UNIVERSIDADE FEDERAL DE SANTA CATARINA
CENTRO DE CIÊNCIAS FÍSICAS E MATEMÁTICAS
PÓS-GRADUAÇÃO EM MATEMÁTICA PURA E APLICADA

MTM 510059 Non-Linear Analysis Methods

Pre-requisite: MTM410027 Measure and Integration; MTM410029 Functional Analysis

Weekly lesson hours: 06h

Discipline syllabus: Consequences of the contraction principle. Introduction to bifurcation theory. Fixed point theorems. Theory of degree and applications. Modern variational calculation.

BIBLIOGRAPHIC REFERENCES

Text book:

1. K.-C. Chang, Methods in Nonlinear Analysis, Springer (2010).
2. K. Deimling, Nonlinear Functional Analysis, Dover Publications, 2010.
3. P. Drábek, J. Milota, Methods of Nonlinear Analysis. Applications to Differential Equations. Birkhäuser Advanced Texts, Birkhäuser, 2007.
4. S. Kesavan, Nonlinear Functional Analysis. A First Course. Hindustan Book Agency, 2004.
5. H. Kielhöfer, Bifurcation Theory: An Introduction with Applications to Partial Differential Equations, Springer, 2012.

COMPLEMENTARY BIBLIOGRAPHY

1. H. Amann, Ordinary differential equations. An introduction to nonlinear analysis, Walter de Gruyter & Co., 1990.
2. D. H. Sattinger. Bifurcation of periodic solutions of the Navier-Stokes equations. Arch. Rational Mech. Anal. 41, 66-80 (1971).
3. D. H. Sattinger, Stability of bifurcating solutions by Leray-Schauder degree. Arch. Rational Mech. Anal. 43, 154-166 (1971).
4. D. H. Sattinger, Topics in Stability and Bifurcation Theory, Lecture Notes in Mathematics, Vol. 309. Springer-Verlag, Berlin Heidelberg, 1973
5. J. T. Schwartz, Nonlinear Functional Analysis, Gordon and Breach Science Publishers, 1969.
6. G. Teschl, Nonlinear Functional Analysis. URL: http://www.mat.univie.ac.at/~gerald/
7. E. Zeidler, Applied Functional Analysis: Applications to Mathematical Physics, Springer, New York 1995.

8. E. Zeidler, Applied Functional Analysis: Main Principles and Their Applications, Springer, New York 1995.
9. E. Zeidler, Nonlinear Functional Analysis and its Applications. I: Fixed-Point Theorems, Springer-Verlag New York, 1986.