COURSE PROGRAMME

COURSE NAME: COMPLEX ANALYSIS
YEAR II SEMESTER II

COURSE TYPE (OB-obligatory/OP-optionally/F-facultative): OB

NUMBER OF HOURS PER WEEK:

Course	Seminary	Laboratory
2	2	1

TOTAL HOURS PER SEMESTER: 28+28+14=70
TOTAL HOURS OF INDIVIDUAL ACTIVITY: 80
CREDITS POINTS: 5
TYPE OF EVALUATION: mixt
TEACHING LANGUAGE: Romanian
TAUGHT BY:
GABRIELA APREUTESEI, LECTURER PHD, DEPARTMENT Of Mathematics
PRE-REQUISITES: Mathematical Analysis, II

COURSE AIMS AND OBJECTIVES

It is one of the fundamental courses of mathematical analysis, making some of the materials used in many subsequent subjects: functional analysis, differential equations, differential geometry, etc., it provides any required knowledge of mathematics graduate faculty.

CONTENTS

1. Algebraic and topological structura of the set of complex numbers: the field of compex numbers, geometriuc properties, the complex pane and Riemann sphere, the sistem of neighbourhooods, convergent sequences
2. Holomorphic functions: limits, continuity, differentiability, derivability, the links between them, Cauchy-Riemann conditions, basic functions
3. Curvilinear integral: line integrals in plane and three-dimensional space, curved, path independent integrals of the second species, Green's formula
4. Integration in the complex case: antiderivatives, the fundamental theorem of calculus, parametric integrals, Cauchy' s integral formula, applications
5. Analytical functions: sequences and series of holomorphic functions, complex power series and equivalence between analytical and holomorphic functions, Laurent series, the representation of holomorfic functions like Taylor or Laurent series
6. Residues: isolated singular points, residues and calculus of residues, residue theorem and applications in the calculation of real integrals

SEMINARY/ LABORATORY TEMATICS:

1. Seminars closely follow the theme of the course

2. In the laboratory will continue and deepen the calculation with complex numbers began in high school, geometric aspects

TEACHING METHODS: Problem-solving, exposure, conversation, learning through discovery

REFERENCES

1. P. Hamburg, N. Negoescu, P. Mocanu – Mathematical Analysis
(Complex Functions), Did. And Ped. Ed., Bucharest, 1982

2. O. Mayer – Theory of functions of a complex variable (vol.1), Acad. Ed., Bucharest, 1981

3. E. Popa –Introduction to the theory of functions of one complex variable, Univ. „Al.I.Cuza" Iasi Ed., 2000

4. S. Nistor, I. Tofan – Teoria functiilor complexe, Ed. Universitatii „Al. I. Cuza"
Iasi, 1997

5. M. Batinetu-Giurgiu – Probleme de functii complexe, Ed. Acad. Romane, 1998

ASSESSMENT AND EXAMINATION: conditions -To entrance exam the students have written 2 papers during the semester (L1,L2)

criteria: Average minimum at the two papers to be 4.50
modes: The final exam consists of written (S) and oral work (O)
final mark formula: (L1+L2)/2+(S+O)/2