**Nazwa przedmiotu:**

Calculus II

**Koordynator przedmiotu:**

Andrzej Fryszkowski, Professor

**Status przedmiotu:**

Obowiązkowy

**Poziom kształcenia:**

Studia I stopnia

**Program:**

Aerospace Engineering

**Grupa przedmiotów:**

Wspólne

**Kod przedmiotu:**

ANW90

**Semestr nominalny:**

2 / rok ak. 2009/2010

**Liczba punktów ECTS:**

5

**Liczba godzin pracy studenta związanych z osiągnięciem efektów uczenia się:**

**Liczba punktów ECTS na zajęciach wymagających bezpośredniego udziału nauczycieli akademickich:**

**Język prowadzenia zajęć:**

polski

**Liczba punktów ECTS, którą student uzyskuje w ramach zajęć o charakterze praktycznym:**

**Formy zajęć i ich wymiar w semestrze:**

|  |  |
| --- | --- |
| Wykład: | 30h |
| Ćwiczenia: | 30h |
| Laboratorium: | 0h |
| Projekt: | 0h |
| Lekcje komputerowe: | 0h |

**Wymagania wstępne:**

Calculus I

**Limit liczby studentów:**

**Cel przedmiotu:**

1. to convey and reinforce the knowledge on definite integrals (proper and improper) and their applications, series (numeric and functional), functions of many variables (sets, limits and continuity, multivariable calculus), ordinary differential equations, Frenet trihedron, line and surface integrals, Green, Stokes and Gauss Theorems. 2. to acquire thorough understanding of basic concepts and computational processes and to master skills of using them (labs) and to master the skill of correct mathematical reasoning and inference.

**Treści kształcenia:**

First order ordinary differential equation. General and particular solutions. Initial value conditions. Existence and uniqueness. Separable equation and transformation a differential equat ion to that form. Linear equations of the first order. General solution. Solving nonhomogenous linear differential equations by the method of integrating factor and the method of variation of a parameter. Linear equations of the higher order. General and particular solutions. Initial value problems. Linear equation of the second order transformable to equation of the first order. Method of trial functions for nonhomogenous equation of the m-th order with constant coefficients. Double integral on a rectangle; integrability theorem. Mean value and integral mean value theorem. Double integral and iterated integral. Double integral on a standard domain. The Fubini theorem. Change of variable in a double integral. Region mapping: Jacobian determinant. Double integral in polar coordinates. Application of double integral to computation of areas and volumes of figures and solids. Double integral application: surface area of a frustum. Triple integral on parallelepiped. Fubini theorem for triple integral on standard solids (standard 3D domains). Changing of variables. Geometric application of a triple integral - volumes of solids, centers of mass. Line integrals. Green Theorem. Potentials. Work of a vector field.

**Metody oceny:**

50% continuous assesment based on laboratory work and tests, 50% written final exam

**Egzamin:**

**Literatura:**

Recommended texts (reading): 1. Thomas “Calculus” 2. Robert A. Adams, Calculus. A complete course 3. Thomas G. Finney: Calculus, ed. Addison-Wesley

**Witryna www przedmiotu:**

**Uwagi:**

## Efekty przedmiotowe