

COURSE NAME / ECTS Credits	Space Weather / 6
FACULTY / DEPARTMENT	I.U. Faculty of Science/ Department of Astronomy and Space Sciences
SEMESTER	8
CONTENT	Definition of Space Weather, Properties of the Sun, Sun- Earth Interactions, Earth's Magnetic Field and Near Earth Space Environment, Technological Impacts of Space Storms, Hazards to Astronauts, Satellites, and Power Grids and Risks Posed by Asteroid Impacts and supernovae.
NAME AND CONTACT INFORMATION OF PROFESSOR (EMAIL / PHONE)	Asuman GÜLTEKİN ANNAK, PhD. Asst. Prof. / asumang@istanbul.edu.tr/ (212) 440 00 00/10538

<u>COURSE NAME/ECTS Credits</u>	GENE TRANSFER TECHNIQUES TO PLANTS/6
<u>FACULTY/DEPARTMENT</u>	Faculty of Science/Molecular Biology and Genetics Graduate Master Course
<u>SEMESTER</u>	1
<u>CONTENT</u>	Introduction and history. Preparation of Gene transfer vectors for plants. Direct gene transfer techniques: Electroporation, Biolistics. Indirect gene transfer techniques: Agrobacterium tumefaciens, Agrobacterium rhizogenes, viral vectors. Analyses of transgenic plants at DNA, RNA, Protein and phenotypic levels, Genome editing, Biosafety.
<u>NAME AND CONTACT INFORMATION OF PROFESSOR (EMAIL/PHONE)</u>	Prof. Dr. Nermin GÖZÜKIRMIZI nermin@istanbul.edu.tr 0212 455 57 00 / 15111-15150

<u>COURSE NAME/ECTS Credits</u>	METHODOLOGY OF RESEARCH/6
<u>FACULTY/DEPARTMENT</u>	Faculty of Science/Molecular Biology and Genetics
<u>SEMESTER</u>	2
<u>CONTENT</u>	Future scientists should know the borders of the science and scientific methods. Besides, they should understand the difference between relation and causality and between data, knowledge and understanding. In this course "history of science" and "epistemology" will be taught. In addition, inferential and noninferential logic, basic mistakes and how to avoid them and introduction to "statistical inference" with classical and Bayesian approach will be taught.
<u>NAME AND CONTACT INFORMATION OF PROFESSOR (EMAIL/PHONE)</u>	Y.Doç.Dr.Andres Aravena Andres.aravena@istanbul.edu.tr 02124555700/15113

<u>COURSE NAME/ECTS Credits</u>	SYSTEMS BIOLOGY/6
<u>FACULTY/DEPARTMENT</u>	Faculty of Science/Molecular Biology and Genetics
<u>SEMESTER</u>	1
<u>CONTENT</u>	In this course, interactions between the components of biological systems and how these interactions affect the functions of systems will be given. This approach allows to evaluate the biological hypothesis together with mathematical and computer models. To use these models alone or in cooperation, our students should learn the statistical analysis in systems biology, basis of mathematical models and computing concepts.

<u>NAME AND CONTACT INFORMATION OF PROFESSOR (EMAIL/PHONE)</u>	Y.Doç.Dr.AndresAravena Andres.aravena@istanbul.edu.tr 02124555700/15113
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<u>COURSE NAME/ECTS Credits</u>	BIOCHEMISTRY I / 6 ECTS (2 h/week Theo.; 3 h/week Lab)
<u>FACULTY/DEPARTMENT</u>	FACULTY OF SCIENCE DEPARTMENT OF MOLECULAR BIOLOGY & GENETICS
<u>SEMESTER</u>	Fall
<u>CONTENT</u>	<ul style="list-style-type: none"> •Description and scope of biochemistry •Physicochemical properties and interactions of biomolecules •Features, tasks, and distribution of water •Amino acids and their properties •Nucleotides and their derivatives •Structural organization, functions and detections of polipeptides and proteins •Structural features and occurrence of nucleic acids •Structural features and occurrence of carbohydrates •Structural features and occurrence of lipids •Basic nutritional elements, vitamins and coenzymes •Macro- and microelements •Transmembrane transport of ions and small molecules •Digestion and absorption of nutrients •Biochemical mechanisms of nutrient transportation and storage
<u>NAME AND CONTACT INFORMATION OF PROFESSOR (EMAIL/PHONE)</u>	Prof. Dr. Nazlı ARDA narda@istanbul.edu.tr +902124555845

<u>COURSE NAME/ECTS Credits</u>	Cell Biology I / 7
<u>FACULTY/DEPARTMENT</u>	Molecular Biology and Genetics

<u>SEMESTER</u>	III
<u>CONTENT</u>	Cell biology is the study of cell structure and function, and it revolves around the concept that the cell is the fundamental unit of life. Focusing on the cells permits a detailed understanding of the organisation of tissues and organisms from the most general properties shared by all cells and also explains how particular cells are specialized.
<u>NAME AND CONTACT INFORMATION OF PROFESSOR (EMAIL/PHONE)</u>	Prof. Filiz Gurel filiz@istanbul.edu.tr Tel. 15472

<u>COURSE NAME/ECTS Credits</u>	COMPUTING IN MOLECULAR BIOLOGY AND GENETICS I/5
<u>FACULTY/DEPARTMENT</u>	Faculty of Science/Molecular Biology and Genetics
<u>SEMESTER</u>	3
<u>CONTENT</u>	This course teaches the basic elements of data handling techniques in modern computing systems that allow the management and understanding of experimental results.
<u>NAME AND CONTACT INFORMATION OF PROFESSOR (EMAIL/PHONE)</u>	Y.Doç.Dr.Andres Aravena Andres.aravena@istanbul.edu.tr 02124555700/15113

<u>COURSE NAME/ECTS Credits</u>	COMPUTING IN MOLECULAR BIOLOGY AND GENETICS II/5
<u>FACULTY/DEPARTMENT</u>	Faculty of Science/Molecular Biology and Genetics
<u>SEMESTER</u>	4
<u>CONTENT</u>	Software is lab equipment for the 21st century. This course teaches the concepts of Scientific Computing that allow Molecular Biologists to be comfortable working in a modern computing environment.
<u>NAME AND CONTACT INFORMATION OF PROFESSOR (EMAIL/PHONE)</u>	Y.Doç.Dr.Andres Aravena Andres.aravena@istanbul.edu.tr 02124555700/15113

İ.Ü.Fen Fakültesi Fizik Bölümü

İngilizce Dersleri, Kısa İçerikleri, Dersi veren Öğretim Üyesi ile ilgili iletişim bilgileri.

<u>COURSE NAME/ECTS Credits</u>	Physics I (4-2-0) / 7
<u>FACULTY/ DEPARTMENT</u>	Faculty of Science / Physics Department

<u>SEMESTER</u>	I
<u>CONTENT</u>	Physics and Measurement, Motion in One Dimension, Vectors, Motion in Two Dimensions, The Laws of Motion, Circular Motion and Other Applications of Newton's Laws, Work and Kinetic Energy, Potential Energy and Conservation of Energy, Linear Momentum and Collisions, Rotation of a Rigid Object About a Fixed Axis, Rolling Motion and Angular Momentum, Static Equilibrium and Elasticity, Oscillatory Motion, The Law of Gravity.
<u>NAME AND CONTACT INFORMATION OF PROFESSOR (EMAIL/ PHONE)</u>	Doç. Dr. Latife Şahin Yalçın (latife.sahin@istanbul.edu.tr / 15410) Faculty of Science, Physics Department, Nuclear Physics Division

<u>COURSE NAME/ECTS Credits</u>	Analysis I (4-2-0) / 7
<u>FACULTY/ DEPARTMENT</u>	Faculty of Science / Physics Department
<u>SEMESTER</u>	I
<u>CONTENT</u>	Introduction to axiomatic real numbers, integers, rational and irrational numbers and their properties, induction, inequalities, real numbers, arrays, functions of a single variable, limit, continuity and uniform continuity. Introduction to axiomatic real numbers, natural numbers, integers, rational numbers, induction method, finite and infinite sets. Limited set of real numbers, open set, closed set definition of accumulation point of the cluster, the cluster's touch

	<p>point, Bolzano-Weierstrass theorem. Sequences of real numbers, limited series, convergent sequences and the limit concept. Algebraic properties of convergent sequences, limits, and ordering relation, compression theorem. Limit and algebraic properties of infinite sequences, monotonous series, sub-series. Cauchy sequence, sequence accumulation point, the definition of the lower limit and upper limit. Real-valued functions of a single real variable and algebraic operations, limited function, monotone function, even and odd functions. The concept of limit of functions, functions, arrays, in the determination of the limit, the limit functions of algebraic operations. Functions compression theorem, the composition of limit, right limit, left limit. Functions with infinite limits, limits at infinity, Cauchy criterion for the existence of the limit function. Functions of a single real variable, continuity, discontinuity types. Continuous functions of algebraic operations, continuity of composite functions, Weierstrass theorem, Bolzano-Cauchy theorem. Intermediate value theorem, monotonic relationship between functions and continuous functions. Images to determine the ranges under continuous functions, uniform continuity, Cantor's theorem.</p>
<p><u>NAME AND CONTACT INFORMATION</u> <u>OF</u> <u>PROFESSOR (EMAIL/ PHONE)</u></p>	<p>Yard.Doç. Dr. Şükrü Yalçınkaya sukru.yalcinkaya@istanbul.edu.tr /15325) Faculty of Science, Mathematics Department, Geometry Division</p>

<u>COURSE NAME/ECTS Credits</u>	Reading and Translation in Science I (2-0-0) / 2
<u>FACULTY/ DEPARTMENT</u>	Faculty of Science / Physics Department
<u>SEMESTER</u>	I
<u>CONTENT</u>	This course offers the students of scientific studies an intermediate level of English grammar, reading and speaking skills. Present Tenses, Past Tenses, Perfect Tenses, Future Tenses, Verb Patterns, Phrasal Verbs, Modals
<u>NAME AND CONTACT INFORMATION OF PROFESSOR (EMAIL/ PHONE)</u>	Gökçe Ünar Department of Foreign Languages

<u>COURSE NAME/ECTS Credits</u>	Physics II (4-2-0) / 7
<u>FACULTY/ DEPARTMENT</u>	Faculty of Science / Physics Department
<u>SEMESTER</u>	II
<u>CONTENT</u>	Physics 2 course includes topics related to electricity and magnetism: Electric Fields, Gauss's Law, Electrical Potential, Capacitance and Dielectrics, Current and Resistance, Direct Current Circuit, Magnetic Fields, Magnetic Field Sources, Faraday's Law, Inductance, Alternating Current Circuit, Electromagnetic Waves
<u>NAME AND CONTACT INFORMATION OF PROFESSOR (EMAIL/ PHONE)</u>	Doç. Dr. Latife Şahin Yalçın (latife.sahin@istanbul.edu.tr / 15410) Faculty of Science, Physics Department, Nuclear Physics Division

<u>COURSE NAME/ECTS Credits</u>	Analysis II (4-2-0) / 7
<u>FACULTY/ DEPARTMENT</u>	Faculty of Science / Physics Department

<u>SEMESTER</u>	II
<u>CONTENT</u>	<p>Derivatives and applications, mean value theorem, Taylor's approach, maximum-minimum theorem, infinite series of real numbers, power series, the Riemann integral, integration techniques and applications, the fundamental theorem of analysis n n. Real-valued and the only real definition of derivative, continuity and derivative relationship between the algebraic operations Differentiability of functions, derivative of composite functions. Exponential, logarithmic, trigonometric, inverse trigonometric, hyperbolic and inverse hyperbolic functions, definition, continuity and derivatives. Parametric derivative, higher order derivatives, Leibnitz rule. The definition of the local extremum point, Fermat's theorem, Rolle's theorem and the geometric interpretation of the Lagrangian (mean value) theorem and its geometric interpretation of the generalized mean value theorem. The critical point, the absolute maximum and absolute minimum, Darboux's theorem, L'Hospital's rule. I. derivative test, II. derivative test, the high-order derivative test, asymptotes, and graph drawing. Series of real numbers, convergence of the series, algebraic operations and convergence of the series, geometric series, arithmetic series. Comparison tests for convergence of series with non-negative terms. Cauchy criterion for the convergence of the series concentration, absolute convergent series, Abel's Theorem, the Riemann series. Power series, Taylor series, Theorems on the convergence of the Taylor series. Definition and properties of indefinite integrals, change of variable method, integration, integration of rational and irrational functions. Binomial integral, integral of trigonometric functions. Darboux and Riemann's definition of definite integrals and equivalence of these definitions, integratable continuous monotone functions, integrable functions, algebraic operations. Integral Calculus I. fundamental theorem of integral calculus II. The fundamental theorem of Leibnitz formula, I. the mean value theorem, II. mean value theorem, area and volume calculation.</p>
<u>NAME AND CONTACT INFORMATION</u> <u>OF</u>	<p>Doç. Dr. Handan Yıldırım handanyildirim@istanbul.edu.tr /15323)</p>

<u>PROFESSOR (EMAIL/ PHONE)</u>	Faculty of Science, Mathematics Department, Geometry Division
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<u>COURSE NAME/ECTS Credits</u>	Reading and Translation in Science II (2-0-0) / 2
<u>FACULTY/ DEPARTMENT</u>	Faculty of Science / Physics Department
<u>SEMESTER</u>	II
<u>CONTENT</u>	This course offers the students of scientific studies an intermediate level of English grammar, reading and speaking skills. Adjectives and Adverbs, The Passive, Gerunds and Infinitives, Clauses, Conjunctions, Conditionals, Causatives

<u>NAME AND CONTACT INFORMATION</u> <u>OF</u> <u>PROFESSOR (EMAIL/ PHONE)</u>	Gökçe Ünar Department of Foreign Languages

<u>COURSE NAME/ECTS Credits</u>	Ordinary and Partial Differential Equations (4-2-0) / 7
<u>FACULTY/ DEPARTMENT</u>	Faculty of Science / Physics Department
<u>SEMESTER</u>	III
<u>CONTENT</u>	<p>First and higher order ordinary and partial differential equations. Methods of solution, initial and boundary conditions. General Properties of first order ordinary Differential Equations Basic Concepts. Methods of solutions of ordinary differential equation separation of Variables, Integration factor, Differential Equations solvable with respect to the derivative, to y and to x. Bernouilli, Riccati, Clairaut and Lagrange Differential equation. Methods of Solutions of differential equation of higher order. General Properties of Partial Differential equations. Initial-Value Problem, Cauchy Problem, Solution Techniques, Method of Separation of Variables, Finite Fourier Transform, Lagrange's Method of Variation of constants, Sturm-Liouville Problem</p>

<u>NAME AND CONTACT INFORMATION</u> <u>OF</u> <u>PROFESSOR (EMAIL/ PHONE)</u>	Prof. Dr. Haşim Mutuş hmutus@istanbul.edu.tr / 15532 Faculty of Science, Physics Department, Mathematical Physics Division
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<u>COURSE NAME/ECTS Credits</u>	Physics IV (4-2-0) / 8
<u>FACULTY/ DEPARTMENT</u>	Faculty of Science / Physics Department
<u>SEMESTER</u>	IV
<u>CONTENT</u>	Theory of special relativity, Quantization of energy and the particle nature of the electromagnetic waves, Classical model of atoms, Sommerfeld model of atom, wave aspects of matter, introduction to quantum mechanics. Physical Reality, Special Theory of Relativity, Discontinuity of Energy, Classical Atom Models, Summerfeld Atom Models, The Wave Properties of Matter, Introduction to Quantum Mechanics
<u>NAME AND CONTACT INFORMATION OF PROFESSOR (EMAIL/ PHONE)</u>	Doç. Dr. İ. Alper Dizdar (alper.dizdar@gmail.com / 15272) Faculty of Science, Physics Department, High Energy and Plasma Physics Division

<u>COURSE NAME/ECTS Credits</u>	Quantum Physics I (4-2-0) / 7
<u>FACULTY/ DEPARTMENT</u>	Faculty of Science / Physics Department
<u>SEMESTER</u>	V
<u>CONTENT</u>	The mathematical tools of quantum mechanics, The postulates of quantum mechanics, The simple problems in a one-dimension, Harmonic Oscillator, The Heisenberg Uncertainty Principle, the hydrogen atom. Experiments which in Classical Physics was insufficient. One-particle wave function space, Dirac Notation, Eigenvalue Equation. Properties of linear operators, unitary operators, parity, and the projection operator. The Postulates of Quantum Mechanics. Schrödinger wave equation, Probability Interpretation of Wave Function. An infinite potential well, Square Well Potential (bound and free states), Potential Step. Tunneling effect and its applications. Energy eigenvalues of the Harmonic oscillator. Eigenfunctions of the Harmonic oscillator. Hermite polynomials. Heisenberg uncertainty principle. Energy eigenvalues of the hydrogen atom. Eigenfunctions of the hydrogen atom. Laguerre polynomials.
<u>NAME AND CONTACT INFORMATION OF PROFESSOR (EMAIL/ PHONE)</u>	Prof. Dr. Y. Gürkan Çelebi gcelebi@istanbul.edu.tr / 15246 Faculty of Science, Physics Department, General Physics Division

<u>COURSE NAME/ECTS Credits</u>	Quantum Physics II (4-2-0) / 7
<u>FACULTY/ DEPARTMENT</u>	Faculty of Science / Physics Department
<u>SEMESTER</u>	VI

<p><u>CONTENT</u></p>	<p>The algebra of angular momentum (and spin) operators, determination of the different representations and of the eigenvalues and spherical harmonics, addition of spins and determination of Clebsch-Gordan coefficients; stating that identical particles have symmetric / anti-symmetric wavefunctions and that Pauli exclusion principle applies to fermions, Fermi surface, band structure in solids; application of time-independent perturbation theory in the non-degenerate and degenerate cases and time-dependent perturbation theory to various problems, finding the ground state wavefunction and its energy approximately using the variational principle, determination of the wavefunction and the energy eigenvalues for the higher excited states by the WKB approximation, analysis of quantum mechanical scattering. Dirac notation, Classical definition of angular momentum, linear Hermitian operators for angular momentum, commutation relations. Angular momentum in spherical coordinates, eigenvalues and eigenvectors of L^2 and L_z operators, vector model. Orthogonality of spherical harmonics, matrix representations of angular momentum operators. Atoms in a magnetic field, Stern-Gerlach experiment, S^2 and S_z eigenvalue equations, electron spin and Pauli spin matrices. Total angular momentum, addition of two angular momenta, two electron system, spin-orbit interaction. Total angular momentum, addition of two angular momenta, two electron system, spin-orbit interaction. Time-independent perturbation theory, selection rules, variation method. Time-dependent perturbation theory, perturbative calculation of transition probabilities. Identical particles in quantum mechanics, symmetrization principle, permutation operator. Pauli exclusion principle, two electron systems, N-particle systems. Introduction to relativistic quantum mechanics, Dirac equation.</p>
<p><u>NAME AND CONTACT INFORMATION OF PROFESSOR (EMAIL/ PHONE)</u></p>	<p>Prof. Dr. Y. Gürkan Çelebi gcelebi@istanbul.edu.tr / 15246 Faculty of Science, Physics Department, General Physics Division</p>

<u>COURSE NAME/ECTS Credits</u>	Thermodynamics and Statistical Mechanics I (4-2-0) / 7
<u>FACULTY/ DEPARTMENT</u>	Faculty of Science / Physics Department
<u>SEMESTER</u>	VI
<u>CONTENT</u>	Introduction to Thermodynamics, improving equilibrium Statistical Mechanics and solution methods. Thermodynamics and Statistical Mechanics Approach. Basic concepts of Thermodynamics. Principles of Thermodynamics and Applications. Phase Transitions and Reactions. Thermodynamical Potentials. Formulation of Statistical Mechanics and Ensemble Theory. Microstate, phase space, Liouville theorem, number of microstate. Microcanonical ensemble and applications. Canonical ensemble and applications. Grand Canonical ensemble and applications.
<u>NAME AND CONTACT INFORMATION OF PROFESSOR (EMAIL/ PHONE)</u>	Prof. Dr. Y. Gürkan Çelebi (gcelebi@istanbul.edu.tr / 15246) Faculty of Science, Physics Department, General Physics Division

<u>COURSE NAME/ECTS Credits</u>	Elementary Particle Physics I (4-2-0) / 6
<u>FACULTY/ DEPARTMENT</u>	Faculty of Science / Physics Department
<u>SEMESTER</u>	VII
<u>CONTENT</u>	<p>Properties of elementary particles, different types of interactions, classification of particles, continuous and discrete symmetries of fundamental interactions, Lagrange formulation, local gauge invariance, symmetry breaking, field theory examples and classical solutions. History of elementary particles. Elementary particles and elementary interactions: Strong, electromagnetic, weak and gravitational interactions. Classification of particles: Leptons, mesons, baryons, quarks, intermediate and anti- particles. Some examples of processes and decays. Symmetry aspects of elementary interactions; symmetries, groups and conservation laws. Concept of spin and Isometric spin; parity, charm, CP violation, charge conjugation. Lie groups, Lie algebra ve generators; Orthogonal groups, SU(2) and SU(3) groups and their properties. Lagrangean formalism in classical particle mechanics and relativistic field theory, Feynman rules. Gauge theories, local gauge invariance, Yang-Mills theory. Symmetry breaking, Higgs mechanism. Introduction to field theories, quantum electrodynamics, Dirac equation. Thirring model, some field theories; classical solutions and their properties, solitons, instanton and meron solutions.</p>
<u>NAME AND CONTACT INFORMATION OF PROFESSOR (EMAIL/ PHONE)</u>	<p>Yard. Doç. Dr. Çağlar Doğan doganc@istanbul.edu.tr / 15188 Faculty of Science, Physics Department, High Energy and Plasma Physics Division</p>

<u>COURSE NAME/ECTS Credits</u>	GENE TRANSFER TECHNIQUES TO PLANTS/6
<u>FACULTY/DEPARTMENT</u>	Faculty of Science/Molecular Biology and Genetics Graduate Master Course
<u>SEMESTER</u>	1
<u>CONTENT</u>	Introduction and history. Preparation of Gene transfer vectors for plants. Direct gene transfer techniques: Electroporation, Biolistics. Indirect gene transfer techniques: Agrobacterium tumefaciens, Agrobacterium rhizogenes, viral vectors. Analyses of transgenic plants at DNA, RNA, Protein and phenotypic levels, Genome editing, Biosafety.
<u>NAME AND CONTACT INFORMATION OF PROFESSOR (EMAIL/PHONE)</u>	Prof. Dr. Nermin GÖZÜKIRMIZI nermin@istanbul.edu.tr 0212 455 57 00 / 15111-15150

<u>COURSE NAME/ECTS Credits</u>	General Physics / 3
<u>FACULTY/DEPARTMENT</u>	Science Faculty/Physics Department
<u>SEMESTER</u>	1
<u>CONTENT</u>	Physics and Measurement, Vectors, Motion in One Dimension, Motion in Two Dimensions, Laws of Motion, Circular Motion and Other Applications of Newton's Laws, Work and Kinetic Energy, Potential Energy and Conservation of Energy, Linear Momentum and Collisions, Electric Fields, Electric Potential, Capacitors and Dielectrics, Current and Resistance, Direct Current Circuits.
<u>NAME AND CONTACT INFORMATION OF PROFESSOR (EMAIL/PHONE)</u>	Elif AKALIN eakalin@istanbul.edu.tr 0212 4555700 / Ext:15445

<u>COURSE NAME/ECTS Credits</u>	Introduction to cell biology / 5
<u>FACULTY/DEPARTMENT</u>	Molecular Biology and Genetics
<u>SEMESTER</u>	II
<u>CONTENT</u>	Learning the essentials of cell structure and functions by giving the examples of diverse kinds of organisms including algae, bacteria, virus, protist, fungi, plants and animals. Energy metabolisms, signalling, cell membranes and biotechnological uses are some of the focused topics.
<u>NAME AND CONTACT INFORMATION OF PROFESSOR (EMAIL/PHONE)</u>	Prof. Filiz Gurel filiz@istanbul.edu.tr Tel. 15472

<u>COURSE NAME/ECTS Credits</u>	METHODOLOGY OF RESEARCH/6
<u>FACULTY/DEPARTMENT</u> I	Faculty of Science/Molecular Biology and Genetics
<u>SEMESTER</u>	2
<u>CONTENT</u>	Future scientists should know the borders of the science and scientific methods. Besides, they should understand the difference between relation and causality and between data, knowledge and understanding. In this course "history of science" and "epistemology" will be taught. In addition, inferential and non-inferential logic, basic mistakes and how to avoid them and introduction to "statistical inference" with classical and Bayesian approach will be taught.
<u>NAME AND CONTACT INFORMATION OF PROFESSOR (EMAIL/PHONE)</u>	Y.Doç.Dr.Andres Aravena Andres.aravena@istanbul.edu.tr 02124555700/15113

<u>COURSE NAME/ECTS Credits</u>	SYSTEMS BIOLOGY/6
<u>FACULTY/DEPARTMENT</u>	Faculty of Science/Molecular Biology and Genetics
<u>SEMESTER</u>	1
<u>CONTENT</u>	In this course, interactions between the components of biological systems and how these interactions affect the functions of systems will be given. This approach allows to evaluate the biological hypothesis together with mathematical and computer models. To use these models alone or in cooperation, our students should learn the statistical analysis in systems biology, basis of mathematical models and computing concepts.
<u>NAME AND CONTACT INFORMATION OF PROFESSOR (EMAIL/PHONE)</u>	Y.Doç.Dr.Andres Aravena Andres.aravena@istanbul.edu.tr 02124555700/15113

<u>COURSE NAME/ECTS Credits</u>	OMICS TECHNOLOGIES/ 8 ECTS (3 h/week Theo.)
<u>FACULTY/DEPARTMENT</u>	FACULTY OF SCIENCE (Institute of Experimental Medicine-Genetics Program/Biohealth Computing Erasmus Mundus Master Program) DEPARTMENT OF MOLECULAR BIOLOGY & GENETICS
<u>SEMESTER</u>	SPRING
<u>CONTENT</u>	<ul style="list-style-type: none"> •Genomics •Toxigenomics •Transcriptomics •Proteomics •Toxicoproteomics •Metabolomics •Glycomics •Allergenomics •Biological information-databases •Data analysis using bioinformatics tools •Microarray technologies •Biomarkers •Systems biology

<u>NAME AND CONTACT INFORMATION OF PROFESSOR (EMAIL/PHONE)</u>	Prof. Dr. Nazlı ARDA narda@istanbul.edu.tr +902124555845
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<u>COURSE NAME/ECTS Credits</u>	Plant Biotechnology, 6
<u>FACULTY/DEPARTMENT</u>	Faculty of Science, Department of MolecularBiologyandGenomics
<u>SEMESTER</u>	1
<u>CONTENT</u>	Application of tissueculture , genictransformationandmoleculargenicmethods in plantbiotechnology, Risk assessmentandBiosafety of GMOs.
<u>NAME AND CONTACT INFORMATION OF PROFESSOR (EMAIL/PHONE)</u>	Prof.Dr.Şule Arı sari@istanbul.edu.tr 212 455 57 00/15108

<u>COURSE NAME/ECTS Credits</u>	PROTEOMICS / 6 ECTS (2 h/week Theo.; 2h/week Lab)
<u>FACULTY/DEPARTMENT</u>	FACULTY OF SCIENCE (Institute of Graduate Studies in Science and Engineering)/ DEPARTMENT OF MOLECULAR BIOLOGY & GENETICS
<u>SEMESTER</u>	SPRING
<u>CONTENT</u>	<ul style="list-style-type: none"> •Description of proteome and proteomic studies 2D electrophoresis: isoelectric focusing and SDS-PAGE •Visualization of proteins •Sample preparation for mass spectrometry (MS) In-gel digestion •Protein analysis using mass spectrometry (MS) •Matrix-assisted laser desorption ionization - time of flight (MALDI-

	TOF) •Electrospray ionization (ESI) – MS •Tandem MS •HPLC MS •Detection of post-translational modifications •Determination of amino acid sequence: Edman degradation Isotope-coded affinity techniques •Proteomic databases
<u>NAME AND CONTACT INFORMATION OF PROFESSOR (EMAIL/PHONE)</u>	Prof. Dr. Nazlı ARDA narda@istanbul.edu.tr +902124555845

<u>COURSE NAME/ECTS Credits</u>	READING AND TRANSLATION IN SCIENCE I/ 2 ECTS (2 h/week)
<u>FACULTY/DEPARTMENT</u>	FACULTY OF SCIENCE / DEPARTMENT OF MOLECULAR BIOLOGY & GENETICS
<u>SEMESTER</u>	Fall
<u>CONTENT</u>	English course •Present tenses •Past tenses •Perfect tenses •Future tenses •Verb patterns •Phrasal verbs •Modals •Readings •Translations
<u>NAME AND CONTACT INFORMATION OF PROFESSOR (EMAIL/PHONE)</u>	Prof. Dr. Nazlı ARDA narda@istanbul.edu.tr +902124555845 Gökçe Ünar gokce.unar@gmail.com

<u>COURSE NAME/ECTS Credits</u>	READING AND TRANSLATION IN SCIENCE II/ 2 ECTS (2 h/week)
<u>FACULTY/DEPARTMENT</u>	FACULTY OF SCIENCE / DEPARTMENT OF MOLECULAR BIOLOGY & GENETICS

<u>SEMESTER</u>	Spring
<u>CONTENT</u>	English course <ul style="list-style-type: none"> • Irregular verbs • Prefixes • Suffixes • Idioms • Vocabulary exercises • Advanced readings • Advanced translations
<u>NAME AND CONTACT INFORMATION OF PROFESSOR (EMAIL/PHONE)</u>	Prof. Dr. Nazlı ARDA narda@istanbul.edu.tr +902124555845 Gökçe Ünar gokce.unar@gmail.com

<u>COURSE NAME/ECTS Credits</u>	STRESS RESPONSE MECHANISMS IN PLANTS/6
<u>FACULTY/DEPARTMENT</u>	Science/Molecular Biology & Genetics
<u>SEMESTER</u>	2
<u>CONTENT</u>	The aim of the course is to understand morphological, physiological and molecular responses of the plant towards biotic and abiotic stress factors.
<u>NAME AND CONTACT INFORMATION OF PROFESSOR (EMAIL/PHONE)</u>	Assist. Prof. Dr. Neslihan Turgut-Kara neslihanTk@istanbul.edu.tr 00902124555700/15139

<u>COURSE NAME/ECTS Credits</u>	Structural Genomics, 8
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<u>FACULTY/DEPARTMENT</u>	Faculty of Science, Department of MolecularBiologyandGenomics
<u>SEMESTER</u>	1
<u>CONTENT</u>	Human genomeproject, mappingstudies in modalorganisms, genomemapping in human,mappingstrategies,contruction of maps, sequencing.
<u>NAME AND CONTACT INFORMATION OF PROFESSOR (EMAIL/PHONE)</u>	Prof. Dr .Şule Arı sari@istanbul.edu.tr 212 455 57 00/15108

<u>COURSE NAME/ECTS Credits</u>	SYSTEMS BIOLOGY/6
<u>FACULTY/DEPARTMENT</u>	Faculty of Science/MolecularBiologyand Genetics
<u>SEMESTER</u>	1
<u>CONTENT</u>	Inthiscourse, interactionsbetweenthecomponents of biologicalsystemsand how theseinteractionsaffectthefunctions of systemswill be given. Thisapproachallowstoevaluate thebiologicalhypothesistogetherwithmathematical andcomputermodels. Tu usethesemodelsaloneor in cooperation, ourstudentshouldlearnthestatisticalanalysis in systemsbiology, basis of mathematicalmodelsandcomputingconcepts.
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