



University of Science and Culture

Remarks:

According to the Academic Instruction of University, in the academic system, each theoretical credit is presented in 16 or 17 hours, each practical credit in 32 or 34 hours, and each of the workshop credit in 48 hours.

There are some different type of the courses passing by a bachelor/master/PHD student at this university, as listed below:

1. Basic
2. Major
3. Specialized
4. Elective
5. General
6. Workshop
7. Internship
8. Project
9. Optional
10. Mandatory
11. Pre-university

Each one of these types contain some courses to be passed, according to the educational regulations passed by the Ministry of Science, Research and Technology or Ministry of Health & Medical Education of Iran.

The grading system in this university is from 0 to 20. The minimum passing grade for a course leading to an Associate's Degree or a Bachelor's Degree is 10, for a course leading to a Master's Degree and Medical Sciences is 12 and for a course leading to a PhD Degree is 14.

Note: This document has been prepared at **TINA SAYARMOAFI's** request.

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Course	Credits	Description
Mathematics 1	3	<p>(Duration: 51 hours Theoretical) (Type of Course: Basic) Basic concepts of Calculus and Geometry will be taught to the students in this course which provides necessary background for technical courses.</p> <p>Syllabus : Cartesian coordinates; polar coordinates; complex numbers; addition, product, root & geometrical representation of complex numbers; polar representation of complex numbers; function; functions algebra; limit and relevant theorems; infinite limit and limit in infinite; left-hand and right-hand limit; connectivity; derivative; derivation formula; inverse function and its derivative; trigonometric functions derivative and their inverse functions; Rolle's theorem; mean theorem; Taylor expansion; geometrical and physical applications of derivative; curves and acceleration in polar coordinates; application of derivative in approximation of equations roots; definition of integral of continuous functions and piecewise continuous; basic theorems of differential & integral arithmetic; primitive function; approximate methods of integral estimate; application of integral in computation of area, length of curve, moment, center of gravity and labor ... (in Cartesian and polar coordinates); logarithm and exponential function and their derivative; hyperbolic functions; integration methods such as change of variable, component and decomposition of fractions; transform of special variables of sequence and numerical series and relevant theorems; power series and Taylor theorem with remainder.</p>
Physics Lab 1	1	<p>(Type of Course: Basic) A laboratory course in elementary physics. The course will include selected experiments in mechanics, heat, light, sound, electricity and magnetism, and modern physics.</p>
General Workshop	1	<p>(Duration: 34 hours Practical) (Type of Course: Basic) Familiarity with the principles of safety and health of workshops and how to use the tools and equipment used. How to work with technical drawings, workshop tools and equipment in the fields of machine tools, welding, modeling and casting, electricity, etc.</p>

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Engineering Probability	3	<p>(Duration: 51 hours Theoretical) (Type of Course: Basic) By learning this course, students will be able to use basic rules of Probability Theory for real modeling of information problems. Syllabus : An introduction to theory of sets, samples and their table display together with average, exponent, middle and variance of conversion and composition, probabilities and the relevant theorems, random variables, intermediate and average and variance of distributions, Poisson's two-pharse distributions, geometric difference, normal distribution, distribution of several random variable, random sampling and random numbers, sampling from small society, estimation of statistical parameters, assurance intervals, test 2 presumptive test of decision-making, analysis and variance, regression, correlation, nonparametric methods test, fitting straight line on data.</p>
Mathematics 2	3	<p>(Duration: 51 hours Theoretical) (Type of Course: Basic) Basic concepts of Calculus and Geometry will be taught to the students in this course which provides necessary background for technical courses, continuing "General Math. I" discussions. Syllabus : Parametric equations; space coordinates; vector and space; numerical product; matrix 3x3 of three-indeterminate linear equations system; operation on lines; matrix reverse; solving equations system; linear independence; base in R^2; R^3 linear transform and its matrix; determinate 3x3 and characteristic value and vector; vector product; second order line and plane equations; two vector functions and its derivative; speed and acceleration; bending; normal vector to a curve; multivariable function; directional and partial derivative; tangent plane and normal line to a curve; multivariable function; directional and partial derivative; tangent plane and projecting line of gradient; chain of rule for partial derivative; exact differential; second kind and third kind integrals and their application in geometrical and physical problems; transform of integration arrangement (without accurate affirmation); cylindrical and spherical coordinates; vector field; curvilinear integral; surface integral; divergence; curl; Laplacian; potential of green space and divergence and stochastic.</p>





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Differential Equations	3	<p>(Duration: 51 hours Theoretical) (Type of Course: Basic) In this course, first and second levels of linear differential equations and some nonlinear differential equations will be introduced, in addition, students will learn about some numerical and analytical ways to solve Mathematical Problems.</p> <p>Syllabus : Nature of differential equations and their solution, family of graphs and vertical routes, physical patterns, separable equation, first order linear differential equation, homogeneous equation, 2nd order linear equation, homogenous equation with fixed constants, method of indefinite constants, method of changing parameters, application of 2nd order equations in physics and mechanics, solution of differential equation with series, Bessel and Gamma functions, Legendre polynomial, an introduction to differential equations set, Laplace transform and its application in solving differential equations</p>
Physics 2	3	<p>(Duration: 51 hours Theoretical) (Type of Course: Basic) Syllabus : Electric charge and Coulomb's law, the electric field, Gauss' law – Electric Potential Energy and Potential, the electric properties of materials, Capacitance and Capacitors, DC Circuits – the magnetic field and magnetic field of a current, Faraday's law in induction, magnetic properties of materials, inductance, AC circuits , Ampere's law.</p>
Physics Lab 2	1	<p>(Duration: 34 hours Practical) (Type of Course: Basic) The purpose of this course is to learn electrical and electronic measuring devices and to perform basic tests of electrical circuits.</p>

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