



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## SYLLABUS DEL CORSO

### Medical Physics II

2324-1-H4102D001-H4102D005M

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#### Aims

Thermodynamics: 1st and 2nd principles of thermodynamics and entropy.

Biomechanics: Statics of the rigid body with applications to the human body.

Fluid mechanics: ideal fluids and real fluids

#### Contents

The primary goal of the course is to provide students with the tools for the understanding of the complex reactions that represent the molecular basis of life, and with the fundamentals to identify the cause-effect relations of the most important chemical and physical processes for the curriculum and the work of a physician. This knowledge will form the primary basis for a rationale approach to the knowledge of medical sciences.

#### Detailed program

THERMODYNAMICS: - Systems and thermodynamics states - Phase transitions - Perfect gas transformations - 1st principle of thermodynamics - 2nd principle of thermodynamics and entropy - Enthalpy and free energy.

BIOMECHANICS - Moment of a force. - Balance of a body with exemplifications of Human Body. - Levers. - Mechanics of locomotion. - Statics of the body. - Young's modulus and elasticity. - Compression module. - Deflections, twists, fractures.

MECHANICS OF FLUIDS: - Stevino's Law - Principle of Archimedes - Theorem of Bernoulli – Poiseuille equation.

Properties of real liquids and viscosity- Concept of hydraulic resistance . - Surface tension in liquids. - Surfactants; phenomena of adhesion and capillarity. - Laplace law.

### **Prerequisites**

Basic knowledges of mathematics and analysis.

### **Teaching form**

Lectures and exercises.

### **Textbook and teaching resource**

Alessandro Bacchetta Domenico Scannicchio "Introduction to Medical Physics" ISBN: 978-8808320469

### **Semester**

Second semester

### **Assessment method**

Multiple choice exercises (numerical exercises that require the application of several physical principles). Oral test on teacher evaluation.

### **Office hours**

By telephone appointment (02 6448 8209) or by email (francesco.mantegazza@unimib.it).

### **Sustainable Development Goals**

GOOD HEALTH AND WELL-BEING

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