



# UNIVERSITÀ DEGLI STUDI DI PALERMO

<b>DEPARTMENT</b>	Medicina di Precisione in area Medica, Chirurgica e Critica		
<b>ACADEMIC YEAR</b>	2016/2017		
<b>MASTER'S DEGREE (MSC)</b>	DENTISTRY		
<b>INTEGRATED COURSE</b>	GENERAL AND APPLIED HISTOLOGY - INTEGRATED COURSE		
<b>CODE</b>	13579		
<b>MODULES</b>	Yes		
<b>NUMBER OF MODULES</b>	2		
<b>SCIENTIFIC SECTOR(S)</b>	BIO/17		
<b>HEAD PROFESSOR(S)</b>	UZZO MARIA LAURA	Ricercatore	Univ. di PALERMO
<b>OTHER PROFESSOR(S)</b>	LA ROCCA GIAMPIERO	Professore Associato	Univ. di PALERMO
<b>CREDITS</b>	8		
<b>PROPAEDEUTICAL SUBJECTS</b>			
<b>MUTUALIZATION</b>			
<b>YEAR</b>	1		
<b>TERM (SEMESTER)</b>	1° semester		
<b>ATTENDANCE</b>	Mandatory		
<b>EVALUATION</b>	Out of 30		
<b>TEACHER OFFICE HOURS</b>	<p><b>LA ROCCA GIAMPIERO</b>  Wednesday 11:00 13:00 Plesso di Anatomia e Istologia, Dipartimento BiND, Policlinico Universitario</p> <p><b>UZZO MARIA LAURA</b>  Tuesday 10:00 12:00 Sezione di Istologia del BIONEC  Thursday 10:00 12:00 Sezione di Istologia del BIONEC</p>		

**DOCENTE:** Prof.ssa MARIA LAURA UZZO

<b>PREREQUISITES</b>	Basic Concepts of Chemistry, Biochemistry, Molecular and Cellular Biology acquired in earlier or contemporary courses.
<b>LEARNING OUTCOMES</b>	<p>Learning Outcomes</p> <p>Acquisition of histological and embryological basic terminology as the basis for definition and critical interpretation of the morphological knowledge.</p> <p>Capacity 'to apply Knowledge and Understanding</p> <p>Know the main features structural and ultrastructural of cells and tissues in relation to their activities and embryological derivation.</p> <p>Autonomy of Rating</p> <p>Offered to students will be opportunities for discussion of the learning level, which will enable them to verify the knowledge acquired on topics of study subject, for good to promptly fill any gaps.</p> <p>Communicative skills</p> <p>Being Able to describe and illustrate through specific Terminology the essential features, the structural and ultrastructural organization of cells and tissues, related to Their specifics Function.</p> <p>Learning ability</p> <p>Acquire the ability 'integration of data derived from the study of the morphology of cells and tissues and their correlations between structure and function, Which essential cultural heritage for future understanding of the physiology and pathophysiology of the organs and human body systems</p>
<b>ASSESSMENT METHODS</b>	<p>ORAL TEST</p> <p>Eccellente</p> <p>A – A+</p> <p>Excellent 30-30 e lode</p> <p>Excellent knowledge of teaching content ; the student demonstrates high analytic - synthetic capacity and is able to apply the knowledge to solve problems of high complexity</p> <p>Ottimo</p> <p>B</p> <p>Very good 27-29</p> <p>Excellent knowledge of teaching content and excellent properties of language ; the student demonstrates analytical - synthetic capacity and able to apply the knowledge to solve problems of medium complexity and , in some cases , even high</p> <p>Buono</p> <p>C</p> <p>Good 24-26</p> <p>Good knowledge of teaching content and good properties of language ; the student is able to apply the knowledge to solve problems of medium complexity</p> <p>Discreto</p> <p>D</p> <p>Satisfactory 21-23</p> <p>Good knowledge of teaching content , in some cases limited to the main topic ; acceptable ability to use the specific language of the discipline and independently apply the acquired knowledge</p> <p>Sufficiente</p> <p>E</p> <p>Sufficient 18-20</p> <p>Basic knowledge of teaching content , often limited to arguments Main ; modest ability to use the language of specific discipline and apply the knowledge acquired</p> <p>Insufficiente</p> <p>F</p> <p>Fail</p> <p>One does not have acceptable knowledge of the main teaching content ; very little or no ability to use the language of specific discipline and apply the knowledge acquired</p>
<b>TEACHING METHODS</b>	Lessons

**MODULE  
GENERAL HISTOLOGY AND EMBRYOLOGY**

*Prof. GIAMPIERO LA ROCCA*

**SUGGESTED BIBLIOGRAPHY**

Gartner, Hyatt, Istologia, Edises.  
Moore, Persaud: Lo sviluppo prenatale dell'uomo, II edizione, Edises.  
Cui, Atlante di Istologia, Piccin  
AA.VV. Istologia di Monesi, Piccin  
AAVV Embriologia umana, Piccin

<b>AMBIT</b>	50447-Morfologia umana, funzioni biologiche integrate degli organi ed apparati umani
<b>INDIVIDUAL STUDY (Hrs)</b>	75
<b>COURSE ACTIVITY (Hrs)</b>	50

**EDUCATIONAL OBJECTIVES OF THE MODULE**

Having done their knowledge about the ecosystem bio cell, to the organization of the major tissues ; yet to know the evolution of the various phases of human embryo development both in the field of descriptive and on the relationship with the molecular movements that direct and modulate the various stages of prenatal development .

**SYLLABUS**

<b>Hrs</b>	<b>Frontal teaching</b>
3	1 / I. MEANS AND METHODS History of Histology and its study methods: the first means of investigation until light microscope. The optical microscope: the 'parts' of the optical microscope. the light microscope limits. The diffraction of light and Hairy discs. Width of the circular visual. The fluorescence microscope. The confocal laser microscope. The microscope in phase contrast. The polarizing microscope. The electron microscope: basic structure of the electron microscope. Resolving power theoretical and real. Technical set-up of the slides: the fixation to the inclusion. Artifacts. The dyes: classifications. Property 'of the dyes; factors influencing the activity of the dyes. Theories about the mechanism of coloration. Techniques of construction of sections: microtome, ultramicrotome, cryostat. The histochemical and cytochemical methods: general histochemical techniques. Smear of blood. Immunohistochemistry: application of the revelation of the peroxidase immunohistochemical techniques.
6	2 / I . CYTOLOGY Cell doctrine. Syncytia and plasmodia. Cell differentiation. General architecture of the cell morphology. The physical and chemical characterization of the cell: the inorganic and organic components. Cellular metabolism and vital manifestations of the protoplasm . The structural and ultrastructural morphological characterization of the cell : the cytoplasmic membrane unit: ultrastructure and function of the plasmatic membrane; plasmatic membrane morpho - functional differentiations . The devices microcavity cytoplasmic : ultrastructure and functions of the endoplasmic reticulum, mitochondria, lysosomes, peroxisomes, Golgi complex. The macromolecular characterization of cellular constituents : Pattern microtrabecular and cytoskeleton .

25	<p>3 / I. Histology Tissues. Organs. Systems. Classification of tissues. Epithelial tissue: classification and morphofunctional considerations of epithelia: lining epithelia, sensory, secreting. The units' secreting cell, exocrine glands, the endocrine glands (classification and structural organization). The hypothalamus-pituitary system. The diffuse neuroendocrine system. The connective tissue: classification and morphological and functional considerations. The cells and the extracellular matrix: macromolecular and functional considerations. The mesenchyme. The connective tissues; cartilaginous tissue; the bone tissues; blood, tissues and bloodforming organs. The contractile tissues: smooth muscle, skeletal striated muscle tissue, cardiac striated muscle tissue. Nervous tissue: evolution of the study concerning neuron and investigative procedures. The neuron as entities' morphological: number and size of neurons; shape of the neurons; classifications; structure and ultrastructure of the neuron components (the membrane of the neuron, the pirenoforo, the tigroide substance, neurotubules and neurofilament, the dendrites, the neuritis, the nerve fiber). Ways of neuron connection: central and peripheral nerve endings. electrical synapses. chemical synapses and their mode of nerve impulse transduction. endocytotic recycling. The neuron as cytochemistry entities . Glia: generalities. Glia of the CNS: ependyma, macroglia, oligodendroglial, microglia, pituicytes, Müller cells, gliocytes</p>
4	<p>EMBRYOLOGY 1 / E. GENERALITY Introduction: meaning and development of Embryology. The various stages of embryonic development, embryo-fetal measurements. embryo-fetal anatomy: description of the various parts of embryo and fetus. Determination and sex differentiation: differentiation of gonads. Primordial germ cells. The development of the male and female gonads. The development of the sperm tracts and of the genital organs. Generality on male genitalia: The testicular unit: The Didymus, epididymis, the seminiferous tubule and Leydig cells. The sperm ducts. The neurohormonal control of male gonadali functions. Generality female genitalia: the united and ovarian folliculogenesis pre-postpubertal; the fallopian tube; the uterus; the vagina. The neurohormonal control of female gonadali functions. The male gamete: the seminiferous epithelium cycle. The cells of the seminal line. Spermatogonia. Spermatocytes. Spermatids. The spermioistogenesis. The sperm. abnormal sperm. The female gametogenesis: oogenesis and projection in the ovarian cycle, uterine and vaginal.</p>
6	<p>2 / E. FERTILIZATION AND EMBRYONIC FIGURES Fertilization: meaning of fertilization. The journey of the sperm through the male genital tract. Maturation and motility sperm. The emission of sperm. The sperm or semen. The sperm capacitation. Vitality 'sperm. Route and vitality oocyte. Phenomenology of fertilization: the acrosome reaction, sperm penetration in ovules, of the oocyte activation, cortical reaction. Zygote formation. IVF: general information. Segmentation: from morula to blastula. Types of egg. Types of segmentation. Segmentation in placental mammals. Development programming. Control of the early stages of development by maternal genetic programs. Transition from mother's program to the embryo. Control of the embryonic development program. Blastogenesis (Nesting and decidual reaction). Gastrulation: the meaning of gastrulation. Gastrulation in placental mammals. cytoskeletal mechanisms during morphogenesis. germ layers. Coordinating cytoskeletal and intercellular signals during gastrulation. The neurulation: meaning and organizational commitment.</p>

4	3 / E. MORPHOGENESIS And HISTOGENESIS Embryonic development and morphogenesis in humans: induction (endogenous and exogenous inducers, the primary and secondary., Interactions, organizers), Determination, morphogens, Stem Cells. The first week of development (segmentation). The second week of development (preparation for gastrulation). The third week of development (gastrulation). The fourth week of development (secondary morphogenesis). From fifth to thirtyeighth week of development. Histogenesis. The evolution of the germ layers: introduction. ectodermal derivatives. entodermici derivatives. mesodermal derivatives. The fetal membranes: introduction. The embryonic annexes in placental mammals. The fetal membranes (embryofetal) in humans.
2	4 / E. ORGANOGENESIS Development overview of the central nervous system, Respiratory and Cardiovascular (hematopoiesis) system, Gastrointestinal and Urogenital System.

## MODULE ORAL HISTOLOGY AND EMBRYOLOGY

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Ten Cate: Istologia Orale, Piccin  
Moore, Persaud: Lo sviluppo prenatale dell'uomo, II edizione, Edises.

<b>AMBIT</b>	50447-Morfologia umana, funzioni biologiche integrate degli organi ed apparati umani
<b>INDIVIDUAL STUDY (Hrs)</b>	45
<b>COURSE ACTIVITY (Hrs)</b>	30

### EDUCATIONAL OBJECTIVES OF THE MODULE

Having done their knowledge about the ecosystem bio cell, to the organization of the tooth tissues ; to know the evolution of the various phases of human tooth development both in the field of descriptive and on the relationship with the molecular movements that direct and modulate the various stages of prenatal and postnatal teeth development .

## SYLLABUS

Hrs	Frontal teaching
3	Generalities on the development of the oral structures and correlation with the pre-implant and post-implant phases of human development.
3	Head and Neck development, pharyngeal gut development, pharyngeal arches, pouches and grooves.
3	Development of orofacial structures: 1)Palate development; 2) Development of nasal cavities and septum; 3) Tongue development
5	Odontogenesis: Development of the dental lamina and dental fields, genetic regulation, molecular movements, stages of teeth development; Root development; Deciduous teeth eruption; definitive teeth eruption
7	Teeth tissues: Enamel; Matrix formation and mineralization; Maturation of enamel, structures in mature enamel, microscopic and morphofunctional aspects Dentin: Dentinogenesis, types of dentin, defects in dentin formation, microscopia and morphofunctional aspects Dental pulp: Embryologic origin, cell types in dental pulp, dental pulp stem cells, vascular and nervous structures, microscopic and morphofunctional aspects
3	Parodontum: Cementum: embryologic origin, classification and distribution, relationships with other dental tissues. Parodontal ligament Alveolar bone
6	Gingiva and junctions between teeth and gingiva. Oral cavity and facial structures: 1)Glands; 2) Lymphoid structures; 3) Nasal cavities and paranasal sinuses Oral mucosa: Structure, regional differences in oral mucosa, pigmentation of oral mucosa, renewal, repair and aging of oral mucosa