

Main course information	
Academic subject	Regulation of Gene Expression
Degree course	Cellular and Molecular Biology
Degree class	LM/6
ECTS credits (CFU)	6
Compulsory attendance	Yes
Teaching language	Italian
Accademic Year	2019/2020

Professor/Lecturer	
Name & SURNAME	Mariateresa Volpicella
email	mariateresa.volpicella@uniba.it
Tel.	080-5443311
Tutorial time/day	by appointment to be requested by email

Course details	Pass-fail exam/Exam with mark out of 30	SSD code	Type of class
	Exam with mark out of 30	BIO/11	Lectures

Teaching schedule	Year	Semester
	I	II

Lesson type	CFU/ECTS	Lessons (hours)	CFU/ECTS lab	Lab hours	CFU/ECTS tutorial/workshop	Tutorial/workshop hours	CFU/ECTS field trip	Field trip Hours
	6	48	0	0	0	0	0	0

Time management	Total hours	Teaching hours	Self-study hours
	150	48	102

Academic Calendar	First lesson	Final lesson
	March	June

Syllabus	
Course entry requirements	Knowledge of molecular biology, biochemistry and genetics
Expected learning outcomes (according to Dublin Descriptors) (it is recommended that they are congruent with the learning outcomes contained in A4a, A4b, A4c tables of the SUA-CdS)	
<i>Knowledge and understanding</i>	Acquisition of advanced knowledge of molecular biology, with particular regard to structure and functions of informational molecules, and to the mechanisms by which information is expressed throughout the life of a cell and is transmitted in next generations.
<i>Applying knowledge and understanding</i>	Application of broad-spectrum methodologies related to the biomolecular research field.
<i>Making informed judgements and choices</i>	Acquisition of autonomy in areas related to evaluation, and interpretation of experimental data and to the formulation of strategies for the study of the mechanisms at the base of gene regulation.
<i>Communicating knowledge and understanding</i>	Acquisition of vocabulary and terminology related to genome regulation in order to understand any further information through a specific bibliography.
<i>Capacities to continue learning</i>	Acquisition of the ability to investigate, update and read with a critical spirit the evolution of the discipline, through the consultation of texts, databases and other information on the net.

Syllabus

Course content

PART 1. RNA polymerase, their promoters, and general transcription factors in Eukaryotes

- Differences in the three eukaryote RNA polymerases
- Promoters
- Enhancer and silencers
- General transcription factors in eukaryotes
- Class I Factor
- Class II Factor

PART 2. Transcription activators in Eukaryotes

- Categories of activators
- Structures of the DNA-Binding motifs of activators
- Interaction among activators
- Regulation of transcription factors

PART 3. Chromatin structure and its effects on transcription

- Histones
- Nucleosomes
- Nucleosome assembling
- Chromatin structure and transcription

PART 4. Regulation of the eukaryote cellular cycle

- General features of cellular cycle and its control
- Cyclins and MPF activity
- Cyclin kinase- dependent during mitosis
- Molecular mechanisms in mitosis regulation
- Phase S, cyclin-CDK complex and ubiquitin-ligase regulation
- Regulation of the cellular cycle in eukaryotic cells
- check points in the regulation of the cellular cycle

PART 5. Gene control during development

- Specification of the cellular type in the yeast
- Specification and differentiation in muscle

PART 6. Regulation of translation in Eukaryotes

- Initiation of translation in eukaryotes
- Regulation of translation
- Regulation of mRNA-dependent translation and protein stability

PART 7. Regulatory RNAs

- RNA-mediated regulation in bacteria
- RNA interference
- Synthesis and function of miRNAs
- Evolution and use of RNAi

Course books/Bibliography	<p>1. J.D. Watson et al BIOLOGIA MOLECOLARE DEL GENE 6a eds- Ed. Zanichelli .</p> <p>2. F. Amaldi et al. BIOLOGIA MOLECOLARE 2a eds - Ed. Zanichelli.</p> <p>3. R.F. Weaver, BIOLOGIA MOLECOLARE - 2a eds -McGraw-Hill</p> <p>4. H. Lodish et al. BIOLOGIA MOLECOLARE DELLA CELLULA 3a eds – Zanichelli.</p>
Notes	The PowerPoint of the lessons are available as support.
Teaching methods	Frontal lessons with the use of power point.
Assessment methods (indicate at least the type written, oral, other)	Oral exam
Evaluation criteria (Explain for each expected learning outcome what a student has to know, or is able to do, and how many levels of achievement there are	In addition to ascertaining the acquisition of concepts, it will be evaluate the capacity of respond to the reasons and make connections with a critical and punctual spirit of the topics within the same discipline and in relation to other disciplines related, such as biochemistry and genetics.
Further information	