

## SYLLABUS

### I. IDENTIFICATION

<b>Degree Course: Business Administration</b>		
<b>Department:</b> Administração Empresarial – DAE		
<b>Course:</b> Operational Research		<b>Code:</b>
<b>Working Hours:</b> 72 hours/class	<b>Academic year:</b> 2017/2	<b>Phase:</b> Elective class
<b>Professor:</b> Julibio David Ardigo, Dr. Eng.		
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### II. SUMMARY

Decision concepts and management focus of operational research. Math programming and modeling: linear programming; quadratic programming. Math programming applied to management issues. Classical decision theory. Lines and simulation theory.

### III. GOALS AND OBJECTIVES

Enable students to use quantitative methods as helpers to make decisions.

### IV. DIDACTIC PROGRAM

1. **Program Presentation**
2. **Business Games**
3. **Decision Theory Concepts**
4. **Math Programming and System Modeling**
5. **Introduction to Operational Research**
  - a. Linear Programming
  - b. Nonlinear Programming
  - c. Quadratic Programming
  - d. Deterministic Dynamic Programming
6. **Introduction to Probabilistic Models**
  - a. Statistic Analysis of Decision
  - b. Risky Decisions
  - c. Decision Making Under Uncertainty
  - d. Criteria Analysis
  - e. Bayesian Analysis
7. **Decision-making among conflicts**
  - a. Game theory
8. **Lines Theory and Systems Simulation**

### V. LEARNING METHODOLOGY

- Lectures and practice lessons to problem solutions (on classroom or lab)
  - The roll call will finish 10 minutes after the beginning of class
  - After the 7<sup>th</sup> absence without formal justification, the student name will be erased from the roll call
  - During the classes, any activity that is not related to the class is forbidden
  - After finishing the activities related to the class, the student can go out of

the classroom

- Complementary readings

#### IV. ASSESSMENT SYSTEM

The assessment of students will occur through the integration of:

- 3 Exams;
  - Exams contents are cumulative, therefore, all contents until the exam day can be on the exam
  - Makeup Exams
    - They occur in the end of the semester. The student has to require it with the secretariat and there are specific rules to require them.
  - Alternative to makeup exams
    - Any student that has 75% of frequency and has not required the makeup exam with the secretariat can do a 4<sup>th</sup> exam, with all subjects presented among the semester, to replace its lower grade or the grade of an exam that it missed.
- Lab Activities and others;
  - Can be used by the professor to round exams grades.
  - Can be used by the professor to non-attending activities to students with a higher average than 7.0

#### V. BIBLIOGRAPHY

##### BASIC BIBLIOGRAPHY

WINSTON, Wayne L. **Operations research: applications and algorithms**. 4th ed. United States: Thomson Learning, c2004. 1418 p.: ISBN 9780534380588 (enc.)

CIRIANI, Tito A; GLIOZZI, Stefano; JOHNSON, E. L; TADEI, Roberto. **Operational research in industry**. West Lafayette, Ind.: Ichor, 1999. 330 p. ISBN 1557531722 (broch.).

RARDIN, Ronald L. **Optimization in operations research**. New Jersey: Prentice-Hall, 2000. 919 p. : ISBN 0023984155 (enc.)

ACKOFF, Russell Lincoln; SASIENI, Maurice W. **Fundamentals of operations research**. 1 ed. New York, NY: J. Wiley, 1968. 455 p. :

RAGSDALE, CLIFF T. CENGAGE. **Modelagem e Análise de Decisão**. Ed. Cengage, 2009 (1<sup>a</sup> Ed.)