

COURSE LIST

Institute of Natural and Applied Sciences

Field : Space Sciences and Technologies

Course Title	Code	ECTS Credit	COMU Credit	Lecturer
Remote Sensing Techniques I	ULP-21-UB001	7.5	3	Assist. Prof. Dr. Mülâyim Gure
Advanced Programmingtechniques In Astronomy I	ULP-21-UB002	7.5	3	Assoc. Prof. Dr. İbrahim Bulut
Clestial Mechanics I	ULP-21-UB003	7.5	3	Prof. Dr. Osman Demircan
Variable Stars	ULP-21-UB004	7.5	3	Prof. Dr. Osman Demircan Assoc. Prof. Dr. İbrahim Bulut
Data Analysis In Astronomy I	ULP-21-UB005	7.5	3	Assoc. Prof. Dr. Faruk Soyduğan
Introduction To Photometry	ULP-21-UB006	7.5	3	Prof. Dr. Osman Demircan Assoc. Prof. Dr. İbrahim Bulut
Pulsation Theory	ULP-21-UB007	7.5	3	Assoc. Prof. Dr. Esin Soyduğan
Remote Sensing Techniques II	ULP-21-UB008	7.5	3	Assist. Prof. Dr. Mülâyim Gure
Advanced Programming Techniques In Astronomy II	ULP-21-UB009	7.5	3	Assoc. Prof. Dr. İbrahim Bulut
Eclipsing Binary Stars	ULP-21-UB010	7.5	3	Prof. Dr. Osman Demircan
Data Analysis In Astronomy II	ULP-21-UB011	7.5	3	Prof. Dr. Ahmet Erdem Assoc. Prof. Dr. Faruk Soyduğan Assoc. Prof. Dr. İbrahim Bulut

Course Code	ULP-21-UB001
Name of the Course in English	Remote Sensing Techniques I
Name of the Course in Turkish	Uzaktan Algılama Teknikleri I

Language of the Course	English
Level of the Course	Master
Lecturer	Assist. Prof. Dr. Mülayim GÜRE
ECTS Credit	7.5
COMU Credit	3
Description	Description and development of remote sensing, electromagnetic spectrum, atmospheric (radiometric) corrections, reflection properties of object on the earth objects on earth, detectors, satellites, air platforms, satellite orbits, image classification, applications

Course Code	ULP-21-UB002
Name of the Course in English	Advanced Programmingtechniques In Astronomy I
Name of the Course in Turkish	Astronomide İleri Duzey Progralama Teknikleri I
Language of the Course	English
Level of the Course	Master
Lecturer	Assoc. Prof. Dr. İbrahim Bulut
ECTS Credit	7.5
COMU Credit	3
Description	Using different programming languages, coordinate transformations, calculation of set and rise times of celestial objects, Julian date calculation, heliocentric julian date calculation, air-mass calculation for a celestial object at a given time, extinction coefficient calculation, transformation to standard system, interpolation calculation for differential magnitudes, determination of normal points for light curves, error estimates, Calculation of Roche coordinates under assumption of Roche model, animation of a binary system whose Roche coordinates are calculated.

Course Code	ULP-21-UB003
Name of the Course in English	Clestial Mechanics I
Name of the Course in Turkish	Gok Mekanigi I
Language of the Course	English
Level of the Course	Master
Lecturer	Prof. Dr. Osman Demircan

ECTS Credit	7.5
COMU Credit	3
Description	Fundamental dynamics, central force motion, two, three and N body problem, computation

Course Code	ULP-21-UB004
Name of the Course in English	Variable Stars
Name of the Course in Turkish	Değişen Yıldızlar
Language of the Course	English
Level of the Course	Master
Lecturer	Prof. Dr. Osman Demircan Assoc. Prof. Dr. İbrahim Bulut
ECTS Credit	7.5
COMU Credit	3
Description	This course is an introduction to variable stars. We will discuss theory and observations at all wavelengths to develop a unified understanding of variable stars of all categories (from pre-main-sequence variables through all stages of evolution to variables - neutron stars and black holes).

Course Code	ULP-21-UB005
Name of the Course in English	Data Analysis In Astronomy I
Name of the Course in Turkish	Astronomide Veri Analizi I
Language of the Course	English
Level of the Course	Master
Lecturer	Assoc. Prof. Dr. Faruk Soyduğan
ECTS Credit	7.5
COMU Credit	3
Description	Topics to be covered in the course will include basic statistic definitions, error calculation and propagation, statistic distributions, error sources in astronomy, analysis of astronomical images.

Course Code	ULP-21-UB006
Name of the Course in English	Introduction To Photometry
Name of the Course in Turkish	Isikolcmede Giriş
Language of the Course	English
Level of the Course	Master
Lecturer	Prof. Dr. Osman Demircan Assoc. Prof. Dr. İbrahim Bulut

ECTS Credit	7.5
COMU Credit	3
Description	The objective of this course is to let the student get acquainted to comprehend the structures of detectors, to remember the magnitude systems to have the knowledge about energy distribution in stellar spectra Characteristic physical parameters of the continuous energy distribution to have the knowledge about the photoelectric photometries, photomultipliers and photometric filters, relationships, between two similar photometric systems, two-dimensional photometric classification of stars to learn atmospheric and interstellar extinction

Course Code	ULP-21-UB007
Name of the Course in English	Pulsation Theory
Name of the Course in Turkish	Zonklama Kurami
Language of the Course	English
Level of the Course	Master
Lecturer	Assoc. Prof. Dr. Esin Soydugan
ECTS Credit	7.5
COMU Credit	3
Description	Nature of non-radial pulsations, equilibrium and pulsations in stars, historical development, basic properties of non-radial pulsations, line profile changes because of non-radial pulsations, early spectral class O, B variables, fast pulsating Ap stars, degenerated variable stars, solar pulsation, solar and stellar seismology, theoretical approach, The Sun as a pulsating star, observational techniques and data reduction, stellar seismology, recent advances.

Course Code	ULP-21-UB008
Name of the Course in English	Remote Sensing Techniques II
Name of the Course in Turkish	Uzaktan Algılama Teknikleri II
Language of the Course	English
Level of the Course	Master
Lecturer	Assist. Prof. Dr. Mülayim Gure
ECTS Credit	7.5
COMU Credit	3
Description	Using the techniques of remote sensing data acquisition and evaluation.

Course Code	ULP-21-UB009
Name of the Course in English	Advanced Programming Techniques In Astronomy II
Name of the Course in Turkish	Astronomide İleri Duzey Proglama Teknikleri II
Language of the Course	English
Level of the Course	Master
Lecturer	Assoc. Prof. Dr. İbrahim Bulut
ECTS Credit	7.5
COMU Credit	3
Description	Using different programming languages, O-C calculations for eclipsing binaries, least-squares linear fit to O-C data, least-squares parabolic fit to O-C data, sinusoidal and parabolic fit to O-C data, Radial velocity determination with cross-correlation algorithm for a single order spectrum, barycentric velocity calculation, least-squares orbital fit to radial velocities and determination of orbital elements, Analysis techniques of ground and satellite-based astrometric data.

Course Code	ULP-21-UB010
Name of the Course in English	Eclipsing Binary Stars
Name of the Course in Turkish	Orten Cift Yildizlar
Language of the Course	English
Level of the Course	Master
Lecturer	Prof. Dr. Osman Demircan
ECTS Credit	7.5
COMU Credit	3
Description	Topics of the course are as follows: classification of eclipsing binaries, photometry, CCD and spectroscopic observations of eclipsing binaries, period variations of eclipsing binaries, O-C analysis, Orbital parameters and Roche Model of eclipsing binaries, The Wilson-Devinney method

Course Code	ULP-21-UB011
Name of the Course in English	Data Analysis In Astronomy II
Name of the Course in Turkish	Astronomide Veri Analizi II
Language of the Course	English
Level of the Course	Master
Lecturer	Prof. Dr. Ahmet Erdem Assoc. Prof. Dr. Faruk Soydugan Assoc. Prof. Dr. İbrahim Bulut
ECTS Credit	7.5
COMU Credit	3
Description	Topics to be covered in the course will include

creating light curves of variable stars, period determination, analysing of the orbital period changes, and spectral analysis.