

SSD: CHIM/06

Academic year: **2016/17**

Faculty: **Department of Chemistry**

Study courses: **Organic Natural Compounds**

Study plans/Curricula: **Master Degree in Chemical Sciences/curriculum properties and characterization of complex systems**

Type: **Activities similar or supplementary the class (type b)**

Total Credits: **4**

Didactic Methods: **Lectures**

Language of the course: **English**

Didactic Period: **2° year - 1° semester (October – January)**

Exam type: **Oral**

Professor in charge: **ANGELO NACCI**

Training objectives: **To complete the cultural background of the Master Chemist providing an overview of the biosynthetic pathways of secondary metabolism, highlighting the main types of organic reactions studied in vitro and adopted in vivo.**

Prerequisites: **Basic concepts of organic chemistry and biochemistry of bachelor degree**

Didactic Methods: **Classroom power point lectures**

Course programme

Main biological functions of secondary metabolites. Biogenetic and biosynthetic theories. The main biosynthetic bricks: Unit C1, C2, C5, C6C3, C6C2N, indolC2N, C4N and C5N.

The construction mechanisms. Water-soluble vitamins (B1, B2, B3, B5, B6, B8, B9, B12 and vitamin C), fat-soluble (A, D, E, K and N) and their main mechanisms of action.

Biogenetic way of acetate. Polyketides and fatty acids. Lipids. Triglycerides. Unsaturated fatty acids and phospholipids. Prostaglandins. Phenols, anthraquinones, tetracyclines and macrolide antibiotics.

Biogenetic way of shikimic acid. Phenolic acids. Catecholamines. Cinnamic acids. Phenilpropens, lignins and coumarins. Flavonoids.

Biogenetic way of mevalonate. Terpenoids and steroids. The isoprene rule. Monocyclic and bicyclic monoterpenes. Triterpenes. Biogenesis of squalene. Mechanism of lanosterol biosynthesis. Steroids. Cholesterol. Steroid hormones. Bile acids. Tetraterpenes.

Reference Texts: Chemistry, Biosynthesis and Bioactivity of Natural Products. P.M.Dewick. Ed. Piccin. Handouts and lecture notes.