

SYLLABUS OF MATTER

(To be published on the institution's website)

IMMUNOLOGICAL TECHNIQUES

MASTER COURSE	Academic Master – Applied Immunology (Biological Sciences) — Semester 2				
TEACHER	Name and surname: ARRAR LAKHEMISI				
Email	lekharrar@yahoo.fr	Reception day	TuesdaY Wednesday	Hour	10-15h
Office phone N°	_____	Building	__SNV__	Office	_____

COURSE DESCRIPTION	
Unit Teaching Type	UEF1
Objective	Give students an overview of immuno-detection, immuno-diagnostic and immuno-localisation methods used in immunology and in research, analysis and diagnostic laboratories.
Prerequisites	Immunology, biochemistry.
Short content	- Immunological reminders: cell markers, Ag-Ab reaction, preparation of specific (polyclonal/monoclonal) antibodies - Precipitation methods; agglutination and haemagglutination - Complement-based methods: complement fixation, cytolysis and inhibition - Seroneutralisation; immunoenzymatic techniques; radio-immunological techniques - Immunofluorescence techniques; antibody-labelling methods; cellular techniques
Subject Credits	6
Matter Coefficient	3
Weekly Hourly Volume (VHH)	06h00
Lecture / Tutorial / Lab (Cours/TD/TP)	Lecture: 03h00 Tutorial: 01h30 Lab work: 00h00
Semester Hourly Volume (VHS)	67h30
Personal Work Hours	82h30
Targeted skills	Mastery of the concepts and techniques listed in the short content; ability to analyse, synthesise and communicate scientific results in the field of Applied Immunology.

EVALUATION OF KNOWLEDGE	
Mode of evaluation	Written examination, practical-work reports.
Continuous assessment weighting	As defined by the teaching team at the start of the semester (typically $\geq 40\%$ for UED/UET units).
First knowledge check	Date / duration / type: to be announced by the teacher.
Second knowledge check	Date / duration / type: to be announced by the teacher.

EQUIPMENT AND MATERIALS USED

Handouts	Lecture notes (polycopiés), slide decks and scientific articles provided by the teacher.
Laboratory materials	Not applicable (no scheduled laboratory sessions).
Application names	Departmental e-learning platform / university digital workspace (as communicated by the teacher).
Protective materials	Not applicable.

EXPECTATIONS	
Expected of students	Regular attendance, active participation, completion of assigned readings/exercises and punctual submission of practical-work reports.
Teacher expectations	Timely delivery of the course content, availability during reception hours, and clear communication of evaluation criteria at the start of the semester.

BIBLIOGRAPHY	
• Béné M.C. et al., Méthodes en immunologie, 2020. • ASSIM, Méthodes en immunologie, Eyrolles, 2020. • Cours AllergoLyon, Immunologie fondamentale et immunopathologie, 2018.	

SYLLABUS OF MATTER

GENOMIC AND PROTEOMIC ANALYSES

MASTER COURSE	Academic Master – Applied Immunology (Biological Sciences) — Semester 2				
TEACHER	Name and surname: DJELILI HANIFA				
Email	hdhanifadj@gmail.com	Reception day	Sunday Tuesday	Hour	10-15h
Office phone N°	_____	Building	SNV	Office	_____

COURSE DESCRIPTION	
Unit Teaching Type	UEF1
Objective	Introduce students to genomics and post-genomics approaches and the techniques used, present recent developments in genome/proteome study, and cover data treatment/analysis using bioinformatics tools.
Prerequisites	Molecular biology and genetic manipulation.
Short content	• Introduction to genomics and proteomics; fundamental and technological aspects • Post-genomic approach; genome structure and telomere roles; centromere structure/function • Extranuclear genomes (chloroplast, mitochondria) • Transcriptomes: quantitative analysis methods (microarrays, SAGE, RT-PCR); applications to early auto-immunity • Multi-protein complexes, gene expression and chromatin/cell-cycle control • Proteomics approaches: 2-D electrophoresis, mass spectrometry, protein quantification and interactions • Functional/structural proteomics; biomarker discovery; expression proteomics
Subject Credits	6
Matter Coefficient	3
Weekly Hourly Volume (VHH)	06h00
Lecture / Tutorial / Lab (Cours/TD/TP)	Lecture: 03h00 Tutorial: 01h30 Lab work: 00h00
Semester Hourly Volume (VHS)	67h30
Personal Work Hours	82h30
Targeted skills	Mastery of the concepts and techniques listed in the short content; ability to analyse, synthesise and communicate scientific results in the field of Applied Immunology.

EVALUATION OF KNOWLEDGE	
Mode of evaluation	Written examination.
Continuous assessment weighting	As defined by the teaching team at the start of the semester (typically $\geq 40\%$ for UED/UET units).

First knowledge check	Date / duration / type: to be announced by the teacher.
Second knowledge check	Date / duration / type: to be announced by the teacher.

EQUIPMENT AND MATERIALS USED

Handouts	Lecture notes (polycopiés), slide decks and scientific articles provided by the teacher.
Laboratory materials	Not applicable (no scheduled laboratory sessions).
Application names	Departmental e-learning platform / university digital workspace (as communicated by the teacher).
Protective materials	Not applicable.

EXPECTATIONS

Expected of students	Regular attendance, active participation, completion of assigned readings/exercises and punctual submission of practical-work reports.
Teacher expectations	Timely delivery of the course content, availability during reception hours, and clear communication of evaluation criteria at the start of the semester.

BIBLIOGRAPHY

- Alberts B. et al., Molecular Biology of the Cell, De Boeck Supérieur, 2015.
- Sambrook J., Russell D., Molecular Cloning, De Boeck, 2012.
- Annual Review of Biochemistry, Quantitative Proteomics by Mass Spectrometry, 2014.

SYLLABUS OF MATTER

BIOTECHNOLOGICAL AND IMMUNOLOGICAL TOOLS

MASTER COURSE	Academic Master – Applied Immunology (Biological Sciences) — Semester 2				
TEACHER	Name and surname: Houcher Zahira				
Email	houcherz@yahoo.fr	Reception day	Monday Tuesday	Hour	13-17h
Office phone N°	_____	Building	_____	Office	_____

COURSE DESCRIPTION	
Unit Teaching Type	UEF2
Objective	Present recent technological developments underlying genomic approaches and molecular-engineering methods, covering library construction/validation, mapping, genotyping, systematic mutagenesis, recombinant-protein engineering and systematic expression/interaction studies.
Prerequisites	Molecular biology and genetic manipulation.
Short content	• Reminders on genomic/proteomic approaches; introduction to biotechnology • Library construction and validation; mapping and genotyping approaches • Plant and animal transgenesis; reproductive and non-reproductive cloning • Gene and cell therapy; vaccine production, immunotherapy and serotherapy • Cytokine production; detection of GMOs; genetic fingerprinting • Systematic expression and interaction studies
Subject Credits	6
Matter Coefficient	3
Weekly Hourly Volume (VHH)	06h00
Lecture / Tutorial / Lab (Cours/TD/TP)	Lecture: 03h00 Tutorial: 00h00 Lab work: 01h30
Semester Hourly Volume (VHS)	67h30
Personal Work Hours	82h30
Targeted skills	Mastery of the concepts and techniques listed in the short content; ability to analyse, synthesise and communicate scientific results in the field of Applied Immunology.

EVALUATION OF KNOWLEDGE	
Mode of evaluation	Continuous assessment and written examination.
Continuous assessment weighting	As defined by the teaching team at the start of the semester (typically $\geq 40\%$ for UED/UET units).
First knowledge check	Date / duration / type: to be announced by the teacher.
Second knowledge check	Date / duration / type: to be announced by the teacher.

EQUIPMENT AND MATERIALS USED	
Handouts	Lecture notes (polycopiés), slide decks and scientific articles provided by the teacher.
Laboratory materials	Equipment of the Techniques d'Analyse / Biochimie / Physiologie Animale teaching laboratories (spectrophotometers, centrifuges, electrophoresis units, microscopes, etc.), as listed in the master's equipment file.
Application names	Departmental e-learning platform / university digital workspace (as communicated by the teacher).
Protective materials	Lab coat, gloves, safety glasses as required for practical sessions.

EXPECTATIONS	
Expected of students	Regular attendance, active participation, completion of assigned readings/exercises and punctual submission of practical-work reports.
Teacher expectations	Timely delivery of the course content, availability during reception hours, and clear communication of evaluation criteria at the start of the semester.

BIBLIOGRAPHY	
• Course notes on molecular biology, Univ. Constantine – genomics, transcriptome, proteomics. • Principes des techniques de biologie moléculaire et génomique, Quae éditions. • Inserm dossier on proteomics.	

SYLLABUS OF MATTER

EXPERIMENTAL BASIS AND APPROACHES IN IMMUNOLOGY

MASTER COURSE	Academic Master – Applied Immunology (Biological Sciences) — Semester 2				
TEACHER	Name and surname: BOUDOUKHA CHAHRA				
Email	boudoukha_chahra@yahoo.fr	Reception day	Sunday Wednesday	Hour	9h-12h
Office phone N°	_____	Building	_____	Office	_____

COURSE DESCRIPTION	
Unit Teaching Type	UEM
Objective	Teach students to locate central and peripheral immune organs in animals, perform histological sections, distinguish immune tissues/cells under the microscope, use the microtome, apply histochemistry/histology techniques and study bone-marrow/peripheral-blood cells.
Prerequisites	Basic immunology, histology and optical-microscope use.
Short content	- Anatomy and histology of primary lymphoid organs; bone-marrow stem cells; identification of thymocytes, B/T lymphocytes and dendritic cells - Macrophages and polynuclear cells - Anatomy and histology of secondary lymphoid organs (lymph node, lymphatic vessels, follicles, germinal centre) - Value of experimental models in immunology; chimeric and transgenic animals - Use of animal models to study immune pathologies - Practical work: mouse dissection, restraint/administration/sampling methods, histological sections
Subject Credits	5
Matter Coefficient	3
Weekly Hourly Volume (VHH)	03h00
Lecture / Tutorial / Lab (Cours/TD/TP)	Lecture: 01h30 Tutorial: 00h00 Lab work: 02h30
Semester Hourly Volume (VHS)	60h00
Personal Work Hours	65h00
Targeted skills	Mastery of the concepts and techniques listed in the short content; ability to analyse, synthesise and communicate scientific results in the field of Applied Immunology.

EVALUATION OF KNOWLEDGE	
Mode of evaluation	Written examination, oral presentations.
Continuous assessment weighting	As defined by the teaching team at the start of the semester (typically $\geq 40\%$ for UED/UET units).
First knowledge check	Date / duration / type: to be announced by the teacher.

Second knowledge check	Date / duration / type: to be announced by the teacher.
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EQUIPMENT AND MATERIALS USED

Handouts	Lecture notes (polycopiés), slide decks and scientific articles provided by the teacher.
Laboratory materials	Equipment of the Techniques d'Analyse / Biochimie / Physiologie Animale teaching laboratories (spectrophotometers, centrifuges, electrophoresis units, microscopes, etc.), as listed in the master's equipment file.
Application names	Departmental e-learning platform / university digital workspace (as communicated by the teacher).
Protective materials	Lab coat, gloves, safety glasses as required for practical sessions.

EXPECTATIONS

Expected of students	Regular attendance, active participation, completion of assigned readings/exercises and punctual submission of practical-work reports.
Teacher expectations	Timely delivery of the course content, availability during reception hours, and clear communication of evaluation criteria at the start of the semester.

BIBLIOGRAPHY

- JoVE, Secondary lymphoid organs: spleen, lymph nodes, MALT. - University of Nantes course notes on bone marrow and thymus anatomy/physiology.
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SYLLABUS OF MATTER

BIostatISTICS

MASTER COURSE	Academic Master – Applied Immunology (Biological Sciences) — Semester 2				
TEACHER	Name and surname: Bensaid Nasreddine				
Email	bensaidnasr@yahoo.com	Reception day	Monday Thursday	Hour	9h-12h
Office phone N°	_____	Building	SNV	Office	_____

COURSE DESCRIPTION	
Unit Teaching Type	UEM
Objective	Give students the statistical competencies required to design, analyse and interpret experimental and clinical data relevant to immunological research.
Prerequisites	Statistics.
Short content	- Fundamental principles of applied statistics: Gaussian law, position/dispersion parameters, confidence intervals, descriptive graphics - Study design: parallel/crossover/factorial/block designs, covariates, sample-size calculation - Comparison of means (t-test, ANOVA), multiple testing, difference vs equivalence tests - Simple and polynomial linear regression, model validity, confidence/prediction intervals - Comparison of proportions (2x2 contingency tables), confidence intervals, sensitivity/specificity
Subject Credits	4
Matter Coefficient	2
Weekly Hourly Volume (VHH)	03h00
Lecture / Tutorial / Lab (Cours/TD/TP)	Lecture: 01h30 Tutorial: 00h00 Lab work: 01h30
Semester Hourly Volume (VHS)	45h00
Personal Work Hours	55h00
Targeted skills	Mastery of the concepts and techniques listed in the short content; ability to analyse, synthesise and communicate scientific results in the field of Applied Immunology.

EVALUATION OF KNOWLEDGE	
Mode of evaluation	Written examination, oral presentations.
Continuous assessment weighting	As defined by the teaching team at the start of the semester (typically $\geq 40\%$ for UED/UET units).
First knowledge check	Date / duration / type: to be announced by the teacher.
Second knowledge check	Date / duration / type: to be announced by the teacher.

EQUIPMENT AND MATERIALS USED	
Handouts	Lecture notes (polycopiés), slide decks and scientific articles provided by the teacher.
Laboratory materials	Equipment of the Techniques d'Analyse / Biochimie / Physiologie Animale teaching laboratories (spectrophotometers, centrifuges, electrophoresis units, microscopes, etc.), as listed in the master's equipment file.
Application names	Departmental e-learning platform / university digital workspace (as communicated by the teacher).
Protective materials	Lab coat, gloves, safety glasses as required for practical sessions.

EXPECTATIONS	
Expected of students	Regular attendance, active participation, completion of assigned readings/exercises and punctual submission of practical-work reports.
Teacher expectations	Timely delivery of the course content, availability during reception hours, and clear communication of evaluation criteria at the start of the semester.

BIBLIOGRAPHY	
• Abbas A.K., Cellular and Molecular Immunology (reference textbook). • Köhler G., Milstein C., foundational work on monoclonal antibodies. • Sallusto F., Lanzavecchia A., studies on antigen-presenting cells.	

SYLLABUS OF MATTER

MOLECULAR BIOLOGY AND IMMUNOLOGY WORKSHOP

MASTER COURSE	Academic Master – Applied Immunology (Biological Sciences) — Semester 2				
TEACHER	Name and surname: BADACHE HOUCINE				
Email	hocine.badache@univ-setif.dz	Reception day	Sunday Tuesday	Hour	13-16h
Office phone N°	_____	Building	_____	Office	_____

COURSE DESCRIPTION	
Unit Teaching Type	UED
Objective	Provide essential hands-on knowledge of molecular-biology and immunology manipulations, from qualitative/quantitative DNA analysis to production of diagnostic kits.
Prerequisites	General immunology and molecular biology.
Short content	• DNA extraction from human blood; DNA electrophoresis; molecular phylogeny • Restriction-enzyme analysis of DNA variations; genetic-pathology diagnosis by digestion-fragment analysis • Introduction to PCR: bacterial identification, fish-species identification, application to a genetic pathology • GFP applications: plasmid production, bacterial transformation, recombinant-protein production and purification • Genetic-polymorphism studies; production of polyclonal antibodies; antigen-antibody reaction; ELISA
Subject Credits	1
Matter Coefficient	1
Weekly Hourly Volume (VHH)	01h30
Lecture / Tutorial / Lab (Cours/TD/TP)	Lecture: 01h00 Tutorial: 00h00 Lab work: 00h30
Semester Hourly Volume (VHS)	22h30
Personal Work Hours	02h30
Targeted skills	Mastery of the concepts and techniques listed in the short content; ability to analyse, synthesise and communicate scientific results in the field of Applied Immunology.

EVALUATION OF KNOWLEDGE	
Mode of evaluation	Continuous assessment (lab reports) and final examination.
Continuous assessment weighting	As defined by the teaching team at the start of the semester (typically $\geq 40\%$ for UED/UET units).
First knowledge check	Date / duration / type: to be announced by the teacher.
Second knowledge check	Date / duration / type: to be announced by the teacher.

EQUIPMENT AND MATERIALS USED

Handouts	Lecture notes (polycopiés), slide decks and scientific articles provided by the teacher.
Laboratory materials	Equipment of the Techniques d'Analyse / Biochimie / Physiologie Animale teaching laboratories (spectrophotometers, centrifuges, electrophoresis units, microscopes, etc.), as listed in the master's equipment file.
Application names	Departmental e-learning platform / university digital workspace (as communicated by the teacher).
Protective materials	Lab coat, gloves, safety glasses as required for practical sessions.

EXPECTATIONS

Expected of students	Regular attendance, active participation, completion of assigned readings/exercises and punctual submission of practical-work reports.
Teacher expectations	Timely delivery of the course content, availability during reception hours, and clear communication of evaluation criteria at the start of the semester.

BIBLIOGRAPHY

• Karp G., Cell and Molecular Biology: Concepts and Experiments, 3rd ed., De Boeck, 2010. • Lodish H. et al., Molecular Cell Biology, 3rd ed., 2005.
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SYLLABUS OF MATTER

COMPUTER PROGRAMMING APPLIED TO SCIENCES AND TECHNOLOGY

MASTER COURSE	Academic Master – Applied Immunology (Biological Sciences) — Semester 2				
TEACHER	Name and surname: Bella F				
Email	nourbela97@gmail.com	Reception day	Monday	Hour	11-14h
Office phone N°	_____	Building	_____	Office	_____

COURSE DESCRIPTION	
Unit Teaching Type	UED
Objective	Acquire the basics of computer programming for scientific data analysis and management, develop scripts to automate experimental-science workflows, use Python/R scientific libraries and apply programming to concrete problems in biology, chemistry, physics and environmental engineering.
Prerequisites	Introductory computer programming.
Short content	• Introduction to scientific programming: variables, functions, data types, control structures, Python/R environments • Manipulation and analysis of scientific data: NumPy, Pandas, ggplot2/Matplotlib/Seaborn • Programming applied to experimental sciences: graphing, sequence analysis, chemical-reaction simulation, physical modelling, GIS with QGIS/Python • Automation and applied artificial intelligence: automation scripts, introduction to Scikit-Learn, linear regression and classification • Practical work: scripting, data visualisation, automation and machine-learning mini-project
Subject Credits	1
Matter Coefficient	1
Weekly Hourly Volume (VHH)	01h30
Lecture / Tutorial / Lab (Cours/TD/TP)	Lecture: 00h30 Tutorial: 00h00 Lab work: 01h00
Semester Hourly Volume (VHS)	22h30
Personal Work Hours	02h30
Targeted skills	Mastery of the concepts and techniques listed in the short content; ability to analyse, synthesise and communicate scientific results in the field of Applied Immunology.

EVALUATION OF KNOWLEDGE	
Mode of evaluation	Continuous assessment (40%) and semester examination (60%).
Continuous assessment weighting	As defined by the teaching team at the start of the semester (typically $\geq 40\%$ for UED/UET units).

First knowledge check	Date / duration / type: to be announced by the teacher.
Second knowledge check	Date / duration / type: to be announced by the teacher.

EQUIPMENT AND MATERIALS USED

Handouts	Lecture notes (polycopiés), slide decks and scientific articles provided by the teacher.
Laboratory materials	Equipment of the Techniques d'Analyse / Biochimie / Physiologie Animale teaching laboratories (spectrophotometers, centrifuges, electrophoresis units, microscopes, etc.), as listed in the master's equipment file.
Application names	Departmental e-learning platform / university digital workspace (as communicated by the teacher).
Protective materials	Lab coat, gloves, safety glasses as required for practical sessions.

EXPECTATIONS

Expected of students	Regular attendance, active participation, completion of assigned readings/exercises and punctual submission of practical-work reports.
Teacher expectations	Timely delivery of the course content, availability during reception hours, and clear communication of evaluation criteria at the start of the semester.

BIBLIOGRAPHY

• Bishop C.M., Pattern Recognition and Machine Learning, Springer, 2021. • Smith J.K., Brown L.M., Programming for Biological Sciences, Cambridge Univ. Press, 2022.

SYLLABUS OF MATTER

LEGISLATION, ETHICS AND DEONTOLOGY

MASTER COURSE	Academic Master – Applied Immunology (Biological Sciences) — Semester 2				
TEACHER	Name and surname: Chafai				
Email		Reception day		Hour	
Office phone N°		Building		Office	

COURSE DESCRIPTION	
Unit Teaching Type	UET
Objective	Train students in the legislative and ethical frameworks governing scientific research, promote integrity and professional responsibility, and raise awareness of deontological issues for ethical, transparent research respecting international standards.
Prerequisites	None.
Short content	• Foundations of ethics, deontology and legislation; hierarchy of norms • Ethics/deontology in education and research; academic integrity • Scientific responsibility and integrity: plagiarism, fraud, transparency, open-access publication ethics, informed consent • Legal and regulatory framework in bioethics (patient/donor rights, clinical trials, transplantation, GMOs, IP) • Standards and certifications in scientific/environmental research in Algeria • Contemporary bioethics issues: embryo/PGD, genetic engineering, AI in biology, responsible science
Subject Credits	1
Matter Coefficient	1
Weekly Hourly Volume (VHH)	01h30
Lecture / Tutorial / Lab (Cours/TD/TP)	Lecture: 01h30 Tutorial: 00h00 Lab work: 00h00
Semester Hourly Volume (VHS)	22h30
Personal Work Hours	00h00
Targeted skills	Mastery of the concepts and techniques listed in the short content; ability to analyse, synthesise and communicate scientific results in the field of Applied Immunology.

EVALUATION OF KNOWLEDGE	
Mode of evaluation	Semester examination (100%), in-person.
Continuous assessment weighting	As defined by the teaching team at the start of the semester (typically $\geq 40\%$ for UED/UET units).
First knowledge check	Date / duration / type: to be announced by the teacher.

Second knowledge check	Date / duration / type: to be announced by the teacher.
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EQUIPMENT AND MATERIALS USED

Handouts	Lecture notes (polycopiés), slide decks and scientific articles provided by the teacher.
Laboratory materials	Not applicable (no scheduled laboratory sessions).
Application names	Departmental e-learning platform / university digital workspace (as communicated by the teacher).
Protective materials	Not applicable.

EXPECTATIONS

Expected of students	Regular attendance, active participation, completion of assigned readings/exercises and punctual submission of practical-work reports.
Teacher expectations	Timely delivery of the course content, availability during reception hours, and clear communication of evaluation criteria at the start of the semester.

BIBLIOGRAPHY

- Brown T., Green S., Ethics in Modern Scientific Research, Springer, 2021. - Foucault M., Smith A., Bioethics and the Law, Oxford Univ. Press, 2023.
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