

Department of Physics

Physics is everywhere around us. The people of this Physics Department are engaged in experimental and theoretical research. Our classes and hands-on laboratories provide our graduates with excellent problem-solving skills. Our Department is dedicated to the strong tradition of the University of Erbil, striving innovative courses within our program. The program introduces many fundamental principles of physics such as Mechanics and Electricity, Linear Momentum, Impulse and Collisions, Work, Energy, Power, Machines, Circular Motion, Harmonic Motion, Fluid Mechanics, Science of Materials, Thermal Physics, Optics, Waves, Earth Science, Astronomy, Atomic and Nuclear Physics.

YEAR 1

SEMSTER ONE

ENG 111 – General English I

This course teaches students how to write a wide range of academic and professional texts in English. The course covers the basics of correct sentence and paragraph structure before progressing to longer more complicated pieces. The aim of the course is to develop student's English language proficiency and provide them with writing skills they need in college as well as in the workplace. This course continues developing reading and writing skills in English at a tertiary level. It focuses on building vocabulary, grammar, and comprehension. It provides a structured and systematic approach to writing a variety of academic texts, including short essays. The ability to communicate information to an audience is an essential skill for all graduates. The course develops Technical English report writing, oral communication, and presentation skills to give students the confidence to present professional reports and to speak clearly, confidently, and effectively.

MTH 112 – Pre – Calculus I

The course covers polynomial equations in general, quadratic equations in particular, functions, counting techniques, permutations, combinations, the binomial theorem, the principle of mathematical induction, arithmetic, and geometric progressions.

SCN 113 – Introduction to Science

A course designed to cover fundamental scientific skills and to introduce basic concepts of science. Students acquire the ability to do scientific inquiry and learn how to think like scientist. This is of value to students wishing to go more in depth in the different fields of science.

ENG 114 –Academic Debate

The objective of this course is to have students to think critically, be able to write scientific reports, present their ideas in a conformable manner in front of an audience, use interpersonal communication skills, be able to evaluate, and practice speed reading.

KRD 115 – Kurdology

Kurdology is the study of Kurdish literature, history of language in general and geography of Kurdistan. It deals with history of Kurds and their religion also. The course implies theoretical work through two courses: course 1 and course 2 for both beginner and advanced groups. The beginner group contains two types of students: The students who were abroad and they are living in Kurdistan now and those students who did not take part in the final exam of Kurdish subject in grade 12 because they were free or not obliged to take Kurdish exam. First course deals with Kurdish language and its creeds in general. Second course contains history of Kurds and the religions that Kurds live in along the history. By the end of the course the students will increase their knowledge and be familiar with literature, history, language and religion of their nation as Kurds.

CSC 116 – Computer Skill

“Computer Skill” is a compulsory course aimed to provide students with transversal skills critically important to success fully develop both their academic process and their professional careers. The objective of this course is twofold. First, this course aims to provide the student with study skills including time management, library research, teamwork, and a short introduction to academic writing and management of information. Second, the aim of this course is improving students’ computer skills and increasing their proficiency with commonly used business applications. Skills for developing effective communications and treatment of information are at the core of the course and will be achieved with practical applications and active student engagement.

SEMSTER TWO

ENG 121 – General English II

This course teaches students how to write and present a wide range of academic and professional texts in English. The course covers the basics of correct sentence and paragraph structure before progressing to longer more complicated pieces. The aim of the course is to develop student’s English language proficiency and provide them with writing and presenting skills they need in college as well as in the workplace.

MTH 122 — Pre -Calculus II

The course focuses on trigonometric ratios, trigonometric functions, inverse trigonometric functions, trigonometric relations and identities, complex numbers, exponential and logarithmic functions, arcs and angles, secants and tangents, and matrix computations.

SOC 123 – Introduction to Sociology

This course introduces the basic concepts, theories, and perspectives in sociology and defines sociology as the scientific study of the influence of groups, institutions, and cultures upon individuals. The course focuses on identifying, explaining, and interpreting patterns and processes of human social relations. It is designed to teach students some of the major findings of sociology and to help master fundamental sociological skills.

ENG 124 – Academic Debate

The objective of this course is to have students to think critically, be able to write scientific reports, present their ideas in a conformable manner in front of an audience, use interpersonal communication skills, be able to evaluate, and practice speed reading.

KRD 125 – Kurdology

Kurdology is the study of Kurdish literature, history of language in general and geography of Kurdistan. It deals with history of Kurds and their religion also. The course implies theoretical work through two courses: course 1 and course 2 for both beginner and advanced groups. The beginner group contains two types of students: The students who were abroad and they are living in Kurdistan now and those students who did not take part in the final exam of Kurdish subject in grade 12 because they were free or not obliged to take Kurdish exam. First course deals with Kurdish language and its creeds in general. Second course contains history of Kurds and the religions that Kurds live in along the history. By the end of the course the students will increase their knowledge and be familiar with literature, history, language and religion of their nation as Kurds

PSY 126 – Introduction to Psychology

This course introduces the vast and exciting field of psychology. It gives an overview of the major concepts, theories, and arguments in selected sub-areas of the discipline. By examining competing claims, students are encouraged to explore the complex interrelationships between biology, society, individuality, and the human mind.

YEAR 2

SEMSTER ONE

ENP 200 – English for Physics I

English for Physics I is English for Specific Purposes (ESP), English for Academic Purposes (EAP) and English for Professional Purposes (EPP) tailored to the needs of undergraduate Primary English Department at International University of Erbil at an introductory level. This course gives the students' knowledge in understanding and using English for academic and professional needs. The course materials include reading comprehension, structure, speaking, and listening, from the chosen topics related Physics and teaching Physics.

CRW 211 – College reading and writing

This course develops reading and writing skills in English for speakers of other languages. It covers six thematic areas from liberal arts. It focuses on developing vocabulary, grammar, and comprehension. It provides a structured and systematic approach to writing basic academic texts, including short essays.

CSC 214 – Pre –Calculus III

Conic sections, polar coordinates, parametric curves, scalar and cross products of vectors, equations of lines and planes, organization and display of data, statistical measures, and probability are covered in this course.

ICM 214 –Interpreting Creative Media

This course introduces strategies for interpreting creative media, including literature, music, art, and film. By focusing on subject, form, and content, and by examining the relationship between representation and its contexts, the course develops key critical skills to enable the analysis of various creative media in their own right, in comparison to other works of art, and within specific societies.

IPY 214 –Introduction to Physics

This course is an introductory course in physics. Topics covered are motion, forces, energy, electricity, optics, and waves. The material covered and hands-on learning methods are very helpful for students planning to teach in elementary and middle school classes. This course is considered as a prerequisite for any assigned physics course. Extra Lab sessions are held on a weekly basis to complement class lessons.

CST 215 – Culture and Civilization

Along with a brief introduction into the study of History itself, the course aims to provide students with insights into why early human societies developed in the Prehistoric period and how this development eventually led to the emergence of ancient civilizations, in both western Asia and the Mediterranean, each of whom played an important role in the development of the modern world. Topics covered include: What is History?; the First Humans and the Prehistoric period; Mesopotamia and the first ancient civilizations; Ancient Egypt; the Phoenicians; Ancient Greece; and Ancient Rome.

SEMSTER TWO**ENP 201 – English for Physics II**

English for Physics II is English for Specific Purposes (ESP), English for Academic Purposes (EAP) and English for Professional Purposes (EPP) tailored to the needs of undergraduate Primary English Department at International University of Erbil at an intermediate level. This course gives the students' knowledge in understanding and using

English for academic and professional needs. The course materials include reading comprehension, structure, speaking, and listening, from the chosen topics related Physics and teaching Physics.

EPY 221 – Educational Psychology

This course comprises a study of the physical, cognitive, emotional, and linguistic development of the learner up to late adolescence, with emphasis on effective teaching and learning.

PHY 222 – College Physics I

This course is an introductory course in Mechanics and Electricity. Students cover the following topics in mechanics: vectors, motion in one dimension, motion in two dimensions (projectile), Newton's Laws of motion, moments, and systems of particles and static equilibrium. Students also cover DC topics in electricity: electrostatics, the electric current, conductivity and resistance, Ohm's law, energy and power, electric potential, capacitance, emf, electric circuits, and Kirchhoff's law.

Lab sessions are held on a weekly basis to complement the lectures.

FTM 223 – Finite Math

The course covers systems of linear equations, linear programming, the simplex method, mathematics of finance, topics in probability, and statistics.

CHY 224 — Calculus I

The course tackles calculus of real functions, limits, derivatives, applications of the derivative, anti-derivatives, the definite integral with applications, the mean value theorem, and the fundamental theorems of calculus.

CST 225 – Culture and Civilization II

The course aims to provide students with a broad understanding of the Medieval World. The initial part of the course, which covers the decline of the Roman Empire in the west and its rebirth in the east, is a prelude to the course proper and is designed to set the scene. The main part of the course addresses the major political, religious, social, economic, and cultural issues of the medieval period, not just in Europe, but also in the Byzantine and Islamic worlds. Topics covered include: The Roman World c.300-600 (the decline of the Roman Empire in and its rebirth in the east); the emergence of sibling cultures c.600-1050 (Byzantium; the Rise of Islam; and the development of European societies); and the growth of European power c.1050 -1500 (the Crusades; the Christian re-conquest of Spain; the Holy Roman Empire; Byzantium; the Islamic World; the Mongol Empire; the Ottoman Empire; the Hundred Years War; plague and the Black Death; religious division; peasant revolts; the growth of cities; the growth of trade; the voyages of discovery; and changes in society, art, culture, literature, and architecture).

YEAR 3

SEMSTER ONE

ENP 300 – English for Physics III

English for Physics III is English for Specific Purposes (ESP), English for Academic Purposes (EAP) and English for Professional Purposes (EPP) tailored to the needs of undergraduate Primary English Department at International University of Erbil at an upper-intermediate level. This course gives the students' knowledge in understanding and using English for academic and professional needs. The course materials include reading comprehension, structure, speaking, and listening, from the chosen topics related Physics and teaching Physics.

CDA 311 – Curriculum Development & Approach

The course examines the origins of the school curriculum and different types of curricula. It also looks into curriculum development, implementation, and course design in the modern era, leading to critical evaluation of curricula regarding their structural elements and assumptions regarding subject content and learning.

MTC 312 – Calculus II

The course looks into transcendental functions, techniques and applications of integration, indeterminate forms and "L'Hôpital's" rule, improper integrals, Taylor's formula, and infinite series.

MTT 313 – Introduction to Probability & Statistics

The course provides special emphasis on concepts needed for K-12 curriculum.

CHY 315 – General Chemistry

This course introduces the fundamental principles of chemistry, kinetics, and the properties of solids, liquids, and gases. It also provides a review of essential topics: stoichiometry, solution-phase reactions, and chemical bonding that are essential for future course work in chemistry.

Lab sessions are required.

CPH 314 – College Physics II

This course is a continuation to PHY212. Topics covered are circular motion and simple harmonic motion in both aspects; kinematics and dynamics; applications on Newton's laws (motion in vertical circles, the ballistic pendulum, and others); electromagnetic induction and alternating current; and electronics (capacitors, diodes, transistors, etc.).

Lab sessions are held on a weekly basis to complement the lectures.

SEMSTER TWO

ENP 301 – English for Physics III

English for Physics III is English for Specific Purposes (ESP), English for Academic Purposes (EAP) and English for Professional Purposes (EPP) tailored to the needs of undergraduate Primary English Department at International University of Erbil at an advanced level. This course gives the students' knowledge in understanding and using English for academic and professional needs. The course materials include reading comprehension, structure, speaking, and listening, from the chosen topics related Physics and teaching Physics.

PHY 315 – Introduction to Philosophy

The course will provide an introduction to three major divisions in philosophy: metaphysics (the study of ultimate REALITY or being), epistemology (the study of human KNOWLEDGE), and ETHICS (the study of moral principles). The course will also cover basic logic and reasoning.

CST 325 – Culture and Civilization III

The course is designed to provide students with a broad understanding of the key events that changed the world in the 20th century. Topics include: The First World War; the Russian Revolution; the Rise of Fascism; the Great Depression; World War II; the Cold War; the Chinese Revolution; the End of Colonialism and the Rise of the Third World; European Unification; and the Collapse of the Soviet Union.

PSY 323 – Optics & Waves

In this course, students study geometrical optics (reflection, refraction, and optical instruments). In the study of waves, students learn the language of waves, types of waves, and wave phenomena (reflection, refraction, diffraction, and interference). The course also covers standing waves and sound. Electromagnetic waves and the electromagnetic spectrum and its different components are also covered in this course.

Lab sessions are held on a weekly basis to complement the lectures.

CRE 324 – Classroom Exposure I

15 weeks at level appropriate schools in blocks of 5 weeks including 2 weeks of initial observation.

CPH 324 – College Physics III

This course is a continuation to PHY212. Topics covered are circular motion and simple harmonic motion in both aspects; kinematics and dynamics; applications on Newton's laws (motion in vertical circles, the ballistic pendulum, and others); electromagnetic induction and alternating current; and electronics (capacitors, diodes, transistors, etc.).

Lab sessions are held on a weekly basis to complement the lectures.

YEAR 4

SEMSTER ONE

ENG 400 – English Knowledge I

This course develops intermediate communicative ability in English for speakers of other languages. It covers vocabulary, grammar, reading, listening, writing, and speaking.

CDA 411 – Public Speaking

The ability to communicate information to an audience is an essential skill for all graduates. The course develops English oral communication and presentation skills to give students the confidence to speak clearly, confidently, and effectively.

LPE 412 – Management, Assessment, & Administration

The course provides an overview of the principles and practices of classroom management and administration. It looks at the principles, types, and practices of testing and assessment in education as well as the techniques and use of software for basic statistical analysis and record keeping.

PHY 413 – Earth Science and Astronomy

This course is split into two parts. The first part is an introductory course in astronomy covering basic astronomical tools and measurements, the solar system, stars, and galaxies. Moreover, the course offers a brief history of the universe, its age, and its fate. The second part of the course studies the Earth in depth. Topics covered include earth structure, plate tectonics, earthquakes and volcanoes, and energy sources.

ENG 414 – Classroom Exposure II

15 weeks at level appropriate schools in blocks of 5 weeks including 2 weeks of initial observation.

PHY 415 – Principles of Physics

This course covers three different areas in physics: fluid mechanics, science of materials, and thermal physics. In fluids, students study fluid properties, pressure, Archimede’s principle, fluid movement, and terminal velocity. In science of materials, students study the physical properties of solids, Young modulus of elasticity, and Mohs scale. In thermal physics, students learn about heat and temperature, thermal properties, the kinetic theory of gases, and the laws of thermodynamics.

Lab sessions are held on a weekly basis to complement the lectures.

SEMSTER TWO

ENG 401 – English Knowledge II

This course develops intermediate communicative ability in English for speakers of other languages. It covers vocabulary, grammar, reading, listening, writing, and speaking.

SPJ 421 — Special Projects

This course is a combination of two subprojects:

Health Education and practice

The course is an introduction to the main theories on health behavior and health promotion. It also focuses on personal hygiene and good eating habits and their impact on physical and mental development and general well-being. The First Aid Certificate will form part of the Health Education course and is compulsory for all full-time students registered with International University of Erbil. Then each student must take what they have learned and use it in real-class.

Report

Each student must prepare a report stating on everything they learned and how they used it in-class situations.

PHE 422 – Philosophies of Education

The course offers an introduction to teaching profession and examines the historical, philosophical, and social foundations of education by focusing on key thinkers and educational innovators. It also examines some significant issues in contemporary education.

PHY 423 – Modern Physics

In this course, students are introduced to atomic and nuclear physics. They study the particle-like properties of electromagnetic radiation (photoelectric effect, photons, spectra, and energy levels), nuclear models and structure, radioactivity, and nuclear reactions (fission and fusion). Other topics such as the special theory of relativity and elementary particle physics are briefly introduced in this course.

PHY 424 – Further Mechanics

Circular motion in detail, angular momentum, rotation of rigid bodies, and collisions in two dimensions are covered in this course. Students also study Newton's theory of gravity, gravitational fields, satellite motion and Kepler's laws; methods of finding the center of mass of composite bodies; oscillations, SHM, damped and forced oscillations, resonance; and applications of Newton's second law using calculus.

Lab sessions are held on a weekly basis to complement the lectures.

SCN 425 – Science for Secondary Teachers

Integrating theory with practical experience through peer group interaction. Students attend and participate in supervised classroom work to improve their potentials in teaching science for secondary levels.