UNIVERSITY OF CRAIOVA
Faculty of Mathematics and Computer Science
Department of mathematics
Fundamental domain : Exact sciences
Domain: Mathematics
Master : Applied mathematics
Form : Day classes
Duration of studies : 2 years
Approved with academic year 2009-2010

Oscillation theory
Syllabus

Course coordinator: Lect.dr. Octavian G. Mustafa
Code: MA214
Second Cycle: MASTER
First Year , Semester 1, Course 28 hours, Seminar 14 hours
No. of credits: 6
Domain: Mathematics
Type : compulsory (or optional)
Category: speciality (or speciality, complementary)

Objectives : Introduction in the oscillation theory of linear and nonlinear ordinary differential equations.
Necessary background : Calculus and ordinary differential equations.
Evaluation : Written test (C).

Contents:
Disconjugate equations: criteria, tests, integration methods.
Nonlinear oscillations: Atkinson, Wong, Kamenev, Philos-type results.
Asymptotic integration of solutions: Kusano-Trench method, Hale-Onuchic and Hartman-Onuchic analysis.
Oscillation of matrix differential equations: Riccati techniques, variational methods.

Bibliography

1. I.T. Kiguradze, T.A. Chanturia, *Asymptotic properties of solutions of nautonomous ordinary differential equations*, Kluwer, Dordrecht, 1993..
2. *Lecture Notes in Mathematics*, Springer-Verlag, Berlin: 220, 989, 1338, 1726.
3. C.A. Swanson, *Comparison and oscillation theory of linear differential equations*, Academic Press, New York, 1968.
4. R.P. Agarwal, S.R. Grace, D. O'Regan, *Oscillation theory for second order linear, half-linear, superlinear and sublinear dynamic equations*, Kluwer, Dordrecht, 2002.
5. W.T. Reid, *Sturmian theory for ODEs*, Springer-Verlag, Berlin, 1980.
6. O.G. Mustafa, *Integrarea asimptotica a ecuatiilor diferentiale ordinare in cazul neautonom*, Ed. Sitech, Craiova, 2006.
7. O.G. Mustafa, *Oscilatiile ecuatiilor diferentiale ordinare*, Ed. Sitech, Craiova, 2007.