiotropy. Pedigree design_2

Chromosomes/mitosis/meiosis_ Chromosome structure (telomeres, centromere) and segregation during mitosis and meiosis. Crossing-over.

Chromosome structure. Chromatin structure and function. Histones and nucleosomes. Chromatin remodelling.

Recombination/mapping (I)_ Molecular basis of recombination.

Recombination/mapping (II)_ Recombination as a measure of genetic linkage. Mapping in bacteria and Drosophila.

Non-Mendelian inheritance (I)_ Gene conversion. De-novo mutations. Mosaicism (X-inactivation).

Non-Mendelian inheritance (II)_ Epigenetic control of gene expression. Imprinting.

Dynamic mutations (I)

Dynamic mutations (II)

Mitochondrial Inheritance

Chromosome mutations

Cytogenetics

CGH

DNA/RNA structure

Transcription/translation_ Gene structure and transcription. The genetic code, structure of tRNA and ribosome.

Translation. Mechanisms of splicing

RNA interference_ miRNA, siRNA, shRNA. Discovery and applications.

Point mutations and repair_ Spontaneous and induced mutations. Repair of mutations and recombination.

Nonsense mediated decay

Complex mutations/polymorphisms/CNVs

Mutation detection techniques

Deep sequencing

Effect of mutations (gain/loss-of-function)_ Gain-of-function and loss-of-function effect of mutations. Negative dominance.

Effect of mutations (ESE)

Genetic markers_ DNA markers (microsatellites, SNPs). Genetic maps. Haplotype maps (the HaploMap project).

Genetic Mapping (I)_Linkage analysis in human pedigrees. LOD score calculation.
Genetic Mapping (II)_Linkage analysis in human pedigrees. Haplotype analysis.
Probability_Bayes' theorem, application for risk calculation in human pedigrees.
Examples of linkage/positional cloning
Examples of functional cloning
Quantitative Trait Loci
Population genetics_1
Population genetics_2
Molecular Evolution (I)
Non-parametric linkage analysis/association studies
Jolly

Embryology and developmental biology

This part of the course will cover the essentials of normal human development and of its main aberrations, providing information on some recognizable patterns of human malformation.

General Embryology

Gametogenesis: Conversion of Germ Cells into Male and female gametes
First Week of Development: ovulation to implantation
Second Week of Development: Bilaminar Germ Disc
Third Week of Development: Trilaminar, Germ Disc
Third to Eighth weeks: The Embryonic Period
Third Month to Birth: The Fetus and Placenta

Systems-based Embryology

Skeletal System
Muscular System
Body Cavities
Digestive System
Cardiovascular System
Respiratory System
Urogenital System
Head and Neck
Central Nervous System
Ear and eye development
Tegumentary System

COURSEBOOKS:

Langman's Medical Embryology / Edition11,

Thomas W.Sadler, ED. Lippincott Williams & Wilkins ISBN: -13: 9780781790697

Human Molecular Genetics ^{3rd} Edition,

Tom Strachan, Andrew Read - ED: Garland Science - ISBN:0-8153-4184-9

USMLE REQUIREMENTS

Human development and genetics

- principles of pedigree analysis
- inheritance patterns
- occurrence and recurrence risk determination
- population genetics: Hardy-Weinberg law, founder effects, mutation-selection equilibrium
- principles of gene therapy
- genetic testing and counselling
- genetic mechanisms

TIMETABLE

Please note that changes may always occur in the daily lesson schedule.
Please refer to the on line timetable for the latest version.

International MD Program A.Y. 2015/2016 - YEAR 1					
TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
	21/09/2015	22/09/2015	23/09/2015	24/09/2015	25/09/2015
09-11	Welcome week				
11-13					
14-16					
16-18					
TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
	28/09/2015	29/09/2015	30/09/2015	01/10/2015	02/10/2015
09-11	inizia precorso, lezioni di humanities e chemistry				
11-13				Chemistry and Biochemistry MD	Statistics & Bioinformatics CDS
14-16	Chemistry and Biochemistry MD	Precourse test in SLM	Chemistry and Biochemistry MD	Precourse	Precourse
16-18		Precourse test in SLM	Precourse		
TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
	5-Oct-15	6-Oct-15	7-Oct-15	8-Oct-15	9-Oct-15
09-11	Statistics & Bioinformatics CDS		Chemistry and Biochemistry MD	Humanities MJ	Humanities MJ
11-13	Chemistry and Biochemistry MD		Statistics & Bioinformatics CDS	Medical Physics TTDF	Medical Physics TTDF
14-16	Precourse			Statistics & Bioinformatics Lab 1 Group A PR	Statistics & Bioinformatics Lab 1 Group B PR
16-18					
TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
	12-Oct-15	13-Oct-15	14-Oct-15	15-Oct-15	16-Oct-15
09-11	Humanities AS	Humanities MJ	Chemistry and Biochemistry MD	Humanities AS	Humanities MJ
11-13	Chemistry and Biochemistry MD	Statistics & Bioinformatics Lab 1 Group A+B - SLM CDS	Statistics & Bioinformatics CDS	Medical Physics TTDF	Medical Physics TTDF
14-16				Statistics & Bioinformatics Lab 1 Group A- SLM FD	Statistics & Bioinformatics Lab 2 Group B PR
16-18					
TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
	19-Oct-15	20-Oct-15	21-Oct-15	22-Oct-15	23-Oct-15
09-11	Humanities AS	Humanities MJ		Statistics & Bioinformatics CDS	
11-13	Chemistry and Biochemistry MD	Statistics & Bioinformatics CDS		Medical Physics TTDF 10	Medical Physics TTDF
14-16	Statistics & Bioinformatics Lab 2 Group A PR	Statistics & Bioinformatics SPSS Lab 1 Group B- SLM FD		Statistics & Bioinformatics Lab 3 Group B PR	Statistics & Bioinformatics SPSS Lab 2 Group A - SLM FD
16-18					
TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
	26-Oct-15	27-Oct-15	28-Oct-15	29-Oct-15	30-Oct-15
09-11	Humanities AS	Humanities AS	Chemistry and Biochemistry MD	Humanities AS	
11-13	Chemistry and Biochemistry MD	Statistics & Bioinformatics CDS	Statistics & Bioinformatics CDS	Medical Physics TTDF	Medical Physics TTDF
14-16	Statistics & Bioinformatics Lab 3 Group A PR	Statistics & Bioinformatics SPSS Lab 2 Group B SLM FD		Chemistry and Biochemistry MD	Statistics & Bioinformatics Lab 4 Group B PR
16-18	Medical Physics ese group A SZ	Medical Physics ese group B SZ			

TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
	2-Nov-15	3-Nov-15	4-Nov-15	5-Nov-15	6-Nov-15
09-11			Chemistry and Biochemistry MD		
11-13	Chemistry and Biochemistry MD		Statistics & Bioinformatics CDS	Medical Physics TTDF	Medical Physics TTDF
14-16	Statistics & Bioinformatics SPSS Lab 3 Group A SLM FD		Statistics & Bioinformatics SPSS Lab 3 Group B SLM FD	Chemistry and Biochemistry MD	
16-18	Statistics & Bioinformatics Lab 4 Group A PR				
TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
	9-Nov-15	10-Nov-15	11-Nov-15	12-Nov-15	13-Nov-15
09-11	Humanities MS	Humanities MS	Medical Physics SZ	Statistics & Bioinformatics Test SLM	
11-13	Chemistry and Biochemistry MD	Humanities AS	Chemistry and Biochemistry MD	Statistics & Bioinformatics Test SLM	
14-16				Chemistry and Biochemistry MD	
16-18	Medical Physics ese group B SZ	Medical Physics ese group A SZ			
TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
	16-Nov-15	17-Nov-15	18-Nov-15	19-Nov-15	20-Nov-15
09-11	Humanities AS	Humanities AS		Humanities AS	Medical Physics SZ
11-13	Medical Physics SZ	Statistics & Bioinformatics SPSS Lab Group A+B SLM CDS		Medical Physics SZ	
14-16	Statistics & Bioinformatics Lab 5 Group A PR	Medical Physics SZ		Statistics & Bioinformatics PR	
16-18		Statistics & Bioinformatics Lab 5 Group B PR			
TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
	23-Nov-15	24-Nov-15	25-Nov-15	26-Nov-15	27-Nov-15
09-11	Humanities AS		Chemistry and Biochemistry MD	Humanities AS	Medical Physics MC
11-13	Chemistry and Biochemistry MD		Humanities AS	Medical Physics MC	Statistics & Bioinformatics PR
14-16				Statistics & Bioinformatics PR	
16-18	Medical Physics ese group A SZ	Medical Physics ese group B SZ			
TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
	30-Nov-15	1-Dec-15	2-Dec-15	3-Dec-15	4-Dec-15
09-11	Humanities AS	Humanities MS	Chemistry and Biochemistry MD	Chemistry and Biochemistry MD	Medical Physics MC
11-13	Chemistry and Biochemistry MD		Statistics & Bioinformatics PR	Medical Physics MC	Statistics & Bioinformatics Lab 7 Group A PR
14-16	Statistics & Bioinformatics Lab 6 Group A PR			Statistics & Bioinformatics Lab 6 Group B PR	
16-18					
TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
	7-Dec-15	8-Dec-15	9-Dec-15	10-Dec-15	11-Dec-15
09-11	Holiday	Holiday	Chemistry and Biochemistry MD	Humanities AS	Medical Physics MC
11-13			Statistics & Bioinformatics Lab 7 Group B PR	Statistics & Bioinformatics PR	Statistics & Bioinformatics Lab 8 Group A PR
14-16				Statistics & Bioinformatics SPSS Lab4 Group B SLM FD	
16-18					

TIME	MONDAY 14-Dec-15	TUESDAY 15-Dec-15	WEDNESDAY 16-Dec-15	THURSDAY 17-Dec-15	FRIDAY 18-Dec-15
09-11	Humanities AS	Humanities MS	Humanities MS		
11-13	Chemistry and Biochemistry MD 48	Statistics & Bioinformatics EB	Statistics & Bioinformatics EB		
14-16	Statistics & Bioinformatics Lab 8 Group B PR	Statistics & Bioinformatics SPSS Lab4 Group A SLM FD	Statistics & Bioinformatics EB		
16-18	Medical Physics ese group B SZ	Medical Physics ese group A SZ			
TIME	MONDAY 21-Dec-15	TUESDAY 22-Dec-15	WEDNESDAY 23-Dec-15	THURSDAY 24-Dec-15	FRIDAY 25-Dec-15
09-11	Holiday	Holiday	Holiday	Holiday	Holiday
11-13					
14-16					
16-18					
TIME	MONDAY 28-Dec-15	TUESDAY 29-Dec-15	WEDNESDAY 30-Dec-15	THURSDAY 31-Dec-15	FRIDAY 1-Jan-16
09-11	Holiday	Holiday	Holiday	Holiday	Holiday
11-13					
14-16					
16-18					
TIME	MONDAY 4-Jan-16	TUESDAY 5-Jan-16	WEDNESDAY 6-Jan-16	THURSDAY 7-Jan-16	FRIDAY 8-Jan-16
09-11	Holiday	Holiday	Holiday		Medical Physics AE
11-13				Medical Physics AE	Chemistry and Biochemistry AC
14-16				Chemistry and Biochemistry AC	
16-18					
TIME	MONDAY 11-Jan-16	TUESDAY 12-Jan-16	WEDNESDAY 13-Jan-16	THURSDAY 14-Jan-16	FRIDAY 15-Jan-16
09-11		Chemistry and Biochemistry AC			Medical Physics AE
11-13		Statistics & Bioinformatics EB		Medical Physics AE	Chemistry and Biochemistry AC
14-16	Chemistry and Biochemistry AC	Statistics & Bioinformatics EB		Chemistry and Biochemistry AC	
16-18					
TIME	MONDAY 18-Jan-16	TUESDAY 19-Jan-16	WEDNESDAY 20-Jan-16	THURSDAY 21-Jan-16	FRIDAY 22-Jan-16
09-11		Chemistry and Biochemistry AC	Statistics & Bioinformatics TEST SLM		Chemistry and Biochemistry AC 20
11-13			Statistics & Bioinformatics TEST SLM	Chemistry and Biochemistry AC	
14-16	Chemistry and Biochemistry AC				
16-18	Medical Physics ese group A SZ	Medical Physics ese group B SZ			

SAN RAFFAELE INTERNATIONAL MD PROGRAM

YEAR 2

Academic Year 2015/2016

- Human Morphology
- Physiology
- Principles of Pharmacology
- Introduction to Surgery

SAN RAFFAELE INTERNATIONAL MID PROGRAM - 2nd YEAR

	sept-2015	oct-2015	nov-15	dec-2015	Jan-2016	feb-16	mar-16	apr-16	may-2016	Jun-2016	jul-2016	aug-2016	sep-2016
1	1			1	1	1	1	1	1	1	1	1	1
2	2			2	2	2	2	2	2	2	2	2	2
3	3	1.		3	3	3	3	3	3	3	3	3	3
4	4			4	4	4	4	4	4	4	4	4	4
5	5			5	5	5	5	5	5	5	5	5	5
6	6		6.	6	6	6	6	6	6	6	6	6	6
7	7			7	7	7	7	7	7	7	7	7	7
8	8			8	8	8	8	8	8	8	8	8	8
9	9	2.		9	9	9	9	9	9	9	9	9	9
10	10			10	10	10	10	10	10	10	10	10	10
11	11			11	11	11	1.	11	11	11	EXAMS	11	11
12	12			12	12	12	12	12	12	12	12	12	12
13	13		7.	13	13	13	13	13	10.	13	EXAMS	13	EXAMS
14	14			14	14	14	14	14	14	14	EXAMS	14	EXAMS
15	15			15	15	15	15	6.	15	15	EXAMS	15	EXAMS
16	16	3.		16	16	16	16	16	16	16	ASSUMPTION	16	EXAMS
17	17			17	17	17	17	17	17	17	Holidays	17	
18	18			18	18	18	2.	18	18	18	EXAMS	18	
19	19			19	19	19	19	19	19	19	EXAMS	19	EXAMS
20	20		8.	20	20	20	20	20	11.	20	EXAMS	20	EXAMS
21	21			21	21	21	21	21	21	21	EXAMS	21	EXAMS
22	22			22	22	22	22	7.	22	22	EXAMS	22	EXAMS
23	23	4.		23	23	23	23	23	23	23	EXAMS	23	EXAMS
24	24			24	24	24	24	24	24	16. END SEM2	24	24	24
25	25			25	25	25	25	25	25	25	EXAMS	25	25
26	26			26	26	26	26	26	26	26	EXAMS	26	26
27	27		9.	27	27	27	27	27	12.	27	EXAMS	27	27
28	28	Beginning Sem. 1		28	28	28	28	28	28	28	EXAMS	28	28
29	29			29	29	29	29	8.	29	29	EXAMS	29	29
30	30	5.		30	30	30	30	30	30	30	EXAMS	30	30
31	31			31	31	31	31	31	31	31	EXAMS	31	31

HUMAN MORPHOLOGY

Total Credits: 30

Lessons: 302 h

Practicals: 68 h

SSD BIO/16, BIO/17, MED/36, MED/37, MED/33

Course Coordinator: Ottavio Cremona

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Professors Teaching:

Giangiaco Consalez

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Marco Vitale

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Celeste Scotti

Email: celeste.scotti@grupposandonato.it

Tutors:

???

Goals

Aim of the course is to provide the morphological basis of the various functions and pathologies of the human body. Approaches to morphological education include the acquisition of foundational knowledge in microscopic observation and in dissection with the aim of correlating structure with function and pathology. Our course emphasizes clinical aspects by integrating radiologic imaging techniques, effective peer teaching and the use of electronic resources to facilitate the understanding and memorization of morphological data. The study of tissue and organ architecture by different microscopic techniques is structured to provide the structural basis for tissue and organ function; principles of tissue development and homeostasis, cellular turnover, isolation and properties of stem cells will be given as a priming for tissue pathology.

Pre-Requisites

Although there are no formal restrictions to the access to the final exam, we strongly advise students to have solid foundations in:

- Cell Biology and Cytology
- Developmental Biology

Knowledge of these disciplines was acquired during the 2nd semester of the past academic year.

Evaluation

Final marks will be the results of in-course and end-of-course exams, including:

- An oral histology exam including observation tests at the microscope
- A multiple-choice exam on "Dynamics of Movement"
- A final written exam covering the remaining part of the program

Program

1st semester:

INTRODUCTORY MORPHOLOGY

1. Introduction to Tissues

2. Epithelial Tissue .
3. Connective Tissues
4. Adhesion & Matrix
5. Cell Migration
6. Anatomical Position & Terminology

MORPHOLOGY OF ORGAN SYSTEMS

➤ *Support and Movement*

i. Skin

ii. Skeletal Tissues

1. Histology of the skeletal muscle
2. Histology of Muscle, Bone & Cartilage
3. Bone remodeling
4. Dynamics of Movement
 - Upper limb
 - Lower limb
 - Thorax
 - Rachis

➤ *Transportation & Defense*

i. Blood

1. Blood.
2. Hematopoiesis
 - ii. Cardiovascular system*
3. Heart.
4. Structure of Vessels
5. Major Vessels. General Organization.
6. Major Vessels.
 - Head and neck.
 - Thorax.
 - Abdomen.

iii. Lymphatic system

7. Overview and structure of the system
8. Major lymphatic vessels
 - iv. Immune system*
9. General overview of the Immune system
10. Immune organs (MV)

➤ *Respiratory System*

1. Nasal Cavity & pharynx
2. Larynx, trachea & bronchi
3. Lung & Pleura

➤ *Digestive System*

1. Oral Cavity.
2. Teeth
3. Esophagus & topography of the mediastinus
4. Peritoneum
5. Stomach
6. Small Intestine
7. Large intestine & rectum
8. Gut stem cells
9. Liver
10. Gallbladder & Pancreas

➤ *Urinary System*

1. Kidney
2. Urinary tract
3. Topography of the abdomen.
4. Topography of the pelvis
5. Perineum

➤ *Endocrine System*

1. Pituitary gland
2. Thyroid & Parathyroid glands
3. Adrenal glands
4. Topography of head and neck

➤ *Reproductive Systems*

i. Male reproductive system

1. Testis
2. Reproductive tract
3. Accessory reproductive glands & Supporting structures

ii. Female reproductive system

4. Ovaries & Uterine tubes (OC)
5. Uterus & placenta (OC)
6. Vagina, Vulva & Breast (OC)

[Human Morphology book list](#)

Suggested textbooks (kindle versions are strongly recommended and indicated with ASIN numbers):

Gray's Anatomy for Students by Richard L. Drake, A. Wayne Vogl and Adam W. M. Mitchell

ISBN: 9780443069529, **ASIN:** B005YZX32I

Atlas of Human Anatomy by Frank H. Netter **ISBN:** 9781416059516, **ASIN:** B005IXCCD2

Neuroanatomy: An Atlas of Structures, Sections, and Systems by D.H. Haines. **ISBN:** 9781605476537 or **ASIN:** B00838KNNK

Neuroanatomy: Text and Atlas by John Martin **ISBN:** 978-0071603966, **ASIN:** B0088NGYY2

Histology: A Text and Atlas by [Michael H. Ross](#) and Wojciech Pawlina **ISBN:** 978-0781772006, **ASIN:** B0080KAXS6

Reference textbooks:

Gray's Anatomy: The Anatomical Basis of Clinical Practice by Susan Standring. **ISBN:** 978-0443066849

Clinically Oriented Anatomy by Keith L. Moore **ISBN-13:** 978-0781775250

Neuroanatomy through Clinical Cases by Hal Blumenfeld **ISBN:** 978-0878930586

Atlas of Anatomy (Thieme Anatomy) by Anne Gilroy, Brian MacPherson, Lawrence Ross and Michael Schuenke **ISBN:** 978-1604060621

Junqueira's Basic Histology: Text & Atlas by A. Mescher **ISBN:** 978-0071630207

PHYSIOLOGY

Total Credits: 17

Lessons: 164 hrs

Practicals: 50 hrs

SSD: BIO/09

Course Coordinator: Antonio Malgaroli Malgaroli.antonio@univr.it

Professors Teaching:

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Federico Esposti Email: federico.esposti@fmi.ch
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Vincenzo Zimarino Email: zimarino.vincenzo@hsr.it

Tutors

Alessandro Arena
Mattia Ferro
Sara Poletti
Gabriella Racchetti
Sara Spadini

COURSE INTRODUCTION

The purpose of this course is to provide a complete training in biophysics and human physiology. This course is designed to promote learning by practice, with a particular emphasis on stimulating student experimental creativity and interdisciplinary approaches. We all know that *Physiology* is the investigation of cell and body functions, hence the major goal is to understand and be able to predict the acute and adaptive responses of the body to external stimuli but also to understand how the body can maintain a stable set of internal conditions while the external environment is constantly changing. Physiology can be studied at many different levels including biophysics, cell physiology, organ physiology and systems physiology. In this course you will be exposed to all of these levels, initially to the biophysical and cellular physiology level, then quickly moving up to the organ and system levels. In the mainframe of this M.D. program, clearly Physiology and Anatomy must be closely related subjects. To fully appreciate the physiology of a given system it is necessary to first know its anatomy, therefore much coordination work has gone into ensuring that each topic will be presented sequentially, first in the Anatomy and then in the Physiology Course. Indeed, in most cases true understanding of physiology can only take place if structure and function are concurrently learned. A complete and in depth understanding of physiology would be essential to appreciate in subsequent courses how the human body might be functionally altered by diseases (pathophysiology) and also to predict the response of the body to pharmacological therapies or drugs.

SPECIFIC GOALS AND OBJECTIVES

The goals of this M.D. Course in Physiology are to train students:

1. To be able to demonstrate comprehensive understanding of biophysics and physiology as well as the integration of these with basic and applied disciplines;
2. To understand the molecular and cellular mechanisms of physiological processes, in order to provide a foundation for understanding pathophysiology and therapeutics in subsequent courses;

3. To integrate knowledge and concepts from cellular physiology and organ physiology to understand the integrative body functions, e.g., maintenance of blood gas levels; responses to stresses; regulation of fluid volumes and compositions; digestion; reproduction, etc.;
4. To use and develop adequate knowledge of the most current developments in basic and medical sciences as related to biophysics and physiology;
5. To acquire skills in research methodologies used in biophysics and physiology to be able to understand experimental research more effectively;
6. To develop communication skills by frequent in-class discussions and be capable understanding scientific papers dealing with physiological results;
7. To function as a productive member of a student team engaged in learning and designing experimental strategies to understand structure-function problems;

DETAILED PROGRAM

FIRST SEMESTER

Review of Electricity (Prof. Eugenio Rapisarda)

1. Electrical Fundamentals and Basic Electricity, basic concepts and units, charge, conductors and capacitors
2. Ohm's Law, Series and parallel circuits, Kirchhoff's Laws
3. Conductances, Batteries and Capacitor as Circuit Elements
4. The RC Circuit, its steady state and transient Response
5. Alternating (AC) and direct (DC) currents, test meters and Safety

Biophysics and Cell Physiology (Prof. Antonio Malgaroli)

6. Historical grounds of physiology; Units and Scales in physiology; The concept of homeostasis
7. Cellular Membranes and Transmembrane Transport of Solutes and Water
8. Thermodynamics of membrane transport
9. Mechanisms of carrier-mediated transport: facilitated diffusion, cotransport, and countertransport. Sodium pump function, Na^+ - Ca^{2+} exchange currents
10. Diffusion and permeability
11. Osmosis and regulation of cell volume
12. Intracellular pH Regulation
13. Ionic Equilibria and the concept of equilibrium potential.
14. Origin of resting membrane potentials. The driving force for ionic-fluxes.
15. Gibbs-Donnan equilibrium potentials. Intracellular chloride regulation
16. Patch-clamp techniques and analysis of cell currents and ion channels
17. Ion channel families
18. Structure-function of voltage-gated ion channels
19. Electrogenesis of membrane excitability
20. Generation and conduction of action potentials
21. The H.H. Model
22. Cable properties and propagation of action potentials
23. Derivation of the Cable Equation and the AC length constant
24. Effects of toxins, drugs, genetic diseases of ion channels and variation in extracellular ions concentration on resting membrane potential and membrane excitability

Physiology of the Digestive System (Prof. Vincenzo Zimarino)

25. Introduction to the digestive system
26. Nutrition and energy metabolism
27. The enteric nervous system
28. Motility of the Gastrointestinal Tract
29. Gastrointestinal Secretions
30. Digestion and Absorption for lipids, carbohydrates, proteins

Physiology of the Endocrine System (Prof. Vincenzo Zimarino)

31. General Principles of Endocrine Physiology
32. Whole-Body Metabolism
33. Hormones of the Pancreatic Islets
34. Endocrine Regulation of the Metabolism of Calcium and Phosphate
35. Hypothalamus and Pituitary Gland
36. Thyroid Gland
37. Adrenal Cortex
38. Adrenal Medulla
39. Overview of Reproductive Function
40. Male Reproduction
41. Female Reproduction

SECOND SEMESTER

Physiology of the Cardiovascular System (Prof. Dario DiFrancesco)

42. Overview of the heart and circulation
43. The autonomic nervous system and its control
44. Introduction to Cardiac Muscle Physiology
45. Electrical Activity of the Heart
46. Natural Excitation of the Heart and the pacemaker ion channels
47. ECG recording techniques
48. Excitation-contraction coupling in the cardiac and skeletal muscle; regulation of Ca²⁺ release from the sarcoplasmic reticulum
49. Cardiac Pump
50. Regulation of the Heartbeat
51. Hemodynamics
52. Arterial System
53. Microcirculation and Lymphatics
54. Peripheral Circulation and Its Control
55. Control of Cardiac Output. Coupling of the Heart and Blood Vessels
56. Interplay of Central and Peripheral Factors in Control of the Circulation

Physiology of the Respiratory System (Prof. Dario DiFrancesco)

57. Overview of the Respiratory System
58. Mechanical Properties of the Lung and Chest Wall
59. Ventilation, Perfusion, and their Relationship
60. Oxygen and Carbon Dioxide Transport
61. Control of Respiration
62. Nonrespiratory Functions of the Lung
- 63.

Renal Physiology (Prof. Antonio Malgaroli)

64. Elements of Renal Function
65. The Nephron; The ultrafiltration process
66. Solute and Water Transport Along the Nephron. Tubular Function
67. Feedback mechanisms and autoregulation of the kidney function
68. Control of Body Fluid Osmolality and Extracellular Fluid Volume
69. Potassium, Calcium, and Phosphate Homeostasis
70. Intracellular pH Regulation and role of the Kidneys in Acid-Base Balance

Physiology of the Nervous System (Federico Esposti, Jacopo Lamanna, Maddalena Ripamonti)

71. Cellular and functional organization of the nervous system
72. Introduction to synaptic transmission
73. Synaptic transmission and ligand-gated ion channels
74. Synaptic transmission and release of neurotransmitter molecules. Quantal analysis of synaptic transmission
75. Associative and non-associative forms of synaptic plasticity
76. The functional organization of the sensory nervous system
77. Psychophysics laws
78. Overview of the visual system
79. The Eye and the retina: Image formation and light transduction
80. The Visual Thalamus and its role in image processing
81. The superior colliculus and brain-stem nuclei: light reflexes and eye movements
82. The functional organization of the Primary Visual cortex
83. The Primary Visual Cortex and its association areas: processing of light intensity, contrast, 3D, color, object movements.
84. Overview of the auditory system
85. The cochlea, its organization and the process of mechano-electrical transduction of sound. The differential role of inner and outer hair cells. The amplification of sound.
86. Cochlear nuclei, the auditory cortex and the perception of sound. The coding of sound frequency, amplitude and spatial origin.
87. The central organization of the motor system and the motor pathways, the role of brainstem, basal nuclei and cerebellum
88. The spinal reflex and locomotor activity centers in the spinal cord
89. Brain rhythms, sleep, wakefulness, consciousness. EEG recordings
90. Generalities on higher brain functions
91. Learning and memory
92. Stress and emotions
93. Decision making and the prefrontal cortex
94. Language processing.

FORMATIVE ASSESSMENT AND EXAMS

The assessment is continuous as well as end-of-term. The **CONTINUOUS ASSESSMENT** is based on the feedback from teachers and tutors, class discussions, homework, an electricity review exam, class presentations, etc. An electricity review exam will be organized (Prof. Eugenio Rapisarda) in the first semester during the 2nd-3rd week of teaching. A session of class presentations will be organized at the end of the first semester to give students the opportunity to discuss with teachers and colleagues recent scientific papers related to some novel and recent results and to the application of modern recording technologies to the study of human physiology and physiopathology. Papers will be selected by the teacher and made available in advance on the intranet web site (see Grading section below for details about grading of this activity). Class attendance is obligatory to theoretical lectures, APT and class presentations. Teachers will keep daily record of the attendance of students in class independently of the automatic

lecture attendance system (on a daily basis any discrepancy between these two modalities will be officially notified to the Dean). Performance of students during theoretical lectures, experimental sessions and homeworks will also be monitored and recorded in log books as evidence of the ability and daily work of students.

The **END OF TERM ASSESSMENT** is based on two separate written tests : 1. The Cellular, GI, and Endocrine review test; 2. The Neuroscience, CVS, Kidney, Lung review test. The first test will be anticipated at the end of the first semester, the second test will be available from the end of the second semester. From the end of the second semester, in each Official Appello students can take one or more of these two Review tests until their attained scores satisfy them. These scores need to be sufficient (above 18/30) to obtain a final mark (see grading section below). If one or both scores are not sufficient students are obliged to retake these tests.

N.B. The end of term assessment does not include an oral exam. Students can repeat how many times they like the two written review tests until satisfied (to see how the final grade is calculated see Grading section below). When students are satisfied by their achieved grade, if enrolled on the intranet in one of the official Appelli, they can ask this grade to be put on record. No score will be registered until students communicate to the teachers their willingness to accept score registration.

N.B. Regarding these review tests, these will be organized either on the computer room using a multiple choice and/or multiple-multiple choice format, these might include numerical questions and small exercises (a pocket calculator with log and exp might be needed), or in a standard classroom using an open-question format (written test on paper). The students are expected to know the proper names and spelling of channels, transporters, receptors, reactions, structures, cells, currents, etc. as presented in class or in textbooks. Regarding the exercises, not only the procedures but also the final results should be accurate (see Grading section below for details about the actual grade breakdown).

N.B. Since the exam simply consists of these two review tests (1. The Cellular, GI, and Endocrine review test; 2. The Neuroscience, CVS, Kidney, Lung review test.), these tests are obligatory and no final grade can be computed until the student has passed both of them (mark above 18/30).

N.B. To participate in a Review Test but also to register their final score, students need to be officially registered on the intranet for a specific Appello. No Review test will be prepared for students that did not register officially. The final score cannot be registered unless students had registered on the intranet for the official Appello.

N.B. Detailed programs for individual progress tests will be posted on the intranet course page well in advance. Intermediate and final scores will be posted on the intranet course page (to maintain privacy, score will be listed in a file where students can identify themselves by their private student registration number).

GRADING REVIEW TESTS

The score for the two Review Tests will be calculated by dividing the number of correct answers for the total number of questions and multiplying this number by 33 (30 with laude).

GRADING FINAL SCORE

The Final Score will be graded in the scale 0-33 (33 = 30 with laude). When all progress tests will be completed, a final score will be computed according to the following scheme:

ELECTRICITY REVIEW Exam	up to	3/30	points
IST REVIEW TEST (obligatory)	up to	14/30	points
IIND REVIEW TEST (obligatory)	up to	14/30	points
CLASS PRESENTATIONS	up to	1/30	points
TEACHERS' FEEDBACKS ON HOMEWORKS AND CLASS DISCUSSIONS	up to	1/30	points

	Total of	33/30	points

SUGGESTED BOOKS AND READINGS

- 1) Course Syllabus and other reading material provided on the intranet (course page)
- 2) E. R. Kandel, J.H. Schwartz e T.M. Jessel: Principles of neural science V ed. McGrawHill, 2012 [CELL PHYSIOLOGY and NEUROSCIENCE]
- 3) Berne & Levy Physiology, Bruce M. Koeppen and Bruce A. Stanton, Mosby-Elsevier VI edition, 2010 [CVS, KIDNEY, RESPIRATORY, ENDOCRINE, GI PHYSIOLOGY]

OTHER BOOKS

- Aidley D.J. The Physiology of Excitable Cells. Cambridge Univ Press, IV ed., 1998.
Hille, B. Ionic channels of excitable membranes. III Edition, Sinauer, Sunderland, 2001
Johnston D., S. Miao_Sin Wu, S. Maio_Sin Wu. Foundations of Cellular Neurophysiology. MIT, 1995.
Katz, B. Nerve, Muscle and Synapse, McGraw Hill, 1966
Sheperd G.M. The synaptic organization of the brain. Oxford, V edition, 2004
Sperelakis N. Cell Physiology Source Book: Essentials of Membrane Biophysics. III edition, Academic Press 2001

PRINCIPLES OF PHARMACOLOGY

Total Credits: 9

Lessons: 80 hrs

Practicals: 16

Scientific Discipline Sector: BIO/14

Teaching Staff

Course Coordinator: Dr. Daniele Zacchetti

Email: zacchetti.daniele@hsr.it

Receiving Hour: Friday from 16:00 to 17:00 in (Dibit1, 3A3, lab 58- to be confirmed by email)

Prof. Michele Simonato

Email: smm@unife.it

Prof. Riccardo Fesce

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Tutors:

Barbara Bettegazzi

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Iliaria Prada

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The course of Principles of Pharmacology, offered to the students already at the IV semester, is one of the unique features of our MD course. Pharmacology is the science that studies the effects of the exogenous substances to the physiology and pathology of the organism. Within the traditional Italian MD curriculum, pharmacology is proposed after the other basic science disciplines, being thought to introduce concepts and instruments not emendable to the practical use of drugs (in diagnostics, anesthesia and, most importantly, therapy). For this reason this course in the other Italian Universities is still offered at the IV year, being addressed to the students already being exposed to Clinics and that have already acquired topics such as General Pathology and Microbiology. In the last years, however, this way of teaching has started to show its limitations. On one side the comprehension of the mechanisms of drug actions and the new therapeutic perspectives have been developed in an extraordinary way thanks to the knowledge at the molecular, cellular, genetic and physiological levels; on the other side the relationship between pharmacology and the clinics has tightened, due to the fact that drugs are not anymore "magic bullets", rather disease-modifying instruments and tools to understand pathology. The aim of our discipline has now widened in both operative and didactic-cultural terms. Teaching pharmacology at the boundary between basic topics and clinical courses is not anymore suitable for a modern School of Medicine. For this reason at the "Vita-Salute" San Raffaele University Pharmacology has been divided in two parts. This course, Principles of Pharmacology (coordinator Prof. Daniele Zacchetti), is offered together the other basic science courses and allows to recall and highlight, under a different point of view, information and basic biological concepts, opening them to problems that lead to clinics and therapeutics. The specific pharmacological issues known as Therapeutics (responsible Prof. Flavia Valtorta) is now integrated within the clinical courses and allows putting the pharmacological topics in the specific issues as a fundamental tool for the approach to the patient. This is an important example of the integration, between basic and clinical teaching, that is a specific feature of our MD course. The two aspects of Pharmacology are so tethered that they make use to the same textbook, i.e. the Goodman and Gilman's, the classical compendium, known to all the physicians and that, not by chance, is entitled 'The Pharmacological Basis of Therapeutics'.

How is the course organized?

The aim of the course on Principles of Pharmacology is to provide the tools to understand drugs and their effects, answering a long list of questions such as 'why a drug has got one (or several) effect(s) and another molecule, possibly almost identical at the molecular level, has got a completely different profile of action?' up to "How a new drug is being developed?". Most of the concepts that will be provided are somehow new for the students of the second year, in the sense that they will be proposed from a different perspective; moreover, the topic of drugs is by itself comprehensive since it involves the entire organism. For this as well as several other reasons academic lessons are being held aimed to the explanation of concepts and issues. Presentation from groups of students might be also organized on specific topics. Last, the course is implemented with an experimental part represented by tutorials in which the techniques employed in pharmacological research are presented and explained. Pharmacology does not have its own techniques but, rather, employs the methods of the other disciplines. The point of view of Pharmacology is anyway often specific and there is always a lot to discuss, to critically analyze and to understand.

DIDACTIC MATERIAL

The textbook of reference is the Goodman e Gilman's, XII edition, published in English at the end of 2010 (mind! Of this book there are obviously 11 editions before this one, published every 5 years, approximately; Pharmacology is a discipline in fast development!).

Goodman & Gilman's, The Pharmacological Basis of Therapeutics, XII Edition, Ed. McGraw Hill, 2011

Clementi and Fumagalli, General and Molecular Pharmacology: Principles of Drug Action 1st Edition, Wiley 2015

Katzung and Trevor, Basic and Clinical Pharmacology 12/E (LANGE Basic Science) 12th Edition, 2014

Meetings with students

Meetings with the coordinator of the course on Principles of Pharmacology can be organized by appointment organized by email (zacchetti.daniele@hsr.it) or calling the 02-2643.4817

Evaluation procedures

The exam is based on two steps: a test with 8-10 open questions, to be completed within 30 min and aimed to highlight students still far from an adequate knowledge of the discipline; then, an oral exam based on the critical discussion of wide and important topics, all included in then teaching program, on the basis of which the final grade will be established.

Program of the course

The Course is organized in the following topics. In details we will deal with

1. Introduction to the course, definitions, drugs and their molecular and biological properties.
2. Pharmacokinetics, i.e. the journey of the drug within the organism, the time-dependence of drug effects and the process that are responsible for them:
 - Absorption and distribution of drugs: way of administration, proteins of the plasma;
 - Drug elimination: drug metabolism, excretion, kinetic aspects.
3. Pharmacodynamics, i.e. the features and the quantification of the drug effects:
 - Drug effects, dose-dependency
 - Dose-effect curves.
4. Pharmacogenetics, pharmacogenomics and mechanisms of resistance.
5. Molecular targets of drugs – the receptors and their transduction mechanisms:
 - Surface receptors;
 - Circulation of receptors;
 - Intracellular receptors.
6. Effects of drugs on cellular signaling:
 - Second messengers – spatial coordination;
 - Cross-talk among transduction pathways.
7. Pharmacology of the peripheral nervous system as a paradigm for the drug action:
 - Sympathetic system; α and β adrenergic receptors;
 - Direct and indirect agonists, receptor antagonists;
 - Parasympathetic system and neuromuscular transmission;
 - Muscarinic e nicotinic receptors;
 - Cholinergic agonists; cholinesterase blockers;
 - Antagonists: ganglioplegics and curare.
8. Autacoids, specific endogenous factors that act locally, and their pharmacology:
 - the arachidonic acid cascade;
 - the nitric oxide;
 - histamine, serotonin, bradykinin, cytokines;
 - ATP; adenosin.
9. General pharmacology of the central nervous system:
 - neurons and glia, the synaptic signalling;
 - excitatory and inhibitory transmissions; drugs of abuse;
 - neurodegeneration.
10. Introduction to chemotherapy (bacteria, viruses, tumors):
 - introduction to antibacterial drugs;
 - introduction to antiviral drugs;
 - growth and death of cells. antitumoral drugs.
11. Principles of pharmacognosy, toxicology and biologic therapy.
12. Principles of Pharmacovigilance and Pharmacoconomy
13. Development of new drugs: history, rules and future of pharmacology.

INTRODUCTION TO SURGERY

Total Credits: 3

Lessons: 30 hrs

Practicals: 8 hrs

Scientific Discipline Sector: MED/18 – MED/19

Course Coordinator: Prof. Riccardo Rosati

Professors Teaching:

Riccardo Rosati Email: rosati.riccardo@hsr.it (by appointment writing to: fumagalli.carla@hsr.it)

Andrea Vignali Email: Vignali.andrea@hsr.it

Franz Baruffaldi Preis Email: f@preisurgery.com

Tutors:

Maria Lemma Email: lemma.maria@hsr.-it

Mariacamilla Zotti Email: zotti.mariacamilla@hsr.it

Giovanni Burtulo Email: burtulo.giovanni@hsr.it

Course aims

The course will give to the students the basic information on:

- 1) Operating room environment
- 2) Rules of asepsis and sterilization
- 3) Pre-habilitation and re-habilitation
- 4) Approach to the surgical patients: taking a history; reviewing the existing data and exams; programming further diagnostic exams; taking a physical exam; obtaining an informed consent
- 5) Approach to the acute patient
- 6) Anaesthesia and perioperative management; principles of enteral and parenteral nutrition.
- 7) Surgical instruments; energy devices. Patient positioning in the operating table; surgical incisions; tissue manipulation
- 8) Surgical dissection, recognition of anatomical structures and planes, principles of haemostasis
- 9) Principles of visceral suturing; manual and mechanical sutures; visceral anastomotic techniques; pathophysiology of intestinal anastomosis; anastomotic complications;
- 10) Tissue healing, cicatrization, tissue repair. Suture technique and materials
- 11) Sutures in plastic surgery
- 12) The adipose tissue: patophysiology and surgery
- 13) Tumors of the skin and subcutaneous tissue; the non oncologic breast

The course will be articulated in 12 lessons of two hours each and 30 hours of practical activity. It will also give basic knowledge of the surgical culture and skills which shall be part of the general medicine. A doctor has to deal with health problems on a daily basis, which require the knowledge of basics of surgery in order to understand diagnostic process, treatment modalities, and possible complications.

The course represents an approach to these issues, which will be followed consistently and completed in the other surgery courses that will enter in details in diagnostic situations.

Introduction to Surgery book list: Textbook of Surgery – Sabiston

Lesson plans of Plastic Surgery

Within 8 hours made available by the university for the treatment of the topics of reconstructive plastic surgery and aesthetics will be held by Prof. FW Baruffaldi Preis four lessons of two hours each, chosen from among the four topics listed below:

- 1) The integumentary repair and healing
- 2) The suture in surgery
- 3) benign and malignant lesions of the skin and breast
- 4) The surgical treatment of adipose tissue

1) The repair tegmental provides an introduction to the many causes responsible for the deterioration of the integument.

In particular, we consider all those physical, biological, metabolic able to modify the characteristics of the skin mantle.

Follows the classification of different types of repair that lead to the creation of a repair tissue of a normal or pathological tissue.

In the discussion of the pathophysiology of tissue repair are considered those factors that can facilitate the process (protection, antiseptic agents, systemic factors) and those responsible for the chronicity of the disease and possible complicating local and general.

Are taken into consideration the peculiarities of tissue repair depending on the area concerned: face-lip-nose-eyelid

Arms

trunk

Is treated the disease burn both as regards the skin lesions that as regards the systemic involvement for major burns .

Introduces the principles underlying the use of skin substitutes.

It decrypts the action of Vacuum therapy used for cleansing of skin ulcers.

2) The suture in plastic surgery

The topic is introduced describing the evolution had in the synthesis of the margins of a wound in surgery.

Are analysed biomaterials used for skin and subcutaneous tissue, their interaction with tissue, the mechanical strength and their degradation.

It analyses the tools applied to the phase of the suture.

Nodes are explained and made examples of how to stabilize the suture manual and instrumental.

Explanations are given on the classification of the sutures according to the type of thread, type of August

Mention the use of glues and staplers.

3) benign and malignant lesions of the skin and subcutaneous tissue

It starts from the histological classification of tumours pigmented and non-pigmented skin. We analyze the therapeutic strategies related to the severity of the injury and the district concerned: direct closure or by grafting or skin flap.

Are taken into account the concepts of tissue autologous, homologous and heterologous.

It describes the characteristics of the skin flaps, skin and muscle cutaneous flaps. We analyse .systemic diseases linked to predisposition to develop tumours of the skin.

Marjolin ulcers.

Angioma and MAV.

4) The introduction of the concept of breast reconstruction post -mastectomy: cutaneous expansion, immediate reconstruction, delayed reconstruction with muscle-skin flaps .I always in the context of breast surgery you enter into the merits of

-gigantomastia: Technical reductive

- Gynecomastia: its aetiology and surgical correction

- Breast ptosis: the pathophysiology of aging and breast mastopexy

- Breast hypoplasia, surgical techniques to increase the biocompatibility of silicone and synthetic materials

-asymmetry mammary gland and malformations of the cone and the areola complex nipple

5) The subcutaneous tissue. Pathophysiology of subcutaneous adipose tissue. Use of the adipose tissue in plastic surgery.

Lipofilling: principles concerning the grafting of fat cells, fields of application, reparative activities related to preadipocitiche cells (stem cells).

Removal of localized fat in the adipose tissue, in the correction of body volumes and in states of obesity.

The post-bariatric surgery

TIMETABLE

Please note that changes may always occur in the daily lesson schedule.
Please refer to the on line timetable for the latest version.

Coming Soon

SAN RAFFAELE INTERNATIONAL MD PROGRAM

YEAR 3

Academic Year 2015/2016

- Basic Pathology and Immunology
- Microbiology and Mechanisms of Infectious Diseases
- Clinical Laboratory Medicine
- Cardiovascular Diseases
- Principles of Surgery
- Digestive System Diseases
- Respiratory, Ear, Nose and Throat Diseases
- Clinical Rotations

Basic Pathology and Immunology

Total Credits: 13

Total hours: 130

Scientific Discipline Sector: MED/04 - MED/08 – MED/09

Teaching staff

Course Coordinator: Prof. Guido Poli Email: poli.guido@hsr.it
Prof. Ruggero Pardi Email: pardi.ruggero@hsr.it
Prof. Maurilio Ponzoni Email: ponzoni.maurilio@hsr.it
Dr. Attilio Bondanza Email: bondanza.attilio@hsr.it
Dr. Matteo Iannacone Email: iannacone.matteo@hsr.it
Dr. Anna Mondino Email: mondino.anna@hsr.it

Course Description

The BPI course will be articulated in three parts. The first part (composed of 32 frontal lessons) aims at providing the fundamental knowledge on the most relevant aspects of human pathology and immunology, including cell and tissue pathology, the mechanisms underlying acute and chronic inflammation, vessel biology, wound repair and the process of neoplastic transformation. Immunology lessons will provide state of art information on both innate and adaptive immune responses to pathogens and transformed cells as well as on key immunologically mediated pathologies, such as immunodeficiencies, allergy and autoimmunity.

In the second part of the course, the student will be directly involved in interactive modules (IM) revolving around clinical cases. Each IM will start from the medical and histopathological description of a clinical case with the goal of identifying its etiology and of reconstructing the fundamental pathogenic steps leading to overt clinical disease. This inductive process will be enriched by elements of epidemiology, genetics and pre-clinical models (when available). Since each module will span over two lessons (i.e. 4 h), the second part of the course foresees 10 IM related to the main areas of human pathology.

Finally, there will be 4 minicourses (each one composed of two lessons, i.e. four h) dedicated to specific topics and including two related scientific seminars, that will conclude the course.

Overall, the course aims at providing a solid base on the fundamental principles underlying human pathology while training the students to exert their skills and acquired knowledge to probe the field of human diseases.

Textbooks:

Robbins Basic Pathology: with STUDENT CONSULT Online Access, 9e (Robbins Pathology) - mandatory

Cellular and Molecular Immunology: with STUDENT CONSULT Online Access, 7e (Abbas, Cellular and Molecular Immunology) – highly suggested

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Microbiology and Mechanism of Infectious Diseases

Total Credits: 7

Total hours: 70

Scientific Discipline Sector: MED/07 - VET/06 – BIO/14

Teaching staff

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Course Description

Bacteriology

The purpose of this course is to give to students a thorough grounding in the comprehension of microbial structure, physiology and in the interplay between humans and microbes in different body sites and conditions. This will be achieved by studying microbial resident flora (microbiota), with particular attention to its composition, its changes during infectious diseases and to its role in the diffusion of resistance to antibiotics.

Following this perspective, students will be introduced to all of the basic structural, physiological and metabolic principles of medical bacteriology including the following points:

- Cell structure of prokaryotes
- Structure and function of endospores
- Microbial metabolism
- Microbial genetics
- Virulence and pathogenicity of bacteria
- Transmission of bacterial infection
- The immune response to bacteria
- Techniques for the diagnosis of bacterial infections
- Novel techniques for the study of resident flora (the "human microbiome project")

The detailed knowledge of the microbiota and its composition will also allow a better comprehension of the role played by specific bacterial genera and species, important in medical microbiology, that will be studied in details. Here it follows a punctual list of the bacterial genera and species that students should understand by the end of the course:

- *Staphylococcus* spp
- *Staphylococcus aureus*
- Coagulase-negative staphylococci
- *Streptococcus* spp
- *Streptococcus pyogenes*
- *Streptococcus agalactiae*
- *Streptococcus pneumoniae*
- Viridans streptococci
- *Enterococcus* spp
- *Enterococcus faecalis*
- *Enterococcus faecium*
- *Bacillus* spp
- *Bacillus anthracis*
- *Bacillus cereus*
- *Clostridium* spp
- *Clostridium difficile*
- *Clostridium perfringens*
- *Clostridium botulinum*
- *Clostridium tetani*
- *Corynebacterium* spp
- *Corynebacterium diphtheriae*

- *Corynebacterium striatum*
- *Listeria monocytogenes*
- *Actinomyces* spp
- *Nocardia* spp
- *Enterobacteriaceae*
- *Escherichia coli*
- *Klebsiella pneumoniae*
- *Proteus mirabilis*
- *Enterobacter* spp
- *Serratia marcescens*
- *Salmonella* spp

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- *Shigella* spp
- *Pseudomonas aeruginosa*
- *Stenotrophomonas maltophilia*
- *Burkholderia* spp
- *Acinetobacter* spp
- *Vibrio cholerae*
- *Campylobacter* spp
- *Helicobacter pylori*
- *Haemophilus* spp
- *Haemophilus influenzae*
- *Moraxella catarrhalis*
- *Bordetella pertussis*
- *Brucella* spp
- *Francisella tularensis*
- *Yersinia pestis*
- *Yersinia enterocolitica*
- *Pasteurella multocida*
- *Neisseria* spp
- *Neisseria meningitidis*
- *Neisseria gonorrhoeae*
- *Legionella pneumophila*
- *Bartonella* spp
- *Bacteroides* spp
- Mycobacteria
- *Mycobacterium tuberculosis*
- *Mycobacterium avium* complex
- Spirochetes
- *Mycoplasma* and *Ureaplasma*
- *Rickettsia*, *Ehrlichia*, *Anaplasma* and *Coxiella*
- *Chlamydia* and *Chlamydophila*

The microbiota-oriented perspective will also be followed in the study of the available prophylactic and therapeutic anti-bacterial approaches:

- Sterilization, Disinfection and Antisepsis
- Modes of action of the main biocides used for disinfection and antisepsis
- Mechanisms of resistance to biocides
- Antibiotics: bacterial targets of available molecules and mechanisms of resistance
- Genetic bases of antibiotic resistance
- Genetic bases of the diffusion of antibiotic resistance
- Multi-drug resistant bacteria
- Passive immunoprophylaxis
- Anti-bacterial vaccines

Virology

The general purpose of this course is to give a robust introduction to basic medical virology, correlating the molecular features of each viral agents to the associated clinical syndromes. The dramatic advances in the comprehension of the different phases of the viral replicative cycle and pathogenesis will be directly correlated to the practical possibility of developing novel antiviral strategies or of improving the available diagnostic tools.

At the end of the course, the students should be familiar with the following general topics:

- Structure and chemical composition of viruses
- Phases of viral replication
- Transmission of viral infection
- Different types of viral infection
- Pathogenesis of viral diseases according to different sites of replication

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- Viral carcinogenesis
- The immune response to viruses
- Techniques for the diagnosis of viral infections
- Antiviral agent and mechanisms of viral resistance
- Passive immunoprophylaxis
- Antiviral vaccines

These general concepts should be specifically correlated to the specific features of each of the following groups of viruses:

- Parvoviruses
- Adenoviruses
- Herpesviruses
- Poxviruses
- Picornaviruses
- Papillomaviruses and polyomaviruses
- Hepatitis viruses
- Rotaviruses
- Caliciviruses
- Arthropod-borne and rodent-borne viruses
- Orthomyxoviruses
- Paramyxoviruses
- Rubella virus
- Coronaviruses
- Rabies virus
- Human retroviruses
- Lentiviruses
- Non-conventional non-viral pathogens (Prions)

Mycology

At the end of the course, the students will be familiar with the following topics regarding medical mycology:

- Structure of fungal cell
- Yeasts and moulds
- Fungal genera and species present in the human microbiota
- Virulence and pathogenicity of fungi
- Immune control of fungal agents
- Causative fungal agents of superficial, cutaneous and subcutaneous mycoses
- Causative fungal agents of endemic mycoses
- Causative fungal agents of opportunistic mycoses
- Diagnostic laboratory techniques of fungal infections
- Antifungal agents: targets of available molecules and mechanisms of resistance

The students should also be familiar with the main features regarding the following fungal genera and species of medical interest:

- *Candida* spp
- *Candida albicans*
- *Candida glabrata*
- *Candida krusei*
- *Cryptococcus neoformans*
- *Aspergillus* spp
- *Aspergillus fumigatus*

- *Aspergillus terreus*

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- *Fusarium* spp

- Zygomycetes

- *Pneumocystis jiroveci*

- *Histoplasma capsulatum* and other dimorphic fungi

Parasitology

By the end of the course, students should be familiar with the following protozoan and helminthic parasites of medical importance, with particular attention given to associated clinical syndromes and diagnostic laboratory techniques:

- *Giardia lamblia*

- *Cryptosporidium* spp and *Cyclospora* spp

- *Entamoeba histolytica*

- *Trichomonas vaginalis*

- *Trypanosoma* spp

- *Leishmania* spp

- Tissue amebae (i.e. *Acanthamoeba* spp)

- *Plasmodium* spp

- *Babesia microti*

- *Toxoplasma gondii*

- *Enterobius vermicularis*

- *Trichuris trichiura*

- *Ascaris lumbricoides*

- *Ancylostoma duodenale*

- *Strongyloides stercoralis*

- *Trichinella spiralis*

- *Taenia* spp

- *Diphyllobotrium latum*

- *Anisakis simplex*

- *Schistosoma* spp

- Filariae

- *Echinococcus granulosus*

Suggested textbooks

1) Patrick R. Murray, Ken S. Rosenthal, Michael A. Pfaller – Medical Microbiology – 7th ed. Mosby Elsevier.

2) Jawetz, Melnick & Adelberg's Medical Microbiology – 26th ed. McGraw-Hill.

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Clinical Laboratory Medicine

Total Credits: 4

Total hours: 40

Scientific Discipline Sector: MED/05 - MED/07 – BIO/12

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Dr Chiara Di resta Email: diresta.chiara@hrs.it

Course Description Clinical Biochemistry

The purpose of the course is to give to students an overview on the most relevant aspects of clinical laboratory medicine. The course will describe the pathophysiological aspects that influence the results of clinical laboratory tests, the interpretation of tests results and will give some insights on the technologies used in clinical laboratory.

Part of the course will be dedicated to the pre-analytical phase to provide the necessary information on variables that could influence and exert a confounding effect on the analytical results.

The following topics will be covered:

- Pre-analytical phase: description of the laboratory process, sources of pre-analytical variability (patient preparation, specimen collection, processing, transportation and storage)
- Statistical methods in laboratory medicine. Internal Quality control, external quality assessment.
- Laboratory report, units of measurement, reference intervals, decision limits, reference change value
- Analytical Techniques: spectrophotometry, mass spectrometry, immunoassays
- Proteins analysis and interpretation
- Lipids and lipoproteins
- Blood gas and critical care testing,
- Water and electrolyte balance
- Calcium biology and disorders
- Carbohydrate disorders
- Uric acid and iron metabolism
- Methods for DNA amplification
- Methods to detect known mutations
- Methods to detect unknown mutations
- New advanced molecular technologies
- Clinical applications of molecular tests

Suggested textbooks

- Contemporary Practice in Clinical Chemistry, 2nd edition. Edited by William Clarke. 2011. ISBN: 9871594251023
- Tietz textbook of Clinical Chemistry and molecular diagnostics, fifth edition, Burtis, Ashwood, Bruns, Elsevier Saunders, ISBN:9781416061649

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Cardiovascular Diseases

Total Credits: 9

Total hours: 86

Scientific Discipline Sector: MED/11, MED/22, MED/23, MED/36, BIO/14

Teaching staff

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Course Description

The course is organised in 7 modules:

Cardiac physiology and principles of echocardiography and ECG

This module will provide the basis of cardiac and coronary pathophysiology necessary for the understanding of cardiovascular syndromes. In addition, the module will cover the principles of echo- and electro-cardiography with practical examples.

Ischaemic heart disease (IHD)

The pathophysiology and clinical acute and chronic syndromes caused by coronary artery disease will be discussed. Furthermore, this module will provide knowledge relative to the main diagnostic techniques/criteria for establishing the diagnosis of IHD. Finally, both pharmacologic and interventional treatment strategies will be discussed.

Myocardial Diseases

In this module both primary/genetic and secondary forms of cardiomyopathy will be presented along with inflammatory disease of the heart, i.e. myocarditis and pericarditis. Diagnosis and treatment of these conditions will also be discussed.

Arrhythmias

The pathophysiology, diagnosis and treatment of rhythm and conduction disturbances will be presented including illustrative clinical cases.

Valvular heart disease

Congenital, degenerative and inflammatory diseases of the cardiac valves will be presented along with diagnostic and treatment strategies.

Heart Failure

The pathophysiology and clinical features of heart failure of ischemic and non ischemic origin will be presented along with the relevant diagnostic techniques and treatment options.

Congenital heart disease, pulmonary embolism and disease of the large vessels

This module will cover the above topics in conjunction with a special lecture on cardiology in the emergency department.

A questions and answers (Q&A) session will close the course.

Students are expected to demonstrate in depth knowledge of all the topics treated in the 7 modules.

Copies of lessons' slides in addition to reference papers will be made available on the University website.

The text suggested is "Harrison's-Principles of Internal Medicine" McGraw-Hill. We also advise reading the

textbook "Coronary microvascular dysfunction" Crea, Lanza, Camici eds.- published by Springer. Finally, we

strongly advise to download and consult the European Society of Cardiology ESC Clinical Practice

Guidelines available at [http://www.escardio.org/guidelines-surveys/esc-](http://www.escardio.org/guidelines-surveys/esc-guidelines/Pages/GuidelinesList.aspx)

[guidelines/Pages/GuidelinesList.aspx](http://www.escardio.org/guidelines-surveys/esc-guidelines/Pages/GuidelinesList.aspx)

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Principles of Surgery

Total Credits: 3

Total hours: 30

Scientific Discipline Sector: MED/18

Teaching staff

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Course Description

The aim of this course is to provide the essential theoretical knowledge to deal with the surgical patient. The student will focus on the epidemiological and physiopathological aspects of the main surgical diseases, on its diagnostic and treatment algorithms. In this course, the basic diseases concerning general surgery will be systematically introduced and discussed in a multidisciplinary setting, including medical, radiological and surgical technical features.

Course Program

Perioperative management

- Preoperative assessment, analysis of risk factors.
- Intraoperative factors influencing recovery.
- Postoperative care, enhanced recovery after surgery protocols.

Transplant Surgery

- History and definitions
- Matching of donor and recipient, principles of immunosuppression.
- Organ preservation.
- Organ transplants (heart, liver, kidney, pancreas, intestine).
- Living donor.

Metabolic surgery

- **Bariatric surgery:** indications, principles of surgical technique, metabolic results, prognosis.

Abdominal wall surgery

- Abdominal wall hernias and incisional hernias.

Thyroid and Parathyroids

- **Surgical anatomy of thyroid and parathyroid**
- **Thyroid nodule and multinodular goiter:** symptoms, differential diagnosis, treatment algorithm.

- **Thyroid tumors:** epidemiology, pathology classification, symptoms, diagnosis, surgical therapy and principles of technique, treatment algorithms, prognosis.
- **Parathyroid tumors:** epidemiology, pathology classification, symptoms, diagnosis, surgical therapy and principles of technique, treatment algorithms, prognosis.

Breast

- **Surgical anatomy of the breast and axilla**
- **Benign breast disease:** epidemiology, pathology classification, symptoms, diagnosis, surgical therapy and principles of technique, treatment algorithms, prognosis.
- **Breast cancer:** epidemiology, pathology classification, symptoms, diagnosis, surgical therapy and principles of technique, treatment algorithms, prognosis.

Esophagus

- **Gastro-esophageal reflux disease and hiatal hernia:** symptoms, diagnosis, surgical therapy and principles of technique, treatment algorithm.
- **Esophageal diverticula:** definitions, epidemiology, classification, physiopathology, symptoms, diagnosis, treatment algorithm.
- **Achalasia:** surgical therapy and principles of technique, endoscopic therapy.
- **Esophageal cancer:** epidemiology, pathology classification, symptoms, diagnosis, surgical therapy and principles of technique, endoscopic palliation, treatment algorithms, prognosis.

Stomach

- **Surgical anatomy of the stomach**
- **Peptic ulcer:** symptoms, diagnosis, treatment algorithms.
- **Stomach cancer:** epidemiology, pathology classification, symptoms, diagnosis, surgical therapy and principles of technique, endoscopic palliation, treatment algorithms, prognosis.

Small intestine

- **Surgical anatomy of the small intestine**
- **Small bowel obstruction:** causes, symptoms, diagnosis, surgical therapy and principles of technique.
- **Inflammatory bowel disease (IBD)**
 - Crohn's disease: symptoms, diagnosis, complications, surgical therapy, treatment algorithm, prognosis.
 - Ulcerative colitis: symptoms, diagnosis, complications, surgical therapy, treatment algorithm, prognosis.

Colon and Rectum

- **Surgical anatomy of the colon and rectum**
- **Diverticular disease:** symptoms, diagnosis, complications, surgical therapy, treatment algorithm.
- **Colorectal cancer:** epidemiology, pathology classification, symptoms, diagnosis, surgical therapy and principles of technique, endoscopic therapy and palliation, treatment algorithms, prognosis.

Anus

- Hemorrhoids.
- Fistula in ano.
- Anal fissure.
- Rectal prolapse.

Spleen

- **Surgical anatomy of the spleen**

- **Spleen trauma:** epidemiology, symptoms, diagnosis, treatment algorithm, surgical therapy and principles of technique.
- **Spleen lesions:** epidemiology, pathology classification, symptoms, diagnosis, surgical therapy and principles of technique, treatment algorithms, prognosis.

Adrenal glands

- **Surgical anatomy of the adrenal glands**
- **Adrenal gland disease:** epidemiology, pathology classification, pathophysiology, symptoms, diagnosis, surgical therapy and principles of technique, medical therapy, prognosis.

Biliary tract

- **Surgical anatomy of the biliary tract**
- **Cholelithiasis and choledocholithiasis:** symptoms, diagnosis, complications surgical therapy and principles of technique, endoscopic and percutaneous approaches, treatment algorithms.
- **Biliary tract tumors:** epidemiology, pathology classification, symptoms, diagnosis, surgical therapy and principles of technique, endoscopic and percutaneous palliation, treatment algorithms, prognosis.

Liver

- **Surgical anatomy of the liver**
- **Benign tumors of the liver:** epidemiology, pathology classification, predisposing factors, symptoms, diagnosis, surgical therapy and principles of technique, treatment algorithms, prognosis.
- **Primary malignant liver tumors:** epidemiology, pathology classification, predisposing factors, symptoms, diagnosis, medical therapy, percutaneous approaches, surgical therapy and principles of technique, treatment algorithms, prognosis.
- **Metastatic liver disease:** clinical scenarios, diagnosis, medical therapy, surgical therapy and principles of technique, treatment algorithms, prognosis.
- **Portal Hypertension:** definitions, classification, pathophysiology, symptoms, complications, diagnosis, medical therapy, endoscopic and percutaneous treatment, surgical therapy and principles of technique, treatment algorithms, prognosis.

Pancreas

- **Surgical anatomy of the pancreas**
- **Acute pancreatitis:** definitions, epidemiology, symptoms, diagnosis, severity classification, complications, surgical therapy, treatment algorithm.
- **Exocrine and endocrine tumors of the pancreas:** epidemiology, pathology classification, symptoms, diagnosis, endoscopic and percutaneous palliation, surgical therapy and principles of technique, treatment algorithms, prognosis.

Surgical emergencies

- **Gastrointestinal bleeding:** epidemiology, symptoms, diagnosis, endoscopic, percutaneous and surgical therapy, treatment algorithms.
- **Acute abdomen:** causes, symptoms, diagnosis, surgical therapy and principles of technique, treatment algorithm.
- **Appendicitis:** classification, symptoms, diagnosis, surgical therapy and principles of technique, treatment algorithm.

Suggested textbook:

- 1) Sabiston Textbook of Surgery, 19th edition
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Digestive System Diseases

Total Credits: 8

Total hours: 84

Scientific Discipline Sector: MED/12 – MED/18 – MED/29 – MED/36 – BIO/14

Teaching staff

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Teaching Assistant: (Gastroenterology Unit)

Dr Alberto Mariani

Dr Edi Viale

Dr Lorella Fanti

Dr Maria Chiara Petrone

Course Description

The course has been designed as a multidisciplinary teaching module and aims to give to students a thorough grounding in the comprehension of diseases of the entire digestive system, including mouth, gastrointestinal tract, liver, biliary system, and pancreas.

The integrated course has the purpose to provide to students a general practitioner level knowledge in gastrointestinal, pancreas, and liver diseases.

This will be achieved by including in the course, beside gastroenterology, some notions of odontology and maxillofacial surgery, pharmacology, radiology, human pathology, surgery, and laboratory testing in an integrated fashion.

As regards surgery, the digestive system diseases course will run head-to-head with the course of general surgery, that will include a number of topics specifically addressed to gastroenterological surgical problems, complementary to the gastroenterology.

As regards the specific gastroenterology program, students will be introduced to basic physiology of the systems and organs, and physiopathology, clinical presentation, natural history, diagnostic work-up, and basic therapeutic notions of the diseases.

Within the course four clinical case presentation sessions will be included, allowing an interactive discussion between teachers and students in a practical approach to outpatients.

At the end of the course, the students should be familiar with the following topics:

Esophagus:

- normal motility and primary motility disorders

- gastroesophageal reflux disease (typical and atypical symptoms)
- complications of gastroesophageal reflux disease, with particular focus on Barrett's esophagus
- esophageal cancer
- surgical approach to functional disorders and cancer

Stomach and duodenum:

- gastric secretion, motility, gastric barrier
- functional dyspepsia
- chronic gastritis, with particular focus on Helicobacter pylori infection
- peptic ulcer disease
- precancerous condition and cancer
- oncological management and surgery

Small bowel:

- digestion, absorption and motility
- celiac disease and other enteropathies, including food intolerance and hypersensitivity
- motility disorders, including obstruction
- definition and classification of diarrhea

Colon and rectum:

- chronic inflammatory bowel diseases and their complications
- diverticular disease and its complications
- irritable bowel syndrome
- precancerous conditions and cancer
- oncological management and surgery
- diseases of anus and functional disorders of pelvic floor

Liver and biliary tract:

- metabolism and laboratory testing
- bile secretion, cholestasis and jaundice
- chronic cholestatic diseases
- bile stone disease and its complications
- Vater's papilla organic and functional diseases
- non alcoholic fatty liver disease
- chronic hepatitis, with particular focus on virus-related infections
- hepatic cirrhosis and hemochromatosis
- portal hypertension and its complications
- tumors of liver and biliary system

Pancreas:

- exocrine and endocrine secretion
- acute pancreatitis
- local and systemic complications of acute pancreatitis
- chronic pancreatitis and its complications
- cystic lesions and neuroendocrine tumors
- cancer

Gastrointestinal bleeding

Suggested textbooks

- 1) Harrison's Principles of Internal Medicine – 18th edition
McGraw-Hill
- 2) Sleisenger and Fordtran's Gastrointestinal & Liver Disease – 8th edition
Saunders
- 3) Yamada T. Textbook of Gastroenterology – 4th edition
Lippincott Williams & Wilkins

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Respiratory, Ear, Nose and Throat Diseases

Total Credits: 7

Lessons: 76 (2 hours every lesson)

SSD: MED/10, MED/36, MED/31, MED/21

Course Coordinator: Piero Zannini

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TEACHERS

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COURSE INTRODUCTION

“Respiratory, Ear, Nose and Throat Diseases” is a course that provides information on the morphology, physiology, pathophysiology, clinical aspects, diagnosis and principles of treatment of the diseases of the upper aerodigestive tract, and of the respiratory and auditive system.

During the course the morphology and physiology of the upper aerodigestive tract and of the respiratory and auditive system will be reviewed in order to introduce the students to the pathophysiology and pathogenesis of potential diseases. Clinical aspects, semeiotics and diagnostic procedures will be explored in depth and the principles of management will be presented. Students will have the opportunity to attend clinical Departments in order to gain practical experience of the diagnostic features and clinical evolution of the diseases.

SPECIFIC GOALS AND OBJECTIVES

The goals of the M.D. Course in Respiratory, Ear, Nose and Throat Diseases are to enable the students:

- 1) to deepen their knowledge of the macroscopic and microscopic morphology of the upper and lower respiratory system and of the ear, nose and throat.
- 2) to deepen their knowledge of the physiology of the upper and lower respiratory system and of the ear, nose and throat.
- 3) to learn about the pathophysiology of the diseases of the upper and lower respiratory system and of the ear, nose and throat.
- 4) to learn the techniques of collecting patients' medical history and of carrying out a physical examination of the upper and lower respiratory system and of the ear, nose and throat.
- 5) to gain knowledge of the most frequent diseases of the upper aerodigestive tract, the lower respiratory system, the ear, nose and throat including aetiology, pathogenesis, pathophysiology and relevant medical treatment.

DETAILED PROGRAM SECTIONS

Respiratory Medicine

Teacher: Prof. George Cremona

Respiratory Medicine is one of the systems-based courses covering all of the systems of the body. This course covers basic physiological, pharmacological and pathophysiological aspects of diseases of the respiratory system. Faculty from the Units of Respiratory Medicine, Pharmacology, Radiology and Surgery teach in the course. By the end of the course students will be able to describe the pathology and pathophysiology of infectious inflammatory and immunologic, metabolic and systemic disorders, trauma, and neoplasms affecting the respiratory system. Students will be able to recognize the differences between the normal and disease states, select diagnostic tests, and understand the pharmacological and non-pharmacological therapies. The course uses lectures to present material, case-based tutorials to reinforce key concepts, and a simulation exercise to link basic science material to clinical medicine. Assessment will consist of written multiple choice test and oral examination at the end of the course.

Radiology

Teacher: Antonio Esposito

1. Introduction to imaging of the upper and lower respiratory system:
the first and second level techniques for the assessment of respiratory system will be presented remarking the principles at the basis of image formation and the main indication for each technique.
2. Imaging in the inflammatory disease of the respiratory system:
the role of imaging in the diagnosis, clinical assessment and management of inflammatory disease will be discussed differentiating upper airways from lungs and pleura
3. Imaging of interstitial lung diseases/pulmonary fibrosis/Chronic Obstructive Pulmonary Disease:
the role of HRCT (high resolution computed tomography) in the assessment of diffuse lung diseases will be explain showing the most common patterns of disease
4. Imaging of throat tumours:
role of imaging techniques in the diagnosis and staging of pharynx and larynx tumors will be presented
5. Imaging of lung cancer:
detection of lung cancer; differential diagnosis; screening programs; lung cancer staging
6. Imaging of pleural tumours:
detection; differential diagnosis; staging
7. Imaging of pulmonary thromboembolism
Imaging techniques involved and main signs of PE
8. Imaging of thoracic trauma
Role of imaging in the assessment of blunt chest trauma or penetrating thoracic lesions in emergency

Otorhinolaryngology

Teacher: Prof. Mario Bussi

Tutor: Matteo Trimarchi

1. Anatomy and physiology of the upper aerodigestive tract: nose and paranasal sinuses, oral cavity, pharynx, larynx, salivary glands, external and middle ear.
2. Pathophysiology of the nose and paranasal sinuses: classification, symptomatology, diagnosis and treatment of the sinonasal diseases (acute and chronic flogoses, benign and malignant neoplasms, traumas, epistaxis).
3. Pharynx pathophysiology: acute and chronic flogoses, tonsillitis, pharynx tumors (symptomatology, diagnoses, treatment).
4. Salivary glands pathophysiology: acute and chronic flogoses, syaloadenoses and tumors.
5. Pathophysiology of the larynx: acute and chronic laryngitis, benign lesions, benign and malignant neoplasms (symptomatology, diagnoses, treatment).
6. Main aspects and clinical features of neck pathologies.

7. Pathology of the external and middle ear: symptoms, diagnosis and treatment of otitis, otosclerosis, congenital malformations.

Thoracic Surgery

Teachers: Prof. Piero Zannini, Prof. Giampiero Negri, Dr Giulio Melloni, Dr Angelo Carretta, Dr Paola Ciriaco

Tutors: Armando Puglisi, Alessandro Bandiera

1. Pleura. Spontaneous pneumothorax and pleural effusion

Pleural effusion: definition, incidence, classification, pathogenesis, pathophysiology, symptoms and signs, treatment. Pleural mesothelioma: epidemiology, pathology, diagnosis and management.

Pleural Empyema: definition, incidence, classification, pathogenesis, pathophysiology, symptoms and signs, treatment.

Spontaneous pneumothorax: definition, incidence, classification, pathogenesis, pathophysiology, symptoms and signs, treatment.

2. Lung cancer.

Epidemiology, risk factors, pathology, diagnosis and staging, symptoms and signs, surgical principles and management.

3. Trachea.

Endoscopic and surgical treatment of benign and malignant diseases.

Post-intubation stenosis, idiopathic stenosis, primary and metastatic tumours, trauma: symptoms and signs, diagnosis, surgical principles and management. Tracheoesophageal fistula: definition, pathogenesis, diagnosis, surgical principles and management.

4. Trauma

Trauma to the chest wall and to the lung: incidence, diagnosis, symptoms and signs, management.

PRACTICAL SESSIONS AND LABS

I. Activities in Thoracic Endoscopy Service: diagnostic and operative fiberoptic endoscopy

II. Activities in Thoracic Surgery Department: chest drainage (indications to, positioning and management)

III. Activities in ENT department: pre-operative and post-operative patient's management

IV. Activities in ENT practice: vestibular and audiologic evaluation, diagnostic endoscopy, oncologic follow-up,

V. Activities in ENT operating theatre

FORMATIVE ASSESSMENT AND EXAMS

Multiple choice questions and clinical cases discussion.

SUGGESTED BOOKS AND READINGS

Sabiston Textbook of Surgery Saunders Company

Pearson's Thoracic and Esophageal Surgery Churchill Livingstone Elsevier 2008

Grillo Surgery of the trachea and bronchi BC Decker

Gibbons's Surgery of the Chest, Saunders Company

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Medical Semiotics Internal Medicine I – 3 Credits
Internal Medicine and Surgery I - 5 credits
SSD: MED/09, MED/18

Course coordinator: Prof. Lorenzo DAGNA, MD, FACP
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Collaborators: Alvise Berti, MD berti.alvise@hsr.it
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"The true mystery of the world is the visible, not the invisible." (Oscar Wilde, 1854-1900)

"He who studies medicine without books sails an uncharted sea, but he who studies medicine without patients does not go to sea at all." (William Osler, 1849-1919)

Aims

The practice of modern medicine is a balanced combination of science and art. The role of science in medicine is clear: science-based technology and deductive reasoning are the basis for the solution of most clinical problems. The scientific advances in the basic sciences, genetics, biochemistry, imaging, laboratory medicine and therapeutics provide the physician of the third millennium with unprecedented tools. In addition to sound scientific basis, however, there is a medical art which is a combination of medical knowledge, intuition, observation and critical judgment which is equally needed by the doctor to practice of medicine.

The most striking example of these nearly artistic skills that the doctor should have is medical semiotics, the ability of understanding and describing physical signs and symptoms. With careful observation, with appropriate and timely questions, with simple gestures, the expert physician can reach incredibly precise deductions about the disease of a patient. For centuries, doctors diagnosed diseases using only their senses, observing, palpating, percussing, listening. Modern technology has undoubtedly radically changed all this. However it is not at all unusual that complex and expensive tests or imaging studies are performed to get the same information that a well performed thorough physical examination and a proper and well conducted history taking could provide.

The course of General Semiotics aims to provide students with the theoretical and practical bases necessary to effectively collect a thorough history and perform a complete physical examination. At the end of the course there will be a short rotation in the medical wards of the hospital to put into practice what students have learned during the course. The results reached during these activities will be strengthened in the following semesters, thanks to more and more prolonged periods of rotation in clinical departments, and as a result of systematic study of different medical subspecialties/blocks.

Objectives

This practical/theoretical course is designed first to provide the student with the correct medical terms and the general signs and symptoms of disease. Then we will analyze the most typical signs and symptoms of the different organs and systems.

At the end of the course the student will be able to take a thorough history and perform a physical examination and to detect the most frequent pathological findings.

Interactive teaching activities

Since this course will be the first direct contact of the students with sick patients admitted to an hospital wards, the course will begin with a seminar to explain all the procedures that are needed in order to preserve their own health and patients' safety.

Then interactive lectures will be held in which, starting from the physiology and pathophysiology of each organ/system, the normal and more common abnormal findings will be analyzed and discussed, in order to provide students with all the skills needed to perform a complete physical examination. Time will be spent to discuss specific techniques commonly used to collect a complete and thorough medical history.

During classes a lot of time will be given for interaction and discussion. The last class of the theoretical part of the course will be devoted entirely to review what was discussed in class and clarify any doubts of the students.

In the practical part of the course (last 2 weeks), students will be attending the general medical wards of our hospital in wards, dealing with real patients, collecting their histories and practicing in physical examination under the supervision of the clinic's doctors. REMEMBER THAT, DUE TO PATIENT ETHNICITY, INTERACTION WITH PATIENTS WILL BE IN ITALIAN.

Teaching materials

Suggestions on possible textbooks will be provided at the first lesson of the course. Slides used in classes will be uploaded in the course on-line folder after each class.

Final assessment/exam

Student **MUST ATTEND** the **INTRODUCTORY SEMINAR** and **ALL THE PRACTICALS**. Attendance to lectures will be checked and recorded electronically (badge scanning) and/or with roll calls. At the end of the course there will a written test (20 short open questions). Passing the written test will be necessary in order to sit for the subsequent practical test. The practical test will be done in the clinic, at the bedside of a real patient, checking for the ability to interact with patients, to collect history and to perform a complete physical examination. The combined evaluation of these tests will result in passing/failing the course.

Course program

General principles of the history taking and physical examination

History taking

- Reason for assessment
- Past medical history
- History of present complaint
- Family history
- Physiological
- Work history
- History taking in special situations

Evaluation of the general parameters and vital signs

Assessment of the behavior and mental status

Physical examination of skin, hair and nails

- Physical examination of the head and neck (eyes, eyelids, visual acuity, ears, the auditory acuity, Weber and Rinne tests, sinuses, mouth, lips, oral mucosa, tongue, pharynx, neck, thyroid)
- Chest examination (inspection, palpation, percussion, auscultation)

Physical examination of the cardiovascular system (inspection, palpation, auscultation)

Physical examination of the breast and axillae

Physical examination of the abdomen (inspection, palpation, percussion, auscultation, Giordano's, Blumberg's, Murphy's, McBurney's, Rovsing's signs)

Physical examination of the vascular peripheral (pulse features, Raynaud's phenomenon, Allen test, deep vein thrombosis and Homans' and Bauer's signs, signs of venous insufficiency, Trendelenburg's and Perthes' tests)

Physical examination of the lymphatic system and lymphnodes

Physical examination of the male genitalia and evaluation of hernias

Physical examination of the female genital

Physical examination of the perineum, rectum and prostate

Physical examination of the musculoskeletal system

Brief neurological physical examination (mental status, cranial nerves, muscle tone and strength, coordination tests, Romberg's test, examination of sensory system, skin and deep tendon reflexes, Lasegue's, Babinski's, Kernig's, Brudzinski's signs)

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TIMETABLE

Please note that changes may always occur in the daily lesson schedule.
Please refer to the on line timetable for the latest version.

International MD Program A.Y. 2015/2016 - YEAR 3					
TIME	MONDAY 28/09/2015	TUESDAY 29/09/2015	WEDNESDAY 30/09/2015	THURSDAY 01/10/2015	FRIDAY 02/10/2015
09-11		NBME EXAM	Clinical Lab. Medicine 1		
11-13			Microbiology NM	Microbiology NM	
14-16	Microbiology NM				
16-18					
TIME	MONDAY 5-Oct-15	TUESDAY 6-Oct-15	WEDNESDAY 7-Oct-15	THURSDAY 8-Oct-15	FRIDAY 9-Oct-15
09-11		Clinical Lab. Medicine 2	Clinical Lab. Medicine 3	Microbiology MP	B. Pathology & Immunology
11-13	B. Pathology & Immunology	B. Pathology & Immunology	B. Pathology & Immunology		
14-16	Microbiology NM		Microbiology MP	Microbiology NM	Microbiology NC
16-18	Clinical Lab. Medicine MF				
TIME	MONDAY 12-Oct-15	TUESDAY 13-Oct-15	WEDNESDAY 14-Oct-15	THURSDAY 15-Oct-15	FRIDAY 16-Oct-15
09-11	Clinical Lab. Medicine MF	Clinical Lab. Medicine MF	Clinical Lab. Medicine 4	Microbiology MP	B. Pathology & Immunology
11-13	B. Pathology & Immunology	B. Pathology & Immunology	B. Pathology & Immunology	B. Pathology & Immunology	B. Pathology & Immunology
14-16	Microbiology NM	B. Pathology & Immunology	Microbiology MP	Microbiology NM	Microbiology NC
16-18	B. Pathology & Immunology				
TIME	MONDAY 19-Oct-15	TUESDAY 20-Oct-15	WEDNESDAY 21-Oct-15	THURSDAY 22-Oct-15	FRIDAY 23-Oct-15
09-11	Clinical Lab. Medicine MF	Clinical Lab. Medicine MF	Clinical Lab. Medicine 5	Microbiology MP	B. Pathology & Immunology
11-13	B. Pathology & Immunology	B. Pathology & Immunology	B. Pathology & Immunology	B. Pathology & Immunology	B. Pathology & Immunology
14-16	Microbiology NM	B. Pathology & Immunology	Microbiology MP	Microbiology NM	B. Pathology & Immunology
16-18					
TIME	MONDAY 26-Oct-15	TUESDAY 27-Oct-15	WEDNESDAY 28-Oct-15	THURSDAY 29-Oct-15	FRIDAY 30-Oct-15
09-11	9-13 Safety Course prenota aula per lezione	9-13 Safety Course prenota aula per lezione	Clinical Lab. Medicine	Microbiology MP	B. Pathology & Immunology
11-13			B. Pathology & Immunology	B. Pathology & Immunology	B. Pathology & Immunology
14-16		ore 15:00 Human Morphology extra appello (all partials)	Microbiology MP	Microbiology NM 20	Microbiology NC
16-18					
TIME	MONDAY 2-Nov-15	TUESDAY 3-Nov-15	WEDNESDAY 4-Nov-15	THURSDAY 5-Nov-15	FRIDAY 6-Nov-15
09-11		Clinical Lab. Medicine 6	Clinical Lab. Medicine 7	Microbiology MP	B. Pathology & Immunology
11-13	B. Pathology & Immunology	B. Pathology & Immunology	B. Pathology & Immunology RP	Clinical Lab. Medicine	
14-16	Microbiology NM	Microbiology NC	Microbiology MP	Microbiology NMlementi NM	Microbiology NC
16-18					

TIME	MONDAY 9-Nov-15	TUESDAY 10-Nov-15	WEDNESDAY 11-Nov-15	THURSDAY 12-Nov-15	FRIDAY 13-Nov-15
09-11	B. Pathology & Immunology RP	Clinical Lab. Medicine 8	B. Pathology & Immunology	B. Pathology & Immunology RP	B. Pathology & Immunology
11-13	B. Pathology & Immunology RP	B. Pathology & Immunology RP	Clinical Lab. Medicine		B. Pathology & Immunology
14-16	Microbiology NM	B. Pathology & Immunology RP	B. Pathology & Immunology RP	Microbiology NM	
16-18					
TIME	MONDAY 16-Nov-15	TUESDAY 17-Nov-15	WEDNESDAY 18-Nov-15	THURSDAY 19-Nov-15	FRIDAY 20-Nov-15
09-11	B. Pathology & Immunology RP	B. Pathology & Immunology	Clinical Lab. Medicine		B. Pathology & Immunology
11-13	B. Pathology & Immunology	B. Pathology & Immunology	B. Pathology & Immunology	B. Pathology & Immunology	B. Pathology & Immunology
14-16	Microbiology NM			Microbiology NM	
16-18					
TIME	MONDAY 23-Nov-15	TUESDAY 24-Nov-15	WEDNESDAY 25-Nov-15	THURSDAY 26-Nov-15	FRIDAY 27-Nov-15
09-11	B. Pathology & Immunology	B. Pathology & Immunology	Clinical Lab. Medicine	B. Pathology & Immunology	B. Pathology & Immunology
11-13	B. Pathology & Immunology	B. Pathology & Immunology	B. Pathology & Immunology	Microbiology NM	B. Pathology & Immunology
14-16	Microbiology NM				
16-18					
TIME	MONDAY 30-Nov-15	TUESDAY 1-Dec-15	WEDNESDAY 2-Dec-15	THURSDAY 3-Dec-15	FRIDAY 4-Dec-15
09-11	B. Pathology & Immunology	B. Pathology & Immunology	Clinical Lab. Medicine 9	B. Pathology & Immunology	B. Pathology & Immunology
11-13	B. Pathology & Immunology	B. Pathology & Immunology	B. Pathology & Immunology	Microbiology NM40	B. Pathology & Immunology
14-16	Microbiology NM				
16-18					
TIME	MONDAY 7-Dec-15	TUESDAY 8-Dec-15	WEDNESDAY 9-Dec-15	THURSDAY 10-Dec-15	FRIDAY 11-Dec-15
09-11	Holiday	Holiday	Clinical Lab. Medicine 10	B. Pathology & Immunology	Rescheduling
11-13			B. Pathology & Immunology	B. Pathology & Immunology	Rescheduling
14-16			B. Pathology & Immunology		Rescheduling
16-18					Rescheduling
TIME	MONDAY 14-Dec-15	TUESDAY 15-Dec-15	WEDNESDAY 16-Dec-15	THURSDAY 17-Dec-15	FRIDAY 18-Dec-15
09-11	Study leave				
11-13					

SAN RAFFAELE INTERNATIONAL MD PROGRAM

YEAR 4

Academic Year 2015/2016

- **Endocrine and Metabolic Diseases**
- **Nephrology and Urology**
- **Oncology**
- **Haematology**
- **Musculoskeletal Diseases**
- **Neurological Sciences**
- **Psychiatry and Clinical Psychology**
- **Ophthalmology**
- **Infectious Diseases**
- **Clinical Rotations: Internal Medicine & Surgery II**

Endocrine and Metabolic Diseases

Total Credits: 6

Lessons: 66 h

Practicals: 12 h

Scientific Discipline Sector: SSD Med/13, Bio/14

Teaching staff

Course Coordinator: Emanuele Bosi

Dozio Nicoletta

Elena Contrino

Federico Furlan

Rossini Alessandro

Scavini Marina

Daniele Zacchetti

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Goals

The overall objective of this course is to provide the student with the theoretical and practical skills for selecting the appropriate diagnostic procedures and implementing recommended treatment for endocrine and metabolic diseases. The specific aims of this course are those included in the Unità Didattiche Elementari (UDE) of the Endocrine and Metabolism chapter within the Core Curriculum of the Magistral Doctorate in Medicine (Medicina e Chirurgia 18: 629-693, 2002 UDE 936-965; <http://www.gruppoeidosis.it/unimed/>). Thematic content (knowing, knowing to do, knowing to be), level of knowledge (theoretical and mnemonic, general and in depth), expertise (mnemonic, interpretational, decisional) and skills (manual, practical, professional, decision making and problem solving) will be treated and pursued as indicated in this document (see also Course Description).

Evaluation

Written exam based on multiple choice questions, with the students' choice of an additional oral exam.

Course Description

The different topics are treated in a systematic way, i.e., by individual endocrine gland or group of endocrine tissues, using an integrated approach encompassing morphology, pathophysiology, clinical medicine, pharmacology and therapy. Specific focus is devoted to the molecular bases of hormone action and pathogenetic mechanisms, prerequisites to a in-depth understanding of the clinical aspects of endocrine and metabolic diseases and appropriate diagnostic and therapeutic procedures. The course also aims at introducing the theme of Endocrinology and Metabolic Diseases as a discipline of Internal Medicine, with emphasis on the general underlying clinical context with the multiple pathophysiological endocrine and non-endocrine interactions typical of these diseases. The course aims at providing the understanding of the general management of the most prevalent endocrine problems that impact on any discipline of medicine.

The course includes frontal lectures on: hypothalamus and pituitary (synthesis, secretion and mechanism of action of hypothalamic and pituitary hormones, panhypopituitarism, hyperprolactinemia, acromegaly, diabetes insipidus); thyroid (secretion and mechanism of action of thyroid hormones, hypo and hyperthyroidism, thyroiditis, thyroid nodules and malignancies, ultrasound diagnostics); parathyroids (calcium homeostasis, hypo and hyperparathyroidism, osteoporosis); glucose metabolism and diabetes mellitus (insulin secretion and mechanism of action, classification, epidemiology, type 1 diabetes, type 2 diabetes, acute and chronic diabetic complications, hypoglycemia); obesity and metabolic syndrome; dyslipidemia; adrenal (secretion and mechanism of action of steroid hormones and catecholamines; hypo and hypercortisolism, hypo and hyperaldosteronism, pheochromocytoma); gonads (male and female hypogonadism, hyperandrogenism, adrenogenital syndromes).

Seminars with a practical approach will be delivered on therapy adjustments, insulin administration principles, self blood glucose monitoring and principles of nutrition.

Attendance to diabetes clinics, endocrinology clinics, thyroid US scan, Day Hospital, ophthalmology clinics and research facilities are integral part of the learning module. Moreover, there is the opportunity for students

to attend the inpatient wards and the laboratories of the Diabetes Research Institute. The participation to daily clinical rounds and periodic research seminars is also welcome.

Textbook

Harrison's Principles of Internal Medicine, part on Endocrinology and Metabolism. McGraw-Hill

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Nephrology and Urology

Total Credits: 7

Total hours: 70

Scientific Discipline Sector: Med/14, Med/24, Bio/14

Teaching staff

Course Coordinators: Francesco Montorsi	Email: montorsi.francesco@hsr.it
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Daniele Zacchetti	Email: zacchetti.daniele@hsr.it

Course Description

UROLOGY

The course is dedicated to the urological topics of greatest epidemiological and clinical-surgery impact. In this context, IMDP students will have the opportunity of attending the clinical and surgical activities throughout the morning timetable. Therefore, students will take part to the daily operating theatre activities looking at open, endoscopic and robotically assisted procedures for benign and oncologic urological disorders. Likewise, students will closely follow the outpatient clinical activities (i.e. ultrasounds assessments, cystoscopy, multichannel urodynamic evaluation, etc) and the inpatient unit activities during the preop- and the postoperative periods. Similarly, students will have the opportunity to closely follow the on duty/on call urologist during the daily activities.

Moreover, during the afternoon timetable on a daily basis IMDP students will attend a formal lesson dedicated to the major functional and uro-oncological themes, thus including

1. Benign Prostate Hyperplasia/Lower Urinary Tract Symptoms
2. Prostatitis and urinary tract infections
3. Prostate cancer
4. Kidney cancer
5. Bladder and upper urinary tract urothelial carcinoma
6. Penis and testis cancer
7. Male and female urinary incontinence
8. Paediatric urology
9. Male sexual dysfunction; Couple's infertility
10. Urolithiasis

NEPHROLOGY

Educational Goals and Objectives

This course is designed to provide the student with a complete understanding of the optimal management of chronic kidney diseases. The focus of this course will be to discuss the pathophysiologic and clinical advances in the major areas of Nephrology including glomerular disease, fluid and electrolyte disorders, hypertension, dialysis, and renal transplantation. Well recognized medical complications and recommendations for optimal care will be discussed.

The material will be presented in several formats including frontal lectures and case based workshops.

In particular: students must understand the epidemiology, pathophysiology and management of common renal disorders and electrolyte and acid base disturbances including: Sodium and water imbalance, Potassium imbalance, Simple and mixed acid-base disturbances, Hypertension, Renal tubular acidosis,

Glomerulonephritis, Renal vasculitis, Nephritic & Nephrotic Syndrome, Calcium & phosphorus metabolism, Pre-renal causes of renal failure, Obstructive Uropathy, Nephrolithiasis, Renal failure in a patient with liver failure, Acute tubular necrosis, Interstitial nephritis, Chronic kidney disease, Diabetic nephropathy and main principles of dialysis and extra corporal procedures.

As renal diseases are often complex pathologies with different interindividual outcomes the course will also give students the tools and the basic notions of genetic involvement in kidney morbidities.

Educational resources

- Harrison's Principles of Internal Medicine (ed: Mc Graw Hill)
- Goodman & Gilman's The Pharmacological Basis of Therapeutics

Suggested Reading

- Textbook of Nephrology SG Massry, RJ Glasscock 2001
- EAU Guidelines, Edition 2014 - http://uroweb.org/fileadmin/guidelines/Guidelines_2014_5_June_2014.pdf

Evaluation methods

Multiple choice question test (60 multiple choices closed questions) at the end of the course.

Oral examination can be performed for students who have not sustained written test or have reached a bad evaluation.

Examinations data will be communicated by official secretary of school of Nephrology.

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Oncology

Total Credits: 5

Total hours: 50

Scientific Discipline Sector: MED/06, BIO/14, MED/36

Teaching staff

Course Coordinator

Andrés J. M. Ferreri

E-mail: ferreri.andres@hsr.it

Receiving Hour: Tuesday from 15:00 and 17:00, Block B, -2 Floor (to be confirmed by email).

Teaching Assistants

Vanesa Gregorc

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Daniele Zacchetti

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Course Description

The course of Oncology consists of practical and academic activities regarding all the clinical, therapeutic, molecular, biological, radiological and pharmacological aspects of cancers. Attendants will discuss notions of the epidemiology of cancer as well as molecular mechanisms involved in the biological processes that led to cancer development, growth control and dissemination. The course covers classical concepts related to suspicion, diagnosis and staging of the most relevant solid tumours and lymphomas. An important part of course regards molecular knowledge of conventional and innovative therapeutic targets as well as the related pharmacological and radiological therapies used in current practice and experimental trials. A detailed discussion of anticancer drugs, their pharmacodynamic and pharmacokinetics as well as other knowledge with relevant therapeutic implications is included. This section includes also supportive care, therapeutic side effects and diagnosis and management of the most common complications as well as late effects in cancer survivors. An important part of the course regards cancer investigation, with a detailed analysis of the different phases of clinical research.

Objectives

The aim of this course is to provide the essential theoretical and practical knowledge to deal with the diagnostic and therapeutic management of cancer patients. The student will focus on the epidemiological and physiopathological aspects of the main solid tumours and lymphomas and, at the end of the course, will be able to develop a systematic and multidisciplinary approach to the studied malignancies, including modern laboratory, radiological and therapeutic tools currently used in oncology. Students will analyze methods and strategies of basic and clinical cancer research as well as understand the cancer as public health problem and global phenomenon. In practice, at the end of the course, the student will be able to take a thorough history and perform a physical examination, to understand lab and radiological exams, to indicate and construe staging procedures, hypothesize therapeutic alternatives, and interpret trial results.

Final assessment/exam

Attendance to lectures will be checked and recorded electronically. At the end of the course there will be an oral test focused on the course contents and clinical cases discussion.

SUGGESTED BOOKS AND READINGS

- 1) DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology – Lippincott, Williams and Wilson – 9th edition - ISBN-13: 978-1451105452
- 2) Longo D., Fauci A., kasper D.: Harrison's Principles of Internal Medicine - McGraw-Hill – 18th Edition - ISBN 9780071748896
- 3) Abeloff M, Armitage J, Niederhuber J, Kastan M, McKenna W: Abeloff's Clinical Oncology - Churchill Livingstone – 4th edition - ISBN: 9780443066948

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Haematology

Total Credits:4

Total hours: 40

Scientific Discipline Sector: Med/15

Teaching staff

Course Coordinator: Claudio Bordignon

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Teaching Assistants

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Luca Vago

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Goals:

The goal of this course is to initiate the student to the fundamental principles of hematology and to provide the student with the theoretical and practical skills for selecting the appropriate diagnostic procedures and implementing recommended treatment for hematological diseases. To this aim we will couple academic lessons to case report discussion.

Special emphasis will be provided to the pathogenesis of haematological diseases and to the growing role of molecular biology in the clinical management of patients with haematological diseases. Based on the pivotal role of hematopathology in hematology, we include practical lessons "at the microscope", to be held in small groups. An important part of course will be held in collaboration with the course of Oncology, with the purpose, for the student, of getting acquainted with the basis of preclinical and clinical investigation in hemato-oncology.

Evaluation/Final assessment/exam

Attendance to lectures will be checked and recorded electronically. At the end of the course there will be an oral test focused on the course contents and clinical cases discussion.

Course Description:

Lessons held in collaboration with the Course of Oncology are in bold.

- **Stem cell biology and Hematopoiesis**
- **Clonal dynamics and Leukemic stem cells**
- **Epidemiology, carcinogenesis, molecular bases of cancer,, tumor microenvironment, metastasis**
- **Principles of cytotoxic and targeted therapy. Alkylating agents.**
- **Staging, Clinical trials, quality of life, performance status, prognostic scores**
- **Diagnostic technologies in Hematology & Oncology: blood counts, flow cytometry & tumor biopsies**
- **Antimetabolites and analogs. Vinca alkaloids and taxans.**
- Anemia definition, classification, Approach to Anemia in the adult and child

- Hemostasis, Thrombosis, Hemophilia
- Hemorrhagic syndromes. Hereditary and acquired disorders of platelets and coagulation.
- **Topoisomerase inhibitors. Kinase inhibitors. Proteasome inhibitors**
- Disorders of iron metabolism: Iron deficiency and Iron Overload. Megaloblastic anemias
- **Imaging in oncology**
- Hemoglobinopathies
- Basis of Transfusion Medicine
- **Lymphoproliferative disorders, Non Hodgkin Lymphoma, Hodgkin Lymphoma, Chronic lymphocytic leukemia**
- **Multiple Myeloma, Amyloidosis**
- Myelodysplasia
- Supportive care
- Acute Leukemias
- Myeloproliferative syndromes
- **Hematopoietic stem cell transplantation, cancer immunotherapy, gene therapy**
- At the microscope (small groups)

Textbooks:

Essential Haematology
 A.V, Hoffbrand / P.A.H. Mosso Wiley-Blackwell
 6th Edition 2011.

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Musculoskeletal Diseases

Total Credits: 2

Total hours: 20

Scientific Discipline Sector: Med/33, Med/34

Teaching staff

Course Coordinator: Celeste Scotti Email: celeste.scotti@grupposandonato.it

Goals: The goal of this course is to provide the students with an overview on the fundamental principles and practices of Orthopaedic and Trauma Surgery. The course will be focused on the most relevant musculoskeletal disorders with hints on the newest advances on Adult Reconstruction Surgery, Arthroscopy, Sport Trauma and Regenerative Medicine. At the end of the course, the students will be able to deal with the spectrum of orthopaedic and trauma conditions and will be confident with the modern Orthopaedic and Trauma practice.

Prerequisites: None

Evaluation: The exam will consist of an oral examination. Exam will be focused on topics covered during the classes and clinical cases discussion.

Course Description

This course is conceived to instruct the students in the pathophysiology, clinical examination, investigation and modern management of the most common musculoskeletal conditions. Typical clinical scenarios will be illustrated and discussed. The lectures will cover the following topics:

- INTRODUCTION: Brief History of Orthopaedics; Clinical Evaluation
- TRAUMA: generalities on trauma, most common trauma and related treatments. Emergencies and Complications.
- METABOLIC DISORDERS & OSTEOPOROTIC FRACTURES
- OSTEOARTHRITIS: Primary and secondary OA; related disorders; principles of Total Joint Replacement.
- PEDIATRIC ORTHOPAEDICS: Developmental Dysplasia of the Hip, Club foot, Scoliosis, and other common pediatric conditions.
- FOOT&ANKLE: Hallux valgus, flat foot, diabetic foot and other common foot&ankle conditions.
- SPORT TRAUMA: Shoulder & Elbow; Hip impingement, Articular Cartilage, Knee & Ankle.
- NEURO ORTHOPAEDICS: Adult Spine & Peripheral Nerve
- TUMORS: Benign and Malignant Tumors of Bone and Soft Tissues, Metastatic Bone Disease.
- INFECTIONS: Chronic and Haematogenous Osteomyelitis, Arthritis, Post-Traumatic and Post-Operative Infections
- REGENERATIVE MEDICINE: Cartilage, Bone and Tendon regeneration, Joint Homeostasis, Orthobiologic treatments.

Textbooks:

Louis Solomon, David J. Warwick, Selvadurai Nayagam. Apley's Concise System of Orthopaedics and Fractures, Fourth Edition. Hodder Arnold Publication.

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Neurological Sciences

Total Credits: 14

Lessons: 104 h

Practicals: 44 h

Scientific Discipline Sector: Med/08, Med/26, Med/27, Med/32, Med/37, Bio/14

Teaching staff

Course Coordinator: Giancarlo Comi

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Staff Assistants:

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Michele Reni

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Collaborators

Andrea Falini, Simonetta Gerevini, Paolo Vezzulli, Francesco Scomazzoni, Antonella Castellano, Claudia Godi, Costantino de Filippis, Giandomenico Caliendo, Politi Letterio, Bruno Colombo, Raffaella Fazio, Marina Scarlato, Giuseppe Magnani, Filippo Martinelli Boneschi, Lucia Moiola, Marco Bacigaluppi, Federica Esposito, Silvia Mammi, Luisa Roveri, Maria Antonietta Volonté, Mariaemma Rodegher, Raffaella Chieffo, Marta Radaelli, Federica Cerri, Nilo Riva, Giulia Pavan, Giuseppe Liberatore, Giacomo Giacalone, Giulio Truci, Giovanna Fanelli, Roberta Guerriero, Letizia Leocani, Stefania Medaglini, Fabio Minicucci, Ubaldo Del Carro, Marco Cursi, Stefania Acerno, Raffaella Barzaghi, Alberto Franzin, Carlo Mandelli (Email: name.surname@hsr.it)

Goals: The aim of this course is to help students acquire an understanding of the fundamental principles of clinical neurology. Students should be able to obtain a careful history of the disease, through a neurological examination and to understand the main neurological signs and symptoms. Students should be able to obtain a careful history of the disease, through a neurological examination and to understand the main neurological signs and symptoms. Students should demonstrate their ability to organize and integrate clinical data in order to produce a correct diagnosis, to learn about the diagnostic tests and understand their values and limitations. They should acquire a knowledge of nervous system development, functions and pathogenesis of neurological diseases, focusing on acute illness with an increased risk of death such as cerebral haemorrhage, intracranial hypertension, stroke, acute paralysis that requires urgent diagnosis and treatment. At the end of the course students should be able to provide an accurate diagnostic evaluation and treatment.

Prerequisites: None

Evaluation: The Commission is usually composed of three teachers of the course. The exam will consist of a multiple-choice test with 50 questions and an oral examination. The result of the multiple-choice test will condition access to the oral test and the final mark.

Course Description: This course will allow students to learn about the main neurological diseases related to the central and peripheral nervous systems. In the initial phase of the course some key aspects of the neuroanatomy and neurophysiology will be refreshed in order to provide students the necessary knowledge to understand the pathophysiology and clinical manifestations of neurological diseases. A modern view of all the major disorders affecting the central and peripheral nervous system will be addressed. Particular emphasis will be dedicated to the role of neuroimaging, advanced laboratory tests and neurophysiological

techniques to the diagnostic processes. Lessons will start focusing on teaching the anatomy and physiology of the nervous system through imaging and neurophysiological techniques, which is of fundamental relevance to produce a specific diagnosis. Other lessons will consider neuromuscular diseases, epilepsy, cerebrovascular diseases, movement disorders, multiple sclerosis, and brain tumours: students will learn how to provide diagnostic evaluation and treatment. Some seminars with other specialists (neurosurgeons, neuroradiologists, oncologists, pathologists and pharmacologists) will be organized to investigate the pathogenesis of the diseases. Frontal lessons will be complemented by a large body of practicalities. Students will spend some hours in neuroradiology and clinical neurophysiology labs, becoming confident with the more common investigations. Large time will be dedicated in neurological department to see patients with acute and chronic neurological diseases, to learn how to perform neurological examination and to become confident with the more common neurological signs.

Textbooks:

Greenberg DA, Aminoff MJ, Simon RP
Clinical Neurology - McGraw-Hill

Allan H. Ropper, Martin A. Samuels
Adams & Victor's Principles of Neurology, 9e - McGraw-Hill

L Pinessi, S Gentile, I Rainero: Neurology book– Edi-Ermes

CG Goetz: Textbook of Clinical Neurology, Saunders, III edition

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Psychiatry and Clinical Psychology

Total Credits: 7

Total hours: 70

Scientific Discipline Sector: Med/25, Med/39, Bio/14, M-Psi/05, M-Psi/08

Teaching staff

Course Coordinator: Cristina Colombo Email: colombo.cristina@hsr.it

Receiving Hour: (to be confirmed via email to be sent to Prof. Colombo.) Tuesday at 4.p.m, in San Raffaele Turro, Block G.

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Rossini David

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Cavallaro Roberto

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Bosia Marta

Email: bosia.marta@hsr.it

Goals: This course will provide an introduction to the clinical features and scientific understanding of the major mental health disorders that characterize medical practice

Prerequisites: none

Evaluation: Evaluation: Classroom performance, written final exams (multiple choice test).

Course Description . Lectures and group discussions will focus on the psychiatric interview, the mental status examination, and major psychiatric disorders including Mood Disorders, Schizophrenia, Anxiety Disorders, Trauma and Personality Disorders. Students will learn to assess the clinical aspects of a range of psychiatric disorders, with the aid of didactic presentations of case material in lectures, review of patient write-ups, and live or videotaped patient interviews with members of the faculty and senior residents as preceptors.

Clinical clerkship goals can be summarized as making psychiatry real, through practical care-centered teaching and clinical exposure to fundamental issues in psychiatry.

Textbooks: Textbook of psychiatry. Kaplan and Saddock IX edition

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Ophthalmology

Total Credits: 3

Total hours: 30

Scientific Discipline Sector: Med/30

Teaching staff

Course Coordinator:

Francesco Bandello Email: bandello.francesco@hsr.it
Receiving Hours on Wednesday 9.30-10:30 to be confirmed by email

Teaching Assistant

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Luisa Pierro Email: pierro.luisa@hsr.it
Giuseppe Querques Email: giuseppe.querques@hotmail.it

Course Description:

The purpose of the course is to give to students an overview on the most relevant diseases in Ophthalmology

The student should achieve a comprehensive understanding of the basic concepts of ocular normal and pathological anatomy

Following this perspective the course will describe the pathophysiological and clinical aspects of the main ocular diseases in order to provide a comprehensive knowledge regarding the pathophysiology, semiotics, clinics and treatment of all the ocular diseases

Students will learn to recognize the signs and symptoms of ocular pathologies to report directly to the specialist ophthalmologist

Furthermore, this module will provide knowledge relative to the main diagnostic techniques/criteria for establishing the diagnosis of ocular diseases

Finally, both pharmacologic and interventional treatment strategies will be discussed.

Suggested textbooks:

Clinical Ophthalmology
Kanski J.J., Bowling B.
7th edition – Saunders
2011 ISBN 9780702040931

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Infectious Diseases

Total Credits: 6

Total hours: 60

Scientific Discipline Sector: Med/17

Course Coordinator: Paola Cinque

Email: cinque.paola@hsr.it

Teaching staff:

Antonella Castagna

Email: castagna.antonella1@hsr.it

Giuseppe Tambussi

Email: tambussi.giuseppe@hsr.it

Goals:

- a. To provide information on epidemiological, pathogenetic and clinical aspects of the most relevant infectious diseases
- b. To provide tools for optimal management of infectious diseases, including prevention, diagnosis and treatment

Prerequisites:

University level knowledge in microbiology, pathology and immunology

Evaluation:

Oral examination

Course Description:

The course will be articulated to include both frontal lessons (approximately 75% of total hours) and interactive discussions of clinical cases (approx 25%).

Frontal lessons aim to provide fundamental knowledge on the most relevant infectious diseases, including epidemiology, pathogenesis, clinical aspects, diagnosis and treatments. In most of the cases - wherever feasible - the diseases will be presented in the context of clinical syndromes.

Interactive discussions of clinical cases aim to start and guide students from clinical symptoms - through diagnostic pathways - towards achievement of diagnosis and establishment of treatment plans.

List of content:

Principles of epidemiology of infectious diseases

Prevention of infectious diseases

Emerging and re-emerging infectious diseases

Respiratory infections

Central nervous system infections

Gastrointestinal infections and viral hepatitis

Skin and soft tissues infections

Sexually transmitted infections

Endocarditis and septic shock

Tuberculosis and other mycobacterial diseases

HIV infection

Infections in the immunocompromised host other than HIV

Health-care associated infections and antibiotic resistance

Tropical infections

Text books:

D. Kasper, A. Fauci, Hauser S, Longo D, J Loscalzo, J. Jameson. Harrison's Principles of Internal Medicine, 18th Edition. McGraw Hill.

G.L. Mandell, J.E. Bennett, R. Dolin . Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases, 7th edition, Churchill Livingstone (for consult only)

The lessons (slides kits and additional material) will be made available online.

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Clinical Rotations: Internal Medicine & Surgery II APRO

Total Credits: 4

Total hours: 100 (practicals)

Scientific Discipline Sector: Med/09, Med/18

Activity Coordinator: Prof. Lorenzo Dagna

Email: lorenzo.dagna@unisr.it

Goals: The primary focus of these clinical rotations is to increase the capacity of students to act as a caring, increasing independent but always supervised physician on an interdisciplinary inpatient internal medicine and surgical team.

These clinical rotations have been designed for further developing the students' fundamental skills of physical exam and history taking that they have approached last year. Time will be given to improve the ability to listening to and communicating with patients, to increase their practical knowledge of medicine through the daily work with residents and faculty as well as self-directed study and research.

Prerequisites: none

Evaluation: pass/fail, based on attendance and on tutor's evaluation

Course Description: students will be working under a tutor's supervision in a general internal medicine and surgical ward and will be involved in all the daily activities of the department.

Textbooks (reference):

- Harrison's Principles of Internal Medicine, 18th Edition (Eds. Dan Longo, Anthony Fauci, Dennis Kasper and Stephen Haus), McGrawHill 2012
- Sabiston Textbook Of Surgery – The Biological Basis Of Modern Surgical Practice, 19th Edition (Eds. Courtney M. Townsend, Jr., R. Daniel Beauchamp, B. Mark Evers, Kenneth L. Mattox); Saunders 2013

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TIMETABLE

Please note that changes may always occur in the daily lesson schedule.
Please refer to the on line timetable for the latest version.

Hematology- Oncology Timetable Year 4- IMDP AY 2015/2016

Date		Teacher	Title
28/09/15	08:30-14:30	DOZIO/BONINI	NBME EXAM
29/09/15	09:00-11:00	Bordignon, Ponzoni	Stem Cell Biology and Hemopoiesis. Bone marrow biopsy and Node biopsy.
29/09/15	11:00-13:00	Bonini, Vago, Bondanza	Clonal dynamics, and Leukemic Stem cells: emerging paradigms in hemato-oncology.
30/09/15	09:00-11:00	Bonini, Doglioni, Milani,	Diagnostic technologies in Hematology & Oncology: blood counts, flow cytometry & tumor bio
30/09/15	11:00-13:00	Ciceri, Marktelt	Anemias. Disorders of iron metabolism: Iron deficiency & Iron Overload. Megaloblastic anaemia
30/09/15	14:00-16:00	D'Angelo	Hemostasis and Thrombosis. Trombophilia
30/09/15	16:00-18:00	Lupo-Stanghellini	Teaching case, Anemia of chronic diseases. Hypersplenism. Hemorrhagic, hemolytic and aplastic anemia.
01/10/15	09:00-11:00	Ferreri	Introduction to modern oncology. Epidemiology. Carcinogenesis.
01/10/15	11:00-13:00	Gregorc	Staging, quality of life, performance status, and prognostic factors. Clinical trials
01/10/15	14:00-16:00	Zacchetti	Principles of cytotoxic and targeted therapy. Alkylating agents
01/10/15	16:00-18:00	Ciceri, Marktelt	Teaching case, Hemoglobinopathies
02/10/15	09:00-11:00	Esposito	Imaging in oncology (part I).
02/10/15	11:00-13:00	Gregorc, Dell'Oca	Principles of Radiotherapy. Multimodality treatments; head & neck cancer (example)
02/10/15	14:00-16:00	Esposito	Imaging in oncology (part II)
05/10/15	14:00-16:00	Ponzoni	At the microscope Group A

05/10/15	16:00-18:00	Zacchetti	Antimetabolites and analogs. Vinca alkaloids and taxans.
06/10/15	14:00-16:00	Bordignon, Vago	Teaching case, Acute leukemias
06/10/15	16:00-18:00	Bonini, Vago Ponzoni	Myelodisplasia , Bone Marrow Biopsy
07/10/15	14:00-16:00	Ciceri, Giglio,	Teaching case, CML and myeloproliferative syndromes.
07/10/15	16:00-18:00	Esposito, Pepe	Imaging in oncology (part III). PET in staging and response assessment
08/10/15	14:00-16:00	D'Angelo	Hemorrhagic syndromes. Hereditary and acquired disorders of platelets and coagulation
08/10/15	16:00-18:00	Gregorc, Tonon	Molecular bases of cancer, tumor microenvironment, metastasis. Carcinoma of Unknown Primary Site
09/10/15	14:00-16:00	Ciceri	Transfusion Medicine
09/10/15	16:00-18:00	Zacchetti	Topoisomerases inhibitors. Kinase inhibitors. Proteasome inhibitors.
12/10/15	16:00-18:00	Gregorc, Doglioni	Lung Cancer
13/10/15	14:00-16:00	Bonini, Malato	Teaching case, MGUS, MM, Amyloidosis
13/10/15	16:00-18:00	Esposito	Response assessment: morphological and functional parameters
14/10/15	14:00-16:00	Ponzoni	At the microscope Group B
14/10/15	16:00-18:00	Ferreri, Doglioni	Colo-rectal cancer
15/10/15	14:00-16:00	Ciceri	Supportive care
15/10/15	16:00-18:00	Gianni	Breast Cancer
16/10/15	14:00-16:00	Zacchetti	Immunomodulators. Hormonal therapy.
19/10/15	14:00-16:00	Bondanza	Hematological manifestations of systemic diseases.
19/10/15	16:00-18:00	Ferreri, Doglioni	Esophageal cancer, gastric cancer.

20/10/15	14:00-16:00	Bordignon; Ciceri; Bonini	Hematopoietic stem cell transplantation, Cancer immunotherapy, Gene therapy
20/10/15	16:00-18:00	Ponzoni	At the microscope Group C
21/10/15	14:00-16:00	Ferreri, Doglioni	Pancreatic and liver cancer
21/10/15	16:00-18:00	Esposito	Interventional radiology
22/10/15	14:00-16:00	Ferreri	Indolent lymphomas
22/10/15	16:00-18:00	Ponzoni	At the microscope Group D
23/10/15	14:00-16:00	Ponzoni, Ferreri	Introduction to lymphomas. Chronic lymphocytic <u>leukaemia</u>
23/10/15	16:00-18:00	Ponzoni	At the microscope Group E
26/10/15	09:00-11:00	Zacchetti	Monoclonal antibodies.
26/10/15	11:00-13:00	Russo	Melanoma
26/10/15	14:00-16:00	Gregorc	Sarcoma, mesothelioma
27/10/14	09:00-11:00	Ferreri	Aggressive lymphomas. Hodgkin's lymphoma.
27/10/15	14:00-16:00	Gregorc, Cozzarini, Doglioni	Urologic cancers
27/10/15	16:00-18:00	Mazza, Doglioni	Tumours of the central nervous system

SAN RAFFAELE INTERNATIONAL MD PROGRAM

YEAR 5

Academic Year 2015/2016

- **Clinical Immunology, Rheumatology and Dermatology**
- **Systematic Pathology**
- **Obstetrics and Gynecology**
- **Pediatrics**
- **Clinical Rotations: Ob/Gyn & Pediatrics**
- **Internal Medicine**
- **Clinical Surgery**
- **Imaging**
- **Clinical Rotations: Community Medicine**

Academic Calendar and Block System

SAN RAFAEL INTERNATIONAL MD PROGRAM YEAR 5

sept-2015		oct-2015		nov-15		dec-2015		jan-2016		feb-16		mar-16		apr-16		may-2016		jun-2016		jul-2016		aug-2016		sep-2016	
1	Immun, Path	1	Immun, Path	1	Path	1	Pediatrics+Ward	1	Holidays	1	study leave	1	Tailored Activities	1		1	Tailored Activities	1	EXAMS	1	EXAMS	1	Holidays	1	EXAMS
2	Immun, Path	2	Immun, Path	2	Path	2	Pediatrics+Ward	2	study leave	2	study leave	2	Tailored Activities	2		2	Community Med.	2	BANK HOLIDAY	2	EXAMS	2	Holidays	2	EXAMS
3	Immun, Path	3	Immun, Path	3	Path	3	Pediatrics+Ward	3	study leave	3	study leave	3	Tailored Activities	3		3	Community Med.	3		3	EXAMS	3	Holidays	3	EXAMS
4	Immun, Path	4	Immun, Path	4	Path	4	Pediatrics+Ward	4	Holidays	4	study leave	4	Tailored Activities	4		4	Community Med.	4		4	EXAMS	4	Holidays	4	EXAMS
5	Immun, Path	5	Immun, Path	5	Study Leave	5	Pediatrics+Ward	5	Holidays	5	study leave	5	Tailored Activities	5	Lessons + Int.med.	5	Community Med.	5		5	EXAMS	5	Holidays	5	EXAMS
6	Immun, Path	6	Immun, Path	6	Study Leave	6	Pediatrics+Ward	6	EPHIANI	6	study leave	6	Tailored Activities	6	Rot	6	Community Med.	6		6	EXAMS	6	Holidays	6	EXAMS
7	Immun, Path	7	Immun, Path	7	Study Leave	7	Pediatrics+Ward	7	EXAMS	7	EXAMS	7	Tailored Activities	7		7	Community Med.	7		7	EXAMS	7	Holidays	7	EXAMS
8	Immun, Path	8	Immun, Path	8	Study Leave	8	Pediatrics+Ward	8	EXAMS	8	EXAMS	8	Tailored Activities	8		8	Community Med.	8		8	EXAMS	8	Holidays	8	EXAMS
9	Immun, Path	9	Immun, Path	9	Study Leave	9	Pediatrics+Ward	9	EXAMS	9	EXAMS	9	Tailored Activities	9		9	Community Med.	9		9	EXAMS	9	Holidays	9	EXAMS
10	Immun, Path	10	Immun, Path	10	EXAMS	10	Pediatrics+Ward	10	Ob-gyn+Ward	10	EXAMS	10	Lessons + Int.med. Rot	10		10	Community Med.	10		10	EXAMS	10	Holidays	10	EXAMS
11	Immun, Path	11	Immun, Path	11	EXAMS	11	Pediatrics+Ward	11	Ob-gyn+Ward	11	EXAMS	11	Lessons + Int.med. Rot	11		11	Community Med.	11		11	EXAMS	11	Holidays	11	EXAMS
12	Immun, Path	12	Immun, Path	12	EXAMS	12	Pediatrics+Ward	12	Ob-gyn+Ward	12	EXAMS	12	Lessons + Int.med. Rot	12		12	Community Med.	12		12	EXAMS	12	Holidays	12	EXAMS
13	Immun, Path	13	Immun, Path	13	EXAMS	13	Pediatrics+Ward	13	Ob-gyn+Ward	13	EXAMS	13	Lessons + Int.med. Rot	13		13	Community Med.	13		13	EXAMS	13	Holidays	13	EXAMS
14	Immun, Path	14	Immun, Path	14	EXAMS	14	Pediatrics+Ward	14	Ob-gyn+Ward	14	EXAMS	14	Lessons + Int.med. Rot	14		14	Community Med.	14		14	EXAMS	14	Holidays	14	EXAMS
15	Immun, Path	15	Immun, Path	15	EXAMS	15	Pediatrics+Ward	15	Ob-gyn+Ward	15	EXAMS	15	Lessons + Int.med. Rot	15		15	Community Med.	15		15	EXAMS	15	Holidays	15	EXAMS
16	Immun, Path	16	Immun, Path	16	EXAMS	16	Pediatrics+Ward	16	Ob-gyn+Ward	16	EXAMS	16	Lessons + Int.med. Rot	16		16	Community Med.	16		16	EXAMS	16	Holidays	16	EXAMS
17	Immun, Path	17	Immun, Path	17	EXAMS	17	Pediatrics+Ward	17	Ob-gyn+Ward	17	EXAMS	17	Lessons + Int.med. Rot	17		17	Community Med.	17		17	EXAMS	17	Holidays	17	EXAMS
18	Immun, Path	18	Immun, Path	18	EXAMS	18	Pediatrics+Ward	18	Ob-gyn+Ward	18	EXAMS	18	Lessons + Int.med. Rot	18		18	Community Med.	18		18	EXAMS	18	Holidays	18	EXAMS
19	Immun, Path	19	Immun, Path	19	Pediatrics+Ward	19	Pediatrics+Ward	19	Ob-gyn+Ward	19	EXAMS	19	Lessons + Int.med. Rot	19		19	Community Med.	19		19	EXAMS	19	Holidays	19	EXAMS
20	Immun, Path	20	Immun, Path	20	Pediatrics+Ward	20	Pediatrics+Ward	20	Ob-gyn+Ward	20	EXAMS	20	Lessons + Int.med. Rot	20		20	Community Med.	20		20	EXAMS	20	Holidays	20	EXAMS
21	Immun, Path	21	Immun, Path	21	Pediatrics+Ward	21	Pediatrics+Ward	21	Ob-gyn+Ward	21	EXAMS	21	Lessons + Int.med. Rot	21		21	Community Med.	21		21	EXAMS	21	Holidays	21	EXAMS
22	Immun, Path	22	Immun, Path	22	Pediatrics+Ward	22	Pediatrics+Ward	22	Ob-gyn+Ward	22	EXAMS	22	Lessons + Int.med. Rot	22		22	Community Med.	22		22	EXAMS	22	Holidays	22	EXAMS
23	Immun, Path	23	Immun, Path	23	Pediatrics+Ward	23	Pediatrics+Ward	23	Ob-gyn+Ward	23	EXAMS	23	Lessons + Int.med. Rot	23		23	Community Med.	23		23	EXAMS	23	Holidays	23	EXAMS
24	Immun, Path	24	Immun, Path	24	Pediatrics+Ward	24	Pediatrics+Ward	24	Ob-gyn+Ward	24	EXAMS	24	Lessons + Int.med. Rot	24		24	Community Med.	24		24	EXAMS	24	Holidays	24	EXAMS
25	Immun, Path	25	Immun, Path	25	Pediatrics+Ward	25	Pediatrics+Ward	25	Ob-gyn+Ward	25	EXAMS	25	Lessons + Int.med. Rot	25		25	Community Med.	25		25	EXAMS	25	Holidays	25	EXAMS
26	Immun, Path	26	Immun, Path	26	Pediatrics+Ward	26	Pediatrics+Ward	26	Ob-gyn+Ward	26	EXAMS	26	Lessons + Int.med. Rot	26		26	Community Med.	26		26	EXAMS	26	Holidays	26	EXAMS
27	Immun, Path	27	Immun, Path	27	Pediatrics+Ward	27	Pediatrics+Ward	27	Ob-gyn+Ward	27	EXAMS	27	Lessons + Int.med. Rot	27		27	Community Med.	27		27	EXAMS	27	Holidays	27	EXAMS
28	Immun, Path	28	Immun, Path	28	Pediatrics+Ward	28	Pediatrics+Ward	28	Ob-gyn+Ward	28	EXAMS	28	Lessons + Int.med. Rot	28		28	Community Med.	28		28	EXAMS	28	Holidays	28	EXAMS
29	Immun, Path	29	Immun, Path	29	Pediatrics+Ward	29	Pediatrics+Ward	29	Ob-gyn+Ward	29	EXAMS	29	Lessons + Int.med. Rot	29		29	Community Med.	29		29	EXAMS	29	Holidays	29	EXAMS
30	Immun, Path	30	Immun, Path	30	Pediatrics+Ward	30	Pediatrics+Ward	30	Ob-gyn+Ward	30	EXAMS	30	Lessons + Int.med. Rot	30		30	Community Med.	30		30	EXAMS	30	Holidays	30	EXAMS
31	Immun, Path	31	Immun, Path	31	Pediatrics+Ward	31	Pediatrics+Ward	31	Ob-gyn+Ward	31	EXAMS	31	Lessons + Int.med. Rot	31		31	Community Med.	31		31	EXAMS	31	Holidays	31	EXAMS

Clinical Immunology, Rheumatology and Dermatology

Total Credits: 5

Total hours: 50

Scientific Discipline Sector: SSD MED/09 MED/35

Teaching staff

Course Coordinator: Patrizia Rovere Querini
Lorenzo Dagna
Angelo A. Manfredi
Flavia Valtorta

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Goals

The mission of this course is to instruct medical students for diseases of the immune system and the skin, providing them with the necessary tools to deal with the patients, both clinically and by laboratory procedures, and to identify appropriate management strategies and treatment options. The student, in particular, should acquire medical knowledge in immunology and autoimmune diseases, and in the clinical care of the basis of the most common diseases of the skin and of the immune system and the core knowledge required to adequately collect the history of the patients, to identify relevant clinical features by medical examination, and to the appropriate use of laboratory tests. The student will develop the ability to cope with the exponential growth of scientific information in the field by identifying the link between clinical events and major molecular events that drive the pathogenesis of diseases of the immune system and skin. We particularly focus on the recent development in our understanding of dermatological, rheumatic and allergic diseases that has fundamentally changed in recent years after the introduction into clinical practice of new therapeutic strategies specifically targeting selected molecules.

An introduction to immunomodulatory therapies will also be provided.

Evaluation

Attendance to lectures will be checked and recorded electronically. At the end of the course there will be an oral test focused on the course contents and clinical cases discussion.

Course Description

- Introduction to the Immune System and to the present course
- Primary Immune Deficiency Diseases,
- Allergies, Anaphylaxis, and Systemic Mastocytosis
- Autoimmunity and Autoimmune Diseases:
 - Systemic Lupus Erythematosus & Antiphospholipid Antibody Syndrome
 - Sjogren's Syndrome
 - Inflammatory myopathies
 - Systemic Sclerosis (Scleroderma) and overlap Syndromes
 - Rheumatoid Arthritis, Palindromic Rheumatism & adult onset Still's Disease
 - Acute Rheumatic Fever
 - The Spondyloarthritides
 - The Vasculitis Syndromes
 - Behcet's Syndrome
 - Erytherma Nodosum & Sarcoidosis
 - Relapsing Polychondritis & Fascitis w or w/o eosinophilia
 - Familial Mediterranean Fever and Other Hereditary Recurrent Fevers
- Disorders of the joints
 - Osteoarthritis & osteoporosis
 - Gout and Other Crystal-Associated Arthropathies
 - Septic Arthritis & Arthritis Associated With Systemic Disease

- Skin Disorders (16 hours)
 - Eczema, Psoriasis, Cutaneous Infections, Acne
 - Skin Manifestations of Internal Disease
 - Immunologically Mediated Skin Diseases
 - Cutaneous Drug Reactions
 - Photosensitivity and Other Reactions to Light

Textbook

Longo D., Fauci A., kasper D.: Harrison's Principles of Internal Medicine - McGraw-Hill – 18th Edition - ISBN 9780071748896

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Systematic Pathology

Total Credits: 6

Total hours: 70

Scientific Discipline Sector: SSD 08

Teaching staff

Course Coordinator: Claudio Doglioni
Receiving Hour: by appointment

Email: doglioni.claudio@hsr.it

Massimo Loda
Maurilio Ponzoni
Federica Pedica
Francesca Sanvito

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Goals

To give students a systematic pathology framework of the most frequent and relevant human diseases: understanding and classifying diseases for a rationale clinical practice. Pathology is a bridging discipline involving both basic science and clinical practice. Students will learn the morphologic alterations of diseased tissues and organs at the gross and microscopic level, as well as how these alterations correlate with the clinical manifestations of the disease and which are the most informative procedures for establishing a pathologic diagnosis.

Evaluation

Multiple choice questions at the end of the course

Course Description

Lectures will cover the most frequent and relevant topics of human pathology: students will be asked to expose with a brief introduction, the most important and frequent symptoms that characterize diseases of the specific organs. Students will also visit, at the beginning of the course, the pathology lab, in order to familiarize with the procedures and techniques utilized for pathology diagnosis.

Textbook

Robbins & Cotran Pathologic basis of Disease, 9th Edition
By Vinay Kumar, Abul K. Abbas, and Jon Aster
Elsevier/Saunders

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Obstetrics and Gynecology

Total Credits: 4

Total hours: 40

Scientific Discipline Sector: MED 40

Teaching staff

Course Coordinator: Massimo Candiani Email: candiani.massimo@hsr.it
Origoni Massimo Email: origoni.massimo@hsr.it
Salvatore Stefano Email: salvatore.stefano@hsr.it

Goals: This course aims to provide knowledge of the fundamental principles of obstetrics and gynaecology to medical students, including anatomy and physiology of the genital tract. This course aims also to offer notions on classification, epidemiology, patho-physiology, diagnostic work-up and management of different obstetrical and gynaecological conditions. Students should therefore acquire skills in taking history and assessing patients, in choosing the most appropriate diagnostic work-up and treatment.

Evaluation : Multiple choice question test at the end of the course. Oral examination will be performed for students who have reached a bad evaluation.

Course Description: The course will include the attendance of the IMDP students to the daily activity of the Dept of Obstetrics and Gynaecology, including ward-rounds, labour ward, outpatient clinics and operating theatre. Moreover the following formal lessons will be organized:

- Topographic and functional anatomy of female pelvis and reproductive system
- Spontaneous and recurrent miscarriage
- Reproductive system endocrinology: hypothalamus-hypophysis-ovary-uterus axis.
- Physiology of pregnancy
- Reproductive medicine
- Obstetrics ultrasound
- Ectopic pregnancy
- Third trimester bleeding
- Diabetes and hypertension in pregnancy
- The vaginal delivery
- The operative and caesarean delivery
- The post-partum and breast feeding
- Chronic pelvic pain and endometriosis
- Uterine fibroids and ovarian cysts
- Screening and diagnosis of female genital tract preneoplastic lesions
- Vulvar, vaginal and cervix cancer
- Sexual transmitted diseases
- Urogynaecology
- Endometrial and ovarian cancer
- Gestational trophoblastic disease
- Abdominal surgery in gynaecology: laparotomy and laparoscopy
- Contraceptive methods
- Vaginal surgery in gynaecology
- Presentation and discussion of obstetrics and gynaecology clinical cases

Textbook

1. Lange: Current Diagnosis & Treatment Obstetrics & Gynecology, Alan DeCherney, Lauren Nathan, T. Murphy Goodwin, Neri Laufer, 11th Edition
2. Danforth's Obstetrics and Gynecology, Ronald S. Gibbs, Lippincott Williams & Wilkins, 2008
3. Williams Obstetrics, Cunningham, Leveno, Bloom, Sponge, Dashe, 24th Edition, ISBN: 0071798935
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Pediatrics

Total Credits: 4

Total hours: 40

Scientific Discipline Sector: SSD MED/38

Teaching staff

Course Coordinator: Alessandro Aiuti Email: a.aiuti@hsr.it Receiving Hour: Friday, 3 PM

Teaching assistant

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Goals

The overall objective of this course is to provide the essential theoretical and practical knowledge to deal with the healthy and sick child of different ages (from neonates to adolescents) from the preventive, diagnostic and rehabilitation point of view. The student should be able to plan the essential medical interventions with regards to the main health problems in terms of frequency and risk inherent to the pediatric pathologies of different ages and identify the conditions that need the intervention of the professional specialist pediatrician.

Evaluation : Classroom attendance. Oral Examination focused on the course content, including clinical cases discussion.

Course Description

The students will learn the methodology for a correct approach to the clinical problems of pediatric age, including the evaluation of medical records, semeiotics, instrumental and laboratory tests. Through an integrated approach based on lessons, seminars and practical exercises the course will illustrate the epidemiological, etiopathogenic, and clinical aspects of the diseases of the pediatric age providing useful information on their prevention, diagnosis, and treatment.

Topics of particular interest will be dealt in depth with the active participation of students in order to stimulate the maximum interest. Students will attend in small groups the Pediatrics, Neonatology, and Pediatric Immunohematology Units, the Pediatric day hospital and clinics (immunology, hematology, endocrinology, neonatology, neurology). These activities will be complemented by interactive lessons with clinical cases and seminars.

Topics:

Introduction

Epidemiology of pediatric diseases. Normal growth and development. The communication in paediatrics. The immigrant child. Ethical aspects. Medicines for children.

Tutorial activities: Pediatric physical examination. Blood pressure in children of different ages. Clinical trials in paediatrics.

The newborn

The healthy newborn: perinatal adaptation. Major diseases of the term newborn: birth asphyxia, physiological jaundice, neonatal sepsis and infection from mother to child transmission, most common metabolic disorders (hypoglycemia, hypocalcemia), most common neurological frameworks (intracranial hemorrhage, hydrocephalus, seizures), preterm infant and dysmature newborn: characteristics, perinatal adaptation, major diseases (hyaline membrane disease, bronchodysplasia, retinopathy of prematurity, necrotizing enterocolitis, ...)

Tutorial Activities: The healthy newborn: evaluation to neonatal area, hints of childcare, nutrition. Physiological and pathological fetal growth. Neonatal screening. Principles of neonatal resuscitation

Genetics

Approach to the main Genetic and Chromosomal Disorders; patterns of Inheritance, clinical signs and natural history. *Tutorial Activities: Observation of some characteristic syndromes / dysmorphic (Down, Turner, Klinefelter, DEL22, Prader-Willi).*

Gastroenterology

Vomiting: differential diagnostics; acute diarrhea, chronic or recurrent. Constipation: differential diagnostics. Malabsorption syndrome: celiac disease in pediatric. Food intolerances

Tutorial Activities: Principles of nutrition: breastfeeding and its benefits; recommended integrations (vitamin D, fluoride, iron); deficiency of vitamin D; weaning (how, when, and why). Importance of nutrition in the prevention of chronic degenerative diseases of the adult (obesity, hypercholesterolemia, hypertension). Recurrent abdominal pain: definition and differential diagnosis, diagnostic process. Learning to detect the nutritional status of a child and the main signs of dehydration

Child Neuropsychiatry

Simple and complex febrile seizures. More frequent forms of epilepsy. Cerebral palsy, main neuromuscular diseases in the pediatric age

Tutorial Activities: Pediatric neurological examination. Neuropsychological development of the healthy child. Febrile seizures.

Haematology

Main changes of haematological values in relation to the age. Leukemia (incidence, clinical suspicion, diagnostic procedure, therapy). Anemia: pediatric aspects. Thrombocytopenia and neutropenia. Pediatric aspects of bone marrow transplant.

Tutorial activities: Interpretation of blood count. Transfusion of blood components.

Oncology

Incidence, symptoms, signs of suspicion of the most common pediatric solid tumors: lymphoma, neuroblastoma, Wilms' tumor. The main brain tumors in children: incidence, signs and symptoms.

Endocrinology and metabolic disorders. Hyposomia: diagnostic approach and therapy. Diabetes mellitus type I: clinical onset, laboratory parameters and therapeutic approach and complications from a distance. Thyroid: congenital hypothyroidism. Essential obesity and differential diagnosis with secondary forms. Physiological puberty, early, late. Congenital Adrenal Hyperplasia. Lysosomal storage diseases and other (neuro)metabolic disorders: diagnostic approach, differential diagnosis and therapy.

Tutorial activities: learning to detect the most important auxological parameters and to evaluate the development of pubertal stage; observation of some characteristic disease variants.

Allergy and Immunology

Main allergic diseases of the child (rhino-conjunctivitis, atopic dermatitis, bronchial asthma, food allergies): principles of therapy.

Juvenile Rheumatoid Arthritis. Schoenlein-Henoch purpura. Rheumatic Disease

Primary and secondary immune deficiencies in children

Tutorial activities: Immunological tests and their interpretation.

Diseases of the respiratory system

Pediatric aspects of upper and lower respiratory tract infections (etiology, epidemiology, clinic, diagnosis, therapy: bronchiolitis, otitis, epiglottitis, pneumonia). Cystic fibrosis. Tuberculosis.

Cardiology

The heart murmur (differential diagnostics)
The main congenital heart disease (tetralogy of Fallot, VSD, ASD, persistent ductus).

Nephrology

Urinary tract infections. Glomerulonephritis. Nephritic and nephrotic syndrome

Tutorial activities: Examination of urine: methods of collection in the first childhoods and evaluation of results.

Hematuria: differential diagnosis

Infectious Diseases

Main exanthematous diseases (measles, rubella, chicken pox, scarlet fever). Main infectious diseases (infectious mononucleosis, CMV, mumps and whooping cough). Vaccinations (calendar and directions).

Orthopedics

Screening of congenital dislocation of the hip.

Emergencies

Detect the presence of conditions that require immediate medical intervention. Meningoencephalitis (etiology, clinical features, CSF test interpretation, complications, mortality and sequelae of meningitis, principles of therapy). Surgical emergencies: Acute abdomen, Acute Scrotum, Hypertrophic pyloric stenosis.

Tutorial activities: ABC of pediatric resuscitation. Basics of head trauma

Textbook

Reference: Nelson Essentials of Pediatrics, Marc d'Antonio and Kliegman, 7th edition, Saunders, ISBN 9781455759804

For students who are interested in internship in pediatrics, "The Harriet Lane Handbook" is a comprehensive practical handbook for diagnosis and treatment.

Authors: Johns Hopkins Hospital, Kristin Arcara and Megan Tschudy. Mosby ISBN 978-0-323-07942-6

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Clinical Rotations: Ob/Gyn & Pediatrics

Total Credits: 7

Total hours: 175

Scientific Discipline Sector: SSD Med/38, Med/40, Med/45

Activity Coordinators:

Alessandro Aiuti

Massimo Candiani

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Goals The main objective of these clinical rotations is to increase the capacity of students to act as caring, increasing independent, but supervised physician on pediatric and ob/gyn patients. Students will improve their listening and communication skills with patients (and families), and increase their practical knowledge on prevention, diagnosis, and treatment of disease of the mother and the child.

Evaluation : pass fail, based on attendance and tutor's evaluation

Course Description: students will be attending ward, day hospitals, clinics and emergency department and will be involved in all the daily activities with residents and faculties of the obstetrics and gynecology department and pediatrics department,.

Textbook : see Pediatrics and Ob/Gyn courses

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Internal Medicine

Total Credits: 10

Total hours: 100

Scientific Discipline Sector: SSD MED/09

Teaching staff

Course Coordinator: Paolo Prospero Ghia
Federico Caligaris-Cappio
Lorenzo Dagna
Angelo Manfredi
Patrizia Rovere-Querini
Antonio Secchi

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Goals

The goal of this course is to provide the student with the theoretical and clinical skills for the correct decision-making process and optimal management of common medical disorders. Signs and symptoms reported by patients will be placed into the context of more general clinical problems that will be analytically discussed according to an evidence-based medicine approach. During the course the student will learn how to apply the essential concepts of disease pathophysiology to the evaluation and treatment of clinical problems. At the end of the course, the student will be able to integrate the existing body of medical knowledge with the advances in molecular medicine in order to identify the appropriate diagnostic procedures and implement recommended therapeutic guidelines in clinical practice for the benefit of the patients.

Evaluation

Attendance to lectures will be checked and recorded electronically. At the end of the course there will be a written and oral test focused on the course contents and clinical cases discussion.

Course Description

The course will be characterized by a mixture of academic lessons, guideline presentation and case report discussions revolving around the following topics:

- Decision-making in clinical medicine
- Principles of molecular medicine
- Approach to the patient with common diseases
- Approach to the patient with cancer
- Principle of cancer treatment
- Hypertensive vascular disease
- Chest discomfort and palpitations
- Abdominal pain
- Fever
- Fever of unknown origin
- Dyspnea
- Edema
- Jaundice
- Anemia
- Iron overload disorders
- Bleeding and thrombosis
- Bone pain
- Arthritis and arthralgia
- Enlargement of lymph nodes and spleen
- Transfusion therapy: indications and complications

Textbook

1) Longo D., Fauci A., Kasper D.: Harrison's Principles of Internal Medicine - McGraw-Hill – 18th Edition - ISBN 9780071748896

2) Lee Goldman, MD and Andrew I. Schafer, MD.: Goldman's Cecil Medicine - Elsevier - 24th Edition - ISBN 978-1-4377-2788-3

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Clinical Surgery

Total Credits:5

Total hours:50

Scientific Discipline Sector: SSD MED/18, MED/20

Teaching staff

Course Coordinator: Massimo Falconi

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Stefano Crippa

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Goals

The goal of this course is to provide the student with the theoretical and clinical skills for the correct decision-making process and optimal management of common surgical disorders. Signs and symptoms reported by patients will be placed into the context of more general surgical problems that will be discussed according to an evidence-based medicine approach. During the course the student will learn how to apply the essential concepts of disease pathophysiology to the diagnosis and treatment of clinical problems. The course will treat the most common surgical diseases of the adult patients with a focus on vascular surgery. Common surgical disorders of the infancy and childhood are discussed as well.

Evaluation

Classroom attendance. Oral Examination focused on the course content, including clinical cases discussion.

Course Description

General Surgery

Abdominal pain

- Clinical presentation, physical examination and diagnostic work up
- Understand the broad differential diagnosis of abdominal pain including the evaluation, differential diagnosis and treatment

Gastrointestinal bleeding

- Give the differential diagnosis for upper and lower GI tract bleeding
- Rank management priorities with an acutely bleeding patient
- Differentiate and describe the basic management of an upper and lower GI bleed

Jaundice

- Create a differential diagnosis for the onset of jaundice associated with abdominal pain
- Create a differential diagnosis for the onset of painless jaundice
- Determinate the appropriate laboratory and radiologic work-up for evaluating patients with jaundice
- Summarize the management strategies associated with treating patients with jaundice

Hernias

- Appreciate the different types of hernias and how they can cause clinically-relevant problems
- Name the difference between reducible, incarcerated and strangulated hernias
- Describe the clinical presentation and diagnostic work-up for incarcerated and strangulated hernias
- Surgical indications for the management of hernias

Breast

- Summarize the important personal history and physical exam features in a patient with breast lump
- Be able to generate a diagnostic work-up and differential diagnosis for women with breast lump and/or calcifications identified on screening mammography
- List the different breast imaging modalities available and indications for each
- Discuss the surgical options for management of both invasive and non-invasive breast cancer

Bowel obstruction

- Clinical presentation, physical examination and diagnostic work up
- Understand the broad differential diagnosis of small- and large-bowel obstruction
- Describe the management and initial treatment for a patient with bowel obstruction
- List the indications for operation on a patient with bowel obstruction and describe the complications of delaying the operation

Transplantation

- Definitions and classifications of solid organ and tissue transplantation
- Solid organ transplantations in clinical practice
- Future perspectives in transplantation

Esophagus

- Jatal hernia and esophageal reflux disease: clinical presentation, diagnostic work-up and treatment
- Achalasia: clinical presentation, diagnostic work-up and treatment
- Esophageal cancer: classification, clinical presentation, diagnosis and treatment
- Indications for neoadjuvant treatment in esophageal carcinoma
- Palliation of advanced esophageal carcinoma

Stomach

- Gastric cancer: clinical presentation, diagnostic work-up and treatment
- Surgical complications of peptic disease: classification, clinical presentation, diagnosis and treatment

Pancreas

- Pancreatic tumors: clinical presentation, diagnostic work-up and treatment
- Indications for neoadjuvant treatment in pancreatic carcinoma
- Determine the appropriate laboratory and radiologic work-up for evaluating patients with incidentally-discovered pancreatic solid or cystic lesions
- Acute pancreatitis: clinical presentation, diagnostic work-up and treatment
- Chronic pancreatitis: clinical presentation, diagnostic work-up and treatment

Liver and biliary tree

- Liver tumors: clinical presentation, diagnostic work-up and treatment
- Understand the broad differential diagnosis of hepatic focal lesion
- Determine the appropriate laboratory and radiologic work-up for evaluating a hepatic focal lesion in patients with and without chronic hepatitis
- Indication for surgical resection of primary and metastatic liver tumors
- Clinical presentation, diagnostic work-up and treatment of patients with biliary tree tumors

Thyroid and parathyroid

- Thyroid and parathyroid tumors: clinical presentation, diagnostic work-up and treatment
- Understand the broad differential diagnosis of thyroid nodule
- Determine the appropriate laboratory and radiologic work-up for evaluating a patient with thyroid nodule

Adrenal gland

- Adrenal gland tumors: clinical presentation, diagnostic work-up and treatment
- Understand the broad differential diagnosis of adrenal gland incidentalomas (functioning versus non-functioning tumors)
- Determine the appropriate laboratory and radiologic work-up for evaluating a patient with incidentally discovered adrenal gland lesion

Small bowel, colon and rectum

- Clinical presentation, diagnostic work-up, differential diagnosis of inflammatory bowel diseases
- Surgical indications for patients with inflammatory bowel diseases
- Clinical presentation, diagnostic work-up, and management of patients with colo-rectal cancer
- Indications for neoadjuvant treatment in rectal carcinoma
- Indications for limited resection in rectal carcinoma
- Management and palliation of locally-advanced or metastatic colorectal cancer

Hereditary cancer syndromes

- General overview
- MEN 1, MEN 2A/2B
- Familial medullary carcinoma of the thyroid
- Hereditary colorectal cancer syndromes: hereditary nonpolyposis colorectal cancer (Lynch syndrome), familial adenomatous polyposis, Peutz-Jeghers syndrome
- Definition of neurofibromatosis, Von-Hippel Lindau syndrome, Li Fraumeni syndrome

Vascular Surgery

- Clinical presentation, diagnostic work-up and management of patients with thoracic, abdominal and thoracoabdominal aortic aneurysms
- Indications for surgical versus endovascular treatment in aortic aneurysm
- Aortoiliac and femoropopliteal arterial occlusive disease: clinical presentation, diagnostic work-up and management
- Cerebrovascular occlusive disease: clinical presentation, diagnostic work-up and management

Pediatric Surgery

- Clinical presentation, diagnostic work-up and treatment of the most common congenital abnormalities in neonatal surgery (from prenatal diagnosis to surgical treatment):
 - Congenital diaphragmatic hernia
 - Esophageal atresia
 - Duodenal obstruction
 - Hypertrophic pyloric stenosis
 - Small bowel atresia
 - Anorectal malformations
 - Abdominal wall defects
 - Sacro-coccygeal teratoma
- Clinical presentation, diagnostic work-up and treatment of:
 - Thoracic malformations
 - Necrotizing enterocolitis
 - Idiopathic intestinal perforations
 - Meconium ileus
 - Midgut volvulus
 - Gastro-esophageal reflux disease
 - Hirschsprung's disease
 - Intussusception
 - Appendicitis in early childhood
- The role of bronchoscopy in pediatric patients
- Clinical presentation, diagnostic work-up and treatment of:
 - Pneumothorax
 - Pleural effusions

Textbook

“Sabiston Textbook of Surgery”, 19th Edition, Elsevier

“Greenfield's Surgery: Scientific Principles & Practice”, 5th Edition, Lippincott

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Imaging

Total Credits:3

Total hours:30

Scientific Discipline Sector: SSD MED/36, MED/37

Teaching staff

Course Coordinator: Francesco De Cobelli
Andrea Falini

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Collaborators

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Antonella Castellano

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Goals

The mission of this course is to instruct medical students to imaging. Most of diagnosis are based on imaging findings and this course will provide to the students the necessary tools to deal with the imaging procedures, and to identify appropriate management of the imaging information and options with different imaging techniques. The student, in particular, should acquire knowledge of different imaging techniques learning how to choose the best techniques for each clinical need. In the previous 4 academic years the Student had already experienced the knowledge of imaging in Physics and in Human Morphology and in different applications fields such as in neck, respiratory and lung diseases, in oncology and in digestive and abdominal diseases. Therefore, the aim of this course is to cover the remaining fields such as orthopedics, cardiovascular and urological, and the applications of imaging in emergency. Part of the lessons will be dedicated to Neuroradiology in order to discuss main topics such as brain tumors, degenerative and inflammatory diseases, and traumas that have not treated during the Neuroscience Course.

All the imaging techniques will be presented: XRay, Ultrasound, Computed Tomography, Digital Angiography, Magnetic Resonance and Nuclear Medicine as well such as Nuclear Scintigraphy and PET. We will also focus on the recent development of Interventional Radiology.

Students will be familiar with the main normal findings and alterations of diseased organs and apparatus with the different imaging modalities, as well as how the alterations and sings correlate with the clinical manifestations of the disease and which are the most informative procedures for establishing the correct diagnosis.

Evaluation

Multiple choice questions at the end of the course

Course Description

- Introduction to Imaging and to the present course
- Diagnostic Imaging in Ortopedics
- Cardiovascular Imaging
- Uroradiology
- Interventional Radiology
- Emergency Radiology
- Nuclear Medicine

Neuro

- Inflammatory diseases
- Degenerative diseases
- Neuro-oncology
- Traumas

Clinical Rotations: Community Medicine

Total Credits:3

Total hours:75

Scientific Discipline Sector: SSD MED/09

Course Coordinator: Antonio Secchi

Email: antonio.secchi@unisr.it

Clinical skills:

To attend the out-patient clinic of the General Practitioner (GP) and follow diagnostic and therapeutic activities of the doctors in patients attending their offices.

To familiarize with prescriptions, certifications etc, used by the GP

To assist activities in the socio-sanitary district

To familiarize with the database and electronic clinical files used by the GP

To familiarize with pharmaceutical research and bibliography research through the most common data base and web sites for biomedical activities

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TIMETABLE

Please note that changes may always occur in the daily lesson schedule.
Please refer to the on line timetable for the latest version.

TIMETABLE A.Y. 2015/2016					
Clinical Immunology, Rheumatology and Dermatology					
Systematic Pathology					
ORA	28/09/2015	29/09/2015	30/09/2015	01/10/2015	02/10/2015
09-11		Systematic Pathology introduction and overview CD	Systematic Pathology CD	Systematic Pathology ESE GR 2 FP - in the Pathology ward	Systematic Pathology ESE GR 3 - FP in the Pathology ward
11-13	INTRODUCTION (PRQ1)	RA (AAM1)	Systematic Pathology ESE GR 1-FP in the Pathology ward	Systematic Pathology Swollen lymph nodes Pathology of Lymphoid tissue MP	Systematic Pathology Acute chest pain Pathology of vessel and heart FS
14-16	SLE (PRQ2)	Small vessel Vasculitides (LD1)	Large/Medium vessel Vasculitides (LD2)	Systematic Pathology Emphysema Pulmonary Pathology 1 CD	
16-18					
ORA	05/10/2015	06/10/2015	07/10/2015	08/10/2015	09/10/2015
09-11	Systematic Pathology Splenomegaly Pathology of the spleen MP	Systematic Pathology Bone Marrow Pathology MP	Acute Allergy (MY2)	Systematic Pathology A lump in soft tissues Soft Tissue tumors CD	
11-13	Sjogren Syndrome (PRQ3)	OA & GOUT (AAM2)	PAPS (PRQ4)	Systematic Pathology Liver Pathology FP	
14-16	Systematic Pathology Pulmonary Pathology 2 CD	Scleroderma, Behcet, Policondritis & Sarcoidosis (LD4)	Systematic Pathology Pathology of the mediastinum MP	IIM (PRQ5)	
16-18					
ORA	12/10/2015	13/10/2015	14/10/2015	15/10/2015	16/10/2015
09-11	Chronic Allergy (MY3)	Systematic Pathology Seizures Pathology of CNS CD	Spondyloarthropaties (AAM3)	Clinical Cases (MY4) Enrico	
11-13	Introduction to dermatology (PRQ6)	Systematic Pathology A pelvic mass Pathology of the ovaries MP	Acne vulgaris (PRQ7)	ARF & septic (AAM4)	
14-16	Systematic Pathology Head and Neck MP	ALLERGY Molecular bases (MY1)	Systematic Pathology dysphagia and dyspepsia Pathology of the upper GI tract CD		
16-18					
ORA	19/10/2015	20/10/2015	21/10/2015	22/10/2015	23/10/2015
09-11	Dermatitis (MY5)	Systematic Pathology endocrine Pathology 1 CD	Systematic Pathology endocrine Pathology 2 CD		
11-13	Systematic Pathology Melena Pathology of the lower GI tract CD	Systematic Pathology Obstructive Jaundice Pathology of pancreas and biliary tract FP	Systematic Pathology Infectious Pathology MP		
14-16	Systematic Pathology Vaginal Bleeding MP	Autoinflammatory disorders & FMF (LD3)		Systematic Pathology Pathology of the breast CD	
16-18					
ORA	26/10/2015	27/10/2015	28/10/2015	29/10/2015	30/10/2015
09-11	Psoriasis (PRQ9)	Systematic Pathology Skin Pathology CD	Systematic Pathology Pathology small bowel CD		
11-13	Pharmacology (FV1)	Systematic Pathology Lymphomas and infectious agents MP	Dermatology (PRQ10)		
14-16	Systematic Pathology autoimmune Pathology MP	Pharmacology (FV2)			
16-18		Primary Immunodeficiencies & Immo mediated cytopenias (PRO8)			
ORA	02/11/2015	03/11/2015	04/11/2015	05/11/2015	06/11/2015
09-11		Pathology of the Prostate Prof. M. Loda			
11-13	Pathology of the Kidney and Urinary Bladder Prof. M. Loda	Molecular Diagnostics in oncology Prof. M. Loda			
14-16	Pathology of the Testis Prof. M. Loda				
16-18					

SAN RAFFAELE INTERNATIONAL MD PROGRAM

YEAR 6

Academic Year 2015/2016

- **Emergency Medicine**
- **Public Health and Legal Medicine**

Emergency Medicine

Total Credits: 6

Total hours: 60

Scientific Discipline Sector: SSD MED/09, MED/18, MED/26, MED/33, MED/41

Teaching staff

Course Coordinator: Antonio Secchi Email: secchi.antonio@univr.it Receiving hour:
appointment by mail

Teachers:

Giovanni Landoni, Riccardo Rosati, Giancarlo Comi, Gianfranco Frascini, Luca Cabrini, Maria Rosa Calvi, Michele Carlucci, Antonella Citterio, Roberto Faccincani, Massimiliano Greco, Lorenzo Mattioli, Giulio Melisurgo, Fabrizio Monaco, Giacomo Monti, Federico Pappalardo, Luisa Roveri, Giovanni Sesana, Marzia Spessot, Massimo Zambon.

Goals

The target of the course is to offer to the students the chance to address the major clinical problems related to the Emergency, through a theoretical and a practical approach. The methodology to efficiently address emergency situations will be offered to the students. Pathophysiological bases, identification of priorities and synthetic approach will be the base of the learning and its practical application.

Exam Modalities

The final exam will be based on multiple choice evaluation. 30 questions with 4-5 answer options, only one answer correct.

- Right answer: 1 point

- Blank: no points

- Wrong answer: penalization of $\frac{1}{4}$ point

Further oral evaluation will be allowed to increase (or decrease) the vote of the written test by a maximum of 3 points.

Certification of all practical activities (see below) is compulsory to attend the final exam.

Course Description

The following topics will be addressed:

Methodology in the clinical approach to the Emergency

Sepsis

Cardiac arrest

Acid-base balance

Shock

Pulmonary embolism

Acute Cardiovascular failure

Acute respiratory failure

Stroke

Headache

Intoxication and poisoning

Acute infectious diseases

Acute renal failure

Endocrinological emergencies
ATLS
Syncope
Chest pain
Surgical emergencies
Burns
Polytrauma
Maxi-emergencies

Practical Activities

Students will spend 7 days in the department of Emergency, from 9 am to 9 pm, as follows: 3 days in the room of Emergency Medicine, 3 days in the room of Emergency Surgery, 1 day in the room of Traumatology.

Students will spend 1 day the operating theatre (from 7.30 to 9.30, Q2 “floor-1” cardiac surgery theatre).

They'll follow the anesthesiologist and will have the opportunity to see

- Mechanical circulatory devices: intraortic balloon pump (IABP), IMPELLA, extracorporeal membrane oxygenation (ECMO V-A), ventricular assist devices, artificial hearts
- orotracheal intubation, mechanical ventilation, manual ventilation
- central venous line cannulation, pulmonary artery pressure and central venous pressure measurements
- arterial and venous cannulation
- standard and advanced monitoring
- transesophageal echocardiography

Training by simulation will be provided for technical skills (airway management, peripheral and central venous lines placement...) and for non - technical skills (full code simulation, team working, communication)

Textbook

Tintinalli's Emergency Medicine: Just the Facts, Third Edition

Rosen's Emergency Medicine - Concepts and Clinical Practice

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Public Health and Legal Medicine

Total Credits: 9

Total hours: 90

Scientific Discipline Sector: SSD MED/42, MED/43, MED/44, SECS-P/10, L-LIN/12

Teaching staff

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Goals

The aim of the course is the supply of notions, rules, and practical knowledge on public health, including preventive medicine, legal medicine, and occupational medicine. The topics of the course are concerning the relationship between the MD and the society, besides the usual relationship MD-patient. The course supplies the necessary background for engaging the obligations of MD on preventive and legal medicine.

Evaluation

Written computer-based examination+ a power point presentation during the course. The written exam contains 54 multiple-choice questions. For Prof. John's part, students will receive a grade for the Power Point presentation they will be asked to hold in class during the course. This last part is mandatory and is part of the final mark. Students without a mark for this part will get a zero which will be part of the final mark.

Course description

The course of Public Health and Legal Medicine includes the following principal chapters and items:

Occupational medicine

Knowledge on the relationship between health and job

Knowledge on risk factors related to job

Knowledge on pathogenetic mechanisms, diagnosis and prevention of the principal occupational diseases

Overview on laws and rules of hygiene and safety on occupational medicine

Public health

Preventive medicine

Organization of hospital and healthcare services

Community medicine

Epidemiology and demography, health education and promotion

Influence of the environment (air, water, waste, microorganisms, food) on human health

Legal Medicine

Knowledge of the responsibility of MD (eg consensus, emergency..)

Forensic pathology, including forensic genetics, forensic psychopathology and toxicology (drugs of abuse, doping, alcohol abuse)

Sexual harassment and sexual offence, rules of occupational medicine and of assurances against disease and injuries

Obligations of MD, professional responsibility, evaluated and illustrated through practical and real cases

Health economics

Knowledge of importance of economics on healthcare and illustration of some econometric systems commonly used for hospitals and healthcare systems

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TIMETABLE

Please note that changes may always occur in the daily lesson schedule.
Please refer to the on line timetable for the latest version.

International MD Program A.Y. 2015/2016 - YEAR 6					
TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
	28/09/2015	29/09/2015	30/09/2015	01/10/2015	02/10/2015
09-11		Public Health & Legal Medicine DC	Obstetrics written exam at 9:00	Public Health & Legal Medicine DC	Obstetrics oral exam at 9:00
11-13	Public Health & Legal Medicine GB			Public Health & Legal Medicine NB	
14-16	Public Health & Legal Medicine GB				Emergency Medicine
16-18					
TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
	5-Oct-15	6-Oct-15	7-Oct-15	8-Oct-15	9-Oct-15
09-11	IFOM 9:00-12:30		Public Health & Legal Medicine Travaini+Casali	Public Health & Legal Medicine DC	Public Health & Legal Medicine Travaini+Casali
11-13				Public Health & Legal Medicine NB	
14-16			Emergency Medicine		Emergency Medicine
16-18					
TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
	12-Oct-15	13-Oct-15	14-Oct-15	15-Oct-15	16-Oct-15
09-11	Public Health & Legal Medicine Travaini+Casali	Public Health & Legal Medicine DC	Public Health & Legal Medicine Travaini+Casali	Public Health & Legal Medicine Travaini+Casali	Public Health & Legal Medicine Travaini+Casali
11-13		Public Health & Legal Medicine DC		Public Health & Legal Medicine NB	
14-16	Emergency Medicine		Emergency Medicine	Public Health & Legal Medicine Travaini+Casali	Emergency Medicine
16-18					
TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
	19-Oct-15	20-Oct-15	21-Oct-15	22-Oct-15	23-Oct-15
09-11	Public Health & Legal Medicine Travaini+Casali		Public Health & Legal Medicine Travaini+Casali	Public Health & Legal Medicine Travaini+Casali	Public Health & Legal Medicine GB
11-13				Public Health & Legal Medicine NB	Public Health & Legal Medicine Travaini+Casali
14-16	Emergency Medicine		Emergency Medicine		Emergency Medicine
16-18					
TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
	26-Oct-15	27-Oct-15	28-Oct-15	29-Oct-15	30-Oct-15
09-11	Public Health & Legal Medicine GB		Public Health & Legal Medicine Travaini+Casali	Public Health & Legal Medicine Travaini+Casali	Public Health & Legal Medicine GB
11-13	Public Health & Legal Medicine Travaini+Casali			Public Health & Legal Medicine NB	Public Health & Legal Medicine GB
14-16	Emergency Medicine		Emergency Medicine		Emergency Medicine
16-18					
TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
	2-Nov-15	3-Nov-15	4-Nov-15	5-Nov-15	6-Nov-15
09-11	Public Health & Legal Medicine GB	Public Health & Legal Medicine MJ		Public Health & Legal Medicine MJ	Public Health & Legal Medicine GB
11-13	Emergency Medicine				
14-16	Public Health & Legal Medicine GB		Emergency Medicine	Public Health & Legal Medicine Travaini+Casali	Emergency Medicine
16-18					
TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
	9-Nov-15	10-Nov-15	11-Nov-15	12-Nov-15	13-Nov-15
09-11	Public Health & Legal Medicine GB			Public Health & Legal Medicine MJ	Public Health & Legal Medicine GB
11-13	Emergency Medicine				
14-16	Public Health & Legal Medicine GB		Emergency Medicine		Emergency Medicine
16-18					

TIME	MONDAY 16-Nov-15	TUESDAY 17-Nov-15	WEDNESDAY 18-Nov-15	THURSDAY 19-Nov-15	FRIDAY 20-Nov-15
09-11	Public Health & Legal Medicine GB	Public Health & Legal Medicine MJ		Public Health & Legal Medicine MJ	Public Health & Legal Medicine GB
11-13	Emergency Medicine				
14-16	Public Health & Legal Medicine GB		Emergency Medicine		Emergency Medicine
16-18					
TIME	MONDAY 23-Nov-15	TUESDAY 24-Nov-15	WEDNESDAY 25-Nov-15	THURSDAY 26-Nov-15	FRIDAY 27-Nov-15
09-11					
11-13					
14-16					
16-18					
TIME	MONDAY 30-Nov-15	TUESDAY 1-Dec-15	WEDNESDAY 2-Dec-15	THURSDAY 3-Dec-15	FRIDAY 4-Dec-15
09-11					
11-13					
14-16					
16-18					
TIME	MONDAY 7-Dec-15	TUESDAY 8-Dec-15	WEDNESDAY 9-Dec-15	THURSDAY 10-Dec-15	FRIDAY 11-Dec-15
09-11	Holiday (ER activities going on)	Holiday (ER activities going on)			
11-13					
14-16					
16-18					
TIME	MONDAY 14-Dec-15	TUESDAY 15-Dec-15	WEDNESDAY 16-Dec-15	THURSDAY 17-Dec-15	FRIDAY 18-Dec-15
09-11	Public health and legal medicine exam at 9:00				Emergency medicine at 9.00
11-13					
TIME	MONDAY 21-Dec-15	TUESDAY 22-Dec-15	WEDNESDAY 23-Dec-15	THURSDAY 24-Dec-15	FRIDAY 25-Dec-15
09-11	Exams		Holiday	Holiday	Holiday
11-13					
TIME	MONDAY 28-Dec-15	TUESDAY 29-Dec-15	WEDNESDAY 30-Dec-15	THURSDAY 31-Dec-15	FRIDAY 1-Jan-16
09-11	Holiday	Holiday	Holiday	Holiday	Holiday
11-13					
TIME	MONDAY 4-Jan-16	TUESDAY 5-Jan-16	WEDNESDAY 6-Jan-16	THURSDAY 7-Jan-16	FRIDAY 8-Jan-16
09-11	Holiday	Holiday	Holiday	Public health and legal medicine exam at 9:00	
11-13					
TIME	MONDAY 11-Jan-16	TUESDAY 12-Jan-16	WEDNESDAY 13-Jan-16	THURSDAY 14-Jan-16	FRIDAY 15-Jan-16
09-11	Exams				Emergency medicine at 9.00
11-13					