# COURSE LIST

## Institute of Natural and Applied Sciences

## Field : Molecular Biology and Genetics

| Course Title | Code | ECTS Credit | COMU Credit | Lecturer |
|---|---|---|---|---|
| Bionformatics and Data Analyses in Molecular Biology | ULP-21-BMS001 | 7.5 | 3 | Assist. Prof. Dr. Hilal ÖZKILINÇ |
| Popolation and Evolutionary Genetics | ULP-21-BMS002 | 7.5 | 3 | Assist. Prof. Dr. Hilal ÖZKILINÇ |
| Molecular Pharmacology and Toxicology | ULP-21-BMS003 | 7.5 | 3 | Assist. Prof. Dr. Tuğba TÜMER |
| Intermediary Metabolism and Regulation | ULP-21-BMS004 | 7.5 | 3 | Assist. Prof. Dr. Tuğba TÜMER |
| Methods in Protein Expresssşon and Purification | ULP-21-BMS005 | 7.5 | 3 | Assist. Prof. Dr. Hüseyin UYSAL |
| Protein Structure and Function | ULP-21-BMS006 | 7.5 | 3 | Assist. Prof. Dr. Hüseyin UYSAL |
| Biotechnological Aroma/Flavor Production | ULP-21-BMS007 | 7.5 | 3 | Prof. Dr. Emin YILMAZ |
| Practical Enzymology | ULP-21-BMS008 | 7.5 | 3 | Prof. Dr. Emin YILMAZ |
| Quantative Genetics and Selection | ULP-21-BMS009 | 7.5 | 3 | Prof. Dr. Akın PALA |

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| Instrumental Analysis in Molecular Life Science | ULP-21-BMS010 | 7.5 | 3 | Prof. Dr. Yusuf DİLGİN |
| Biosensors and Applications | ULP-21-BMS011 | 7.5 | 3 | Prof. Dr. Yusuf Dilgin |

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| Course Code | ULP - 21 -BMS001 |
| Name of the course in English | Bionformatics and Data Analyses in Molecular Biology |
| Name of the course in Turkish | Biyonformatik ve Moleküler Biyolojide Veri Analizleri |
| Language of the course | English |
| Level of Course | Master |
| Lecturer | Assist. Prof. Dr. Hilal ÖZKILINÇ |
| ECTS Credits | 7.5 |
| COMU Credits | 3 |
| Description | This course provide basic principles of bioinformatics and how computuational approaches can be used in the disciplines such as molecular biology, population genetics and phylogenetics. Topics will cover theoretical and practical applications of computational based methods to analyze DNA, RNA and protein sequence data. |

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| Course Code | ULP - 21 -BMS002 |
| Name of the course in English | Population ve Evolutionary Genetics |
| Name of the course in Turkish | Populasyon ve Evrim Genetiği |
| Language of the course | English |
| Level of Course | Master |
| Lecturer | Assist. Prof. Dr. Hilal ÖZKILINÇ |
| ECTS Credits | 7.5 |
| COMU Credits | 3 |
| Description | This course covers population genetics and evolutionary theory. How evolutionary mechanism shape population structures and their consequences are discussed. The main topics are genetic bases of the ecolution of organisisms; genetic mutation of populations; gene selection; origin and mechanism of formation of species; interactions between species; natural selection and adaptation, co-evolution and analyses of population genetic structures. |

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| Course Code | ULP - 21 -BMS003 |
| Name of the course in English | Molecular Pharmacology and Toxicology |
| Name of the course in Turkish | Moleküler Farmakoloji ve Toksikoloji |
| Language of the course | English |
| Level of Course | Master |
| Lecturer | Assist. Prof. Dr. Tuğba Tümer |
| ECTS Credits | 7.5 |
| COMU Credits | 3 |
| Description | In this course a molecular approach to pharmacology and toxicology is intended. In this frame, the terms of xenobiotics, drug, prodrug, metabolism, metabolite, activation, metabolic activation, detoxification, pharmacodynamic and pharmokinetic will be defined. |

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| | Besides, absorption, distribution, metaboism and excretion of xenobiotics including drug compounds and also done- response relationship will be covered. Speical topics on pharmacogenetics and chemical carcinogenesis will be handled in the scope of this course. |

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| Course Code | ULP - 21 -BMS004 |
| Name of the course in English | Intermediary Metabolism and Regulation |
| Name of the course in Turkish | Ara metabolizma ve Regülasyonu |
| Language of the course | English |
| Level of Course | Master |
| Lecturer | Assist. Prof. Dr. Tuğba Tümer |
| ECTS Credits | 7.5 |
| COMU Credits | 3 |
| Description | In this course, the metabolic pathways of carbohydrates, lipids and nitrogenous compouds and their relations including regulatory mechanisms and co-regulations are the main topics that will be covered in detailed. |

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| Course Code | ULP - 21 -BMS005 |
| Name of the course in English | Methods in Protein Expression And Purification |
| Name of the course in Turkish | Protein Üretimi ve Saflaştırılmasında Kullanılan Metotlar |
| Language of the course | English |
| Level of Course | Master |
| Lecturer | Assist. Prof. Dr. Hüseyin Uysal |
| ECTS Credits | 7.5 |
| COMU Credits | 3 |
| Description | The course presents the basis knowledge about the preparation of proteins in sufficient quantity and quality for biochemical measurements and analysis. Course covers different approaches in the cloning of various expression vectors using affinity tags or without tags, purification of the recombinant protein with chromatography; the tag removal methods for the fusion proteins; expression hosts and various methods for protein detection and quantization |

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| Course Code | ULP - 21 -BMS006 |
| Name of the course in English | Protein Structure and Function |
| Name of the course in Turkish | Protein Yapı ve Fonksiyonu |
| Language of the course | English |
| Level of Course | Master |
| Lecturer | Assist. Prof. Dr. Hüseyin Uysal |
| ECTS Credits | 7.5 |
| COMU Credits | 3 |
| Description | The course presents an in-depth understanding of the relationship between the structure, dynamics, and functions of proteins. Course covers different levels of protein structure, current methods for structure determination, energetics of protein structure, protein folding and folded state dynamics, and the functions of interaction domains of proteins. |

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| Course Code | ULP - 21 -BMS007 |
| Name of the course in English | Biotechnological Aroma/Flavor Production |
| Name of the course in Turkish | Biyoteknolojik Aroma/Flavor Üretimi |
| Language of the course | English |
| Level of Course | Master |
| Lecturer | Prof. Dr. Emin Yılmaz |
| ECTS Credits | 7.5 |
| COMU Credits | 3 |
| Description | In this course, chemistry and properties of aroma compounds, aroma biosynthetic pathways in living tissues, aroma production by microbial fermentations, aroma bio-conversions by enzymes, aroma production in tissue and aroma extraction topics will be taught. |

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| Course Code | ULP - 21 -BMS008 |
| Name of the course in English | Pratical Enzymology |
| Name of the course in Turkish | Uygulamalı Enzimoloji |
| Language of the course | English |
| Level of Course | Master |
| Lecturer | Prof. Dr. Emin Yılmaz |
| ECTS Credits | 7.5 |
| COMU Credits | 3 |
| Description | In this course, the basics of enzyme kinetics and catalysis, preparation of buffers and other solutions in enzyme laboratory, general enzyme purification protocols, general enzyme kinetic assays, protein determination techniques, enzyme electrophoresis, kinetics assays of enzyme inhibitors topics will be covered. |

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| Course Code | ULP - 21 -BMS009 |
| Name of the course in English | Quantita |
| Name of the course in Turkish | Protein Üretimi ve Saflaştırılmasında Kullanılan Metotlar |
| Language of the course | English |
| Level of Course | Master |
| Lecturer | Assist. Prof. Dr. Hüseyin Uysal |
| ECTS Credits | 7.5 |
| COMU Credits | 3 |
| Description | The course presents the basis knowledge about the preparation of proteins in sufficient quantity and quality for biochemical measurements and analysis. Course covers different approaches in the cloning of various expression vectors using affinity tags or without tags, purification of the recombinant protein with chromatography; the tag removal methods for the fusion proteins; expression hosts and various methods for protein detection and quantization |

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| Course Code | ULP - 21 -BMS010 |
| Name of the course in English | Instrumental Analysis in Molecular Life Sciences |
| Name of the course in Turkish | Moleküler Yaşam Bilimlerinde Enstrümental Analiz |
| Language of the course | English |
| Level of Course | Master |
| Lecturer | Prof. Dr. Yusuf Dilgin |
| ECTS Credits | 7.5 |
| COMU Credits | 3 |
| Description | This course includes teaching of basis principle, theory and application areas of Instrumental Analysis Methods (such as Spectroscopic, Electrochemical and Chromatographic) which have been extensively used in the area of molecular life science. |

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| Course Code | ULP - 21 -BMS011 |
| Name of the course in English | Biosensors and Applications |
| Name of the course in Turkish | Biyosensörler ve Uygulamaları |
| Language of the course | English |
| Level of Course | Master |
| Lecturer | Prof. Dr. Hüseyin Uysal |
| ECTS Credits | 7.5 |
| COMU Credits | 3 |
| Description | This course includes teaching of the typical aspect of biosensors, instrumentation and definition in detail. The course will also provide and introduction to the development of bio-analytical system and biosensors as bio-analytical detection devices. |