



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Scienze e Tecnologie Biologiche, Chimiche e Farmaceutiche		
ACADEMIC YEAR	2019/2020		
BACHELOR'S DEGREE (BSC)	BIOLOGICAL SCIENCES		
SUBJECT	BIOLOGY OF DEVELOPMENT		
TYPE OF EDUCATIONAL ACTIVITY	B		
AMBIT	50026-Discipline botaniche, zoologiche, ecologiche		
CODE	01610		
SCIENTIFIC SECTOR(S)	BIO/06		
HEAD PROFESSOR(S)	DI LIEGRO CARLO	Professore Associato	Univ. di PALERMO
	MARIA		
	GERACI FABIANA	Professore Associato	Univ. di PALERMO
OTHER PROFESSOR(S)			
CREDITS	6		
INDIVIDUAL STUDY (Hrs)	102		
COURSE ACTIVITY (Hrs)	48		
PROPAEDEUTICAL SUBJECTS			
MUTUALIZATION			
YEAR	3		
TERM (SEMESTER)	1° semester		
ATTENDANCE	Not mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	<p>DI LIEGRO CARLO MARIA Monday 14:30 15:30 stanza 403, ed. 16, viale delle scienze Wednesday 14:30 15:30 stanza 403, ed. 16, viale delle scienze Friday 14:30 15:30 stanza 403, ed. 16, viale delle scienze</p> <p>GERACI FABIANA Monday 15:00 16:00 Studio docente. Ricevimento da fissare previo contatto per mail.</p>		

DOCENTE: Prof. CARLO MARIA DI LIEGRO- *Lettere A-K*

PREREQUISITES	Students should know the main topics of the following courses: i) Cytology and Histology, ii) Biochemistry, iii) Molecular Biology.
LEARNING OUTCOMES	<p>Knowledge and understanding Students should reach a good level of knowledge on cellular and molecular mechanisms which regulate embryo development, and should be able to understand and explain the experiments which allowed studying those mechanisms.</p> <p>Applying knowledge and understanding Students should be able to use acquired knowledge to build connections with fields related to Developmental Biology, and to apply knowledge to their next studies as well as to experimentation and research</p> <p>Making judgements Students should develop the capacity of describing and analyzing experimental embryology, and providing their own opinions on the value of the experiments for the understanding of animal development.</p> <p>Communication skills Students should be able to present the topics addressed in the course and should also provide their opinions over related unsolved questions.</p> <p>Learning skills Students should acquire the ability to analyze and summarize the studied topics, and should be able to study autonomously.</p>
ASSESSMENT METHODS	Oral examination consisting of an interview aimed at verifying knowledge and understanding of the topics of the syllabus of the course, as well as the ability of processing knowledge and presenting arguments. The capacity to provide independent opinions and establish connections between the program of the course and previously acquired knowledge in related fields will be evaluated.
EDUCATIONAL OBJECTIVES	<p>Knowing the main mechanisms for tissues and organs formation in the embryos of model organisms.</p> <p>Knowing the molecular processes regulating development of embryonic structures, i.e. patterns of gene expression and intercellular signaling pathways.</p> <p>Understanding and describing the experiments of embryology which allowed acquiring current knowledges in the field of Developmental Biology.</p>
TEACHING METHODS	The course is organized in frontal lectures during which, by powerpoint presentations and short videos, the topics described in the attached syllabus will be presented, with special focus on the experimental procedures which allowed to acquire current knowledges about development of the animal organisms used as models.
SUGGESTED BIBLIOGRAPHY	<p>Biologia dello Sviluppo di S.F. Gilbert - M.J.F. Barresi (Ed. Zanichelli)</p> <p>Biologia dello Sviluppo di L. Wolpert, C. Tickle, A. Martinez Arias (Ed. Zanicheli)</p> <p>Biologia dello Sviluppo di G. Giudice, G. Tocco, C. Campanella (Ed. Piccin)</p>

SYLLABUS

Hrs	Frontal teaching
2	Introduction to Educational Objectives and Program of the course. Elements of the History of Developmental Biology and choice of embryonic experimental models.
4	Introduction to Developmental Biology. Mechanisms of development. Specification, induction, signal transduction pathways. Environmental influence on development.
4	Structure of the gonads and gametogenesis in chosen model organisms. Sex determination.
4	Fertilization in Sea urchin and in Mammals
3	<i>C. elegans</i> developmental pattern. Blastomere identity specification. Integration of autonomous and conditional pathways of specification.
8	<i>Drosophila melanogaster</i> development. Anteroposterior and dorsoventral axes formation. Maternal effect genes, segmentality genes, homeotic selector genes.
4	Sea urchin development. Developmental pattern. Experiments of embryology. Gene expression during development. Gene networks.
3	Tunicate development. Autonomous and conditional specification of embryonic territories. Specification of embryonic axes.
7	Amphibian development. Specification of the body axes in amphibian embryos. Mesoderm specification. Nieuwkoop center formation. Spemann organizer's functions. Factors participating in the organization and execution of embryonic development.
4	Mammal embryonic development, and embryo annexes formation. Specification of embryonic axes.
5	The concept of stem cell. Adult and embryonic stem cells.

DOCENTE: Prof.ssa FABIANA GERACI- *Lettere L-Z*

PREREQUISITES	Students should know the main topics of the following courses: i) Cytology and Histology, ii) Biochemistry, iii) Molecular Biology.
LEARNING OUTCOMES	<p>Knowledge and understanding Students should reach a good level of knowledge on cellular and molecular mechanisms which regulate embryo development, and should be able to understand and explain the experiments which allowed studying those mechanisms.</p> <p>Applying knowledge and understanding Students should be able to use acquired knowledge to build connections with fields related to Developmental Biology, and to apply knowledge to their next studies as well as to experimentation and research</p> <p>Making judgements Students should develop the capacity of describing and analyzing experimental embryology, and providing their own opinions on the value of the experiments for the understanding of animal development.</p> <p>Communication skills Students should be able to present the topics addressed in the course and should also provide their opinions over related unsolved questions.</p> <p>Learning skills Students should acquire the ability to analyze and summarize the studied topics, and should be able to study autonomously.</p>
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EDUCATIONAL OBJECTIVES	<p>Knowing the main mechanisms for tissues and organs formation in the embryos of model organisms.</p> <p>Knowing the molecular processes regulating development of embryonic structures, i.e. patterns of gene expression and intercellular signaling pathways.</p> <p>Understanding and describing the experiments of embryology which allowed acquiring current knowledges in the field of Developmental Biology.</p>
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SYLLABUS

Hrs	Frontal teaching
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