

COURSE: MATHEMATICS II			
ACADEMIC YEAR:2016-2017			
TYPE OF EDUCATIONAL ACTIVITY: Affine			
TEACHER: Dr. Vita LEONESSA			
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phone: 0971205868		mobile (optional): 3492211610	
Language: Italian			
ECTS: 6 ( 5 for lessons and 1 for tutorials/practice)		n. of hours: 52 (40 for lessons and 12 for tutorials/practice)	Campus: Potenza Dept.: DiS Program:Chimica (L27)
<p><b>EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES</b>          Mathematics II is the second teaching in mathematics area and it deal with infinite and power series, integral calculus for real valued functions of 1 variable, differential calculus for real valued functions of 2 variables and first and second order differential equations.          Principal knowledge are:</p> <ul style="list-style-type: none"> <li>○ knowledge of fundamental notion regarding to infinite series;</li> <li>○ knowledge of basic elements of Riemann integration theory elementi and methods for computing integrals of real valued functions of 1 variable;</li> <li>○ knowledge for searching maximum or minimum for real valued functions of 2 variables;</li> <li>○ knowledge of fundamental notion of the theory of ordinary differential equations.</li> </ul> <p>Principal abilities are:</p> <ul style="list-style-type: none"> <li>○ study the character of a infinite series;</li> <li>○ solve integrals;</li> <li>○ apply the integration theory to find areas;</li> <li>○ find maximum and minimum for functions of 2 variables;</li> <li>○ solve first order linear differential equations and relevant Cauchy problems;</li> <li>○ solve second order linear differential equations and relevant Cauchy problems.</li> </ul>			
<p><b>PRE-REQUIREMENTS</b>          It is necessary to know the following basic arguments of Mathematics I:</p> <ul style="list-style-type: none"> <li>○ sequences (properties and limits);</li> <li>○ limit and derivatives of functions of 1 variable;</li> <li>○ elementary functions;</li> <li>○ methods for solving equations, inequalities and system.</li> </ul>			
<p><b>SYLLABUS</b></p> <ul style="list-style-type: none"> <li>○ Infinite series (12 hours). Character of an infinite series. Properties. Positive series and methods to study them. Series of any sign. Power series. Taylor and McLaurin series.</li> <li>○ Integration theory (16 hours). Definition and properties. Calculus of integrals.</li> <li>○ Two-variables functions (16 hours). Limit,continuity and differentiability for two-variables functions. Searching of maximum and minimun (local or</li> </ul>			

absolut).

- Ordinary differential equations (8 hours). First- order (linea r/ separable variables) differential equations and relevant Cauchy problems. Second-order linear differential equations and relevant Cauchy problems.

#### TEACHING METHODS

The course consists in 52 hours of theoretical lessons; in particular 12 hours are of tutorial lessons.

#### EVALUATION METHODS

The aim of examination is to verify the level of the achievement of the above educational goals.

The final test consist of a written examination which requires both numerical exercises and theoretical ones. The time for the written examination is 3 hours. In order to overcome the exam it is necessary to achieve at least 18/30. The student that wants to improve the grade may require to do also an oral examination.

The student that achieves 16/30 or 17/30 to the written examination, has to do also an oral examination in order to overcome the final test.

There will also be two optional tests the overcoming of which "exempt" students from the oral test. In these tests are included both the exercises and the questions related to theoretical knowledge.

Each test is overcome with 16/30 and the final grade is the average grade of all two tests plus 2 points (bonus).

#### TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

- Lecture notes available on the course web site  
oldwww.unibas.it/utenti/leonessa/matii1617/matii1617.html;
- M. Bertsch, R. Dal Passo, L. Giacomelli, ANALISI MATEMATICA, McGraw-Hill, 2011;
- P. Marcellini, C. Sbordone, ELEMENTI DI ANALISI MATEMATICA UNO (versione semplificata per i nuovi corsi di laurea), Liguori Editore, 2002.

#### INTERACTION WITH STUDENTS

Educational goals, syllabus and evaluation methods are described at the beginning of the course.

*During the teaching all lecture notes will be available on the course web site.*

Office hours: Monday 10:30-11:30, Tuesday 10:30-11:30, next to the office n. n. 3D236 of the Department of Mathematics, Computer Science and Economics.

*It can be possible to contact the professor also by e-mail.*

*News of every type will be available on the NEWS session of the course web site.*

#### EXAMINATION SESSIONS (FORECAST)<sup>1</sup>

06/02/2017, 19/06/2017, 19/07/2017, 25/09/2017, 06/11/2017, 04/12/2017

SEMINARS BY EXTERNAL EXPERTS    YES     NO

#### FURTHER INFORMATION

<sup>1</sup>Subject to possible changes: check the web site of the Teacher or the Department/School for updates.