UNIVERSITÀ VITA-SALUTE SAN RAFFAELE

STUDENT GUIDE

FACULTY OF MEDICINE AND SURGERY

MASTER’S DEGREE COURSE
INTERNATIONAL MD PROGRAM

Academic Year 2017/2018
## Academic Calendar

### International MD Program

#### Year 1

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*Note: Dates in red indicate exam dates.*

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**Student Guide A.Y. 2017/2018**

Master's Degree Course International MD Program_Year 1

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Notice from the University Committee of the enhancement of quality
on the questionnaires for the evaluation of courses and teaching

Vita-Salute San Raffaele University considers a continuous process of monitoring and evaluating the quality of the educational mission, also in terms of planning, as essential for achieving excellence in higher education and research.

UniSR Students can assess the correspondence between the teaching quality offered and their expectation. That is very important to improve teaching and training and develop successful strategies.

At the end of each semester, students’ opinions are collected through evaluation questionnaires. Filling in the questionnaire is compulsory, according to the guidelines published in November 2013 by ANVUR (the National Agency for the Evaluation of the University and Research Systems). IT techniques have been implemented to speed up questionnaire collection and processing. Anonymity is fully guaranteed.

Filling in the questionnaires is the necessary condition which allows a student to register for the exams. After collection, data are firstly conveyed to the Master’s degree course Coordinators and to the Deans of the Faculties and finally to the University Evaluation Commission for the analysis of data.

The data collected will be a fundamental source to spot every sort of issue, thus for future improvement.

In short, filling in the questionnaires represents a key moment of University life in which students take a role of responsibility together with academia and University organization structures in the continuous process of improvement and innovation which makes it possible for our University to rank among the top Universities in the nation and Europe.

We really appreciate all respondents’ valuable time to fill up the questionnaires, especially during intense study times and we would like to raise students’ awareness of the importance of their contribution by carrying out this task responsibly and sharing the same objectives together with this Institution.

The President of the University Committee
for the enhancement of quality
YEAR 1

- Statistics and Bioinformatics
- Medical Physics
- Medical Humanities
- Chemistry and Biochemistry
- Cell and Molecular Biology
- Human Genetics and Genomics
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@unisr.it (Coordinator)
(www.unisr.it/k-teacher/disero-mariacleliastefania)
Prof. Elia Biganzoli Email: elia.biganzoli@unimi.it
Dr. Paola Rancoita Email: rancoita.paolamaria@unisr.it
(www.unisr.it/k-teacher/rancoita-paolamariavittoria)
Dr. Federica Cugnata Email: cugnata.federica@hsr.it

Receiving Hour to be requested per e-mail addressed 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 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:
- Supplementary Online Material.

Additional material (one of the following):

Schedule of the Lectures

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<th>Session</th>
<th>Topics</th>
<th>SPSS LAB/Practicals</th>
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<tr>
<td>1</td>
<td>Introduction to Medical Statistics, graphical methods for representing data</td>
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<td>Univariate analysis: measures of location</td>
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<td>Univariate analysis: measures of dispersion</td>
<td>SPSS LAB 1</td>
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<td>Practical 1</td>
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<td>Bivariate analysis: covariance and correlation</td>
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<td>Bivariate analysis: regression and R-squared</td>
<td>SPSS LAB2</td>
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<td>Probability, Bayes’ Theorem and conditional probability</td>
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<td>Independency and contingency table (chi-square statistic)</td>
<td>SPSS LAB 3</td>
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<td>Practical 3</td>
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<td>Introduction to discrete probability distributions, Binomial distribution</td>
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<td>Poisson distribution</td>
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<td>10</td>
<td>Introduction to continuous probability distributions, Normal distribution</td>
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<td>Practical 5</td>
<td>SPSS LAB</td>
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<td><strong>Screening test, ROC curve</strong></td>
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<td>Sampling distribution for the mean and for the difference of means, Central Limit Theorem</td>
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<td>Confidence intervals for the means (variance known and unknown), Student’s t-distribution</td>
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<td>Confidence intervals for the difference of means</td>
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<td>Hypothesis testing: basic concepts and hypothesis test for the mean (with variance known)</td>
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<td>Hypothesis testing: hypothesis test for the mean (with variance unknown) and for the difference of means</td>
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<td>Introduction to Evidence Based Medicine reasoning based on quantitative statistical evidence</td>
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<td>Diagnostic tests: screening and diagnosis</td>
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<td>Test with dichotomous variables: sensibility and specificity, PPV, NPV</td>
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<td>Test with continuous and ordinal variables, ROC curves</td>
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<td>Fagan nomogram and practical application in diagnostic testing</td>
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<td>Information and medical decision making in screening test: examples of early diagnosis</td>
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<td>Evaluating risk factors</td>
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<td>Probability and disease risk</td>
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<td>Observational vs. experimental studies. Cross-sectional and case-control studies Cohort studies (prospective/retrospective) Inference on odds ratio and relative risks</td>
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<td>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</td>
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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)  Email: tommaso.tabarellidefatis@unimib.it
Prof. Giovanni Mauro Cattaneo  Email: cattaneo.mauro@hsr.it
Prof. Antonio Esposito  Email: esposito.antonio@unisr.it
(www.unisr.it/k-teacher/esposito-antonio)
Prof. Samuel Zambrano  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
The course requires the knowledge of algebra and trigonometry as introduced in High Schools. Basic notions of calculus will be introduced as needed during the lectures.

Textbooks
Detailed notes, with problems, on the topics covered during the lectures will be made available. A reference textbook covering all the topics presented (and more) is:
** Zinke-Allmang, Sills, Nejat, Galiano-Riveros  "Physics for the life sciences", Ed. Nelson

Alternative textbooks with coverage of the topics presented:
“Physics” or “General Physics”, by Morton Sternheim and Joseph Kane, Wiley;
“Physics Principles with Applications”, by Douglas Giancoli, Pearson/Prentice Hall;

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.
- 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.
- 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 vapor.
- Diffusion and osmosis. Solutions, solubility, dissociation. Matter transport and exchange in the human body.
- Thermodynamics. The first principle (and the second principle) of thermodynamics. Metabolic rate

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.

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

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CHEMISTRY AND BIOCHEMISTRY
Total Credits: 12
Lectures: 120 hours
Practicals: 46 hours (divided in groups)
Scientific Discipline Sector: BIO/10- BIO/11

Course Coordinator: Prof. Andrea Graziani
Email: graziani.andrea@hsr.it (www.unisr.it/k-teacher/graziani-andrea)
50 hours

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

Prof. Angelo Corti
Email: corti.angelo@hsr.it (www.unisr.it/k-teacher/corti-angelo)
20 hours

Tutorials: 96 hours to be divided into groups/tutors
Dr. Claudia Minici - Dr. Francesca Giannese - Dr. Marco Patrone – Dr. Valeria Malacarne – Dr. Michele Ferrara

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:*
ISBN 9781137563453
Voet & Voet - Biochemistry, Wiley eds. (at least 2nd edition)

**The course is a prerequisite for:**
Foundation for “Cellular and Molecular Biology” and “Human Genetics and Genomics”.

**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.

Once the students have passed the Biochemistry section, the final score may be integrated with an optional oral 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).
Modules and Subjects

**Chemistry and Structural Biochemistry (Prof. Massimo Degano)**

1. Introduction to the course. Tips and suggestions for a proficient C&B course. Chemistry and biochemistry in human physiology
3. Nuclear chemistry: radioisotopes, decay; medical application of radioactivity
7. Classification of Chemical Reactions.
15. Amines
16. Ketones and aldehydes
17. Carboxylic acids and esters.
18. Phosphoric acids, inorganic and organic phosphates
19. Amines and amides and nitrogen-containing biomolecules.
20. Aromatic compounds
21. Major features of organic molecules reactivity.
23. Lipids structure: fatty acid saturated and insaturated, triglyceride, glycerol-phospholipids, sphingolipids and glycosphingolipids. Structural features of cholesterol and cholesterol derivatives.

**Protein Structure and Function (Prof. Angelo Corti)**

24. Aminoaids structure, chemical and biochemical properties
25. Peptidic bond and peptides.
26. Protein purification and characterization. Recombinant proteins design and production. Production of NGF-TNF
28. Protein function I: Myoglobin and Hemoglobin as allosteric proteins. Oxygen saturation curves and regulation of hemoglobin affinity for oxygen.
30. Enzymatic catalysis. Kinetics at the steady state: $K_m$, $V_{max}$ and $K_{cat}$.
33. Protein function I: the coagulation cascade as example of enzymatic regulation by proteolytic cleavage and membrane interaction.
34. Protein function II: antibodies.

**Metabolism (Prof. Andrea Graziani)**
35. Introduction to bioenergetics with elements of thermodynamics of the biological systems. Significance of high energy bonds. Biological redox reactions.
36. Role of mitochondria in energetic metabolism I: pyruvate dehydrogenase; the citric acid cycle (TCA); Cataplerotic and anaplerotic metabolism; NADPH from TCA intermediates oxidation; plasticity of TCA in proliferating and in hypoxic cells.
40. Glycolysis and its regulation by intracellular balance, Insulin and Glucagone. Fructose and galactose metabolism. Lactic acid dehydrogenase and its different role in skeletal muscle, heart, liver and hypoxic cells. Warburg effect and role of glycolysis in proliferating cells. Glycolysis intermediates as precursors for the synthesis of biological molecules.
41. The Pentose Phosphate Pathway and its role in NADPH generation and nucleotides biosynthesis. G6PDH mutations and oxidative stress in favism (familiar emolytic anemia).
42. Gluconeogenesis and its regulation. Comparison between glycolytic and gluconeogenesis. Sources of pyruvate for gluconeogenesis from aminoacid metabolism and extra-hepatic lactic fermentation: Cory cycle and Alanine-Pyruvate cycle.
44. Lipid metabolism: triglyceride digestion and the role of biliary salts. General structure and common features of lipoproteins. Chylomicrons metabolism and lipid delivery from the gut to the adipose tissue and the liver. Lipid mobilization from the adipose tissue and its regulation. Detailed mechanisms of free fatty acid (FA) uptake and intracellular oxidation (beta-oxidation). Oxidation of unsaturated FA, long chain FA (peroxysomal omega oxidation), and odd chain FA. Specific role of FA oxidation in different tissues (liver, skin muscle, heart and brown adipose tissue). Ketone bodies: structural features, and biosynthesis from FA and ketogenic aminoacids. Ketone bodies utilization as glucose surrogate during fasting.
45. Fatty acid biosynthesis from mitochondrial Acetyl-CoA and its regulation. Detailed regulation of Acetyl CoA Carboxylase (ACC) and its role in reciprocally regulating FA oxidation and biosynthesis. Role of AMPK in the regulation of lipid and carbohydrate metabolism. Regulation and main steps of triglycercide biosynthesis and their VLDL-mediated transport to the adipose tissue. Most relevant features of phospholipid and sphingolipid biosynthetic pathways.
46. Phospholipase A2 and the metabolism of Arachidonic acid, an omega-6 FA: cyclooxygenase as the aspirin target and prostaglandin/thromboxan generation; lipoxigenase-mediated arachidonic acid metabolism and leukotriens generation. Metabolism of omega-3 FA: role of
cyclooxygenase in resolvins generation. Endocannabinoid as metabolites of Arachidonic acid and Phosphatidyl-ethanolamine.

47. Cholesterol metabolism I: main steps of cholesterol biosynthesis and cholesterol esterification; LDL-mediated cholesterol transport from the liver to extr-hepatic tissues; integrated regulation of cholesterol uptake and cholesterol biosynthesis through an ER/Golgi cholesterol sensor. HDL and reverse cholesterol transport.

48. Cholesterol metabolism II: Main features of biliary salt structure and biosynthesis from cholesterol. Main features of steroid hormones (glucorticoids, ocoids, mineralocorticoids, sexual hormones and vitamin D) and their biosynthesis from cholesterol. Regulation of cortisol biosynthesis by ACTH and hypothalamic peptides.


50. Aminoacid metabolism II: Aminoacids as precursors for the biomolecules biosynthesis. Most relevant monosomic inherited syndromes caused by defective aminoacids metabolism Role of glutaminolysis in the gut, kidney, liver, immune system and in proliferating cells. Arginine as precursor of nitric oxide. Tyrosine as precursor of melanine and catecholamines. Glutamate as precursor of neurotransmitters Tyrosine as precursor of thyroid hormone. Feedback regulation of thyroid hormone biosynthesis from pituitary and hypothalamic hormones.

51. One carbon metabolism: role of serine, folic acid derivates, vitamin B12 and Methionine in biosynthetic pathways involving transfer of one carbon groups (methyl/methylene) and protein/DNA methylation


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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@unisr.it
(Coordinator - Receiving Hours by appointment: Wednesday, 13:00 - 14:00 – Room 27, Dibit 1)
Prof. Federico Pennestrì pennestri.federico@gmail.com
Prof. William Cooke william@maptraining.it
Prof. Massimo Reichlin reichlin.massimo@hsr.it
(www.unisr.it/k-teacher/reichlin-massimo)
Prof. Roberta Sala sala.roberta@unisr.it

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.

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 a compulsory single date end-of-year multiple-choice computer-based written test on the following topics: Doctor-patient communication skills (John part 1), Peer-to-peer communication skills (John part 2), Bioethics (Reichlin), History of Medicine (Pennesiti).

As will be 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. The mark will be calculated using an Excel worksheet where various ‘weights’ will be given to each exercise. 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 all group-exercise results will be maintained) on a single date during the September examination session.

The dates for the end-of-course test and re-sit are to be defined.

Students that achieve a positive result (18+) will not be permitted to re-sit any part or all of the examination merely to ‘up the mark’.

Cell phones, tablets, and computers must be turned off for the duration of each class, unless they are being used to follow the projected slides or for note-taking.

No eating or drinking in class. Break time must be respected (maximum 10 minutes, or as advised by the teacher); no recording or filming of lessons without permission.

Cheating or plagiarism in any of the examination exercises will result in immediate failure.

Be respectful of all classmates, professors, guests, peers. Any disciplinary or academic problems will be discussed with the Program Director and with the Didactic Committee.

*****
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  (www.unisr.it/k-teacher/sitia-roberto/)
(Receiving Hours: on Thursdays 14:30, Dibit1, 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
5 hours
Prof. Gianvito Martino  (www.unisr.it/k-teacher/martino-gianvito/)
Email: martino.gianvito@hsr.it
5 hours

Integrated Course of Molecular Cell Biology
II Semester

Goals

To illustrate the structure, functions, lifestyle and death of cells, highlighting the underlying molecular mechanisms in health and disease.
To explain how to find, understand and interpret data in the scientific literature.

Main topics

Evolution; structure and function of cells and organelles; intracellular transport mechanisms; cytoskeleton, molecular motors, extracellular matrix, cell migration and metastasis; proteostasis and proteotoxicity; cell cycle; mitosis, meiosis, apoptosis and necrosis; membranes, receptors and signalling; biotechnology and molecular medicine; intercellular communication and inflammation; stem cells, cell differentiation; basic systems biology.

Students should become familiar with the mechanisms of DNA replication and transcription, translation, structure and function of macromolecules, covered in Genetics and Biochemistry.

Lectures will NOT cover the entire program. Students should ask teachers and tutors how to tackle the remaining parts, and read one of the reference textbooks suggested.
Main Contents of the Lectures

Evolution
What is life?
A brief history of molecular biology.
From Galileo and Darwin to manipulating the human genome.
Reductionism vs vitalism.

Origin and structure of cells
Prokaryotes and eukaryotes
Organelles of eukaryotic cells
Structure, biogenesis and functions of the nucleus, mitochondria, endoplasmic reticulum (ER),
Golgi, endosomes, lysosomes, peroxisomes, cytosol
Membranes, cytoskeleton, organelles, tissues and multicellular organisms
Bioenergetics: Where do living things get their energy from?

Concepts, tools and technologies of molecular biology
Cloning, cDNA libraries, tagging, PCR, sequencing.
Standard protein techniques
Function prediction, genetic screens, tagged libraries, reporter genes
Knock-downs and knock-outs, RNAi, Cre-lox, CRISPR, knockout libraries, epistasis & EMAP,
Proteomics, microarray, RNAseq, ribosome profiling

Visualizing cells
Standard microscopy techniques
Advanced microscopy techniques

Cytoskeleton and adhesion molecules
Structure of cytoskeletal elements
Microtubules
Microfilaments
Intermediate filaments
Muscle
Tissue organization
The extracellular matrix
Adhesion molecules
Cell junctions
Molecular motors: kinesins and dyneins
Axonal transport
Cell migration
Cilia and flagella

Membrane Structure
Architecture and composition of biological membranes
Fluid model, patches, transmembrane proteins
Mechanisms and regulation of macromolecular transport: intracellular sorting
The logics of intracellular transport
To and from the nucleus
Membrane translocation
Vesicular transport
Exocytosis
Endocytosis
Pinocytosis
Phagocytosis
Transcytosis
 Mechanisms of cell polarity

Intercellular communication: Signalling
Different types of intercellular communication.
Long range and short range communication.
Examples of spatio-temporal restriction of signaling: the synapse (nervous system, immune system).
The logics of signal transduction
Tyrosine kinase receptors
G protein coupled receptors
IP3, calcium, redox
How do receptors work?
The power of weak bonds
Affinity and avidity

Intercellular communication: Secretion
Protein targeting: the discovery of signal sequences. The classical secretory pathway
Constitutive and regulated secretion
Polarized secretion
Autocrine, paracrine, endocrine and juxtacrine secretion.
Properties of cytokines and chemokines: chemical structure, function, mode of actions.
Cytokine-generating cells: Introduction to cells of innate and adaptive immunity

Alternative secretory pathways
How does a leaderless secretory protein leave the producing cell?
A non-classical, active mechanism of secretion for IL-1β and other leaderless secretory proteins.
Pathophysiology of leaderless secretion.

Inflammation
Overview of the inflammatory process
Infectious and sterile inflammation
Inflammation as a vital process aimed at maintaining or restoring tissue homeostasis and a major component in most diseases
Inducers (PAMPs, DAMPs), sensors (PRRs) and mediators (cytokines) of inflammation
The multilevel of control of IL-1β activity
IL-1Receptor antagonist (IL-1Ra): a unique example of endogenous IL-1 inhibitor
Role of the IL-1/IL-1Ra balance in tissue homeostasis: the example of autoinflammatory diseases due to hyper-production of IL-1β or deficiency or IL-1Ra
IL-1Ra as a highly effective drug
Other members of the IL-1 family: cytokines or DAMPs?
**Organismal homeostasis:** control of cell division and death.
Mechanisms that control cell lifespan.
How molecules and cells keep track of time.
How cells determine their shape. A case example: B cell differentiation

**Cell cycle**
Phases and logics of the cell cycle.
Experimental approaches.
The Cell Cycle Control System. Significance of G phases.
Molecular players: cyclins, cyclin-dependent kinases, Cdk inhibitors. Checkpoints.
Regulatory strategies: cyclic degradation, post-translational modifications, de novo synthesis.
Exemplar 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 auto-induction loop.
The DNA damage checkpoints. p53 and p14/19ARF.
Cancer as a cell cycle disease.

**Mitosis**
Phases and mechanics of mitosis.
Cohesins and condensins.
Centrosome, microtubules and the mitotic spindle.
Role of motor proteins.
Mechanisms of high-fidelity segregation: centromere and kinetochore.

**Mechanisms of cell death: apoptosis vs. necrosis**
Apoptosis (programmed cell death): functions in physiology and disease.
Mechanisms: extrinsic (ligand-dependent) vs. intrinsic (stress-induced).
Death receptors, tranducers and effectors.
Caspases: redundancy, efficiency, velocity.
Mitochondria as homeostatic signal integrators and death executors.
The mitochondrial checkpoint: role of fission in apoptosis.
The apoptosome.
The Bcl2 family: sensors/transducers, brakes, and effectors. Stress specificity of BH3-onlies.
Multiple, bi-directional cross-talks between mitochondria and endoplasmic reticulum.
Apoptosis as an integrated response: “daily jobs” and “night killers”.

**Proteostasis and disease**
Protein folding, quality control and degradation
Anfinsen’s demonstration of the central dogma.
Chaperones and enzymes that assist protein folding
Protein evolution
Protein degradation: proteasomes, lysosomes and autophagy
The Ubiquitin Proteasome System (UPS)
Many diseases are linked to defective UPS

**Autophagy**
Recycling as an intrinsic feature of life.
Proteome plasticity in homeostasis and differentiation.
Main functions of (macro)autophagy.
Role in cell physiology and tissue homeostasis.
Mechanisms, selectivity, receptors/adapters.
Protection from proteotoxicity.
Autophagy and cancer: model of *non-oncogene addiction.*
Mechanisms of proteotoxicity
Three organelles mediate protein folding
The seeding hypothesis
Amyloid fibrils in differentiation and disease
Prototypic examples of protein folding diseases: Prions, Alzheimer and Parkinson diseases, Alpha1 antitrypsin mutations and juvenile emphysema.
Intracellular storage diseases

Molecular Biology of reproduction
Oogenesis, spermatogenesis, molecular steps in fecundation
Molecular basis of egg-sperm interaction
Endometrial stromal cells decidualization and embryo implantation: building the nest for the incoming embryo

How cells respond and adapt to change
The heat shock response
The Unfolded Protein Responses (UPR) of endoplasmic reticulum (ER) and mitochondria (mit)
Three branches control the UPR$^\text{ER}$ Perk, Ire1 and ATF6
Experiments on the UPR in yeast
Experiments on the UPR in mammalian cells

Multilevel control of gene expression
How are genetic programs executed in response to signaling events?
Heterochromatin and euchromatin
How nucleosome position and histone modifications affect gene expression
Promoters, enhancers and silencers
RNA transport and stability: miRNA, siRNA, heterochromatin and centromeres
Translational and posttranslational events

Emerging concepts
Imagine there is a new disease identified – what can we do?
A DNA driven world.
The future of biomedicine.

*****
HUMAN GENETICS AND GENOMICS

Total Credits: 12  
Total Hours: 96  
Scientific Discipline Sector: BIO/13 – MED/03

Course Coordinator: Prof. Giorgio Casari  
Email: casari.giorgio@hsr.it  
(www.unisr.it/k-teacher/casari-giorgio/)  
(Receiving Hour to be scheduled by email)

35 hours

Collaborators:  
Dr. Luca Rampoldi  
Email: rampoldi.luca@hsr.it  
35 hours

Tutorials: 5 groups for 15 hrs tutorials each.  
Tutors: Drs. Maltecca Francesca (www.unisr.it/k-teacher/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.  
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 (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  
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 (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.

COURSEBOOKS:

**Human Molecular Genetics 3rd Edition,**

**Langman’s Medical Embryology / Edition11,**
Thomas W.Sadler, ED. Lippincott Williams & Wilkins ISBN: -13: 9780781790697

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

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**International MD Program A.Y. 2017/2018**

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Timetable Sem. I

Please note that changes may always occur in the daily lesson schedule. Please refer to the on line timetable for the latest version.
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</table>
INSTRUCTORS’ CVs

Statistics and Bioinformatics

Elia Biganzoli is qualified as Full Professor in Medical Statistics (MED/01) with 2012 ASN.
• Occupation or position held Professor of the courses of “Medical Statistics” and “Statistics I and II” for the Faculty of Medicine, Master, Specialization and Doctorate School in Medical Statistics of the University of Milan.
Clinical Epidemiology modules in English for University Vita Salute and Humanitas MD courses.
• Main activities and responsibilities Teaching activity to undergraduate and graduate students from different disciplines (Medicine, Biology, Pharmacy, Biotechnology, Veterinary, Natural Sciences)

Federica Cugnata Ph.D. in Statistics, L. Bocconi University, Milan, Italy
Research Fellow, University Centre of Statistics for Biomedical Sciences, Vita Salute San Raffaele University, Milan. Supervisor: Professor Clelia Di Serio.
Teaching experience: September 2009 - July 2015
Statistics. Teaching assistant and tutorial activity, L. Bocconi University, Milan.
Co-author of several publications and conference presentations.

Medical Physics

Tommaso Tabarelli de Fatis is Associate Professor of Physics – Università di Milano Bicocca1.
Main responsibilities in coordination of research:
- 2015-present: Coordinator of Italy (INFN) contribution to maintenance & operation of the electromagnetic calorimeter (ECAL) of the CMS detector at CERN LHC;
- 2013-present: Coordinator of Milano-Bicocca research activity in the CMS experiment at CERN LHC (under INFN Grant CNSI - National coordinator M.Pastrone/R.Tenchi); member of CMS Institution Board and ECAL Institution and Finance Boards (IB and FB);
- 2011-2012: Project Leader of the Electromagnetic Calorimeter (ECAL) of the CMS experiment; Member of the CMS Management Board and Executive Board; Chair of the ECAL Steering Committee; ex-officio member of the CMS CB and ECAL IB/FB.
- 2009-2010: Co-leader of the CMS ECAL Detector Performance Group; ex-officio Member of the ECAL Steering Committee.
- 2009-present: Member of the CMS ECAL Editorial Board.
- 2014-present: PI of the i-MCP R&D project on picosecond timing of high-energy photons (INFN grant CSN V); co-coordinator of the Fast-Timing Working group in the CMS collaboration;

Giovanni Mauro Cattaneo
Education:
- M.Sc. Physics (Nuclear Physics), University of Milan 1981
- Qualified expert in Radioprotection (3rd level), 1983
Work Experience
- Senior Medical Physicist, Servizio di Fisica Sanitaria, Ospedale San Raffaele (Scientific Institute and Hospital), Milan, Italy, from 1987
Teaching Experience
- 2015 Physics. MD Program, University San Raffaele
2014-2017, “abilitazione scientifica nazionale alla funzione di professore universitario di seconda fascia nel settore congressuale 02/B3”
- Co-author of 81 full papers indexed on “medicine database”.

Student Guide A.Y. 2017/2018
Master’s Degree Course International MD Program_Year 1
Samuel Zambrano

EDUCATION / TRAINING
2003: B. Sc. Physics, Universidad Complutense, Madrid (Spain)
2006: MAS in Computer Science and Mathematical Modeling, Universidad Rey Juan Carlos, Madrid (Spain).
2007: Ph. D. Physics, Universidad Rey Juan Carlos, Madrid (Spain).

POSITIONS HELD
- 2007-2009 Assistant Professor.
- 2009-2011 Associate Professor.

Research and teaching in the fields of Chaos, Complex Systems and Physics.
- March 2012- March 2014 Marie Curie IEF Research Fellow.
Research: Quantitative and Systems Biology, with emphasis in the mathematical modeling and analysis of the dynamics of the transcription factor NF-κB.

TEACHING EXPERIENCE
2003-2011: UNIVERSIDAD REY JUAN CARLOS, MADRID (SPAIN)
2011-2015: SAN RAFFAELE UNIVERSITY, MILAN (ITALY)

Tutor for “Systems Biology” in the Molecular and Cell Biology Course coordinated by Prof. Roberto Sitia,

Chemistry and Biochemistry

Massimo Degano

Education
1992 - Doctoral Degree in Chemistry, University of Padua, Italy
1993-1996 - Research Associate, Department of Biochemistry, Albert Einstein College of Medicine of Yeshiva University, Bronx, NY, USA
1996-1999 - Research Associate, Department of Molecular Biology, The Scripps Research Institute, La Jolla, Ca., USA

Professional Experiences
2001-today Head of Biocrystallography Unit, Scientific Institute San Raffaele, Milan, Italy
1996-1999 Research Associate, Department of Molecular Biology, The Scripps Research Institute, La Jolla, CA, USA
1993-1996 Research Associate, Department of Biochemistry, Albert Einstein College of Medicine of Yeshiva University, Bronx, NY, USA
1996-1999 Lecturer in Molecular and Cell Biology, Vita-Salute San Raffaele Medical School, Milan, Italy
2004-today Lecturer in Molecular and Cellular Biology, Vita-Salute San Raffaele Medical School, Milan, Italy
2004-today Lecturer in Chemistry and Introductory Biochemistry, Vita-Salute San Raffaele Medical School, Milan, Italy
2005-today Lecturer in Chemistry and Biochemistry, International MD Program, San Raffaele Medical School, Vita-Salute San Raffaele University, Milan, Italy

Student Guide A.Y. 2017/2018  Pag. 29 di 32
Master's Degree Course International MD Program | Year 1
Medical Humanities

Michael John
Michael John has been working in the field of biomedical communication skills for almost 20 years. During that time he has taught general communication skills, including medical writing and public speaking, at both undergraduate and postgraduate level. More specifically, his undergraduate courses focus on doctor-patient communication and peer-to-peer communication. Furthermore, he has worked extensively alongside clinicians, surgeons, and research scientists on the editing of well over 200 biomedical manuscripts, thereafter published in impact-factor journals.

William Cooke
Education
1. Lord Williams' School, Thame, Oxon (1966-73)
2. St. Edmund Hall, Oxford University (1973-1976)
   Open Exhibition and M.A. in English Language and Literature.
   Played in the Oxford University Rugby Football Club Team.
Professional Experiences:
Adjunct Professor at the Faculty of Medicine of the University of Pavia post lauream managing education. (2001-).
Founder and onwer of Map Training (1999-)
Adjunct Professor, responsible for the course of English at the Faculty of Psychology at Vita-Salute San Raffaele University (1996-)  

Maria Grazia Strepparava
01.11.2002- Associate Professor of Clinical Psychology at State University of Milan-Bicocca

Antonio Siccardi
Education
1975 Specialist in Hematology (Magna cum laude) Medical School, University of Pavia, Italy
1968 MD Degree (Magna cum laude) Medical School, University of Pavia, Italy
Professional experiences
2006-today Deputy Professor, History of Molecular Genetics, Faculty of Biotechnology, Università Vita Salute San Raffaele, Milan, Italy
2000-2008 Deputy Professor, Genetics, Faculty of Psychology, Università Vita Salute San Raffaele, Milan, Italy
1998-today Visiting Investigator, DIBIT, San Raffaele Scientific Institute, Milan, Italy
1998-2009 Visiting Professor, Laboratory of Tumor Biology and Immunology, NCI, NIH, Bethesda MD. USA (1 semester in 1998 and 1 semester in 1999); Institute of Virology, Technical University, Monaco, Germania (1 semester in 2000 and 1 semester in 2001); Robert Koch Institute, Berlin (1 semester in 2007 and 1 semester in 2008)
1991-1998 Coordinator of HIV/AIDS basic Research, San Raffaele Scientific Institute, Milano
1990-1994 Operative Director of DIBIT, San Raffaele Scientific Institute, Milano
1984 Visiting Professor, Service de Immunochemie Analytique, Institut Pasteur, Paris
1982-today Full Professor, Dipartimento di Biologia e Genetica per le Scienze mediche, University of Milano, Italy. Teaching several courses; currently, Gene Therapy in the Faculty of Medical Biotechnology and Molecular Medicine
1980-1982 Full Professor, Istituto di Biologia generale, University of Rome, Italy
1974-1980 Deputy Professor, Microbiology, University of Pavia, Italy
1973-1980 Assistant Professor, Istituto di Genetica, University of Pavia, Italy
1965-1973 Visiting Investigator/Post Doctorate Fellow, Hammersmith Hospital, London; Medical Microbiology, Stanford University Medical School, Stanford, Calif. USA; Lister-Guinness Unit, Lister Institute for Preventive Medicine, London; Service de Genetique Cellulaire, Institut Pasteur, Paris; Laboratory of Biochemistry, NHLI, NIH, Bethesda, MD. USA; Istituto di Biologia Generale, Università di Pavia; Department of Biochemistry, University of Washington, Seattle, WA. USA.

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Cell and Molecular Biology

Anna Rubartelli

Present position and affiliation: Director of the Cell Biology Unit - IRCCS AOU San Martino - IST National Cancer Research Institute Largo Rosanna Benzi 10, 16132 Genova, ITALY

Research and Professional Experience

1999-2003 Group Leader of the Protein Biology Unit, IST, Genova, Italy. 2003-to date: Director of the Cell Biology Unit, IST (from 2011: IRCCS AOU San Martino - IST), Genova, Italy. Research topics include: 1. inflammation and redox: role of redox remodelling in the development and outcome of different inflammatory processes; 2. characterization of the mechanism of secretion of interleukin- 1ß by monocytes in health and autoinflammatory/autoimmune diseases. 3. inflammation and cancer, role of redox and DAMPs of the microenvironment on tumor progression.

Teaching

1999, 2002, 2004, 2009: Member of jury of Doctoral Degree (PhD) theses in France (Centre d’Immunologie de Marseille-Luminy, University of Montpellier, University of Toulouse) and Sweden (Karolinska Institut, Stockholm) 2011-to date: Professor of Cell & Molecular Biology, International MD program, Università Vita-Salute San Raffaele, School of Medicine & Surgery.

Simone Cenci

Education

2000 Specialization in Gerontology and Geriatrics, University of Perugia, Italy
1995 MD Degree, University of Perugia, Italy

Professional experiences

2015-today Head of Unit, San Raffaele Scientific Institute, Milan, Italy
2006-2015 Staff Scientist and Group leader, San Raffaele Scientific Institute, Milan, Italy
2003-2006 Junior Researcher, Molecular immunology, San Raffaele Scientific Institute, Milan, Italy
1998-2003 Research Associate, Division of Bone and Mineral Diseases, Internal Medicine, Washington University, St. Louis, MO, USA

Research grants (as Principal Investigator)

2014-2014 Italian Association for Cancer Research (AIRC Investigator Grant)
2011-2013 Multiple Myeloma Research Foundation (MMRF)
2010-2015 National Institutes of Health (Giovani Ricercatori)
2010-2013 European Calcified Tissue Society (Career Establishment Award)

Honors and awards

2014 Abilitazione Scientifica Nazionale (Italian Ministry of University and Research) as Professor of Internal Medicine, Pathology and Molecular and Applied Biology
2011 Multiple Myeloma Research Foundation (MMRF) Senior Research Award
2009 European Calcified Tissue Society (ECTS) Career Establishment Award, Wien, Austria
2009 Premio Giovane Ricercatore, Società Italiana Osteoporosi, Metabolismo Minerale e Malattie dello Scheletro (SIOMMMS), Turin, Italy
2000 Società Italiana Osteoporosi (SIOP) Young Investigator Award, Padova, Italy
2000 Young Investigator Award, American Society for Bone and Mineral Research, Toronto, Canada
1998 American Society for Bone and Mineral Research (ASBMR) Young Investigator Award, San Francisco, USA

**Eelco van Anken**

*Education*

2003 PhD Chemistry, Utrecht University, The Netherlands
1997 MSc Medical Biology, Utrecht University, The Netherlands

*Professional experiences*

2010-today Group Leader, San Raffaele Scientific Institute, Milan, Italy
2006-2010 Postdoctoral Fellow, University of California, San Francisco, USA
2003-2005 Junior Researcher, Utrecht University, The Netherlands

*Honors*

2013-2016 "My First AIRC Grant" (Associazione Italiana della Ricerca sul Cancro)
2010-2015 Armenise-Harvard Career Development Award
2006-2008 Rubicon Fellowship, Netherlands Organization for Scientific Research (NWO)
2003-2004 Biannual Award “Zilveren Zandloper” for the best PhD thesis in biotechnology, Netherlands Society for Biotechnology
2003 Best PhD Publication Award, Bijvoet Center for Biomolecular Research, Utrecht University, The Netherlands

**Tiziana Anelli, PhD.**

I got a degree in Biological Sciences at the University of Milan in 1999, and in 2003 the PhD in Immunology at the University of Ancona, during which I isolated and described a protein, identified as key element in Protein Quality Control in the Secretory Pathway. Since 2006, I work as a Post Doc in the Protein Transport and Secretion laboratory, San Raffaele Scientific Institute Milan, in 2008 I started teaching in Vita-Salute University. Since 1st October 2016, I’m hired as Researcher at San Raffaele Scientific Institute Milan. In 2012 I became a member of the ABCD and since 2014 member of the Editorial Board of BioMed Research International. I was one of the organizers of the Retreat of the OSR Division of Genetics and Cell Biology in 2014 and 2015. During my career I got interested in protein folding and aggregation in the secretory pathway, identifying new steps of quality control and describing how this processes are linked to Calcium signaling from the Endoplasmic Reticulum.

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**Genetics and Developmental Biology**

**Luca Rampoldi**

*Education*

1998 PhD in Genetics, Università degli Studi of Padua
1994 Master’s Degree with honor, Università degli Studi of Milan

*Professional Experience*

2009- Associate Telethon Scientist, Head of Research Group, Telethon Dulbecco Institute, DIBIT San Raffaele Scientific Research Institute

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UNIVERSITÀ VITA-SALUTE SAN RAFFAELE

STUDENT GUIDE

FACULTY OF MEDICINE AND SURGERY

MASTER’S DEGREE COURSE
INTERNATIONAL MD PROGRAM

Academic Year 2017/2018
Notice from the University Committee of the enhancement of quality on the questionnaires for the evaluation of courses and teaching

Vita-Salute San Raffaele University considers a continuous process of monitoring and evaluating the quality of the educational mission, also in terms of planning, as essential for achieving excellence in higher education and research.

UniSR Students can assess the correspondence between the teaching quality offered and their expectation. That is very important to improve teaching and training and develop successful strategies.

At the end of each semester, students’ opinions are collected through evaluation questionnaires. Filling in the questionnaire is compulsory, according to the guidelines published in November 2013 by ANVUR (the National Agency for the Evaluation of the University and Research Systems). IT techniques have been implemented to speed up questionnaire collection and processing. Anonymity is fully guaranteed.

Filling in the questionnaires is the necessary condition which allows a student to register for the exams. After collection, data are firstly conveyed to the Master’s degree course Coordinators and to the Deans of the Faculties and finally to the University Evaluation Commission for the analysis of data.

The data collected will be a fundamental source to spot every sort of issue, thus for future improvement.

In short, filling in the questionnaires represents a key moment of University life in which students take a role of responsibility together with academia and University organization structures in the continuous process of improvement and innovation which makes it possible for our University to rank among the top Universities in the nation and Europe.

We really appreciate all respondents’ valuable time to fill up the questionnaires, especially during intense study times and we would like to raise students’ awareness of the importance of their contribution by carrying out this task responsibly and sharing the same objectives together with this Institution.

The President of the University Committee for the enhancement of quality
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<td>26</td>
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<td>27</td>
<td>Extra Exam Session</td>
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<td>28</td>
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<td>30</td>
<td>Extra Exam Session</td>
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<td>31</td>
<td>Easter Monday</td>
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<td>New Academic Year</td>
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<td>Start of New Session</td>
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**Weekend Event**

- **New Year’s Day**
- **Easter Monday**
- **Holiday**
- **Extra Exam Session**
- **Study Leave**

**Notes**

- Extra Exam Session: Additional exam sessions that may be scheduled outside of the regular academic year.
- Study Leave: Periods when students are not required to attend classes but are expected to continue with their academic work.
- Holiday: Observance of various holidays that may affect academic schedules.

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**Student Guide A.Y. 2017/2018**

Master's Degree Course International MD Program_Year 2
YEAR 2

- Human Morphology
- Histology
- Physiology
- Principles of Pharmacology
- Introduction to Surgery
HUMAN MORPHOLOGY

Total Credits: 21
Lessons: 165 h
Practicals: 16 h

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

Course Coordinator: Ottavio Cremona
Email: cremona.ottavio@unisr.it

Professors:
Ottavio Cremona Email: cremona.ottavio@hsr.it
(www.unisr.it/k-teacher/cremona-ottavio/)
Andrea Falini Email: falini.andrea@hsr.it
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Filippo Casoni Email: casoni.filippo@hsr.it
(www.unisr.it/k-teacher/casoni-filippomarco/)
Antonio Esposito Email: esposito.antonio@hsr.it
(www.unisr.it/k-teacher/esposito-antonio/)
Laura Mangiavini Email: mangiavini.laura@hsr.it
Giangiacomo Consalez Email: consalez.giangiacomo@hsr.it
(www.unisr.it/k-teacher/consalez-giangiacomogermano/)
Marco Vitale Email: marco.vitale@unipr.it
Angelo Lombardo Email: lombardo.angelo@hsr.it
(www.unisr.it/k-teacher/lombardo-angeloleone/)
Fabrizio Michetti Email: fabrizio.michetti@unicatt.it

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:

- Histology
- Cell Biology and Cytology

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

- A multiple-choice exam on “Dynamics of Movement”
- A multiple-choice exam on “Splanchnology”
- A multiple-choice exam on “Neuroanatomy”
Program
1<sup>st</sup> semester:

MORPHOLOGY OF ORGAN SYSTEMS

- **Support and Movement**
  - Skin
  - 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**
  - Blood
    1. Blood.
    2. Hematopoiesis
  - Cardiovascular system
    3. Heart.
    4. Structure of Vessels
      - Head and neck.
      - Thorax.
      - Abdomen.
  - Lymphatic system
    7. Overview and structure of the system
    8. Major lymphatic vessels
  - 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):

- **Moore - Clinically Oriented Anatomy** by Keith L. Moore, Anne M. R. Agur, Arthur F. Dalley
  **ISBN:** 978-1451119459

- **Atlas of Human Anatomy** by Frank H. Netter  **ISBN:**978-1455704187


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

Reference textbooks:

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

- **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

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HISTOLOGY
Total Credits: 9
Lectures: 64 hours
Practicals: 20 hours (divided in groups)
Scientific Discipline Sector: BIO/17

Course Coordinator: Prof. Luigi Naldini
Email: naldini.luigi@hsr.it  (http://www.unisr.it/k-teacher/naldini-luigi/)

Prof. Angelo Lombardo
Email: lombardo.angelo@hsr.it

Prof. Alessio Cantore
Email: cantore.alessio@hsr.it

Tutorials:
Prof. Alessio Cantore – Dr. Renato Ostuni – Dr. Nadia Coltella

Type of subject: Biological bases of medical discipline.
Field: Structure, function and maintenance of human tissues.

Course objectives:
The aim of this course is to provide a comprehensive understanding of structure, composition and function of the basic tissue types and their contribution to organ architecture. The course will start with the morphological description of tissues, accompanied by direct observation of histological specimens at the optical microscope, during practical sessions. Particular emphasis will be given to histogenetic mechanisms and functional aspects that characterize the differentiated state in different tissues and to cellular and extra-cellular specializations, interactions among different cell types and the tissue microenvironment. Moreover, recent updates on tissue homeostasis, stability/reversibility of the differentiated state, tissue turnover, aging, regeneration and functional aspects of the different stem cell compartments will also be covered. We will also touch upon the main methods of research and experimental models and the possible therapeutic implications of regenerative medicine, including cell and gene therapy.

Course attendance
Class attendance is recommended for easier capture of the key topics and recent updates provided by the teachers, however, class attendance and audio recordings do not substitute for a comprehensive review of the subject on one of the suggested textbook.

At the end of this course, students should be able to:
- Describe all major tissue types and subtypes, their developmental origin, function, maintenance and contribution to organs and systems.
- Identify tissue types, subtypes, the major contributing cell types and presence/type of extracellular matrix on histological sections.
- Understand and describe the role of differentiated cells and extracellular matrix to tissue composition and function, and the contribution of stem and progenitor cell compartments to tissue homeostasis, turnover, aging and regeneration.
- Describe the experimental methods and techniques used for studying the tissues and relate the findings to the current understanding of tissue biology.
- Acknowledge from a scientifically informed standpoint the promise of recent advances in stem cell manipulation and tissue replacement and regeneration while being aware of their current limitations and major gaps in our knowledge.
- Search the scientific literature for further investigation of a subject.
Textbooks
Wheater – Functional histology – A text and color atlas
Young B., O’Dowd G., Woodford P.
Elsevier
ISBN: 9780702047473

Histology: A Text and Atlas, with Correlated Cell and Molecular Biology, 7th Edition
Michael H. Ross, Wojciech Pawlina.
Wolters Kluwer
ISBN: 9781451187427

Langman’s Medical Embryology. Thirteenth Edition
Sadler T. W.
Wolters Kluwer
ISBN: 9781451113426

The course has as prerequisite the knowledge acquired in the courses:
“Chemistry and Biochemistry”, “Cell and Molecular Biology” and “Human Genetics and Genomics”

The course is a prerequisite for:
“Human Morphology”, “Physiology” and “Basic Pathology and Immunology”

Evaluation of acquired knowledge
The exam comprises:
- a multiple choice written test, probing general knowledge of the topics of the program, drawn from widely adopted international databases of questions
- a test conducted on histological sections to identify the tissue types, subtypes and major contributing cell types; if this test will be conducted together with the Human Morphology course it will be broadened to identify the organ, and the outcome will be used in both courses for computing the final scores.
- an oral exam probing the critical knowledge of the subject acquired during the classes

The final score will be computed from the three sessions.
PHYSIOLOGY
Total Credits: 17
Lessons: 169 hrs
Practicals: 50 hrs
SSD: B10/09

Course Coordinator:
Federico Esposti
Email: esposti.federico@hsr.it
www.unisr.it/k-teacher/esposti-federico

Professors Teaching:
Mirko Baruscotti
Email: mirko.baruscotti@unimi.it
Giacomo De Propris
Email: depropris.licia@hsr.it
Federico Esposti
Email: esposti.federico@hsr.it
Chiara Mazzarelli
Email: chiara.mazzarelli@ospedaleniguarda.it
Marco Paoli
Email: marco.paoli@unitn.it
Eugenio Rapisarda
Email: rapisarda.eugenio@hsr.it

Tutors
Gabriella Racchetti
Email: racchetti.gabriella@hsr.it
Maddalena Ripamonti
Email: ripamonti.maddalena@hsr.it

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. Marco Paoli and Prof. Licia De Propris)
1. Historical grounds of physiology; Units and Scales in physiology; The concept of homeostasis
2. Cellular Membranes and Transmembrane Transport of Solute and Water
3. Thermodynamics of membrane transport
5. Diffusion and permeability
6. Osmosis and regulation of cell volume
7. Intracellular pH Regulation
8. Ionic Equilibria and the concept of equilibrium potential.
10. Gibbs-Donnan equilibrium potentials. Intracellular chloride regulation
11. Patch-clamp techniques and analysis of cell currents and ion channels
12. Ion channel families
13. Structure-function of voltage-gated ion channels
14. Electrogenesis of membrane excitability
15. Generation and conduction of action potentials
16. The H.H. Model
17. Cable properties and propagation of action potentials
18. Derivation of the Cable Equation and the AC length constant
19. 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. Chiara Mazzarelli)**
1. Introduction to the digestive system
2. Nutrition and energy metabolism
3. The enteric nervous system
4. Motility of the Gastrointestinal Tract
5. Gastrointestinal Secretions
6. Digestion and Absorption for lipids, carbohydrates, proteins
7. The liver physiology (Prof. Giacomo Concone)

**Physiology of the Cardiovascular System (Prof. Mirko Baruscotti)**
1. Overview of the heart and circulation
2. The autonomic nervous system and its control
3. Introduction to Cardiac Muscle Physiology
4. Electrical Activity of the Heart
5. Natural Excitation of the Heart and the pacemaker ion channels
6. ECG recording techniques
7. Excitation-contraction coupling in the cardiac and skeletal muscle; regulation of Ca2+ release from the sarcoplasmic reticulum
8. Cardiac Pump
9. Regulation of the Heartbeat
10. Hemodynamics
11. Arterial System
12. Microcirculation and Lymphatics
13. Peripheral Circulation and Its Control
14. Control of Cardiac Output. Coupling of the Heart and Blood Vessels
15. Interplay of Central and Peripheral Factors in Control of the Circulation

**Physiology of the Respiratory System (Prof. Federico Esposti)**
1. Overview of the Respiratory System
2. Mechanical Properties of the Lung and Chest Wall
3. Ventilation, Perfusion, and their Relationship
4. Oxygen and Carbon Dioxide Transport
5. Control of Respiration
6. Nonrespiratory Functions of the Lung

**Physiology of the Reproductive System (Prof. Federico Esposti)**
1. Introduction: Reproductive systems & Evolution
2. Male Reproductive System
3. Female Reproductive System
4. Human Reproductive Behaviour
SECOND SEMESTER

Renal Physiology (Prof. Giacomo Concone)
  1. Elements of Renal Function
  2. The Nephron; The ultrafiltration process
  3. Solute and Water Transport Along the Nephron. Tubular Function
  4. Feedback mechanisms and autoregulation of the kidney function
  5. Control of Body Fluid Osmolality and Extracellular Fluid Volume
  6. Potassium, Calcium, and Phosphate Homeostasis
  7. Intracellular pH Regulation and role of the Kidneys in Acid-Base Balance

Physiology of the Endocrine System (Prof. Chiara Mazzarelli)
  1. General Principles of Endocrine Physiology
  2. Whole-Body Metabolism
  3. Hormones of the Pancreatic Islets
  4. Endocrine Regulation of the Metabolism of Calcium and Phosphate
  5. Hypothalamus and Pituitary Gland
  6. Thyroid Gland
  7. Adrenal Cortex
  8. Adrenal Medulla

Physiology of the Nervous System (Prof. Federico Esposti)
  1. Cellular and functional organization of the nervous system
  2. Introduction to synaptic transmission
  3. Synaptic transmission and ligand-gated ion channels
  4. Synaptic transmission and release of neurotransmitter molecules. Quantal analysis of synaptic transmission
  5. Associative and non-associative forms of synaptic plasticity
  6. The Autonomic Nervous System
  7. Emotions and the Limbic System
  8. Psychophysics laws
  9. The general structure of sensory nervous systems
 10. The somatosensory system
 11. The visual system
 12. Attention and Eye Movements
 13. The auditory system
 14. Chemical senses
 15. The central organization of the motor system and the motor pathways, the role of brainstem, basal nuclei and cerebellum
 16. The spinal reflex and locomotor activity centers in the spinal cord
 17. Brain rhythms, sleep, wakefulness, consciousness. EEG recordings
 18. Pain
 19. Generalities on higher brain functions
 20. Learning and memory
 21. Decision making and the prefrontal cortex
 22. Language processing.
FORMATIVE ASSESSMENT AND EXAMS

Class attendance is compulsory to all theoretical lectures and class presentations. Teachers will keep record of the attendance of students in class independently of the automatic lecture attendance system (any discrepancy between these two modalities will be officially notified to the Dean).

The evaluation process will be performed in five steps.

1. Students will be evaluated at the end of the first week of lesson in a written exam concerning the Review of Electricity. This test will give the students a mark between 0 and 2 points. The participation to this test is compulsory.
2. Students will be evaluated at the end of the first semester in a multiple-choice test concerning all the subjects presented during the lessons of the first semester (but Review of Electricity). This test will give the students a mark between 0 and 12 points. The test will be considered as positive if the student will obtain a mark of 8 or above. The participation to this test is compulsory.
3. In the course of the first semester, students will be evaluated in small groups on the oral presentation to the class of a scientific paper provided by the teachers. This presentation will give the student an evaluation between 0 and 2 points.
4. Students will be evaluated at the end of the second semester in a multiple-choice test concerning all the subjects presented during the lessons of the second semester. This test will give the students a mark between 0 and 14 points. The test will be considered as positive if the student obtains a mark of 9 or above. The participation to this test is compulsory.
5. Students that will obtain a sum of the previous 4 tests equal or above 27 will have the possibility to have an oral exam, that will modify their mark in the range between plus or minus 3 points. The oral exam will focus on the topics of the second semester.

The final mark will be the arithmetic sum of the points gained in the five tests, rounded to the closest integer. Full marks (30 cum laude) will be awarded to students reaching a total of points above 30.

In the multiple-choice tests, students will gain 1 point for each correct answer, 0 points for any blank answer, and -0.2 points for any wrong answer. The obtained sum will be scaled on 12 (in the case of the first multiple-choice test) or 14 (in the case of the second multiple-choice test) points.

If a student did not obtain a positive evaluation in one of (or both) the multiple-choice tests, they will have to repeat that (or both the) multiple-choice test(s). The scientific paper small-group presentation will not be repeated; the student will keep the points gained at the first time of his/her presentation.

The students that got a total evaluation equal or higher than 18, but willing to redo one or both of the multiple-choice tests, will have this option. However, please be aware that participating to one of such tests will automatically delete the corresponding evaluation that the student gained in the previous test.

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).

COURSE TEXTBOOKS

3) Course Syllabus and other reading material provided on the intranet (course page)

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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: on Fridays from 16:00 to 17:00 in (Dibit1, 3A3, lab 58 – to be confirmed by email)

Prof. Michele Simonato  Email: simonato.michele@hsr.it
Prof. Riccardo Fesce  Email: riccardo.fesce@uninsubria.it
Dr. Jenny Sassone  Email: sassone.jenny@hsr.it

Tutors:
Barbara Bettegazzi  Email: bettegazzi.barbara@hsr.it
Daniele Carettoni  Email: daniele.carettoni.dc@axxam.com
Ilaria Prada  Email: ilariaprada@gmail.com
Gianluca Verlengia  Email: verlengia.gianluca@hsr.it

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 analyse 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!). The XIII edition is going to be released soon.

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 multiple choice test with 30 questions, to be completed within 45 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 analyses:
   - 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;
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.
12. Principles of Pharmacovigilance and Pharmacoeconomy

*****
INTRODUCTION TO SURGERY

Total Credits: 3
Lessons: 30 hrs
Practicals: 8 hrs

Scientific Discipline Sector: MED/18 – MED/19

LOCK HOURS: 30 hours of academic lessons; 8 hours of practical activities (dummy practice, OR attendance)

COURSE DIRECTOR: Andrea Vignali MD, Professor
COURSE TEACHERS: Vignali Andrea MD, Professor, Rosati Riccardo MD, professor, Martella Stefano MD, Doctor
COURSE TUTORS: Puccetti Francesco MD, Iera Marco MD,

EMAIL: vignali.andrea@hsr.it; rosati.riccardo@hsr.it; martella.stefano@hsr.it

COURSE DESCRIPTION: Medical terms, abbreviations and definitions with associated anatomy. Topics include roots, prefixes, and suffixes commonly used in the medical field and terminology related to body systems and disorders. The aim of the training in basis of the surgical propaedeutic is to introduce the main principles of the surgical care and treatment, training of the basic surgical procedures. The Course will be also focused on the knowledge of the wound healing, care and complications, its prevention and treatment and also the basic principles, techniques and specifics of the anesthesiology, general surgery and plastic surgery. The course will be articulated in 15 lessons of two hours each and 8 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.

COURSE OUTCOMES: Upon successful completion of this course, the Student will be able to:

- to provide complete clinical investigation of the surgical patient, taking a medical history of the patient, making objective examination of the patient,
- Fulfill an informed Consent for surgical procedure
- Have a complete knowledge of the operation room and its equipment, and related rules of asepsis and antisepsis, and the appropriate use of antibiotics
- Demonstrate the preparation of the surgical wound dressing
- Identify /distinguish sutures by package labeling, sizes and select proper sutures
- Properly pass suture-needle combinations
- Describe safe use of dispersive and active electrodes
- Describe the preoperative preparation of room equipment for different surgical procedure and patient positioning
- Describe the characteristics of tissue
- Identify classifications of instruments
- Describe the care and handling of instruments
- Recognize specific abdominal incisions
- Differentiate between muscle-splitting and muscle cutting incisions
• Describe the tissue layers of the anterior abdominal wall
• Describe and recognize the different type of drain and their appropriate use
• Describe and recognize the different type of surgical anastomosis and their use
• Basic principles of anesthesia in general surgery and early postoperative care
• Recognize the basic principles of Parenteral and enteral nutrition, diets
• Knowledge of basic principles of Enhanced Recovery after Surgery pathway and their application in the current clinical practice
• Principles and Techniques of flaps, graft and lipofilling.
• The role of plastic surgery in the harmony of the face
• Bases and device in wound care
• Suture: Bases and instruments
• Techniques and innovations in reconstructive Breast surgery

**TEXTS:** Sabiston Textbook of Surgery
20th Edition The Biological Basis of Modern Surgical Practice (elsevier)

**Disclaimer:** Textbooks frequently change editions, so please be sure to check with the school to verify the current ISBN of the textbook.

**OTHER SUPPLIES:** In lesson slides, will be available for the student on the University website.

**METHODS OF EVALUATION:**
Students will be evaluated on the themes treated during the course, including also the practice part.

- Tests will consist of 31 multiple choices and possibly matching. The instructor will go over the number of tests and quizzes to be taken.
- 45 Minutes will be given to complete the test.
- A judgement of idoneity will be given once the final written test will be passed. Completion of 60 of higher is necessary to obtain a passing grade.

**EXAM RULES**

**Cheating Don’t**

- Do not use books, notes or any materials other than those specified at the time of testing.
- Do not exchange information with a classmate during the test or afterwards with a classmate who has not yet taken the test.
- Failure to abide by the rules on cheating even once will result in dismissal from this course
- Further information regarding plagiarism is included with the report assignment.

**Academic Dishonesty**

Any form of academic dishonesty, cheating, plagiarizing, or other academic misconduct is prohibited. “Plagiarism may result from: (1) failing to cite quotations and borrowed ideas, (2) failing to enclose borrowed language in quotation marks, and (3) failing to put summaries and paraphrases in your own words”.

Academic dishonesty may be defined as, but is not limited to, intentionally trying to deceive by:

- Claiming credit for the work of another person, using information from a web page or source without citing the reference
- Fraudulently using someone else’s work on an exam, paper, or assignment
- Recycling your own work from another course
- Purchasing papers or materials from another source and presenting them as your own
- Attempting to obtain exams/ materials/ assignments in advance of the date of administration by the instructor
- Impersonating someone else in a testing situation
- Providing confidential test information to someone else
- Submitting the same assignment in two different classes without requesting both instructor’s permission
- Allowing someone else to copy or use your work
- Using someone else’s work to complete your own
- Altering documents, transcripts or grades
- Forging a faculty/ staff member’s signature

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

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INSTRUCTORS’ CVs

Alessio Cantore
Alessio Cantore graduated in Biotechnology in 2004 at the University of Bologna, Italy. In 2006 he got his Master degree in Medical Biotechnology at the San Raffaele “Vita-Salute” University in Milano. In 2012, he got an international Ph.D. in Cellular and Molecular Biology, by “Vita-Salute” San Raffaele University, Milan and the Open University, London, UK. After a 3-year post-doctoral training in Prof. Luigi Naldini laboratory at the San Raffaele Telethon Institute for Gene Therapy, in 2016 he was appointed Project Leader at the same institute. He has 10-year experience in regenerative medicine, lentiviral vector development and liver gene transfer and therapy, in several animal models of different diseases. He is author on 9 original research articles in peer-reviewed international scientific journals, of which 4 as first author, 4 as second author, that have been collectively cited more than 750 times (as of August 2016).

Renato Ostuni, PhD
Renato Ostuni is Group Leader of the research unit “Genomics of the Innate Immune System” at the San Raffaele-Telethon Institute for Gene Therapy (SR-TIGET. Research in our lab focuses on the epigenetic and transcriptional mechanisms controlling the development and functions of innate immune cells. We are particularly interested in the mechanic principles of macrophage activation and plasticity in vivo during physiological and pathological conditions, including microbial infections, neurodegeneration, and cancer. To address these questions, we employ a combination of cutting-edge genomic approaches (large-scale/low-input epigenomics and transcriptomics, CRISPR-based genome engineering), advanced lentiviral-mediated gene delivery platforms and immunological assays, together with relevant animal and human models. Our goal is to develop novel cell and gene therapy approaches involving manipulation of macrophage functions for human inflammatory diseases.

Laura Mangiavini
Current Position
Attending orthopaedic surgeon at IRCCS Galeazzi, Milan
Education
University of Milan Italian National Board Medicine and Surgery (01/2008)
University of Milan-Bicocca Specialization in Orthopaedics and Traumatology (03/2013)
Postdoctoral Training
Residency in Orthopaedics and Traumatology (04/2008-03/2013) c/o Hospital San Gerardo, Milan
Massachusetts General Hospital Research fellow Medicine/Endocrinology
and Harvard Medical School

Marco Vitale
1985: MD degree, cum laude, University of Bologna.
1986: visiting scientist at the New York Medical College, Dept. of Microbiology and Immunology, NY, USA.
1994-95: visiting scientist at the Kimmel Cancer Center, Jefferson University, Philadelphia, USA.
1992- 2000: Associate Professor of Human Anatomy, Faculty of Medicine, University of Brescia.
2000-present: Full Professor of Human Anatomy, Faculty of Medicine, University of Parma.
Vice-Dean, Faculty of Medicine, University of Parma.
Dean, Curriculum of Sport Sciences, University of Parma.
Director of the Center for Body Composition (CMBC)

Referee for international journals: Blood, Journal of Immunology, Stem Cells, Journal of Biological Chemistry.

Author of 127 peer reviewed full length papers, covering the following fields: antitumor cytokines, hematopoietic progenitors, signal transduction, apoptosis, platelet activation, anthropometry, biometry.

**Fabrizio Michetti**

*CURRENT POSITION AND TITLE*

1999/present: Full Professor of Anatomy and Chairman of the Institute of Anatomy and Cell Biology, School of Medicine, Università Cattolica S. Cuore, Rome. Retired since November 1st, 2016.
1997/present: Director of PhD program in Molecular Morphology, Università Cattolica S. Cuore, Rome
1999/present: Member of the academic board for the PhD program in Neuroscience, Università Cattolica S. Cuore, Rome
2006/present: Chairman of the Latium Musculo-Skeletal Tissue Bank
2011/present: Appointed to hold a course on Neuroanatomy, Master's degree in Bioengineering, University Paris Descartes

*EDUCATION AND TRAINING*

1970: MD Degree (Università Cattolica S. Cuore, Rome).
1974: Neurologist (Università Cattolica S. Cuore, Rome).
1977: Psychiatrist (Università Cattolica S. Cuore, Rome).

*POSITIONS AND EMPLOYMENT*

1996/1999: Full Professor of Histology, School of Medicine, Università Cattolica S. Cuore, Rome

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**Marco Paoli**

*EDUCATION*

2010 PhD
Bioscience – Cell Biology / Department of Biomedical Sciences, University of Padova, Italy
2006 Master Degree
Molecular Biology / University of Padova, Italy
2004 Bachelor Degree
Molecular Biology / University of Padova, Italy

*CURRENT POSITION*

Nov, 2016 – Research Associate
Laboratory of Insects Neurobiology / Dept of Biology, University of Konstanz, Germany
2012 – Oct, 2016 Research Associate
Laboratory of Neurophysics / CIMeC, University of Trento, Italy

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**Eugenio Rapisarda**

*Professional Experiences*

Oct. 2013-
Vita-Salute San Raffaele University – Faculty of Medicine and Surgery
Adjunct Professor for "Biophysics" – International MD Program, Master’s Degree in Medicine and Surgery in English

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**Vincenzo Zimarino**

*Education and Professional Experience*
1978-1981 Pre-graduate student, Dept. Molecular Pathology, University of Naples.
1981 Medical degree, summa cum laude.
1981-1983 Post-graduate student, Dept. Molecular Pathology, University of Naples.
1984-1990 Research Associate, Laboratory of Biochemistry, National Cancer Institute, National Institutes of Health, Bethesda, MD, USA.
Visiting scholar (1989-1990) - Department of Biochemistry, Molecular and Cellular Biology, Northwestern University, Evanston, IL, USA
1991-1994 Seniorfellow, Danish Cancer Society grant, Institute of Molecular Cell Biology, København University, København DK.
1994-present Staff - San Raffaele Scientific Institute, Milan, Italy.

**Giacomo Concone**
Giacomo Concone graduated in Medicine at the University of Milan in July 2009; He then moved to the University of Pavia and specialized in General Surgery in May 2016 with honors.
In the last few years he has worked at the General Surgery and Transplantation Centre of Niguarda Ca’ Granda Hospital in Milan, under the guidance of Professor Luciano De Carlis, M.D. F.E.B.S. with whom he has deepened his knowledge in multi-organ procurement, liver and kidney transplantation and hepatobiliary surgery. His relevant past experiences were carried out first at Ospedale San Paolo in Milan, where he dedicated to open and laparoscopic surgery in an emergency department, and subsequently at IRCCS policlinico San Matteo in Pavia, where he continued his training on general and emergency surgery under the supervision of Prof. P.Dionigi and received a focused training in laparoscopic and robotic surgery with Prof. Pietrabissa. He took part into several congresses, predominantly dedicated to liver and pancreatic surgery or minimally-invasive surgery and he was participant in several sponsor international multicenter trials conducted following the ICH-GCP requirements in continuous update. His major areas of medical interest reside in hepatobiliary and pancreatic surgery for malignancies, abdominal organ transplantation, living donor transplantation, laparoscopic liver resection and minimally invasive surgery. He is also research associate in the lab of Dr. Esposti - San Raffaele Research Institute, Department of Neuroscience - where he works on the development of new diagnostic biomarkers for liver pathophysiology.

**Daniele Zacchetti**

*EDUCATION AND QUALIFICATIONS*
Doctor of Pharmaceutical Chemistry and Technology, grade 110/110 cum laude, University of Milano, Italy.
12 July 1989.
Thesis: "Mechanisms of alpha-latrotoxin action: role of Ca2+ in receptor binding and polyphosphoinositide hydrolysis".
Italian State Professional Examination for Pharmacist, Milano, Italy.
April 1990

Ph. D. in Cellular and Molecular Biology, University of Milano, Italy.
14 September 1993
Thesis: "Receptor activation and calcium increases: multiple mechanisms working in PC12 cells".

*RESEARCH EXPERIENCE*
Oct 1997 - Present.
Investigator at the Department of Biological and Technological Science (Dibit)-Scient. Inst. H. San Raffaele, Milano, Italy.

*TEACHING EXPERIENCE*
20 October - 1 November 1991
Lecture: "Calcium fluxes and distribution in neurons".
Ph. D. program in Pharmacology, University of Milano, Italy. Course on "Morphological techniques in pharmacological research".
10 February 1993
Lecture: "Video-imaging".

Demonstrator at the International Course on Advanced techniques for calcium ion measurements in living cells. Milano, Italy.
Titles: "\([\text{Ca}^{2+}]_i\) measurements on cell populations" and "\(\text{Ca}^{2+}\) fluxes measured by means of 45\(\text{Ca}^{2+}\)"

Demonstrator at the EMBO Course "Methods in Cell Biology", EMBL, Heidelberg, Germany.
1-11 October 1995
Topic: "Biogenesis of epithelial cell polarity"

Demonstrator at the Ph.D. Program of the European Molecular Biology Laboratory, Heidelberg, Germany.
November 1995
Title: "Two-dimensional gel electrophoresis"

**Riccardo Fesce**
1983-1985 Research Associate at Biophysics Department, the Rockefeller University, New York, NY.
- From 1985 Researcher, Consiglio Nazionale delle Ricerche Centro di Farmacologia Cellulare e Molecolare, Milano.
- From 1995, Head of Theoretical Biology Unit at Dibit, S. Raffaele Scientific Research Institute, Milan. Affiliated to the Neuroscience Department.
- From Sept. 2001, Associate Professor of Physiology, Università dell'Insubria, Varese, Italy.

**Michele Simonato**

*EDUCATION*
- Medical Toxicology Specialization, December 1986, University of Firenze, Florence, Italy. Final score: 70/70, cum laude.

*PROFESSIONAL BACKGROUND*
- Postdoctoral Research Fellow. Department of Pharmacology, University of Alabama at Birmingham, Birmingham, AL, USA (1986-87).
- Research Associate. Department of Medicine, Duke University, Durham, NC, USA (1988-89).
- Fulbright Scholar. Duke University Medical Center, Department of Medicine, Durham, NC, USA (1989).
- Consultant. Department of Medicine, Duke Center for the Advanced Study of Epilepsy, Duke University, Durham, NC, USA (1990-93).
- Ricercatore Universitario (Researcher and Assistant Professor). Institute of Pharmacology, University of Ferrara, Ferrara (1985-2001).
- Dirigente Medico (Medical staff). Clinical Pharmacology Unit, Sant'Anna Hospital, Ferrara (1994-present).
- Associate Professor. Department of Clinical and Experimental Medicine – Section of Pharmacology, University of Ferrara, Ferrara (2001-present).

**SCIENTIFIC ACTIVITY**
- Author of 96 papers in international, peer-reviewed journals.

**Andrea Vignali**

*Education*
- Doctor of Medicine (MD), University of Milan, School of Medicine, Medical degree score 110/110 cum laude, 1989.
- Residency in Emergency Surgery, University of Milan. Medical degree score 70/70 cum laude, 1994.

*International Experience*
1990 Training in Emergency Surgery, Departamento de Cirurgía de Urgencia, Hospital Arnau De Vilanova Lleida (Lefe Prof E. Vinas) Universidad de Barcelona, Spain
1994 -1996 Research Fellow, Department of Colorectal Surgery, The Cleveland Clinic Foundation Cleveland (OH)-USA

Active member of the following international scientific societies: European Society of Coloproctology, American Society of Colorectal Surgeons and of Società Italiana di Chirurgia Colorettale.
UNIVERSITÀ VITA-SALUTE SAN RAFFAELE

STUDENT GUIDE

FACULTY OF MEDICINE AND SURGERY

MASTER’S DEGREE COURSE
INTERNATIONAL MD PROGRAM

Academic Year 2017/2018
# Academic Calendar

## Provisional

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**Student Guide A.Y. 2017/2018**

Master's Degree Course International MD Program

Pag. 2 di 32
Notice from the University Committee of the enhancement of quality
on the questionnaires for the evaluation of courses and teaching

Vita-Salute San Raffaele University considers a continuous process of monitoring and evaluating the quality of the educational mission, also in terms of planning, as essential for achieving excellence in higher education and research.

UniSR Students can assess the correspondence between the teaching quality offered and their expectation. That is very important to improve teaching and training and develop successful strategies.

At the end of each semester, students’ opinions are collected through evaluation questionnaires. Filling in the questionnaire is compulsory, according to the guidelines published in November 2013 by ANVUR (the National Agency for the Evaluation of the University and Research Systems). IT techniques have been implemented to speed up questionnaire collection and processing. Anonymity is fully guaranteed.

Filling in the questionnaires is the necessary condition which allows a student to register for the exams. After collection, data are firstly conveyed to the Master’s degree course Coordinators and to the Deans of the Faculties and finally to the University Evaluation Commission for the analysis of data.

The data collected will be a fundamental source to spot every sort of issue, thus for future improvement.

In short, filling in the questionnaires represents a key moment of University life in which students take a role of responsibility together with academia and University organization structures in the continuous process of improvement and innovation which makes it possible for our University to rank among the top Universities in the nation and Europe.

We really appreciate all respondents’ valuable time to fill up the questionnaires, especially during intense study times and we would like to raise students’ awareness of the importance of their contribution by carrying out this task responsibly and sharing the same objectives together with this Institution.

The President of the University Committee
for the enhancement of quality
YE3R 3

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

Total Credits: 13
Total hours: 130
Scientific Discipline Sector: MED/04 - MED/08

Teaching staff
Course Coordinator: Prof. Guido Poli
(www.unisr.it/k-teacher/poli-guido/)
Email: poli.guido@hsr.it
Prof. Ruggero Pardi
(www.unisr.it/k-teacher/pardi-ruggero/)
Email: pardi.ruggero@hsr.it
Prof. Maurilio Ponzoni
(www.unisr.it/k-teacher/ponzioni-maurilio/)
Email: ponzoni.maurilio@hsr.it
Dr. Attilio Bondanza
(www.unisr.it/k-teacher/bondanza-attilio/)
Email: bondanza.attilio@hsr.it
Dr. Matteo Iannacone
Email: iannacone.matteo@hsr.it
Dr. Mirela Kuka
(www.unisr.it/k-teacher/kuka-mirela/)
Email: kuka.mirela@hsr.it
Dr. Federica Pedica
Email: pedica.federica@hsr.it

Course Description
The BPI course will be articulated in two parts. The first part (composed of 36 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 and evolution. Immunology lessons will provide state of art information on both innate and adaptive immune responses to pathogens and to 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 form 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.

In addition, there will be 5 lessons (10 h) in the Microscope Laboratory with the objective of linking the students’ theoretical knowledge with histopathological images of actual clinical cases.

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, 10e (Robbins Pathology) - mandatory
Cellular and Molecular Immunology: with STUDENT CONSULT Online Access, 8e (Abbas, Cellular and Molecular Immunology) – highly suggested
Microbiology and Mechanism of Infectious Diseases

Total Credits: 7
Total hours: 70
Scientific Discipline Sector: MED/07 - VET/06 – BIO/14

Teaching staff

Course Coordinator: Prof. Nicasio Mancini  Email: mancini.nicasio@hsr.it (www.unisr.it/k-teacher/mancini-nicasio/)
Receiving hour: Monday from 13:00 to 14:00

Prof. Mauro Pistello  Email: mauro.pistello@med.unipi.it
Prof. Nicola Clementi  Email: clementi.nicola@hsr.it (www.unisr.it/k-teacher/clementi-nicola/)
Dr. Laura Infurnari  Email: infurnari.laura@hsr.it

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 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
- 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 agent 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
- 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*
- *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
- Diphyllobothrium latum
- Anisakis simplex
- Schistosoma spp
- Filariae
- Echinococcus granulosus

**Suggested textbooks**

Reference:
Title: Medical Microbiology - 8th ed., Authors: Patrick R. Murray, Ken S. Rosenthal, Michael A. Pfaller,

Suggested Readings:

**** **** ****
**CLINICAL LABORATORY MEDICINE**

*Total Credits: 4*
*Total hours: 40*

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

**Course Coordinator:** Prof. Giuseppe Banfi  
Email: [direzione.generale@fondazionesanraffaele.it](mailto:direzione.generale@fondazionesanraffaele.it) (www.unisr.it/k-teacher/banfi-giuseppe/)

Prof. Maurizio Ferrari   Email: [ferrari.maurizio@hsr.it](mailto:ferrari.maurizio@hsr.it)  
(www.unisr.it/k-teacher/ferrari-maurizio/)

Dr. Chiara Di Resta   Email: [diresta.chiara@hsr.it](mailto:diresta.chiara@hsr.it)  
(www.unisr.it/k-teacher/diresta-chiara/)

**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)
- Precision and accuracy. Internal Quality control, external quality assessment.
- Laboratory report, units of measurement, reference intervals, decision limits, reference change value
- Protein analysis and interpretation
- Lipids and lipoproteins
- Blood gas and critical care testing
- Water and electrolyte balance
- Calcium biology and disorders
- Carbohydrate disorders
- Haematological parameters
- Urinalysis and renal parameters
- Methods for DNA amplification
- Methods to detect known mutations
- Methods to detect unknown mutations
- New advanced molecular technologies
- Clinical applications of molecular tests

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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
Course Coordinator: Prof. Paolo Camici
Email: camici.paolo@hsr.it
(www.unisr.it/k-teacher/camici-paologuido/)

Prof. Domenico Cianflone
Email: cianflone.domenico@hsr.it
(www.unisr.it/k-teacher/cianflone-domenico/)

Prof. Alberto Margonato
Email: margonato.alberto@hsr.it
(www.unisr.it/k-teacher/margonato-alberto/)

Dr. Daniele Zacchetti
Email: zacchetti.daniele@hsr.it

Dr. Azeem Latib
Email: latib.azeem@hsr.it

Prof. Franco Cecchi
Email: francocecchi337@gmail.com
(www.unisr.it/k-teacher/francocecchi/)

Prof. Yamume Tshomba
Email: tshomba.yamume@hsr.it
(www.unisr.it/k-teacher/yamume-tshomba/)

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-guidelines/Pages/GuidelinesList.aspx
PRINCIPLES OF SURGERY

Total Credits: 3  
Total hours: 30  
Scientific Discipline Sector: MED/18

Teaching staff
Course Coordinator: Prof. Riccardo Rosati  
Email: rosati.riccardo@hsr.it  
(www.unisr.it/k-teacher/rosati-riccardo/)
Prof. Andrea Vignali  
Email: vignali.andrea@hsr.it
Dr. Luca Aldrighetti  
Email: aldrighetti.luca@hsr.it
Dr. Gianpaolo Balzano  
Email: balzano.gianpaolo@hsr.it
Dr. Paola De Nardi  
Email: denardi.paola@hsr.it
Dr. Ugo Elmore  
Email: elmore.ugo@hsr.it
Prof. Massimo Falconi  
Email: falconi.massimo@hsr.it  
(www.unisr.it/k-teacher/falconi-massimo/)
Dr. Oreste Gentilini  
Email: gentilini.oreste@hsr.it
Dr. Carlo Socci  
Email: socci.carlo@hsr.it
Dr. Andrea Tamburini  
Email: tamburini.andreamarco@hsr.it
Dr. Paolo Parise  
Email: parise.paolo@hsr.it
Dr. Andrea Cossu  
Email: cossu.andrea@hsr.it

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. Attendance to the operating theatre to see directly some open and minimally invasive procedure is also scheduled.

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 different techniques, 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, treatment algorithms, principles of technique, prognosis.
  - **Parathyroid tumors**: epidemiology, pathology classification, symptoms, diagnosis, treatment algorithms, principles of technique, prognosis.

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

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

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

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

**Colon and Rectum**
- **Surgical anatomy of the colon and rectum**
  - **Diverticular disease**: symptoms, diagnosis, complications, treatment algorithm, principles of surgical therapy.
  - **Colorectal cancer**: epidemiology, pathology classification, symptoms, diagnosis, treatment algorithms, principles of surgical and endoscopic therapy, prognosis.
Anus
- Hemorrhoids.
- Fistula in ano.
- Anal fissure.
- Rectal prolapse.

Spleen
- **Surgical anatomy of the spleen**
  - Splenic trauma: epidemiology, symptoms, diagnosis, treatment algorithm, principles of surgical therapy.
  - Splenic lesions: epidemiology, pathology classification, symptoms, diagnosis, treatment algorithms, principles of surgical therapy, prognosis.

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

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

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

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

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

**Suggested textbook:**

1) Sabiston Textbook of Surgery, 19th edition

**Digestive System Diseases**

*Total Credits: 8*
*Total hours: 84*

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

**Teaching staff**

**Course Coordinator**: Prof. Pier Alberto Testoni  
Email: testoni.pieralberto@hsr.it

Receiving hour: by appointment (candela.tiziana@hsr.it) on Wednesday at 13:00 to 14:00.

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**Teaching Assistant**: (Gastroenterology Unit)

Dr. Lorella Fanti
Dr. Chiara Notaristefano
Dr. Sandro Passaretti
Dr. Edi Viale

**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 diarrhoea

**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 hemocromatosis
- 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
Lippincott Williams & Wilkins

RESPIRATORY DISEASES
Total Credits: 5
Lessons: 76 (2 hours every lesson)
SSD: MED/10, MED/36, MED/31, MED/21

Course Coordinator: Prof. Giampiero Negri
Email: Negri.giampiero@hsr.it (http://www.unisr.it/k-teacher/negri-giampiero/)

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COURSE INTRODUCTION

“Respiratory 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 auditory 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 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: Prof. 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.
Tutor:

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).
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. Giampiero Negri
Tutors: Prof. Angelo Carretta, Dr. Alessandro Bandiera, Dr. Paola Ciriaco, Dr. Piergiorgio Muriana, Dr. Armando Puglisi

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,
IV. 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’ 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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- Giacomo De Luca deluca.giacomo@hsr.it

"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 lymph nodes
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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Musculoskeletal Diseases

Total Credits: 2
Total hours: 20
Scientific Discipline Sector: Med/33, Med/34

Teaching staff
Course Coordinator: Prof. Antonio Moroni
E-mail: moroni.antonio@hsr.it
Tutor
Dr. Salvatore Mosca
E-Mail: salvatore.mosca2@unibo.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 a combined written and 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:
**Timetable Sem. I**

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

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INSTRUCTORS CVs

Matteo Iannacone, MD, PhD
Group Leader – Division of Immunology, Infectious Diseases and Transplantation
San Raffaele Scientific Institute - Via Olgettina, 58 – 20132 Milano, ITALY  www.iannaconelab.com

EDUCATION:
2011  Ph.D. in Immunology, Vita-Salute San Raffaele University, Milan, Italy
2007  European Board Certification in Internal Medicine
2001  M.D. degree, University of Milan, Italy

POSITIONS AND TRAINING:
2015 – present  Head, Dynamics of Immune Responses, San Raffaele Scientific Institute, Milan, Italy
2010 – 2015  Group Leader, Dynamics of Immune Responses, San Raffaele Scientific Institute, Milan, Italy
2007 – 2010  Postdoctoral Fellow, Laboratory of Prof. Ulrich von Andrian, Harvard Medical School, Boston, MA
2002 – 2007  Postdoctoral Fellow, Laboratory of Prof. L.G. Guidotti and Prof. F.V. Chisari, The Scripps Research Institute, La Jolla, CA.

Federica Pedica

Work Experience
June 1st 2013–ongoing Consultant histopathologist
Unit of Pathology, Department of Experimental Oncology, DIBIT 2, San Gabriele via Oggettina 60, 20132, Milan
 ▪ Consultant histopathologist
 ▪ Teaching activities for International MD program at San Raffaele University
 ▪ Scientific collaborator of the Director of Pathology Professor Claudio Doglioni

Education and Training
2013-2016 Ph.D in HUMAN ONCOLOGICAL PATHOLOGY AND STEM CELL (School of Biomedical Translational sciences) (completed with “ottimo”, April 22nd, 2016)
Policlinico G.B. Rossi, piazzale L.A. Scuro, University of Verona, Italy
 ▪ Title of Ph.D. thesis “Characterization of neoplastic and non neoplastic microenvironment in liver, lung and bone marrow through the study of class III betatubulin”
may-june 2015 Honorary Clinical Fellow
Institute of Liver Studies, Liver Labs, 3rd Floor, Cheyne Wing, King's College Hospital, Denmark Hill, London
2008-2013 Residency in Human Pathology

George Ian Cremona

In 1986 he graduated in Medicine and Surgery the Università Cattolica del Sacro Cuore of Rome nel 1986 and became qualified doctor in the same year. Nel 1990 he earned the Diploma di Specializzazione in Physiology and Respiratory Diseases at Università Cattolica del Sacro Cuore of Rome and in 1995 il Ph.D. in Physiology at Darwin College, Cambridge University, U.K.
He got many awards among others «Young Investigator Award» at 2nd Annual Meeting, European Society, in Vienna on 29th August 1992.
He has been Professor of Respiratory Diseases at the Residence School the University of Ferrara in 1997, and in 1999, at the Residency School for Thoracic Surgery at the University of Milan, where he taught Respiratory Physiopathology. In 2000, he was coordinator of the integrated course of Pneumology for the Master’s Degree in Medicine and Surgery at Vita-Salute San Raffaele University, Milan, while he taught Physiology and Respiratory Diseases for the Master’s Degree course in Physiotherapy. As from November 1999, he has been Head of Unit of Pneumology and Respiratory Physiopathology at the San Raffaele Scientific Institute.
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Vita-Salute San Raffaele University considers a continuous process of monitoring and evaluating the quality of the educational mission, also in terms of planning, as essential for achieving excellence in higher education and research. 

UniSR Students can assess the correspondence between the teaching quality offered and their expectation. That is very important to improve teaching and training and develop successful strategies.

At the end of each semester, students’ opinions are collected through evaluation questionnaires. Filling in the questionnaire is compulsory, according to the guidelines published in November 2013 by ANVUR (the National Agency for the Evaluation of the University and Research Systems). IT techniques have been implemented to speed up questionnaire collection and processing. Anonymity is fully guaranteed.

Filling in the questionnaires is the necessary condition which allows a student to register for the exams. After collection, data are firstly conveyed to the Master's degree course Coordinators and to the Deans of the Faculties and finally to the University Evaluation Commission for the analysis of data.

The data collected will be a fundamental source to spot every sort of issue, thus for future improvement.

In short, filling in the questionnaires represents a key moment of University life in which students take a role of responsibility together with academia and University organization structures in the continuous process of improvement and innovation which makes it possible for our University to rank among the top Universities in the nation and Europe.

We really appreciate all respondents’ valuable time to fill up the questionnaires, especially during intense study times and we would like to raise students’ awareness of the importance of their contribution by carrying out this task responsibly and sharing the same objectives together with this Institution.

The President of the University Committee for the enhancement of quality
YEAR 4

Academic Year 2017/2018

- Endocrine and Metabolic Diseases
- Nephrology and Urology
- Oncology
- Hematology
- 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
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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.gruppoeidos.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).
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 hyperaldosterosims, pheochromocytoma); gonads (male and female hypogonadism, hyperandrogenisms, 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

**** **** ****
Nephrology and Urology

Total Credits: 7
Total hours: 70
Scientific Discipline Sector: Med/14, Med/24, Bio/14

Teaching staff
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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 everyday scheduled clinical and surgical activities. 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. ultrasound assessments, flexible cystoscopy, 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. Male and female urinary incontinence
4. Paediatric urology
5. Urolithiasis
6. Male sexual dysfunction and andrological emergencies
7. Prostate cancer
8. Kidney cancer
9. Bladder and upper urinary tract urothelial cancer
10. Penis and testis cancer

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**
- Goodman & Gilman’s The Pharmacological Basis of Therapeutics

**Suggested Reading**
- Textbook of Nephrology SG Massry, RJ Glassock 2001

**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.
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
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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
### Hematology

**Total Credits:** 4  
**Total hours:** 40  
**Scientific Discipline Sector:** Med/15

#### Teaching staff

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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 hematological diseases and to the growing role of molecular biology in the clinical management of patients with hematological 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: concept of the stem cell, models of hematopoiesis, hematopoietic lineages and growth factors, stem cell mobilization and collection.
- Clonal dynamics in hematological cancers: concept of founder and driver mutations, linear and branching evolution in cancer, evolutionary models of cancer, implications for targeted therapy.
- 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
- Hemorragic syndromes. Hereditary and acquired disorders of platelets and coagulation.
- Topoisomerases 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: epidemiology, molecular pathogenesis, clinical presentation, differential diagnosis, diagnostic tests, prognostic factors, selection of treatment, principles of therapy
- Supportive care
- Acute Leukemias (myeloid and lymphoblastic): epidemiology, molecular pathogenesis, clinical presentation, differential diagnosis, diagnostic tests, prognostic factors, selection of treatments, principles of therapy
- Myeloproliferative syndromes (CML, PV, ET, PMF): epidemiology, molecular pathogenesis, clinical presentation, differential diagnosis, diagnosis tests, prognostic factors, selection of treatment, principles of therapy
- Hematopoietic stem cell transplantation, cancer immunotherapy, gene therapy: rationales of autologous and allogeneic HSCT, concepts of conditioning, graft –versus-host diseases and graft-versus-leukemia effect, determinants of GvHD and GvL, strategies to prevent and treat GvHD, principles of adoptive immunotherapy, TCR transfer, chimeric antigen receptors
- At the microscope (small groups)

Textbooks:
Essential Haematology
A.V. Hoffbrand / P.A.H. Mosso Wiley-Blackwell

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Musculoskeletal Diseases

Total Credits: 2
Total hours: 20
Scientific Discipline Sector: Med/33, Med/34

Teaching staff
Course Coordinator: Laura Mangiavini E-mail: mangiavini.laura@hsr.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 a combined written and 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:

**** **** ****
Neurological Sciences

Total Credits: 14
Lessons: 104 h
Practicals: 44 h


Teaching staff
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Collaborators
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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:**


Clinical Adult Neurology, 3rd Editions
Di Jody Corey-Bloom, MD, PhD, Ronald B. David, MD, ed. DemosMedical

Allan H. Ropper, Martin A. Samuels


***** ***** ****
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

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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: 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. 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. Students will attend formal lessons dedicated to major psychiatric disorders, including:

- Psychotic disorders
- Schizophrenia
- Bipolar disorder
- Mood disorders
- Anxiety disorders
- Obsessive Compulsive disorder
- Feeding and eating disorders
- Sleep-Wake disorders
- Child Psychiatry
- General Pharmacology
- Clinical Psychopharmacology
- Psychology
- Psychobiology
- Forensic Psychiatry

Ophthalmology

Total Credits: 3
Total hours: 30
Scientific Discipline Sector: Med/30

Teaching staff

Course Coordinator:
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Paolo Bettin Email: bettin.paolo@hsr.it
Ugo Introini Email: introini.ugo@hsr.it
Rosangela Lattanzio Email: lattanzio.rosangela@hsr.it
Elisabetta Misericocchi Email: miserocchi.elisabetta@hsr.it
Luisa Pierro Email: pierro.luisa@hsr.it
Giuseppe Querques Email: querques.giuseppe@hsr.it
(www.unisr.it/k-teacher/querques-giuseppe/)

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
2011ISBN 9780702040931

**** **** ****
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
(www.unisr.it/k-teacher/castagna-antonella/)
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:


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.

**** **** ****
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: dagna.lorenzo@unisr.it
(www.unisr.it/k-teacher/dagna-lorenzo/)

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):

**** **** ****
TIMETABLE_ Hematology and Oncology
Please note that changes may always occur in the daily lesson schedule. Please refer to the online timetable for the latest version.

<table>
<thead>
<tr>
<th>Day</th>
<th>Date</th>
<th>Time</th>
<th>Teacher</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>25/09/2017</td>
<td>09:00-11:00</td>
<td>Ferreri</td>
<td>Introduction to modern oncology. Epidemiology. Carcinogenesis.</td>
</tr>
<tr>
<td>Monday</td>
<td>25/09/2017</td>
<td>11:00-13:00</td>
<td>Bordignon; Ponzoni</td>
<td>Stem Cell Biology and Hemopoiesis. Bone marrow biopsy and Node biopsy.</td>
</tr>
<tr>
<td>Tuesday</td>
<td>26/09/2017</td>
<td>09:00-11:00</td>
<td>Ciceri; Marktel</td>
<td>Anemias, Disorders of iron metabolism: Iron deficiency &amp; Iron Overload. Megaloblastic anaemia</td>
</tr>
<tr>
<td>Tuesday</td>
<td>26/09/2017</td>
<td>11:00-13:00</td>
<td>D'Angelo</td>
<td>Hemostasis and Thrombosis. Trombophilia</td>
</tr>
<tr>
<td>Tuesday</td>
<td>26/09/2017</td>
<td>16:00-18:00</td>
<td>Esposito</td>
<td>Imaging in oncology (part I).</td>
</tr>
<tr>
<td>Thursday</td>
<td>28/09/2017</td>
<td>11:00-13:00</td>
<td>Bonini; Vago</td>
<td>Clonal dynamics: an emerging paradigm in hemato-oncology</td>
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<tr>
<td>Thursday</td>
<td>28/09/2017</td>
<td>14:00-16:00</td>
<td>Giglio</td>
<td>Teaching case, Anemia of chronic diseases. Hypersplenism. Hemorrhagic, hemolytic and aplastic anemia</td>
</tr>
<tr>
<td>Thursday</td>
<td>28/09/2017</td>
<td>16:00-18:00</td>
<td>Gregorc</td>
<td>Staging, quality of life, performance status, and prognostic factors. Clinical trials</td>
</tr>
<tr>
<td>Friday</td>
<td>29/09/2017</td>
<td>09:00-11:00</td>
<td>Gregorc, Dell’Oca</td>
<td>Principles of Radiotherapy. Multimodality treatments; head &amp; neck cancer.</td>
</tr>
<tr>
<td>Friday</td>
<td>29/09/2017</td>
<td>11:00-13:00</td>
<td>Esposito</td>
<td>Imaging in oncology (part II)</td>
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<tr>
<td>Friday</td>
<td>29/09/2017</td>
<td>14:00-16:00</td>
<td>Esposito, Pepe</td>
<td>Imaging in oncology (part III). PET in staging and response assessment</td>
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<tr>
<td>Monday</td>
<td>02/10/2017</td>
<td>09:00-11:00</td>
<td>Ponzoni, Ferreri</td>
<td>Introduction to lymphomas. Chronic lymphocytic leukaemia</td>
</tr>
<tr>
<td>Monday</td>
<td>02/10/2017</td>
<td>14:00-16:00</td>
<td>Vago; Ponzoni</td>
<td>Myelodysplasia, Bone Marrow Biopsy</td>
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<tr>
<td>Monday</td>
<td>02/10/2017</td>
<td>16:00-18:00</td>
<td>Bordignon; Vago</td>
<td>Teaching case, Acute leukemias</td>
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<tr>
<td>Tuesday</td>
<td>03/10/2017</td>
<td>09:00-11:00</td>
<td>Ciceri; Marktel</td>
<td>Teaching case, Hemoglobinopathies</td>
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<tr>
<td>Tuesday</td>
<td>03/10/2017</td>
<td>11:00-13:00</td>
<td>Zacchetti</td>
<td>Principles of cytotoxic and targeted therapy. Alkylating agents</td>
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<td>Tuesday</td>
<td>03/10/2017</td>
<td>14:00-16:00</td>
<td>Bondanza</td>
<td>Hematological manifestations of systemic diseases</td>
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<tr>
<td>Tuesday</td>
<td>03/10/2017</td>
<td>16:00-18:00</td>
<td>D’Angelo</td>
<td>Hemorrhagic syndromes. Hereditary and acquired disorders of platelets and coagulation</td>
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<tr>
<td>Wednesday</td>
<td>04/10/2017</td>
<td>09:00-18:00</td>
<td>NBME EXAM</td>
<td>Diagnostic technologies in Hematology &amp; Oncology: blood counts, flow cytometry &amp; tumor bio Anemia: definition, classification, management. psies.</td>
</tr>
<tr>
<td>Thursday</td>
<td>05/10/2017</td>
<td>09:00-11:00</td>
<td>Bonini; Milani</td>
<td>Interventional radiology</td>
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<tr>
<td>Thursday</td>
<td>05/10/2017</td>
<td>11:00-13:00</td>
<td>Esposito</td>
<td>Histopathology and molecular features of esophageal, gastric and colorectal cancers</td>
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<tr>
<td>Thursday</td>
<td>05/10/2017</td>
<td>14:00-16:00</td>
<td>Doglioni</td>
<td>At the microscope Group A</td>
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<tr>
<td>Friday</td>
<td>06/10/2017</td>
<td>14:00-16:00</td>
<td>Zacchetti</td>
<td>Antimetabolites and analogs. Vinca alkaloids and taxans.</td>
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<tr>
<td>Day</td>
<td>Date</td>
<td>Time</td>
<td>Name(s)</td>
<td>Topic</td>
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<tr>
<td>Monday</td>
<td>09/10/2017</td>
<td>14:00-16:00</td>
<td><strong>Gregorc, Doglioni</strong></td>
<td>Lung Cancer</td>
</tr>
<tr>
<td>Monday</td>
<td>09/10/2017</td>
<td>16:00-18:00</td>
<td>Ciceri; Giglio</td>
<td>Teaching case, CML and myeloproliferative syndromes.</td>
</tr>
<tr>
<td>Tuesday</td>
<td>10/10/2017</td>
<td>11:00-13:00</td>
<td>Ciceri, Santoleri</td>
<td>Transfusion Medicine</td>
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<tr>
<td>Tuesday</td>
<td>10/10/2017</td>
<td>14:00-16:00</td>
<td><strong>Zachetti</strong></td>
<td>Topoisomerases inhibitors. Kinase inhibitors. Proteasome inhibitors.</td>
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<tr>
<td>Wednesday</td>
<td>11/10/2017</td>
<td>16:00-18:00</td>
<td>Ponzioni</td>
<td>At the microscope Group B</td>
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<tr>
<td>Thursday</td>
<td>12/10/2017</td>
<td>14:00-16:00</td>
<td><strong>Ferreri</strong></td>
<td>Esophageal cancer, gastric cancer</td>
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<tr>
<td>Friday</td>
<td>13/10/2017</td>
<td>09:00-11:00</td>
<td><strong>Gregorc, Tonon</strong></td>
<td>Molecular bases of cancer, tumor microenvironment, metastasis. Carcinoma of Unknown Primary Site</td>
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<tr>
<td>Monday</td>
<td>16/10/2017</td>
<td>14:00-16:00</td>
<td><strong>Ferreri, Doglioni</strong></td>
<td>Pancreatic and liver cancer</td>
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<tr>
<td>Monday</td>
<td>16/10/2017</td>
<td>16:00-18:00</td>
<td><strong>Zachetti</strong></td>
<td>Immunomodulators. Hormonal therapy.</td>
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<tr>
<td>Tuesday</td>
<td>17/10/2017</td>
<td>09:00-11:00</td>
<td><strong>Ferreri</strong></td>
<td>Indolent lymphomas</td>
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<tr>
<td>Tuesday</td>
<td>17/10/2017</td>
<td>14:00-16:00</td>
<td>Ponzioni</td>
<td>At the microscope Group C</td>
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<tr>
<td>Tuesday</td>
<td>17/10/2017</td>
<td>16:00-18:00</td>
<td>Ponzioni</td>
<td>At the microscope Group D</td>
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<tr>
<td>Wednesday</td>
<td>18/10/2017</td>
<td>11:00-13:00</td>
<td><strong>Esposito</strong></td>
<td>Response assessment: morphological and functional parameters</td>
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<tr>
<td>Thursday</td>
<td>19/10/2017</td>
<td>11:00-13:00</td>
<td>Bonini; Malato</td>
<td>Teaching case, MGUS, MM, Amyloidosis</td>
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<tr>
<td>Thursday</td>
<td>19/10/2017</td>
<td>14:00-16:00</td>
<td>Ponzioni</td>
<td>At the microscope Group E</td>
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<tr>
<td>Thursday</td>
<td>19/10/2017</td>
<td>16:00-18:00</td>
<td><strong>Gianni</strong></td>
<td>Breast Cancer</td>
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<tr>
<td>Friday</td>
<td>20/10/2017</td>
<td>14:00-16:00</td>
<td>Ponzioni</td>
<td>At the microscope Group F</td>
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<tr>
<td>Friday</td>
<td>20/10/2017</td>
<td>16:00-18:00</td>
<td><strong>Zachetti</strong></td>
<td>Monoclonal antibodies.</td>
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<tr>
<td>Monday</td>
<td>23/10/2017</td>
<td>14:00-16:00</td>
<td><strong>Ferreri, Doglioni</strong></td>
<td>Tumours of the central nervous system</td>
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<tr>
<td>Monday</td>
<td>23/10/2017</td>
<td>16:00-18:00</td>
<td><strong>Gregorc</strong></td>
<td>Sarcoma, mesothelioma</td>
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<tr>
<td>Tuesday</td>
<td>24/10/2017</td>
<td>14:00-16:00</td>
<td>Bordignon; Ciceri; Bonini</td>
<td>Hematopoietic stem cell transplantation, Cancer immunotherapy, Gene therapy</td>
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<tr>
<td>Tuesday</td>
<td>24/10/2017</td>
<td>16:00-18:00</td>
<td><strong>Russo</strong></td>
<td>Melanoma</td>
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<tr>
<td>Thursday</td>
<td>26/10/2017</td>
<td>09:00-11:00</td>
<td>Ciceri</td>
<td>Supportive care</td>
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<tr>
<td>Thursday</td>
<td>26/10/2017</td>
<td>14:00-16:00</td>
<td><strong>Ferreri</strong></td>
<td>Aggressive lymphomas, Hodgkin’s lymphoma.</td>
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<tr>
<td>Friday</td>
<td>27/10/2017</td>
<td>14:00-16:00</td>
<td><strong>Gregorc, Cozzarini, Doglioni</strong></td>
<td>Urologic cancers</td>
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</tbody>
</table>
# TIMETABLE__ Endocrinology and Ophtalmology

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

<table>
<thead>
<tr>
<th>Day</th>
<th>Date</th>
<th>Time</th>
<th>Teacher(s)</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thursday</td>
<td>16.11.2017</td>
<td>9.00-10.00</td>
<td>Bosi; Dozio</td>
<td>Course presentation and learning outcomes</td>
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<tr>
<td></td>
<td></td>
<td>10.00-13.00</td>
<td>Bosi; Dozio</td>
<td>Introduction to Endocrinology and Metabolic Diseases</td>
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<tr>
<td></td>
<td></td>
<td>14.00-17.00</td>
<td>Zacchetti (tbc)</td>
<td>Synthesis, secretion and mechanism of action of hypothalamic and pituitary hormones</td>
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<tr>
<td>Friday</td>
<td>17.11.2017</td>
<td>9.00-11.00</td>
<td>Giustina-Losa</td>
<td>Acromegaly and hyperprolactinemia</td>
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<td></td>
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<td>11.00-13.00</td>
<td>Giustina</td>
<td>Panhypopituitarism and diabetes insipidus</td>
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<tr>
<td>Monday</td>
<td>20.11.2017</td>
<td>9.00-11.00</td>
<td>Bandello</td>
<td>Course Presentation and Paedriatic ophtalmology and strabismus</td>
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<tr>
<td></td>
<td></td>
<td>11.00-13.00</td>
<td>Falini</td>
<td>Imaging and pituitary gland</td>
</tr>
<tr>
<td>Tuesday</td>
<td>21.11.2017</td>
<td>9.00-11.00</td>
<td>Zacchetti (tbc)</td>
<td>Synthesis, secretion and mechanism of action of thyroid hormones</td>
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<td></td>
<td></td>
<td>11.00-13.00</td>
<td>Querques</td>
<td>Ocular seemology: FAG, perimetry, microperimetry, electrphysiology</td>
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<tr>
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<td></td>
<td>14.00-16.00</td>
<td>Querques</td>
<td>Retinal vascular occlusion and retinal anomalies in hypertension</td>
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<tr>
<td>Wednesday</td>
<td>22.11.2017</td>
<td>9.00-11.00</td>
<td>Bosi</td>
<td>Thyroid diseases I: pathophysiology, epidemiology and clinical diagnosis; hypothyroidism</td>
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<tr>
<td></td>
<td></td>
<td>11.00-13.00</td>
<td>Bosi; Dozio</td>
<td>Disorders of glucose metabolism; type 1 diabetes</td>
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<td></td>
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<td>14.00-16.00</td>
<td>Pierro</td>
<td>Diagnostic evaluation: ultrasound and OCT</td>
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<tr>
<td>Thursday</td>
<td>23.11.2017</td>
<td>9.00-13.00</td>
<td>Field training in clinical diabetes and endocrinology *gr, A</td>
<td>Field training in Ophtalmology 9.00-11.00 gr B 11.00-13.00 gr, C</td>
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<tr>
<td></td>
<td></td>
<td>14.00-17.00</td>
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<td>Filed training in clinical diabetes and endocrinology *gr, A</td>
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<tr>
<td>Friday</td>
<td>24.11.2017</td>
<td>9.00-11.00</td>
<td>Bosi</td>
<td>Thyroid diseases II: hyperthyroidism, thyroiditis</td>
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<tr>
<td></td>
<td></td>
<td>11.00-13.00</td>
<td>Bosi; Dozio</td>
<td>Type 2 diabetes and diabetic complications</td>
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<tr>
<td></td>
<td></td>
<td>14.00-15.00</td>
<td>Zerbini</td>
<td>Diabetic nephropaty</td>
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<tr>
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<td></td>
<td>15.00-17.00</td>
<td>Lattanzio</td>
<td>Diabetic retinopathy</td>
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<tr>
<td>Day</td>
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<td>Time</td>
<td>Lecturer(s)</td>
<td>Topic</td>
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<tr>
<td>Monday</td>
<td>27.11.2017</td>
<td>9.00-11.00</td>
<td>Zacchetti (tbc)</td>
<td>Synthesis, secretion and mechanism of action of steroid hormones and catecholamines</td>
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<td>11.00-13.00</td>
<td>Giustina</td>
<td>Adrenal diseases I: hypercortisolism (Cushing syndrome and disease) and hypocortisolism (Addison disease)</td>
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<td>14.00-16.00</td>
<td>Beretta; Maggiore</td>
<td>Thyroid diseases III: goiter, nodules, thyroid cancer and the surgical approach</td>
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<tr>
<td>Tuesday</td>
<td>28.11.2017</td>
<td>9.00-11.00</td>
<td>Salonia</td>
<td>Testis: anatomy, pathophysiology and male hypogonadism</td>
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<td></td>
<td></td>
<td>11.00-13.00</td>
<td>Dozio; Scavini; Furlan</td>
<td>Training session Practical diabetes I (insulin preparations, infusions and injections) DKA basic of treatment</td>
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<tr>
<td></td>
<td></td>
<td>14.00-17.00</td>
<td>Furlan</td>
<td>Parathyroid glands and bone metabolism I</td>
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<tr>
<td>Wednesday</td>
<td>29.11.2017</td>
<td>9.00-11.00</td>
<td>Giustina</td>
<td>Adrenal Disease II: hyper-and hypocortisolism pheochromocytoma</td>
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<tr>
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<td></td>
<td>11.00-13.00</td>
<td>Scavini</td>
<td>Hypoglycemia</td>
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<tr>
<td>Thursday</td>
<td>30.11.2017</td>
<td>9.00-13.00</td>
<td>Field training in clinical diabetes and endocrinology * gr B</td>
<td>Filed training in ophthalmology 9.00-11.00 gr A 11.00-13.00 gr D</td>
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<td></td>
<td>14.00-17.00</td>
<td>Field training in clinical diabetes and endocrinology * gr B</td>
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<tr>
<td>Friday</td>
<td>1.12.2017</td>
<td>9.00-10.00</td>
<td>Bosi</td>
<td>Diabetic neuropathy</td>
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<td></td>
<td>10.00-12.00</td>
<td>Caravaggi</td>
<td>The diabetic foot</td>
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<tr>
<td>Monday</td>
<td>4.12.2017</td>
<td>9.00-10.00</td>
<td>Giustina</td>
<td>Ovary hormone pathophysiology: hyperandrogenic syndrome of ovary or adrenal origin (PCOS, genetic syndromes)</td>
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<td>10.00-12.00</td>
<td>Piemonti</td>
<td>Future therapies in type 1 diabetes: islet and stem cell transplantation</td>
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<tr>
<td></td>
<td></td>
<td>14.00-16.00</td>
<td>Scavini Dozio</td>
<td>Principles of nutrition, food pyramid and mediterranean diet (Cellai, De Vecchi, Zanardini)</td>
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<tr>
<td>Tuesday</td>
<td>5.12.2017</td>
<td>09.00 – 11.00</td>
<td>Bandello</td>
<td>Cornea and cataract</td>
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<td>11.00 – 13.00</td>
<td>Iuliano</td>
<td>Ocular tumors</td>
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<td>14.00 – 16.00</td>
<td>Barboni</td>
<td>Neuro ophthalmology and thyroid eye disease</td>
</tr>
<tr>
<td>Wednesday</td>
<td>6.12.2017</td>
<td>09.00 – 12.00</td>
<td>Dozio Scavini Furlan</td>
<td>Training session Practical diabetes and endocrinology II (glucose and ketone monitoring)</td>
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<td>12.00 – 13.00</td>
<td>Dozio Scavini</td>
<td>Diabetes and pregnancy</td>
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<td>Monday</td>
<td>11.12.2017</td>
<td>9.00 – 11.00</td>
<td>Furlan</td>
<td>Parathyroid glands and bone metabolism II</td>
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<td>Furlan</td>
<td>Parathyroid glands and bone metabolism III</td>
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<td>Tuesday</td>
<td>12.12.2017</td>
<td>9.00– 11.00</td>
<td>Dozio Scavini (tbc)</td>
<td>Training session Practical diabetes and endocrinology III (tbc)</td>
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<td>14.00 – 17.00</td>
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### Field Training in Clinical Diabetes and Endocrinology

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<td>Field training in clinical diabetes and endocrinology* gr D1-2</td>
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<td>11.00 – 12.00</td>
<td>Enocrine tumors and Multiple Endocrine Neoplasms (MEN)</td>
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<td>Autoimmune polyendocrine syndromes</td>
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<td>Personal study</td>
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*Field training in clinical diabetes and endocrinology include the following activities, with each activity to be attended by some students, some activities might change according to the availability of clinics and staff:

1. Thyroid ultrasound imaging and fine needle biopsy (dr Contrino) Settore R -2 stanza 6 (Thursday morning slots of 40 minutes - 2 scans – 2 students each time slot, arrive 10 min earlier than allocated time)
2. Diabetes clinic (Monti, Piatti, Laurenzi, Bonasio, Bolla, Molinari, Caretto), settore G -1
3. Diabetes and pregnancy settore AB-1 area ginecologica amb 4 (Scavini, Dozio Thursday a.m.) (slots of 1.30-2 hours)
4. Day Hospital of endocrinology and diabetes Mon/Wed/Fri (Lanzi, Laurenzi, Bolla, Molinari, Caretto, Perticone, Castellino) Settore diamante +4
5. Andrology clinic Thursday morning Prof Salonia (slots of 1.30-2 hours) for 4 students
6. Ophthalmology Department (slots of 1 hour) settore A -1
INSTRUCTORS CVs

**Elena Contrino**

1989, Graduation and Qualification in Medicine and Surgery at University of Milan
1989–1994, activity at the Medical Clinic Unit of the Department for Rehabilitative Medicine
DIMER of the San Raffaele Scientific Institute. Research activity in the field of glucose and lipid
metabolism in diabetic and obese patients in relation to the pituitary GH secretion / PRL in
physiology and pathology.
1994-1999, counselling as diabetes, endocrinology and diet specialist at the Department of
Medicine and Surgery of the Clinic San Carlo, Milan
1995-2005, Head of General Endocrine, Metabolic Diseases and Dietetics Unit at the H.S. Raffaele
Resnati polyspecialist healthcare facilities.
Member of European Thyroid Association
Present, General and interventional sonographer consultant at Radiology Unit, San Raffaele
Hospital, Milan.

**Daniele Zacchetti**

**EDUCATION AND QUALIFICATIONS**

Doctor of Pharmaceutical Chemistry and Technology,
grade 110/110 cum laude, University of Milano, Italy.
12 July 1989.
Thesis: "Mechanisms of alpha-latrotoxin action: role of Ca2+ in receptor binding and
polyphosphoinositide hydrolysis".

Italian State Professional Examination for Pharmacist, Milano, Italy.
April 1990

Ph. D. in Cellular and Molecular Biology, University of Milano, Italy.
14 September 1993
Thesis: "Receptor activation and calcium increases: multiple mechanisms working in PC12 cells".

**RESEARCH EXPERIENCE**

Oct 1997 - Present.
Investigator at the Department of Biological and Technological Science (Dibit)-Scient. Inst. H. San
Raffaele, Milano, Italy.

**TEACHING EXPERIENCE**

20 October - 1 November 1991
Lecture: "Calcium fluxes and distribution in neurons".

Ph. D. program in Pharmacology, University of Milano, Italy. Course on "Morphological techniques
in pharmacological research".
10 February 1993
Lecture: "Video-imaging".

Demonstrator at the International Course on Advanced techniques for calcium ion measurements
in living cells. Milano, Italy.
Titles: "[Ca2+]i measurements on cell populations" and "Ca2+ fluxes measured by means of
45Ca2+"

Demonstrator at the EMBO Course "Methods in Cell Biology", EMBL, Heidelberg, Germany.
1-11 October 1995
Topic: "Biogenesis of epithelial cell polarity"

Demonstrator at the Ph.D. Program of the European Molecular Biology Laboratory, Heidelberg, Germany.
November 1995
Title: "Two-dimensional gel electrophoresis".

Andrés José María Ferreri

Education
2005  Resident in Clinical Oncology, University of Milan
1989  Resident in Clinical Oncology, Cátedra de Oncología Clínica y Quimioterapia Antineoplásica, Hospital Militar, Buenos Aires, Argentina
1992  Graduation in Medicine, Medicine and Surgery Faculty, Università degli Studi di Parma, Italy
1985  Graduation in Medicine, Facultad de Medicina de la Universidad de Buenos Aires, Argentina

Work Experience
2006-2007  Coordinator of the Disease Unit “Tumori Linfoïdi”, Division of Radiochemotherapy, San Raffaele Scientific Institute, Milan, Italy
2004-2007  Unit Coordinator, Medical Oncology, San Raffaele Scientific Institute, Milan, Italy.

Paola Cinque

WORK EXPERIENCE
July 1987–July 1991 Fellow Clinic of Infectious Diseases, Luigi Sacco Hospital, University of Milan, (Italy)
October 1987–July 1991 Consultant Blood Transfusion Unit, Sesto San Giovanni Hospital, Italy, (Italy)
August 1991–October 1993 Visiting Scientist, Karolinska Institute, Stockholm (Sweden)
October 1993–Present Faculty Member, San Raffaele Hospital/Scientific Institute, Department of Infectious Diseases, Milano, (Italy)
January 1999–Present Head of Clinical Research Group, San Raffaele Hospital/Scientific Institute, Milano, (Italy)
March 1999–Present Contract Professor, San Raffaele University, (Italy)
June 2009–May 2013 Program Director, San Raffaele Hospital/Scientific Institute, Research Division of Immunology, Transplantation and Infectious Diseases, San Raffaele Scientific Institute, Milan, (Italy)

EDUCATION AND TRAINING
September 1981–October 1987 M.D., University of Milan, (Italy)
November 1987–July 1991 Specialist in Infectious Diseases, University of Milano, (Italy)
August 1991–October 1993 Ph.D., Karolinska Institute, Stockholm (Sweden).

Nicoletta Dozio

Education
1983, graduation in Medicine and Surgery, University of Milan
1986, specialist in Diabetology and metabolic diseases, University of Milan, Italy
1995, PhD in Clinical Pathophysiology, University of Milan, Italy
1998, specialist in Internal Medicine
FRCP – Fellow of the Royal College of Physicians

Employment
1987- 2001, San Raffaele Scientific institute, Medical Researcher
2001-2003, Locum consultant in diabetes Whipps Cross University Hospital London - UK
2003-2008, Consultant in Diabetes and internal medicine and Honorary Senior lecturer Norfolk and Norwich University Hospital NHS Trust and University of East Anglia Norwich-UK
2008-2013 Società Italiana di Diabetologia (SID) Italian society of Diabetes for work at AOU Sant’Anna di Ferrara
2010-2012, Medical Director - ADO Hospice and palliative home care- Ferrara - Italy
April- August 2013- Diabetes Specialist, Regional Health System Azienda ULSS 19 Adria (Rovigo)

**Marina Scavini, M.D., Ph.D.**

*Education*
1983, Medical Degree, Università degli Studi di Milano, Medical School, Milan
1986, Board Certification in Diabetes and Metabolic Diseases
1994, Ph.D., Clinical Pathophysiology
2005, Board Certification in Nephrology

1987, ECFMG Certification (404-306-3), indefinite validity

*Employment*
1988-1999, San Raffaele Scientific Institute, Milan (Italy)
2000-2004, DCI, Inc. and Division of Endocrinology, University of New Mexico, Albuquerque, NM
2005-2008, San Raffaele Scientific Institute, Milan (Italy)
2009-present, Diabetes Research Institute, IRCCS Ospedale San Raffaele, Milan (Italy)

*Teaching Activity*
2005-present Endocrinology Fellowship Program, Università Vita-Salute San Raffaele, Medical School, Milan (Italy),
2006 Urology Fellowship Program
2000-2004 University of New Mexico Health Sciences Center, Albuquerque, NM (USA)
2013-present International MD Program

**Federico Furlan**

*Education*
1995 Degree in Medicine, Università di Verona, Italy
2000 Specialist in Internal Medicine, Università di Verona, Italy
1995-1999 Resident doctor at the Internal Medicine Clinic D of the Department of Biomedical and Surgical Sciences of the Università di Verona
1999-2002 Research assistant at the division “Bone and Mineral Diseases” of the Policlinico G.B. Rossi of Verona, Italy
2002-2007 Research assistant at the Unit of Molecular Genetics at Vita-Salute University, DIBIT, San Raffaele hospital, Milan

*Most recent work experience*
2003-present first level medical director at the Emergency Department (Emergency Medicine) at San Raffaele hospital, Milan. Responsible for the training activity “Updating in Emergency Medicine and Surgery”
2006-present Teacher within the course of Endocrinology and Metabolic Diseases, International MD Program, Vita-Salute University, Milan

**Francesco Tecilazich**

*Education*
2003 MD University of Trieste Medical School, Italy.
Expected 01/2018 PhD University of Trieste Medical School, Italy.

*Postdoctoral Training*
2003-2008 Residency and Clinical Fellow in Endocrinology and Metabolic Diseases, University of Verona, Italy
2008-2009 Sub-Speciality Clinical Fellow in diabetic vascular disease and wound healing, Endocrinology and Metabolic Diseases, University of Verona (Director Prof. M. Muggeo)
2009-2012 Research Fellow, Microcirculation Laboratory and Joslin-Beth Israel Deaconess Foot Center, Harvard Medical School (Mentor: Prof. A. Veves). Topic: Pathophysiology
of diabetic chronic complications and wound healing impairment in diabetes, with emphasis on assessment of vascular dysfunction in the micro and macrocirculation.

2012-2015 Senior Research Fellow, Schepens Eye Research Institute, Massachusetts Eye and Ear Infirmary, Harvard Medical School (Mentor: Prof. M. Lorenzi). Mechanisms of protection and repair of microvessels.

2013-2014 Certificate in Applied Biostatistics, Harvard University

Faculty Academic Appointments

2016 Instructor, Department of Ophthalmology, Harvard Medical School.

Appointments at Hospitals/Affiliated Institutions

2016 Investigator, Schepens Eye Research Institute - Massachusetts Eye and Ear

2017 Investigator, Diabetes Research Institute, IRCCS San Raffaele

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Academic Calendar

Provisional
Notice from the University Committee of the enhancement of quality
on the questionnaires for the evaluation of courses and teaching

Vita-Salute San Raffaele University considers a continuous process of monitoring and evaluating the quality of the educational mission, also in terms of planning, as essential for achieving excellence in higher education and research.

UniSR Students can assess the correspondence between the teaching quality offered and their expectation. That is very important to improve teaching and training and develop successful strategies.

At the end of each semester, students’ opinions are collected through evaluation questionnaires. Filling in the questionnaire is compulsory, according to the guidelines published in November 2013 by ANVUR (the National Agency for the Evaluation of the University and Research Systems). IT techniques have been implemented to speed up questionnaire collection and processing. Anonymity is fully guaranteed.

Filling in the questionnaires is the necessary condition which allows a student to register for the exams. After collection, data are firstly conveyed to the Master’s degree course Coordinators and to the Deans of the Faculties and finally to the University Evaluation Commission for the analysis of data.

The data collected will be a fundamental source to spot every sort of issue, thus for future improvement.

In short, filling in the questionnaires represents a key moment of University life in which students take a role of responsibility together with academia and University organization structures in the continuous process of improvement and innovation which makes it possible for our University to rank among the top Universities in the nation and Europe.

We really appreciate all respondents’ valuable time to fill up the questionnaires, especially during intense study times and we would like to raise students’ awareness of the importance of their contribution by carrying out this task responsibly and sharing the same objectives together with this Institution.

The President of the University Committee
for the enhancement of quality
YEAR 5

- 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
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  
Email: rovere.patrizia@hsr.it  
(www.unisr.it/k-teacher/roverequerini-patrizia/)

Lorenzo Dagna  
Email: dagna.lorenzo@hsr.it  
(www.unisr.it/k-teacher/dagna-lorenzo/)

Angelo A. Manfredi  
Email: manfredi.angelo@hsr.it  
(www.unisr.it/k-teacher/manfredi-angeloandreamaria/)

Flavia Valtorta  
Email: valtorta.flavia@hsr.it  
(www.unisr.it/k-teacher/valtorta-flavia/)

Collaborators
Mona Rita Yacoub  
Email: yacoub.monarita@hsr.it

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

**** **** ****
Systematic Pathology

Total Credits: 6
Total hours: 70
Scientific Discipline Sector: SSD MED/08

Teaching staff
Course Coordinator: Maurilio Ponzoni
(www.unisr.it/k-teacher/ponzoni-maurilio/)
Receiving Hour: by appointment

Claudio Doglioni
(www.unisr.it/k-teacher/doglioni-claudio/)
Massimo Loda
Federica Pedica

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
Written multiple choice test and oral exam 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 present a brief introduction which, according to the topic, may involve the most important and frequent symptoms that characterize diseases of the specific organs or the basic histological features recapitulating essential concepts necessary to better understand the classic histopathological feature of individual entities (‘histology for pathologists’). 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

**** **** **** ****
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
(www.unisr.it/k-teacher/candiani-massimo/)
Massimo Origoni Email: origoni.massimo@hsr.it
(www.unisr.it/k-teacher/origoni-massimo/)
Stefano Salvatore Email: salvatore.stefano@hsr.it
(www.unisr.it/k-teacher/salvatore-stefano/)

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, pathophysiology, 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: hypotalamus-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

**Textbooks**

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

**** **** ****
**Pediatrics**

*Total Credits: 4*

*Total hours: 40*

*Scientific Discipline Sector: SSD MED/38*

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**Teaching staff**

**Course Coordinator:** Prof. Alessandro Aiuti  
Email: aiuti.alessandro@hsr.it  
(www.unisr.it/k-teacher/aiuti-alessandro/)

**Receiving Hour:** on Fridays, 3:00pm

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**Teaching assistant**

Dr. Maria Ester Bernardo  
Email: bernardo.mariaester@hsr.it

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**Collaborators**

- Dr. Graziano Barera  
  Email: barera.graziano@hsr.it
- Dr. Federica Barzaghi  
  Email: barzaghi.federica@hsr.it
- Dr. Valeria Calbi  
  Email: calbi1.valeria@hsr.it
- Dr. Maria Pia Cicalese  
  Email: cicalese.mariapia@hsr.it
- Dr. Francesca Ferrua  
  Email: ferrua.francesca@hsr.it
- Dr. Chiara Lanzani  
  Email: lanzani.chiara@hsr.it
- Dr. Maddalena Migliavacca  
  Email: migliavacca.maddalena@hsr.it
- Dr. Maria Grazia Natali Sora  
  Email: natali.mariagrazia@hsr.it
- Dr. Maria Grazia Patricelli  
  Email: patricelli.mariagrazia@hsr.it
- Dr. Paolo Silvani  
  Email: silvani.paolo@hsr.it
- Prof. Giovanna Weber  
  Email: weber.giovanna@hsr.it  
  (www.unisr.it/k-teacher/weber-giovanna/)

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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 paediatric pathologies of different ages and identify the conditions that need the intervention of the professional specialist paediatrician.

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

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**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**


**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, bronchodyplasia, retinopathy of prematurity, necrotizing enterocolitis, ...)


**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**


*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

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

Oncology


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

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**

**Textbook**

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

**** **** ****
Clinical Rotations: Ob/Gyn & Pediatrics

Total Credits: 7
Total hours: 175

Activity Coordinators:
Alessandro Aiuti  Email: aiuti.alessandro@hsr.it
(www.unisr.it/k-teacher/aiuti-alessandro/)
Massimo Candiani  Email: candiani.massimo@hsr.it
(www.unisr.it/k-teacher/candiani-massimo/)

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 ad 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

**** **** ****
Internal Medicine

Total Credits: 10
Total hours: 100
Scientific Discipline Sector: SSD MED/09

Teaching staff

Course Coordinator: Paolo Prospero Ghia
(www.unisr.it/k-teacher/ghia-paoloprospero/)
Email: ghia.paolo@hsr.it

Lorenzo Dagna
(www.unisr.it/k-teacher/dagna-lorenzo/)
Email: dagna.lorenzo@hsr.it

Angelo Manfredi
(www.unisr.it/k-teacher/manfredi-angeloandreamaria/)
Email: manfredi.angelo@hsr.it

Patrizia Rovere-Querini
(www.unisr.it/k-teacher/roverequerini-patrizia/)
Email: rovere.patrizia@hsr.it

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

Textbooks:

**** **** ****
Clinical Surgery

Total Credits: 5
Total hours: 50
Scientific Discipline Sector: SSD MED/18, MED/20

Teaching staff
Course Coordinator: Massimo Falconi
(www.unisr.it/k-teacher/falconi-massimo/)
Email: falconi.massimo@hsr.it
Riccardo Rosati
(www.unisr.it/k-teacher/rosati-riccardo/)
Email: rosati.riccardo@hsr.it
Stefano Crippa
Email: crippa1.stefano@hsr.it
Andrea Kahlberg
(www.unisr.it/k-teacher/kahlberg-andrealuito/)
Email: kahlberg.andrea@hsr.it

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
- Determine 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

Textbooks

***** ***** ****
Imaging
Total Credits: 3
Total hours: 30
Scientific Discipline Sector: SSD MED/36, MED/37

Teaching staff
Course Coordinator: Francesco De Cobelli
Email: decobelli.francesco@hsr.it
(www.unisr.it/k-teacher/decobelli-francesco/)

Andrea Falini
Email: falini.andrea@hsr.it
(www.unisr.it/k-teacher/falini-andrea/)

Collaborators
Maria Picchio
Email: picchio.maria@hsr.it
Antonella Castellano
Email: castellano.antonella@hsr.it

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 been 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 Orthopedics
- Cardiovascular Imaging
- Uroradiology
- Interventional Radiology
- Emergency Radiology
- Nuclear Medicine

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

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Clinical Rotations: Community Medicine

Total Credits: 3
Total hours: 75
Scientific Discipline Sector: SSD MED/09

Course Coordinator: Antonio Secchi
Email: antonio.secchi@hsr.it
(www.unisr.it/k-teacher/secchi-antonio/)

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 websites for biomedical activities

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INSTRUCTORS CVs

Mona-Rita Yacoub

Education and Training
2012, July, PhD Degree in Molecular Medicine

Work Experience
Actual affiliation: Consultant at San Raffaele Scientific Institute, Milan, Italy
2014/10 in course, Educational activity at the “Università Vita-Salute San Raffaele” for the international MD course, in the field of Allergy
2009/10 in course, Allergist consultant in Day Hospital Unit for allergic patients
2009/06, 2014/04 Contract for the surveillance of adverse drug reactions (Farmamonitor, Lombardy Region)
04/2007, in course Allergist consultant for internal patients at San Raffaele hospital (hospitalized, pre-chirurgical and employees)
06/2008, in course Educational activity at the “Università Vita-Salute San Raffaele” for the MD course, in the field of Allergy
04/2007, in course Role of subinvestigator in clinical trials in the field of allergic diseases. Last GCP certificate: January 2015 (Module 1 to 5) and May 2015 (Module 6 to 8).

Maria Ester Bernardo

WORK EXPERIENCE
• Since November 17, 2014 to present: Permanent Staff Paediatrician, Pediatric Immunohematology and Bone Marrow Transplantation Unit, San Raffaele Scientific Institute, Milan.
• Since November 17, 2014 to present: Project Leader, San Raffaele Telethon Institute for Gene Therapy (SR-TIGET), San Raffaele Scientific Institute, Milan.
• May 2010 – November 2014: Permanent Staff Paediatrician, Department of Hematology and Oncology, IRCCS Ospedale Pediatrico Bambino Gesù, Roma.
• May 2010 – November 2014: Head of the Research Unit “Cellular Therapy” of the Laboratories of the Department of Hematology and Oncology, IRCCS Ospedale Pediatrico Bambino Gesù, Roma.
• April 2007-May 2010: Permanent Staff Paediatrician, Department of Paediatric Oncohematology, Fondazione IRCCS Policlinico San Matteo, Pavia
• November 2005 - March 2007: Fellowship - Department of Paediatric Oncohematology, Fondazione IRCCS Policlinico San Matteo, Pavia.

EDUCATION AND TRAINING
• Since 2015: “Professore a Contratto” in Paediatrics, MD Program, Università Vita-Salute San Raffaele, Milano.
• February 2014: certification as Associate Professor (Abilitazione Scientifica Nazionale) in Paediatrics.

Massimo Loda M.D.

Education
1974-76 Pre-clinical University of the Witwatersrand, Johannesburg, South Africa
1980 M.D., cum laude Medicine & Surgery University of Milan, Milan, Italy

Postdoctoral Training
07/80-06/85 Resident Emergency Surgery Ospedale Policlinico, University of Milan, Italy
07/85-06/86 Resident General Surgery Deaconess Hospital, Harvard Medical School, Boston, MA
07/86-06/88 Resident Anatomic Pathology Deaconess Hospital, Harvard Medical School
07/88-06/89 Fellow Anatomic and Molecular Pathology  
New England Medical Center, Tuft University, Boston, MA

**Licensure and Certification**
1980  State licensure examination, Italy  
1981- ECFMG examination  
1985- FMGEMS examination  
1985  Boards in Emergency Surgery, Italy  
1986  FLEX Examination  
1988  Massachusetts Medical License  
1989  American Board of Anatomic Pathology (re-certification 2014)

**Faculty Academic Appointments**
1984-1985 Assistant Research Professor Surgery Boston University, Boston, MA  
1988-1989 Instructor Pathology Tufts University, Boston MA  
1997-1998 Lecturer Pathology Residency Training Programs in Anatomic Pathology and Medical Oncology, University of Bologna, Bologna, Italy  
1992-1994 Instructor Pathology Harvard Medical School, Boston, MA  
1994-1999 Assistant Professor Pathology Harvard Medical School  
1999-2006 Associate Professor Pathology Harvard Medical School  
2006  Professor Pathology Harvard Medical School  
2007  Associate Member Broad Institute of Harvard and MIT, Cambridge, MA  
2011-2014 Visiting Professor and Professorial Chair in Molecular Oncology  
Visiting Professor, Division of Cancer Studies, King’s College London School of Medicine, London, UK  
2014- Visiting Professor, Universita’ Vita-Salute, Milan, Italy

**Federica Pedica**

**Work Experience**
June 1st 2013-ongoing Consultant histopathologist  
Unit of Pathology, Department of Experimental Oncology, DIBIT 2, San Gabriele via Oggettina 60, 20132, Milan  
• Consultant histopathologist  
• Teaching activities for International MD program at San Raffaele University  
• Scientific collaborator of the Director of Pathology Professor Claudio Doglioni

**Education and Training**
2013-2016 Ph.D in HUMAN ONCOLOGICAL PATHOLOGY AND STEM CELL (School of Biomedical Translational sciences) (completed with “ottimo”, April 22nd, 2016)  
Policlinico G.B. Rossi, piazzale L.A. Scuro, University of Verona, Italy  
• Title of Ph.D. thesis “Characterization of neoplastic and non neoplastic microenvironment in liver, lung and bone marrow through the study of class III betatubulin”  
may-june 2015 Honorary Clinical Fellow  
Institute of Liver Studies, Liver Labs, 3rd Floor, Cheyne Wing, King's College Hospital, Denmark Hill, London  
2008-2013 Residency in Human Pathology

**Antonella Castellano**

**Education**
2015, PhD in Molecular Medicine - Experimental Neurology, San Raffaele Research Institute, Milan  
2007, Residency in Radiodiagnostics, Vita-Salute University, Milan, Italy  
2006, Degree in Medicine and Surgery, Vita-Salute University, Milan, Italy

**Work Experience**
2012- Present, Researcher in the neuro-oncological field at the Functional Neuroradiology Unit, Dept. of Neuroscience, Vita-Salute San Raffaele University, Milan, Italy
Department of Neurology - Department of Radiology & Biomedical Imaging
### TIMETABLE

**Systematic Pathology & Clinical Immunology, Rheumatology and Dermatology**

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

#### International MD Program A.Y. 2017/2018
Lecture room: Origene (DIBIT 2, floor -1)

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<td>09-11</td>
<td>Systematic Pathology introduction and overview MP</td>
<td>Systematic Pathology Swollen lymph nodes Pathology of Lymphoid tissue MP</td>
<td>Systematic Pathology ESE GR 2 -FP in the Pathology ward MP</td>
<td>Systematic Pathology ESE GR 3 FP - in the Pathology ward MP</td>
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<td>11-13</td>
<td>1. INTRODUCTION (PRQ1)</td>
<td>Systematic Pathology ESE GR 1 -FP in the Pathology ward MP</td>
<td>Systematic Pathology Emopthysis Pulmonary Pathology 1 CD</td>
<td>Systematic Pathology Emopthysis Pulmonary Pathology 2 CD</td>
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<td>14-16</td>
<td>2. SLE (PRQ2)</td>
<td>3. RA (AAM1)</td>
<td>4. OA &amp; GOUT (AAM2)</td>
<td>5. SS/PAPS (PRQ3)</td>
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<td>Systematic Pathology ESE GR 4 - FP in the Pathology ward MP</td>
<td>Systematic Pathology ESE GR 5 - FP in the Pathology ward MP</td>
<td>Mediastinal mass Pathology of the mediastinum MP</td>
<td>A lump in the Breast Pathology of the breast CD</td>
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<td>11-13</td>
<td>Peripheral blood cytopenia Bone Marrow Pathology MP</td>
<td>Systematic Pathology Splenomegaly Pathology of the spleen MP</td>
<td>8. Spondyloarthropaties (AAM3)</td>
<td>A lump in soft tissues Soft Tissue tumors CD</td>
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<td>14-16</td>
<td>6. Scleroderma (PRQ4)</td>
<td>7. IIM / MCTD/UCTD (PRQ5)</td>
<td>9. ALLERGY Molecular bases (MY1)</td>
<td>10. Small vessel Vasculitides (LD1)</td>
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<td>Systematic Pathology ESE GR 6 - FP in the Pathology ward MP</td>
<td>Abnormal liver tests Liver Pathology FP</td>
<td>Systematic Pathology Melena Pathology of the lower GI tract MP</td>
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<td>Seizures Pathology of CNS CD</td>
<td>Dysphagia and dyspepsia Pathology of the upper GI tract MP</td>
<td>13. Autoinflammatory disorders &amp; FMF (LD3)</td>
<td>Molecular Diagnostics in oncology MGC and LP</td>
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<td>Obstructive Jaundice Pathology of pancreas and biliary tract MP</td>
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<td>Pathology of the Kidney and Urinary Bladder Prof. M. Loda</td>
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UNIVERSITÀ VITA-SALUTE SAN RAFFAELE

STUDENT GUIDE

FACULTY OF MEDICINE AND SURGERY

MASTER’S DEGREE COURSE
INTERNATIONAL MD PROGRAM

Academic Year 2017/2018
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<th>Academic Calendar</th>
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<tr>
<td><strong>VITA-SALUTE SAN RAFFAELE UNIVERSITY</strong></td>
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<td><strong>INTERNATIONAL MD PROGRAM - 6th YEAR</strong></td>
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Vita-Salute San Raffaele University considers a continuous process of monitoring and evaluating the quality of the educational mission, also in terms of planning, as essential for achieving excellence in higher education and research.

UniSR Students can assess the correspondence between the teaching quality offered and their expectation. That is very important to improve teaching and training and develop successful strategies.

At the end of each semester, students’ opinions are collected through *evaluation questionnaires*. Filling in the questionnaire is compulsory, according to the guidelines published in November 2013 by ANVUR (the National Agency for the Evaluation of the University and Research Systems). IT techniques have been implemented to speed up questionnaire collection and processing. *Anonymity is fully guaranteed.*

Filling in the questionnaires is the necessary condition which allows a student to register for the exams. After collection, data are firstly conveyed to the Master’s degree course Coordinators and to the Deans of the Faculties and finally to the University Evaluation Commission for the analysis of data.

The data collected will be a fundamental source to spot every sort of issue, thus for future improvement.

In short, filling in the questionnaires represents a key moment of University life in which students take a role of responsibility together with academia and University organization structures in the continuous process of improvement and innovation which makes it possible for our University to rank among the top Universities in the nation and Europe.

We really appreciate all respondents’ valuable time to fill up the questionnaires, especially during intense study times and we would like to raise students’ awareness of the importance of their contribution by carrying out this task responsibly and sharing the same objectives together with this Institution.

The President of the University Committee
for the enhancement of quality
YEAR 6

- 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 (www.unisr.it/k-teacher/secchi-antonio/)
Email: secchi.antonio@hsr.it
Receiving hour: appointment by e-mail

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

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 ¼ point
Further oral evaluation will be allowed to increase (by a maximum of 3 points) or decrease the vote of the written test.
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 and infectious emergencies
- Cardiac arrest
- Acid-base balance
- Shock
- Pulmonary embolism
- Acute coronary syndrome
- Acute Cardiovascular failure
- Acute respiratory failure
- Stroke
- Headache
- Intoxication and poisoning
- Acute infectious diseases
- Acute renal failure
- Endocrinological emergencies
Practical Activities
Students will spend 7 days in the department of Emergency, from 9 am to 9 pm, as reported in the attached Weekly Plan.

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

Students will spend 1 day in Intensive Care Unit.

Textbook
Tintinalli’s Emergency Medicine: Just the Facts, Third Edition
Rosen's Emergency Medicine - Concepts and Clinical Practice

**** **** ****
PUBLIC HEALTH & LEGAL MEDICINE

INSTRUCTORS
The course will be held by:

Carlo Signorelli, MD MSc PhD (co-ordinator)  Email: signorelli.carlo@hsr.it
Guido Travaini  Email: guido.travaini@unimi.it
Michelangelo Casali  Email: casalimichelangelo@gmail.com
Dario Consonni  Email: dario.consonni@unimi.it
Nicola Bedin  Email: fallabrino.tanja@hsr.it
Michael John  Email: john.michael@hsr.it

TEXTBOOK & COURSE MATERIALS

> Public Health
Targeted readings and relevant background references will be distributed by the instructors during the course

> Occupational medicine
Targeted readings and relevant background references will be distributed by the instructors during the course

> Legal and Forensic medicine
W.G. Eckert Introduction to Forensic Science, II edition

> Health Economics
Targeted readings and relevant background references will be distributed by the instructors during the course

> Medical English
Topics for group exercises will be communicated during the presentation of the course.

OBJECTIVES
A solid background in public health and legal medicine is of fundamental importance for every physician and transversal to any medical specialty. In fact, understanding determinants of population health, implementing prevention strategies, reporting disease outbreaks, ensuring infection control - among other public health aspects - are much needed skills for tomorrow’s physicians. This course introduces the general principles of health and disease, health determinants, health policy and management, health systems and health economics, legal and forensic medicine, occupational medicine and prevention in workplaces. The topics of the course refer to the relationship between the MD and the society at the population level, besides the usual relationship MD-patient at the individual level.
Aim of the course is to offer an overview of key global and public health topics, methodological and clinical epidemiology, determinants of health, health policy and management, health economics, occupational medicine, occupational health, legal and forensic medicine as well as
to stimulate students’ critical thinking and to equip them with content and skills they can further develop and apply in their careers.

CONTENTS

The course will cover the following topics:

PUBLIC HEALTH
- General concepts of Public Health and preventive medicine
- Health indicators and health assessment
- Global health and health promotion. The role of international organizations
- Health policy and management. The Italian National Health Service (INHS)
- Epidemiological methods & Clinical epidemiology
- Epidemiology and prevention of vaccine preventable diseases (VPD)
- Determinants of health and environmental health risks

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
- Occupational epidemiology

LEGAL & FORENSIC MEDICINE
- Knowledge of the responsibility of MD (e.g. 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.
- Basic concepts of Health Economics.
- Illustration of some econometric system commonly used for hospitals and healthcare systems.

ENGLISH MEDICINE
Examination of five healthcare systems. The class will be divided into 5 groups, and each group will hold a lesson (ppt. presentation with questions from the audience) on the allocated topic. Each group will receive a mark (0-10) for the presentation. The exercise is mandatory, and will be calculated as part of the final result (see). Any student who does not participate is, first of all, letting down the rest of the group, and will be given 0 (ZERO) for this section.

ASSESSMENT
The following components will contribute to the final grade:

| A. Presentation (VPD carousel) | 10% |
| B. Presentation (paper interpretation) | 10% |
| C. Presentation (M John presentation) | 10% |
| D. FINAL EXAM (36 MCQs) | 70% |
Please note:
- Oral presentations grades are assigned on an individual (or group) basis and take into account both quality and content of slides (PowerPoint or Prezi), presenting skills and clarity of speech.

**STUDENT RESPONSIBILITY POLICY**
*Students are responsible to confirm all assignments are received by their instructor. This includes assignments submitted electronically or left on the web space.*

**ACADEMIC INTEGRITY**
Plagiarism, cheating, submitting work of another person or work previously used and other forms of academic dishonesty will lead to lowered course grades, failure of the course or more severe measures, depending on judgments of the gravity of the individual case.

**CLASS ATTENDANCE / BEHAVIOUR**
Attendance is mandatory. Students are expected to attend class regularly and to participate in all class activities and activate the individual badge as required by University Regulations.

Cell phones, I-pad and computers must be turned off for the duration of each class, unless otherwise noted by the instructor. No eating or drinking in class. Break time must be respected (no longer than 10 minutes or as advised by the teacher); no recording or filming of lessons without written permission from all present.

Any cheating or plagiarism will result in immediate failure on assignment and possible removal from and failure of course.

Please be respectful of all classmates, professors, guests, peers. Any discipline or academic problems will be discussed with the program director and student’s home university, if necessary. Auditing students must attend all lessons, complete all classwork, group work and presentations.

**INSTRUCTORS BIO**

**Carlo Signorelli, MD, MSc, PhD** is Full Professor of Hygiene and Public Health at the University of Parma and at the University Vita-Salute where is also Director of the Post-Graduate School in Hygiene and Preventive Medicine. He is Past-President of the Italian Society of Hygiene, Preventive medicine and Public Health (SItI) and Treasurer of the European Public health Association (EUPHA). He qualified in Medicine at the University of Milan in 1986, he holds an MSc in Epidemiology and a PhD (1994) from the London School of Hygiene & Tropical Medicine. His research work focuses on public health, epidemiology, environmental health, health organisation and immunization policies. He is author or co-author of over 30 teaching books in the fields of epidemiology, environmental health and public health and of over 500 scientific papers.

**Michelangelo Casali MD, PhD** is a forensic pathologist at the Institute of Legal Medicine UNIMI and at the "Luigi Mangiagalli" gynecological hospital in Milan. He is a PhD in Occupational Medicine and Industrial Hygiene. He is also a professional mediator focusing mainly on medical malpractice disputes. He is a member of the MedMal Lab UNIMI. Current research fields: forensic pathology of blunt force trauma, clinical forensic pathology, medical malpractice and clinical risk management, forensic asbestology.

**Guido Travaini, ML** – Degree in Law at Milan University, Qualification in Clinical Criminology at the Specialization School in Criminology at the Medicine and Surgery Faculty of Milan University. Qualification as a Doctor in Criminology (Ph.D) at the Legal Science Faculty of Bari and Trento Universities. Since the
academic year 2005 he has been acting as Professor in charge at the Specialization School in Legal Medicine of Milan University. Since the academic year 2007 he has been teaching Criminology at the University “Vita e Salute”-San Raffaele Hospital - Medicine and Surgery Faculty – Master in Forensic Psychopathology and Criminology. He works at Institute of Legal Medicine University of Milan.

**Dario Consonni, MD, PhD** works in the Epidemiology Unit, Fondazione IRCCS Ca’ Granda Ospedale Maggiore Policlinico in Milan. His activities include study design and statistical analysis of occupational, environmental, and clinical epidemiology studies. He graduated at the University of Milan in 1987 and got the Diploma in Occupational Health in 1991. He was visiting scientist at the International Agency for Research on Cancer, Lyon in 1993. In 1995 he got a PhD at the University of Bari with a thesis on statistical models in occupational epidemiology. He followed residential courses in epidemiology in Florence (1989), Boston (1990), and Finland (1992). Since 1997 he has been teaching epidemiology in the Master in Epidemiology of the Italian Epidemiology Association, University of Turin and since 2000 at the School of Occupational Medicine, University of Milan. He authored or co-authored over 200 papers.

**Nicola Bedin, MBA** – Economist graduated of Bocconi University and experiences at the University of California at Berkeley (US) and at the University of Texas at Austin (US). Since 2005 CEO of IRCCS Policlinico San Donato, Company Leader of San Donato Hospital Group. Since May 2012 CEO of IRCCS Ospedale San Raffaele and since May 2015 CEO of University Vita-Salute San Raffaele. He is Lecturer of Health Economics at University of Pavia and the University Vita-Salute San Raffaele.

**Michael John, BA PGCE** has been teaching English Communication Skills and Medical Humanities at the Vita-Salute University since 1998. He teaches on various courses in the Faculty of Medicine: Medicine and Surgery (traditional course), International MD Program, Biotechnology; Odontoiatrics. He has also taught on the Nursing Course and the Dental Hygiene Course. He is responsible for Communication Skills and Medical Humanities in all of the Postgraduate Specialty Schools of the University. He teaches in-house PhD students, and has taught various PhD and professional courses throughout Italy and abroad. He is the author of numerous indexed papers on the topic of communication skills in medicine. In 2006 he published *English for the Medical Profession* (Masson/Elsevier). He graduated from Exeter University in 1978 and received his post-graduate qualification at Sheffield University in 1980.

**COLLABORATORS BIO**

**Anna Odone, MD MSc MPH** is a Research Fellow at the University of Parma, Italy. MD, she was further trained in epidemiology and public health at the London School of Hygiene and Tropical Medicine and at the Harvard School of Public Health, where she was awarded a 2-year Fulbright scholarship. She has research and work experience in several universities and international organizations and she is author and co-author of 61 indexed papers with an expertise in vaccine preventable diseases and tuberculosis control.
### TIMETABLE

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

#### International MD Program A.Y. 2017/2018

**PUBLIC HEALTH & LEGAL MEDICINE**

**EMERGENCY MEDICINE**

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**IFOM Exam**

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