

Polytechnic Institute of Coimbra (P COIMBRA 02) Coimbra Institute of Engineering - ISEC Informatics and Systems Engineering Department

ECTS CATALOGUE

The main language of instruction at Coimbra Institute of Engineering is Portuguese. However, some courses from degree and master programs can be offered in English and/or with a tutorial support in English.

The ECTS catalogue includes subject contents in English Language.

Students can choose subjects from this Catalogue to the study plan proposal (Learning Agreement) to be analyzed carefully by the Departmental Coordinators and to be adjusted, after student's arrival, if necessary.

This ECTS catalogue contains information that is valid for this academic year. ISEC reserves the right to adjust the courses offered during the academic year and is not responsible for typing errors or printing mistakes.

Prof. Luís Castro International Relations Office Coordinator

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Polytechnic Institute of Coimbra (P COIMBRA 02) Coimbra Institute of Engineering - ISEC Informatics and Systems Engineering Department

ECTS CATALOGUE

Bachelor Informatics Engineering

Code	ode Title - Portuguese Title - English E			
	1	.º ano / 1 st Year		
60022849	Análise Matemática I	Mathematical analysis I	6	Fall
60022890	Sistemas Digitais	Digital Systems	5	Fall
60022928	Álgebra Linear	Linear Algebra	5	Fall
600236931	ntrodução à Programação	Introduction to Programming	5	Fall
61001545	Fecnologias WEB	Web Technologies	5	Fall
610015391	inguagens Script	Script Languages	4	Spring
60024304	Electrónica	Electronics	4	Fall
60023055	Análise Matemática II	Mathematical Analysis II	6	Spring
600238261	Nétodos Estatisticos	Statistical Methods	5	Spring
60023764	Programação	Programming	5	Spring
60024222	Fecnologias e Arquitecturas de Computadores	Computer Technologies and Architectures	5	Spring
60023852 F	Fundamentos de Computação Gráfica	Fundamentals of Computer Graphics	5	Spring
	2	.º ano / 2 nd Year		
600231001	ntrodução às Redes de Comunicação	Introduction to Data Networks	5	Fall
600231781	nvestigação Operacional	Operations Research	5	Fall
60023747	Sistemas Operativos	Operative Systems	5	Fall
61000608	Bases de Dados	Databases	5	Fall
60024233	Programação Orientada a Objectos	Object Oriented Programming	5	Fall
600238371	ntrodução à Inteligência Artificial	Introduction to Artificial Intelligence	5	Fall
60023232	Modelação e Design	Modeling and design	5	Spring
600234769	Sistemas Operativos II	Operating Systems 2	5	Spring
600235450	Conhecimento e Raciocínio	Knowledge and Reasoning	5	Spring
600242561	nteracção Pessoa-Máquina	Human Computer Interaction	5	Spring
600232321	Modelação e Design	Modeling and Design	5	Spring
60024065	Programação Avançada	Advanced Programming	5	Spring
600241341	ntegração de Dados	Data Integration	5	Spring
60024289	Arquitectura e Administração de Bases de Dados	Database Architecture and Management	5	Spring
600237360	Gestão	Management	5	Spring
60024155	Sistemas de Informação I	Information Systems I	5	Spring
60023927	Serviços de Rede I	Network Services 1	5	Spring
600239490	Cablagem Estruturada	Structured Cabling	5	Spring
60023962	Encaminhamento de Dados	Routing	5	Spring
60023984	Segurança	Security		Spring
	3	.º ano / 3 rd Year		
60023880	Programação WEB	WEB Programming	6	Fall
60024002	Fecnologias de Ligação	Link-Layer Technologies	6	Fall
60024013	Serviços de Rede II	Network services II	6	Fall
60024024	Disponibilidade e Desempenho	Network Availability and Performance	6	Fall
600240300	Gestão de Redes	Network Management	6	Fall
60024087	Estruturas de Dados	Data Structures	6	Fall
60024098 F	Programação Distribuída	Distributed Programming	6	Fall
600241771	nteligência Computacional	Computacional Intelligence	6	Fall
60024188	Sistemas de Informação II	Information Systems II	6	Fall
60024200	Estratégia Organizacional	Organizational Strategy	6	Fall
60024267	Arquitecturas Móveis	Mobile Architectures	6	Fall
60024278	Gestão de Projecto de Software	Software Project Management	6	Fall
60024295	Metodologias de Optimização e Apoio à Decisão	Optimization and Decision Support Methodologies	6	Fall
60023905	Ética e Deontologia	Ethics and Deontology	3	Spring
60024244	Projecto ou Estágio	Project or Traineeships	27	Spring



ENGENHARIA

Instituto Superior de Engenharia de Coimbra <u>www.isec.pt</u>

Signature of Teacher:	Areal	
-		

BsC Informatics Engineering

BsC Informatics Engineering (Evening Classes)

Academic Year: 2018/2019

Program Contents

Course Unit HUMAN COMPUTER INTERACTION

Specialization (s) APPLICATIONS DEVELOPMENT

Subject type

Research Area Informatics Engineering

Year	2nd	Semester	2nd		EC	TS 5
Working	g Hours				Unaccompanied Working H	ours
Activity	Туре		Working Hours Per Week	Total Hours	Activity Type	Total Hours
Theoret	ical Lectu	ires	1	14	Study	29
Theoret	ical-Pract	ical Lectures			Works / Group Works	60
Practica	I-Laborat	ory Lectures	2	28	Project	
Tutorial	Orientatio	on			Evaluation	2,5
Project					Additional	
Total of	Working	Hours		133,5		

Lecturer

Activity Type	Name	Qualifications	Category
Theoretical Lectures	Anabela Gomes	PhD	Adjunct Professor
Theoretical-Practical Lectures			
Practical-Laboratoty Lectures	Anabela Gomes	PhD	Adjunct Professor
Tutorial Orientation			
Project			

Responsible(s) Lecturer (s) Anabela Gomes

Goals

The main purpose of the Human Computer Interaction curricular unit is to introduce students the fundamental principles and rules for the design and development of User Interfaces that are usable, useful, efficient and safe. To this, the student should develop the following basic skills: identify the users and the tasks they wish to accomplish with the interactive system to be developed; knowing how to evaluate the interfaces at different stages of their development, applying evaluation techniques that best suit them; identify the critical factors in the design of interfaces; understand and adopt compromises between the various constraints to which the interface design is subject to and frame the design of interfaces in the computer engineering project

Skills

Knowledge and Understanding

A.1. Explain how to conceptualize the interaction.

A.2. Understand the importance of the Human Perception System, the Cognitive System and the Motor System to design systems suitable to the users' needs.

A.3. Understand the Psychology of Everyday Things.

A.4. Understand the importance of Mental and Conceptual Models for the success of an interaction.

A.5. Explain and recognize the Conceptual Models used in interactive systems.

A.6. Explain and recognize the Mental Models of users.

A.7. Define the most important characteristics that form the Conceptual Models.

A.8. Explain and understand the usefulness of metaphors in an interface.

A.9. Define Interaction Modes and Styles in Conceptual Models.



A.10. Knowing principles of good Interaction Design and Graphic Design.

A.11. Understand the importance of Task and User Analysis for the success of an interactive system.

A.12 Knowing the rules of Heuristic Evaluation and Predictive Evaluation.

Knowledge and Understanding

A.1. Explain how to conceptualize the interaction.

A.2. Understand the importance of the Human Perception System, the Cognitive System and the Motor System to design systems suitable to the users' needs.

A.3. Understand the Psychology of Everyday Things.

A.4. Understand the importance of Mental and Conceptual Models for the success of an interaction.

A.5. Explain and recognize the Conceptual Models used in interactive systems.

A.6. Explain and recognize the Mental Models of users.

A.7. Define the most important characteristics that form the Conceptual Models.

A.8. Explain and understand the usefulness of metaphors in an interface.

A.9. Define Interaction Modes and Styles in Conceptual Models.

A.10. Knowing principles of good Interaction Design and Graphic Design.

A.11. Understand the importance of Task and User Analysis for the success of an interactive system.

A.12 Knowing the rules of Heuristic Evaluation and Predictive Evaluation.

Application of Knowledge

B.1. Apply the knowledge of the Human Perception System, the Cognitive System and the Motor System to plan systems that are appropriate to the user's needs.

B.2. Apply, in the planning of interactive systems, rules that work and avoid bad examples about the "Psychology of "Everyday Things".

B.3 Develop Conceptual Models.

B.4. Apply the rules of Graphic Design and Interaction Design in order to increase the Usability of interactive systems.

B.5. Apply in a structured way the scientific techniques for the development of a product.

B.6. Design Interactive System Prototypes.

B.7. Apply rules of Heuristic Evaluation, Predictive Evaluation and Empirical Methods, in the evaluation of interactive systems.

Justification of decisions

C.1 Analyse Conceptual Models.

C.2 Analyse interactive systems in order to identify used and violated Usability Rules.

C.3 Identify and solve specific problems of an interactive system.

C.4 Analyse interactive systems to help to recognize problems of Interaction Design and Graphic Design.

C.5 Justify proposals for solutions that should integrate an interactive system, against a set of existing features or desirable functionalities.

C.6 Know how to perform the Tasks and Users Analysis in the design of an interactive system.

C.7 Describe and present the prototype of a Project, being able to convincingly explain why the Project is good.

Making Judgment

D.1. Evaluate solutions used in different interactive systems, demonstrating critical attitude.

D.2. Test the Usability and Accessibility of Interactive Systems.

Communication

E.1. Prepare appropriate documentation on the performed work.

E.2. Present and explain the projects developed in a clear, structured and with a logical chain of ideas.

Self-learning skills

F.1. Develop prototypes of projects, with some degree of autonomy, with application of concepts beyond those learned in classes.

F.2. Monitor and understand the evolution of interaction mechanisms.

Program Contents

Introduction Concepts Human Factors Psychology of Everyday things Interaction Models Interaction Design Project Usability and Accessibility Evaluation

Bibliography

[1] Human-Computer Interaction, Dix, A., Finlay, J., Abowd, G., Beale, 2003, R. ISBN: 978-0130461094 (Cota 1ª-12-76)

[2] Interaction Design: Beyond Human-Computer Interaction, Sharp, H.; Rogers, Y., Preece, J., Hoboken, NJ: Wiley & Sons, 2015, ISBN: 978-1119020752 (Cota 1ª-12-76)

[3] Designing Interactions, Moggridge, B., Cambridge, MA: The MIT Press, 2007, ISBN: 978-0-262-13474-3 (Cota 1ª-12-77)

[4] Designing the User Interface: Strategies for Effective Human-Computer Interaction, Shneiderman, B., Plaisant, C., Maxine Cohen, M., Jacobs, S., Elmqvist, N., Diakopoulos, N. Boston: Pearson/Addison, 2016, ISBN: 0-321-26978-0, Cota 1A-12-115

[5] The Design of Everyday Things, Norman, D., New York: Basic Books, 2013, ISBN: 978-465-06710-7, Cota 1A-12-78

[6] Measuring the User Experience: Collecting, Analyzing, and Presenting Usability Metrics, Tullis, T., Albert, B., 2013, Amsterdam: Elsevier/Morgan Kaufmann, ISBN: 978-0124157811, Cota 1A-12-118

[7] The Humane interface: new directions for designing interactive systems, Raskin, J., Boston: Addison-Wesley, 2000, ISBN: 978-0201379372, Cota 1A-12-19

[8] A practical guide to usability testing, Dumas, J., Redish, J. C:, Exeter: Intellecte Books, 1999, ISBN: 9781841500201, Cota 1A-12-74

[9] Contextual Design, Second Edition: Design for Life (Interactive Technologies), Holtzblatt, K. And Beyer, H., 2016, ISBN: 978-0128008942

[10] Don't make me think, Krug, S., Berkeley, CA: New Riders, 2014, ISBN: 978-0321965516, Cota 1A-12-73.

[11] Assistive Technology, Bouck, E., S., Berkeley, Sage Publications Inc., 2016, ISBN: 978-1483374437

[12] Brain-Computer Interfaces 1: Methods and Perspectives (Cognitive Science) 1st Edition, Maureen Clerc, M., Bougrain, L. and Lotte, F., 2016, ISBN: 978-1483374437

[13] Software Assistive Technologies for the Blind and Visually Impaired: Guidelines for Building Accessible and Usable Interfaces, a Review of Assistive Technologies and Accessibility Problems, Doush, I., 2010, ISBN: 978-3639280326

Access Conditions and Attendance Excuse Not applicable.

Conditions for Exam Admission

Those provided for by Law.

Evaluation Method

The final mark may be obtained through different modes of evaluation. The first being the completion of a written exam with a weight of 20 marks. The second being the completion of a written examination, weighing 8 marks and practical works with a weight of 12 marks.

Practical works will only have a single assessment and cannot be targeted for improvement.

In order to pass, it is necessary to achieve at least 40% of the elements that the student submits for assessment.

Conditions for Results Improvement

Students who have passed the course can sign up for improving exam grade in the period of exams, according to the law. The score obtained in the previous exam will be assured.

Date

Signature from the lecturer responsible for the course

21/01/2019



Licenciatura – BsC Informatics Engineering Licenciatura – BsC Informatics Engineering – Evening Classes Licenciatura – BsC Informatics Engineering – European Course

Academic Year: 2018/1019

Program Contents

Course Unit ENTREPRENEURSHIP AND INNOVATION						
Specialization (s	s) ALL					
Subject type	Specialization	course	Research Area		Informatics E	ngineering
Year 2 nd	Semester	2 nd	2004-		ECTS	5 ,0
Working Hours				Unaccompani	ed Working Hou	rs
Activity Type		Working Hours Per	Total Hours	Activity Type		Total Hours
Theoretical Lecture Theoretical-Practic Practical-Laboratot	es al Lectures y Lectures	2 2	28 28	Study Works / Group Project Evaluation	Works	40 90
Project	I			Additional		3,5
Total of Working I	Hours		133,5			
Lecturer						
Activity Type			Name		Qualifications	Category
Theoretical Lectures Theoretical-Practical Lectures Practical-Laboratoty Lectures Tutorial Orientation Project		Joaquim Macedo de Sousa Elsa Pedroso / Joaquim Macedo de Sousa / Ricardo Ferraz		PhD PhD	Inv. Adjunct Prof. Inv. Adjunct Prof.	
Responsible(s) Le	ecturer(s)	Joaquim M	lacedo de Sousa			

Goals

To frame the dimension of innovation in the process of entrepreneurship and creation of value in organizations. Encourage students to develop an entrepreneurial mind-set through case study, analysing crucial factors of success. Reflect on the steps to be taken from the generation of a business idea and its economic-financial evaluation, to the creation of an innovative company, including aspects related to the nature and organization of the startup, the business model, the industrial property and, finally, to the go to market plan of a new service and / or product. Present students entities and programs in support to entrepreneurship (ex. Poliempreende).

Skills

- To develop the empowerment and team working skills, in order to improve the integration of students in an organizational context;

- Create and develop an entrepreneurial attitude, aimed at innovation;

- To know and interpret in an appropriate way the concepts of entrepreneurship and innovation;

- Understand the value chain of innovation, adequately managing the process of generating and selecting ideas, planning their implementation, achieving innovative projects as well as their monitoring;

- Develop "hard" - and "soft" - skills that underpin the entrepreneurial mind-set;

- Develop a vision of organizational management that encompasses entrepreneurship and innovation as tools for generating value and gaining competitive advantage.

Program Contents

Theoretical lectures:

Anatomy of the entrepreneur Generating business models The market and its analysis Investment and financing Industrial property Legal aspects of business constitution Business organisation Accounting and Taxation Financial analysis and management Internationalization Entities and programs supporting of entrepreneurship The "Elevator Pitch" Communication The program "Poliempreende"

Theoretical-Practical Lectures:

Structuring the Go-To-Market (G-T-M) The Business Model Canvas Preparing and developing the G-T-M plan:

- Executive summary
- Business opportunity
- Context
- Go to market strategy
- Milestones and action plan
- Investment and key financial indicators
- Major risks and mitigations strategies

The Elevator Pitch" in practice

Case study (Theoretical and Theoretical-Practical Lectures):

Seminars by invited speakers for the analysis and reflection on cases of business success and failure

Bibliography

Costa, H. (2010). Criação & Gestão de Micro-Empresas & Pequenos Negócios (9ª Edição). Lisboa: Lidel-Edições Técnicas (ISBN: 978-972-757-677-7).

• Dantas, J., Moreira, A. (2011). O Processo de Inovação. Como potenciar a criatividade organizacional visando uma competitividade sustentável. Lisboa: Lidel-Edições Técnicas (ISBN: 978-

972-757-758-3).

• Duarte, C., Esperança, J. (2012). Empreendedorismo e Planeamento Financeiro. Transformar oportunidades em negócios. Criar micro, pequenas e medias empresas. Lisboa: Edições Sílabo (ISBN: 978-972-618-670-0).

• Sarkar, S. (2010). Empreendedorismo e Inovação (2ª Edição). Lisboa: Escolar Editora (ISBN 978-972-592-269-9).

Access Conditions and Attendance Excuse

Those foreseen by current legislation. Students are advised to systematically attend classes as a prerequisite to school achievement and to the correct understanding of the subjects.

Conditions for Exam Admission

All students regularly enrolled. For students who opt for the continuous evaluation regime, group work must have an evaluation of of 8/20 or more.

Evaluation Method

Students may choose one of the following evaluation schemes:

<u>Continuous assessment scheme</u>

It consists of a group work and a written test.

The groups should consist of 5 students. The group work is composed of a written work to be delivered and an oral presentation that will take place in the theoretical-practical lectures.

For the second theoretical-practical lecture, the students must already formed the groups and chosen the idea that they intend to develop in the work. Written works must be submitted by the 19th of May 2019. The oral presentations will take place hereafter.

All evaluation elements (group work and written test) will be quoted to 20 (twenty) values, each with a 50% weighting, both of which shall have a grade equal to or greater than 8,0 (eight) values in order to allow students to pass.

Final score will be calculated and followed:

Final score = 0,5 Work group grade + 0,5 Written test grade

<u>Please note</u>: only students who **attend a minimum of 10 theoretical-practical lectures** may opt for this scheme, except for students with worker-student status.

General assessment scheme

It consists of a written test.

Students who opt for this evaluation scheme or who do not obtain the minimum classification in the group work should answer an additional set of development questions, which will correspond to 50% of the evaluation of the test.

In both schemes, the grades from the group works will be valid for all exam periods from the 2018/2019 academic year, and the written test corresponds to the final exam.

During the exams, the use of mobile phones and other equipment that allow communication with the exterior of the room is expressly prohibited. The elements of paper consultation to be used in the exams will be only those allowed in the scope of the course unit, and the students will be obligatorily informed previous to the exams.

Conditions for Results Improvement

Those foreseen by current legislation, and cannot be carried out in the Regular Season

Date 21/01/2019 Signature from the lecturer responsible for the course

Jonnin Arcule Comarkona



Instituto Superior de Engenharia de Coimbra

www.isec.pt

3

Signature of Teacher:_

Licenciatura – BsC Engenharia Informática

Licenciatura - BsC Engenharia Informática (Pós-Laboral)

Licenciatura – BsC Informatics Engineering

Licenciatura – BsC Informatics Engineering (Evening Classes)

Academic Year: 2018/2019

Program Contents

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Course Unit	INFORMATION SYSTEMS
Specialization (s)	INFORMATION SYSTEMS

Subject type **Research Area**

Year 2 Semester 2

ECTS	

Working Hours			Unaccompanied Working Hours			
Activity Type	Working Hours Per Week	Total Hours	Activity Type	Total Hours		
Theoretical Lectures Theoretical-Practical Lectures	2	30	Study Works / Group Works	28 48		
Practical-Laboratoty Lectures Tutorial Orientation Project	2	30	Project Evaluation Additional	1.5		
Total of Working Hours		133.5				

Lecturer			
Activity Type	Name	Qualifications	Category
Theoretical Lectures	Paulo Mariano	Master	Assistant
Theoretical-Practical Lectures			
Practical-Laboratoty Lectures	Paulo Mariano	Master	Assistant
Tutorial Orientation			
Project			

Responsible(s) Lecturer (s)

Paulo Mariano (pmariano@isec.pt)



Goals

Overview of current SIs and underlying techniques in a sociotechnical perspective Awareness raising for ethical and deontological issues related to information Contact with the existing SI in the business reality and establish relation of these systems with the theoretical concepts learned.

Skills

- Know, evaluate and use IS's and their technologies
- Assess impact and circumventing difficulties
- · Raising awareness of ethical and ethical issues
- Ability to work in groups and self-learning
- Ability to identify and apply theoretical IS concepts to a practical reality

Program Contents

- Role and impact of Information Systems in today's organizations
- Information systems and globalization
- SI's, Organizations and Strategy
- Ethics in information management
- SI technological infrastructures
- Business intelligence fundamentals
- Infrastructures and networks
- Safety
- Relations with customers and suppliers (CRM, SCM)
- Corporate Systems (ERP)
- E-commerce
- Importance and knowledge management tools
- Geographic Information Systems (GIS)

Bibliography

- Management Information Systems, Laudon & Laudon
- Comércio Electrónico, Silva, Romão & Conde
- Planeamento de Sistemas de informação, Amaral & Varajão
- Business Intelligence, Santos & Ramos
- Sistemas de Inforatión Geográfica, Víctor Olaya

Access Conditions and Attendance Excuse

Not applicable

Conditions for Exam Admission

Realization of practical work and theoretical presentation Theoretical: written: Exam - 8 values, presentation of a topic - 2 values, total 10 values. Practice: Practical work of research and application to real companies, 10 values The practical work and the theoretical presentation component are mandatory. Minimum of 25% in theoretical exam

Conditions for Results Improvement

The improvement of classification is only possible through improvement in the written exam component, in a total of 8 values.

Date

21/1/2019

Signature from the lecturer responsible for the course

Ung



www.isec.pt

Signature of Teacher:_



Licenciatura – BsC em Engenharia Informática (Português)

Licenciatura – BsC in Informatics Engineering (Inglês)

Academic Year: 2018/2019

Program Contents

Course Unit Specializatio	DATA IN	TEGRATION ATION SYS	N TEMS			
Subject type	Specialty	Resear	ch Area		Informatics E	ngineering
Year 2	Semester	2			ECTS	5 5
Working Hou	rs			Unaccompan	ied Working Hou	rs
Activity Type		Working Hours Per Week	Total Hours	Activity Type		To tal Hours
Theoretical Le Theoretical-Pr Practical-Labo Tutorial Orien Project	ectures ractical Lectures oratory Lectures tation	2	28 28	Study Works / Group Project Evaluation Additional	Works	23.50 50 4
Total of Work	king Hours		133.50			
Lecturer						
Activity Type			Name		Qualifications	Category
Theoretical Le	ectures ractical Lectures		Anabela Borges S	imões	PhD	Adjunct Professor
Practical-Labo Tutorial Orien Project	pratoty Lectures tation		Anabela Borges Si	mões	PhD	Adjunct Professor
Responsible	(s) Lecturer (s)			Anabela Borges Si	mões	

Goals

To provide students the capacities of analyze and solve data integration problems in different levels of an organization. The unit focus different types and strategies of data integration and explores the use of tools and/or programming solutions for data integration.

Skills

Learning outcomes and competences:

a) To explain the main reasons for data integration

b) To identify the principal types of data integration

c) To explain the stages involved in the process of data integration

d) To understand the basic concepts to design data integration solutions

e) To apply the knowledge about interoperability of different components and applications implemented using different programming languages

f) To implement wrappers for extracting data from web and non-structured sources

g) To use markup languages to query heterogeneous sources of information

h) To make correct choices about data integration technologies

i) To elaborate clear documentation identifying and justifying the main undertaken options.

Program Contents

1.

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- 2.
- 3.

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- 4.
- Introduction 1.1. Motivation and context 1.2. Definition of Data Integration 1.3. Data Integration Difficulties Data Integration Architectures Data Extracting Web Data 2.2. Extracting data from text 2.3. Regular Expressions 2.4. String matching algorithms Formats for storing and integrating data 3.1. JSON 3.2. XML JSON Data Models 4.1. Features 4.2. Advantages / Disadvantages 4.3. Examples XML data models 5.1. XML Language 5.2. Validation of XML documents 5.3. Interrogation and modification languages: XPath, XSLT, XQuery, XQuery Update Data Integration Techniques 6.1. Schema Mapping 6.2. Mediators and wrappers 6.3. Query processing 6.4. Matching Strings Service-based integration 7.1. Web services 7.2. Simple Object Access Protocol (SOAP) 7.3. Web Services Description Language (WSDL) Commercial and open source tools for Data Integration
- 7.
- 8.

Bibliography

Anhai Doan et al (2012). Principles of Data Integration, Morgan Kaufmann

Victor Martins (2006). Integração de Sistemas de Informação - Perspectivas, Normas e Abordagens, Edições Silabo.

Notes of the theoretical and practical classes

Access Conditions and Attendance Excuse N/A

Conditions for Exam Admission

Admission to the exams is conditioned by a minimum of 35% in the practical work The presentation of copied and non-original works will prevent the students from continuing with the evaluation of the Course in the current academic year.

Evaluation Method

The final classification will be obtained by the grades of the theoretical component and the practical component. The theoretical component is worth 14 values and can be obtained by continuous evaluation or by final exam. The practical component is worth 6 values and consists of the accomplishment of a practical work.

To obtain approval of the course unit, a student must obtain a grade of 9.5 or higher, and the following requirements:

- Minimum of 35% of the price in the theoretical component.
- Minimum of 35% in practical work

Components of evaluation:

Theoretical:

The grade of the theoretical component is obtained by one of the following modalities (at the student's choice): Continuous assessment: 2 written theoretical tests to be carried out without consultation during the semester Each test is scored to 7 points (in 20)

Assessment by examination: 1 written exam without consultation Exam is scored to 14 values (in 20)

The date of Test nº 1 is the March 25/26, 2019 The date of Test nº 2 is the May 27/28, 2019 The tests and exams are without consultation.

Practice:

The grade of the practical component corresponds to the grade obtained in the practical work to be carried out during the semester

Work: Quotation: 6 points.

Mandatory defense on date to be combined

The work should be done individually or in groups of two students.

The practical work can only be delivered once, on the date indicated in the statement, being valid for all epochs of evaluation (normal, resource, special).

The delivery of the work is done through Moodle.

The practical work delivery date is May 26, 2019

The grade of the practical component is valid for the normal, resource and special exams, and all the evaluation epochs for students with special status to have access.

Students who have access to the special exam and students under other regimes (associative leader, high competition athlete, etc.), who may require several dates for the theoretical exam, must deliver the practical work on the same date as above, and must have the minimum required.

Conditions for Results Improvement

The practical work cannot be improved. The theoretical grade (for 14 values) can only be improved in resource exam.

Date

18.01. 2019

Signature from the lecturer responsible for the course

Anel Simon



Instituto Superior de Engenharia de Coimbra www.isec.pt

Licenciatura – BsC Eng. Informática Pós-Laboral (Português)

Licenciatura – BsC Informatics Engineering Evening Classes (Inglês)

Academic Year: 2018/2019

Program Contents

Course Unit Specialization (s)	SECURIT	Y				
Subject type		Researc	h Area			
Year 2 nd	Semester	2 nd			ECTS	5
Working Hours				Unaccompanied Wor	king Hours	i
Activity Type		Working Hours Per Week	Total Hours	Activity Type		Total Hours
Theoretical Lectures Theoretical-Practica Practical-Laboratoty Tutorial Orientation Project Total of Working H	i Lect <mark>ures</mark> Lectures ours	2 0 2 0 0	28 0 28 0 0 133,5	Study Works / Group Works Project Evaluation Additional		44,5 25 0 8 0
Lecturer						
Activity Type			Name	Qualifi	cations	Category
Theoretical Lectures Theoretical-Practica Practical-Laboratoty Tutorial Orientation Project	l Lect <mark>ures</mark> Lect <mark>ures</mark>	Pedro Alexan Pedro Alexan	dre Vale Pinheiro dre Vale Pinheiro	Pi	hD	Assistant teacher Assistant teacher
Responsible(s) Leo	turer (s)	Pedro Alexan	dre Vale Pinheiro			

Goals

Fundamental security aspects will be analysed in this course unit, targeting the information systems and communications. in terms of models, risk assessments, politics and existing technologies. It's the aim of this course, additionally, that students acquire practical skills in defining, planning and implementing security politics. This course unit uses most of the curricular program of the source Cisco Certified Network Associate Security (CCNA Security) that is actually in the scope of the Cisco Academy of the DEIS/ISEC.

Skills

Knowledge and understanding skill of:

A.1. Identify several security vulnerabilities

A.2. Describe main encryption Technologies and mechanisms

A.3. Describe main protocols for secure communications

A.4. Describe main authentication systems

A.5. Describe main access control devices (firewall, IDS, IPS, so on)

Understanding and applying knowledge:

B.1. Identify security vulnerabilities

B.2. Security planning

B.4. Configure correctly secure communications mechanisms, authentication and access control

Handling security decisions

C.1. Justify proposed solutions at the projects

Communication skills

D.1. Technical reports within the projects

D.2. Present and justify projects in a clear mode

Skills development

E.1. Develop innovative projects, with high level of autonomy, in a quest for going beyond the lecturer information

Program Contents

Security vulnerabilities in communication and information systems Technologies and mechanisms of encryption Secure communication protocols Technologies and mechanisms of authentication Access control devices (firewall, IDS, IPS)

Bibliography

Luís Santos, diapositivos e demais recursos : https://moodle.isec.pt/;
Yusuf Bhaiji, "Network security technologies and solutions", Cisco Press, 2008, ISBN 978-1-58705-246-0, 1A-6-183

(ISEC);
Roberta Bragg, Mark Rhodes-Ousley, Keith Strassberg, "Network security : the complete reference", McGrw-Hill/Osborne, 2004, ISBN 0-07-222697-8, 1A-6-180 (ISEC);
André Zúquete, "Segurança em Redes Informáticas", 2ª edição, FCA, 2008, ISBN 978-972-722-565-1 1A-6-138 (ISEC);
Alfred J. Menezes, Paul C. van Oorschot, Scott A. Vanstone, "Handbook of Applied Cryptography", ISBN: 0-8493-8523-7, CRC-Press, 1997, (disponível on-line) http://www.cacr.math.uwaterloo.ca/hac/
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Anâncio Santos, José Marinho, José Rosado, Luís Santos, "CCNA 4: Acesso às redes WAN", 2008, 1A-6-193 (ISEC)

Access Conditions and Attendance Excuse

Excuse if applied any legal or institutionally planned conditions
 Excuse in presence of attendance in previous years
 If attendance is required, at least should be presente at 18 hours in theoretical classes and 18 hours in practical classes

Conditions for Exam If all legal and institution in case of plagiarism c

Evaluation Method

- Continuous evalua o Test 1 (2 o Test 2 (2 o Practical •

 - Practical 0
- o Practical If a minimal of 50% evaluation at the r o Written ex o Practical \ o Practical \ •
- Minimal values: 35 •

Conditions for Results All legal and planned in

Date

21/1/2019





Instituto Superior de Engenharia de Coimbra www.isec.pt Signature of Teacher:

Licenciatura – BsC Eng. Informática (Português)

Licenciatura – BsC Informatics Engineering (Inglês)

Academic Year: 2018/2019

Program Contents

Course Special	Unit ization (s)	SECURI	ΓY				
Subject	type		Researc	ch Area			
Year	2 nd	Semester	2 nd			ECTS	5 5
Working	Hours				Unaccompanie	ed Working Hour	s
Activity T Theoretic Practical Tutorial C Project Total of	Type cal Lectures cal-Practica -Laboratoty Drientation Working H	l Lect <mark>ures</mark> Lect <mark>ures</mark> ours	Working Hours Per 2 0 2 0 0 0	Total Hours 28 0 28 0 0 133,5	Activity Type Study Works / Group V Project Evaluation Additional	Works	Total Hours 44,5 25 0 8 0
	Type			Namo		Qualifications	Catagory
Theoretic	cal Lect <mark>ures</mark>		Pedro Alexar	ndre Vale Pinheiro	,	PhD	Assistant teacher
Theoretic Practical Tutorial C Project	cal-Practica -Laboratoty Drientation	Lect <mark>ures</mark> Lect <mark>ures</mark>	Pedro Alexar	ndre Vale Pinheiro		PhD	Assistant teacher
Respons	sible(s) Leo	turer (s)	Pedro Alexar	ndre Vale Pinheiro			

Goals

Fundamental security aspects will be analysed in this course unit, targeting the information systems and communications, in terms of models, risk assessments, politics and existing technologies. It's the aim of this course, additionally, that students acquire practical skills in defining, planning and implementing security politics. This course unit uses most of the curricular program of the source Cisco Certified Network Associate Security (CCNA Security) that is actually in the scope of the Cisco Academy of the DEIS/ISEC.

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C.1. Justify proposed solutions at the projects

Communication skills

D.1. Technical reports within the projects

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Skills development

E.1. Develop innovative projects, with high level of autonomy, in a quest for going beyond the lecturer information

Program Contents

Security vulnerabilities in communication and information systems Technologies and mechanisms of encryption Secure communication protocols Technologies and mechanisms of authentication Access control devices (firewall, IDS, IPS)

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Roberta Bragg, Mark Rhodes-Ousley, Keith Strassberg, "Network security : the complete reference", McGrw-Hill/Osborne, 2004, ISBN 0-07-222697-8, 1A-6-180 (ISEC);
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John Rullan, "Accessing the WAN : CCNA exploration labs and study guide", Cisco Press, 2008, ISBN 978-1-58713-201-8, 1A-6-174 (ISEC), 1A-6-174CD (ISEC);
Andrác Santos, José Marinho, José Rosado, Luís Santos, "CCNA 4: Acesso às redes WAN", 2008, 1A-6-193 (ISEC)

Access Conditions and Attendance Excuse

Excuse if applied any legal or institutionally planned conditions
 Excuse in presence of attendance in previous years
 If attendance is required, at least should be present at 18 hours in theoretical classes and 18 hours in practical classes

Conditions for Exam Admission

If all legal and institutional rules are met

In case of plagiarism or copy the student is automatically and summarily reproved

Evaluation Method

- Continuous evaluation (100%, 20 values)
 - o Test 1 (25%, 5 values): 28/3/2019
 - o Test 2 (25%, 5 values): 23/5/2019
 - o Practical Work 1 (25%, 5 values): 8/4/2019
 - o Practical Work 2 (25%, 5 values): 27/5/2019
- If a minimal of 50%, 10 values, is not achieved in the continuous evaluation, then the student may apply for additional evaluation at the normal and special times, with the following evaluation values:
 - o Written exam (50%, 10 values)
 - o Practical Work 1 (25%, 5 values)
 - Practical Work 2 (25%, 5 values)
- Minimal values: 35% of each of evaluation times (tests, practical works or written exams)

Conditions for Results Improvement

All legal and planned institutional rules are met

Date

Signature from the lecturer responsible for the course

21/1/2019



IP addressing. VLSM.

IP routing. Routing table. Parent and child rc Distance vector routing protocols. RIPv1. RI Link-state routing protocols. OSPF. Areas a IPv6. Addressing. Tunnels. IPv6 routing. RIPng. EIGRPv6. OSPFv3

Bibliography

Wendell Odom, CCNA Official Exam Certific Todd Lammle, CCNA Cisco Certified Netwo Richard Stevens, TCP/IP Illustrated, Volume Cisco Certified Network Associate (CCNA) -<u>http://moodle.isec.pt/moodle/course/ind</u>

Access Conditions and Attendance Excu

Students must attend at least 75% of the cla Students subject to the special regimes prov

Conditions for Exam Admission

All students duly enrolled in this course unit The presentation of plagiarized and non-orig current academic year due to the lack of class

Evaluation Method

A written exam, with a weighting of 60%. A original planning and configuration project weighting of 40%. The report should include map, routing protocols, equipment configuraand during a maximum of 20 minutes. The s Both the written test and the individual project

Conditions for Results Improvement

At student request, the evaluation achieved a considered in this unit, as long as it exceeds

Date

21/01/2019



Instituto Superior de Engenharia de Coimbra <u>www.isec.pt</u> Signature of Teacher:



Licenciatura – BsC Engenharia Informática

Licenciatura – BsC _ Informatics Engineering

Academic Year: 2018/ 2019

Program Contents

Course Unit	ETHICS /	S AND DEONTOLOGY				
Specialization	(s) ALL					
Subject type	Speciality	Research Area		Informatics		
Year 3	Semester	2		ECTS	3	
Working Hours				Unaccompanied Working Hours		
Activity Type		Working Hours Per Week	Total Hours	Activity Type	Total Hours	
Theoretical Lectu Theoretical-Pract Practical-Laborat Tutorial Orientatio Project	res ical Lectures oty Lectures on	3	42	Study Works / Group Works Project Evaluation Additional	14 20 4	
Total of Working Hours		80				
Lecturer						
Activity Type Theoretical Lectures Theoretical-Practical Lectures Practical-Laboratoty Lectures Tutorial Orientation Project		Name Jorge Bernardino		Qualifications PhD	Category Coordinator	
Responsible(s) Lecturer (s)		Jorge Bernardino				

Goals

To develop knowledge and comprehension skills in the field of Ethics and Deontology, supported in lectures by the professor, seminars by guests and research in texts of the specialty carried out by the students and guided by the teacher.
 Develop the ability to apply the knowledge acquired in solving specific problems of professional life, supported by own argument:

- To create the capacity to collect, select and interpret relevant information in the area of Ethics, together with the capacity for critical analysis, synthesis and formulation of opinions;

- To promote an ethical and deontological attitude in the development of their tasks by the acquired knowledge and the capacity of critical understanding of its scope, applicability and opportunity in the face of specific situations of the day to day.

Skills

Generic Skills:

1-Create and develop the ability to interpret and master basic concepts of Ethics and Deontology, communicate topics of the area exposing ideas, problems, information and interconnection with the external environment.

2-Develop personal skills that allow students to learn independently.

3-Provide students with the ability to work in groups, developing interpersonal relationships as a way to improve their insertion in the job market

4-Promote the concern for the quality and rigor in the acquisition of the basic concepts of these areas of knowledge, concepts that will allow the development of decision-making capacities in their professional life.

Specific Skills:

1-Develop knowledge and ability to understand in the field of Ethics and Deontology, drawing on the knowledge acquired in class, in the lectures of the guests, in texts of the specialty and in research conducted by the students.

2-Provide students with the ability to apply the knowledge acquired to solve specific problems and concrete cases of their daily life, thus understanding the world in which they live.

3-Create the capacity to collect, select and interpret relevant information in these areas, combined with the capacity for analysis, synthesis and formulation of own opinions that will allow a more insightful participation in these areas of knowledge.

Program Contents

1. Introduction

- Ethics (definitions)
- Ethics, Morals and Deontology
- Ethics and Deontology
- Engineering Ethics
- Engineering Case studies.

2 - Engineers at a Crossroads

- Engineering Ethics and Ethical dilemmas
- Challenger shuttle and other examples
- The Triangle of Doubts
- Professional Deontology
- Code of Ethics for engineers in Portugal
- Ethical Practice
- Case study
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- Challenger Shuttle
- Group Think
- Greed, arrogance, and cowardice?
- The seven "mortal sins" of a "male" culture
- Need to revise "male" organizational cultures

4 - Ethical Leadership

- The 10 simple (but difficult) leadership lessons
- Building trust
- Group Thinking What Can Leaders Do?
- Responsibilities of engineers or system responsibility?

- A code of ethics for codes of ethics
- The essence of individual responsibility
- 5 Codes of Ethics
- A code of ethics for codes of ethics
- The essence of individual responsibility
- Codes of Ethics and Professional Conduct
- Roles and Limitations of Codes of Ethics

6- Information Technology Law

- Intellectual Property
- Regulation of information society services
- Cybercrime

7 - Guest lectures

- Talks by invited speakers from different areas.

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Cota no ISEC: 2A - 1 - 230

- Ética em Investigação Científica, Luis Adriano Oliveira, Lidel, 2013

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- Ethics and Technology: Controversies, Questions, and Strategies for Ethical Computing, Herman T. Tavani, 5th Edition, Wiley, 2015, ISBN-10: 1119355311.

- Ethically Aligned Design: A Vision for Prioritizing Human Well-being with Autonomous and Intelligent Systems, (EADv2), IEEE 2018, https://ethicsinaction.ieee.org/

Access Conditions and Attendance Excuse

There are no conditions for attendance excuse.

Conditions for Exam Admission

No prerequisites for access to the exam.

Those provided for in the legislation in force. Students are advised to systematically follow classes as a prerequisite to school achievement and to the correct understanding of the subjects.

Evaluation Method

1) CONTINUOUS EVALUATION

In the continuous evaluation, the students are evaluated for all the work developed during the semester. In the final classification method three evaluation elements are used: work and its defense (T), challenges (D) and examination (E). The work should preferably be developed in groups and the theme defined in agreement with the teacher. The challenges will be small written assignments that are released during class.

The work must be delivered two weeks before the end of classes and the defense should be in the last week of classes.

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Conditions for Results Improvement

Those provided for in the legislation, but cannot be carried out in the normal exam.

Date

Signature from the lecturer responsible for the course

17th January 2019

Jorce Bernardino

Jorge Bernardino



Instituto Superior de Engenharia de Coimbra www.isec.pt Licenciatura – BsC Engenharia Informática – Curso Europeu

Licenciatura – BsC European Computer Science

Academic Year: 2018/ 2019

Program Contents

Course Unit	ETHICS A	AND DEON	TOLOGY			
Specialization	(s) ALL					
Subject type	Speciality	Research Area		Informatics		
Year 3	Semester	2		ECTS	3	
Working Hours		-		Unaccompanied Working Hours		
Activity Type		Working Hours Per Week	Total Hours	Activity Type	Total Hours	
Theoretical Lectures Theoretical-Practical Lectures Practical-Laboratoty Lectures Tutorial Orientation Project		3	42	Study Works / Group Works Project Evaluation Additional	14 20 4	
Total of Working Hours		80				
Lecturer						
Activity Type Theoretical Lectures Theoretical-Practical Lectures Practical-Laboratoty Lectures Tutorial Orientation Project		Name Jorge Bernardino		Qualifications PhD	Category Coordinator	
Responsible(s) Lecturer (s)		Jorge Berna	rdino			

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Access Conditions and Attendance Excuse

There are no conditions for attendance excuse.

Conditions for Exam Admission

No prerequisites for access to the exam.

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The final classification of the evaluation method by examination and research work will result from the application of the following formula:

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Conditions for Results Improvement

Those provided for in the legislation, but cannot be carried out in the normal exam.

Date

Signature from the lecturer responsible for the course

Torce

vernard-no

Jorge Bernardino

17th January 2019



0

Instituto Superior de Engenharia de Coimbra www.isec.pt Signature of Teacher: Are Arc Boy

Licenciatura – BsC Licenciatura em Engenharia Informática Licenciatura em Engenharia Informática - Pós-laboral (ramos) Licenciatura em Engenharia Informática – Curso Europeu Alunos de Programas Mobilidade (Português)

Licenciatura – BsC in Informatics Engineering Licenciatura – BsC in Informatics Engineering, evening classes Licenciatura – BsC in European Computer Science Engineering *Mobility Program Students* (Inglés)

Academic Year: 2018/2019

Program Contents

Course Unit OPTIMIZ	ATION AND	DECISION SUP	PORT METHODOL	OGIES		
Specialization (s) INFORM	ATION SYSTEMS					
Subject type Mandatory	ry Research Area			Informatics Engineering		
Year 3 rd Semester	• 1 st			ECTS	6	
Working Hours	Unaccompanied Working Hours					
Activity Type	Working Hours Per Week	Total Hours	Activity Type		Total Hours	
Theoretical Lectures Theoretical-Practical Lectures Practical-Laboratoty Lectures Tutorial Orientation Project	2 2 1	28 28 14	Study Works / Group Project Evaluation Additional	Works	60 28 2	
Total of Working Hours	160					
Lecturer				,		
Activity Type		Name		Qualifications	Category	
Theoretical Lectures	Ana Rosa Pereira Borges (arborges@isec.pt)			PhD	Coordinator Prof.	
Theoretical-Practical Lectures	Ana Rosa Pereira Borges (<u>arborges@isec.pt</u>)			PhD	Coordinator Prof.	
Practical-Laboratoty Lectures	Teresa Raquel Corga Telxeira Rocha (teresa@isec.pt)		Rocha	PhD	Assistant Prof.	
Tutorial Orientation Project						
Responsible(s) Lecturer (s)	Ana Rosa P	ereira Borges (<u>arbo</u>	orges@isec.pt, office	G01 - DEIS)		

Goals

Signature of Teacher: Are Are By

Based on the concepts acquired in Operations Research, in this curricular unit students expand their knowledge in optimization and decision support areas. Accordingly, will be introduced methodologies to apply to more complex decision problems than those previously studied, as is the case of problems involving multiple objectives, integer variables, etc.. Students are also skilled to computationally implement different optimization and decision support algorithms. The knowledge acquired in this course can be applied in solving similar algorithms/problems in a real context.

Skills

After attending this curricular unit, students must:

1 - Know and understand the fundamental characteristics of the most representative optimization and decision support problems

2 - Identify different approaches that can be used to solve them.

3 - Solve simple practical problems using the appropriate optimization and decision support algorithms and interpret the obtained solution(s).

4 - Be able to implement computationally some of the optimization and decision support algorithms.

Program Contents

Theoretical content:

- 1. The linear programming model (revisions)
- 2. Pos-Optimization and Sensitivity analysis
- 3. Integer linear programming
- 4. Multi-objective linear programming
- 5. Lnear Goal Programming

Theoretical-practical/practical content:

- Resolution of theoretical-practical exercises involving the various chapters of the theoretical program (exercises sheets available on moodle);

- Computational implementation of algorithms.

Bibliography

Hillier, F.S., Liberman, G.J. "Introduction to Operations Reasearch" – 9th Edition McGraw-Hill, 2009 (Pdf version available online)

Hamdy A.Taha "Operations Reasearch: an introdution" – 8th Edition Pearson Prentice Hall, 2007

Bazaraa M.S., Jarvis J.J. and Sherali H.D. "Linear Programming and Network Flows" – 4th Edition Wiley, 2010

Steuer, R., "Multiple Criteria Optimization: theory, computation and application", John Wiley & Sons, 1986.

Ramalhete M., Guerreiro J., Magalhães A. "Programação Linear" (Volumes I e II) McGraw-Hill, 1985

Clímaco J. N., Antunes C.H. e Alves M. J. "Programação Linear multiobjectivo: do modelo de programação linear clássico à consideração explícita de várias funções objectivo" Coimbra – Imprensa da Universidade, 2003

Notes and slides used in class (available in moodle, some translated into English)

Access Conditions and Attendance Excuse Not applicable

Ane Rose Perecedo yos

Signature of Teacher: And Nor Day

Conditions for Exam Admission Not applicable

Evaluation Method

Students can choose two different assessment methods: a) Final Evaluation (**17** points), covering all subjects

Practical Work (3 points), to be delivered by 7th of December 2018.

Or b) Continuous Assessment, which consists of two (2) Evaluation Tests to be carried out during the semester and covering all the subject matter given up to the day of the test (8,5 points + 8,5 points).

Mandatory minimum of 30% in each evaluation Test.

Practical Work (3 points), to be delivered by 7^{th} of December 2018.

The Continuous Assessment Final Grade is the sum of the marks obtained in both evaluation tests and in the Practical Work.

The approval requires a grade greater than or equal to 9,5 ([0, 20]).

Comments:

• The 1st evaluation test will be held in the theoretical-practical class on 16/11/2018 and the 2nd evaluation test in the theoretical -practical class on 21/12/2018.

• Mandatory minimum of 30% in each evaluation Test.

• One of the tests failure implies that the student will move to the final assessment methods.

• Students in Continuous Assessment (who meet the minimum required of 30% in the grade of each test) which get a grade of 9.5 (or higher) in the sum of the two tests with the grade of the practical work will automatically be dismissed from assessment by final evaluation.

• Continuous Assessment grades of approved students will be posted in the 1st call evaluation grade list.

<u>Attention</u>! If any student in these conditions makes 1st call evaluation exam, the student will automatically be given the grade of this final exam, (being discarded the grade obtained in the sum of the 2 tests of Continuous Assessment).

• Practical work statement and rules will be made available in a timely manner.

• The delivery date of the practical work (7/12/2018) is unique and valid for all Final Evaluation times (1st Call, or 2nd Call) that students be subject to assessment by final exam.

Conditions for Results Improvement

No restriction is placed, and the improvement of the grade to the discipline is possible according to the evaluation rules of the school.

Date

Signature from the lecturer responsible for the course

Are have Perer 30308,

14th September 2018




Instituto Superior de Engenharia de Coimbra www.isec.pt



Licenciatura em Engenharia Informática Licenciatura em Engenharia Informática – Pós-Laboral

BsC in Informatics Engineering BsC in Informatics Engineering – Evening Classes

Academic Year: 2018/2019

Program Contents

Course Unit Specialization (s)	SOFTWA APPLICAT	RE PROJEC	T MANAGEMENT DPMENT	7	
Subject type Spe Sci	ecialty ences	Researc	h Area Informatics	s Engineering	
Year 3	Semester	1		ECTS	6
Working Hours				Unaccompanied Working Hours	6
Activity Type		Working Hours Per Week	Total Hours	Activity Type	Total Hours
Theoretical Lectures Theoretical-Practical I Practical-Laboratoty L Tutorial Orientation Project	Lectures Lectures	2 3	28 42	Study Works / Group Works Project Evaluation Additional	42 42 6
Total of Working Ho	urs		160		
Lecturer					
Activity Type			Name	Qualifications	Category
Theoretical Lectures Theoretical-Practical	Lectures		João Cunha	PhD	Coordinating Prof.
Practical-Laboratoty L Tutorial Orientation Project	.ectures		João Cunha	PhD	Coordinating Prof.

Responsible(s) Lecturer (s) João Cunha

Goals

Software management is concerned with knowledge about the planning, organization, and monitoring of all software lifecycle phases. Management is critical to ensure that:

- software development projects are appropriate to an organization,
- the work in different organizational units is coordinated,
- · software versions and configurations are maintained,
- resources are available when necessary,
- project work is divided appropriately,
- · communication is facilitated, and
- progress is accurately charted.

The main objective of this course is to provide knowledge, understanding and practice on software project management.

Skills

On completion of this course, the students shall be able to:

- 1. Demonstrate through involvement in a team, the central elements of team building and team management
- 2. Prepare a project plan for a software project that includes estimates, a schedule, and resources allocation
- 3. Timely monitor and control the project

- 4. Indicate and follow appropriate risk identification and management that will help to secure the on-time delivery of software
- 5. Use different methods and techniques to assure the quality of a software product, including configuration control, change management, and test
- 6. Demonstrate knowledge about software processes and methodologies, and the principles and rationale of software process improvement

Program Contents

- 1. Project planning
 - a. Software estimation and scheduling
 - b. Development of a software development plan
- 2. Quality management
 - a. Quality plan
 - b. Reviews and inspections
 - c. Software testing
 - d. Configuration management and version control
- 3. Software project management
 - a. Requirements management
 - b. Project monitoring and control
 - c. Risk analysis and managementd. Team management
- Software development processes 4
 - a. Process models and process measurements

Bibliography

- Andrew Stellman and Jennifer Greene, Applied Software Project Management, O'Reilly, 2006. •
- Ian Sommerville, Software Engineering, 9th ed., Pearson Education, 2011
- Steve McConnell, Software Project Survival Guide, Microsoft Press, 1998.
- Pankaj Jalote, An Integrated Approach to Software, 3rd Edition, Springer, 2005
- Pankaj Jalote, Software Project Management in Practice, Addison-Wesley, 2002.
- Frank Tsui and Orlando Karam, Essentials of Software Engineering, Jones and Bartlett Publishers, 2007.

Access Conditions and Attendance Excuse

Students who have obtained the minimum classification in one of the evaluation components described below during the previous two academic years, are exempt from performing that component.

Conditions for Exam Admission

All students can take the exam.

Evaluation Method

Final grades are based on:

- Project: 10 points
- Written exam: 10 points
- A minimum grade of 40% in each of these components is mandatory.

The goal of the project is to build a software product within the expected scope, cost, quality and deadline. Before the project begins, it must be carefully planned.

This project shall follow a defined project management plan and quality assurance plan. The teams shall have 4 or 5 members. The project shall be finished by the end of the semester, with no extension.

Conditions for Results Improvement

There is no project resubmission

Date

14/9/2019

The cas of



Instituto Superior de Engenharia de Coimbra www.isec.pt Signature of Teacher:



Licenciatura em Engenharia Ínformática Licenciatura em Engenharia Informática (Pós-Laboral)

Licenciatura – BsC Informatics Engineering Licenciatura – BsC Informatics Engineering (Evening Classes)

Academic Year: 2018/2019

Program Contents

Course Unit	MOBILE ARCHITECTURES
Specialization (s)	APPLICATIONS DEVELOPMENT

Subject type		Research Area		Informatics Engineering			
Year	3 rd	Semester	1 st			ECTS	6
Working	y Hours				Unaccompan	ied Working Hours	
Activity	Туре		Working Hours Per Week	Total Hours	Activity Type		Total Hours
Theoretic Theoretic	cal Lectures cal-Practical	Lectures	2	28	Study Works / Group	Works	16 70
Practical Tutorial (Project	-Laboratoty Orientation	Lectures	3	42	Project Evaluation Additional		4
Total of	Working Ho	ours		160			
Lecture	r						
Activity	Туре			Name		Qualifications	Category
Theoretic Theoretic	cal Lectures cal-Practical	Lectures	Álvaro Nuno	Ferreira Silva Santos	6	Master	Adj. Professor
Practical Tutorial Project	l-Laboratoty Orientation	Lectures	Álvaro Nuno I	Ferreira Silva Santos		Master	Adj. Professor
Respon	sible(s) Lec	turer (s)		Álvaro	Nuno Ferreira Sil	va Santos	

Goals

The study and exploration of various platforms and operating systems used in mobile equipment The application development for mobile devices

The discussion of the specificities of the mobile applications development

Skills

- Learning Outcomes
- Identify and distinguish mobile systems, pervasive systems and ubiquitous systems Understand the specificities in the application development for devices with limited capacities Know current mobile operating systems Know development environments to implement mobile applications Learn about storage mechanisms and data synchronization suitable for mobile systems Learn about communication mechanisms suitable for mobile systems Understand the security issues involved Learn how to deploy software - Applying knowledge and understanding

Develop applications for different mobile operating systems Choose systems and/or platforms that are suitable for specific applications



- Making judgment
 - Evaluate the limitations of mobile system applications
- Communication skills
 - Present and explain the benefits of the applications developed
 - Justify the limitations of the applications developed
- Learning skill
 - Using new mobile operating systems and development platforms

Program Contents

Basic concepts about mobile systems, pervasive systems and ubiquitous systems Mobile application development specificities Mobile application development: Android (Java) and iOS (Swift)

Bibliography

- Android

- iOS

Ricardo Queirós, 2014, "Desenvolvimento de Aplicações Profissionais em Android", FCA Editora Online Resources: http://www.android.com; http://developer.android.com

- http://developer.apple.com https://developer.apple.com/swift/
- Other http://www.stackoverflow.com http://www.codeproject.com

Access Conditions and Attendance Excuse

n.d.

Conditions for Exam Admission

All the students enrolled in this course unit have access to the exam.

Evaluation Method

The curricular unit is evaluated on a 0..20 values scale, taking into consideration the following components:

- Written exam
 - Weight is 8/20 in the final grade
 - Focus on all the course unit contents
 - Minimum required grade: 35%
- Research assignment
 - Weight is 4/20 in the final grade
 - Group work: 2 students
 - Written document about a technology, platform, ...
 - Explain the underlying concepts
 - Requirements, specificities, ...
 - Usage examples
 - Subject for the assignment
 - Sample subjects to choose from: NFC, Bluetooth, Wifi Direct, Push Notifications, Material Design, MultiDEX, Room, Firebase, ...
 - Deadline to choose: 10.11.2018 00:00:00
 - Submission
 - File format: PDF file (max 20 pages)
 - Deadline: 10.12.2018 00:00:00
 - Penalty of 5% for each hour of delay
- Practical work
 - Weight is 8/20 in the final grade
 - Group work: 2 students
 - Components

\$5

- Android mobile application (70%)
- iOS mobile application (20%)
- Documentation (10%)
 - Technical Report (PDF)
 - User manuals (PDF)
- Submission
 - Single ZIP file with all project files and documentation
 - Deadline: 31.12.2018 13:00:00
 - Penalty of 5% for each delay hour after 02.01.2019 00:00:00
 - The defense of the work is mandatory
- The final grade of the practical work (PW) is obtained using the formula:
 - PW = (70% * And + 20% * IOS + 10% * Docs) * Defense Delay * 5%
 - And Android application grade
 - IOS iOS application grade
 - Docs Documentation grade
 - Defense one of the following values:
 - 1.00 completely successful
 - 0.75 there were limited parts of the code that the student didn't know how to explain
 - 0.50 changes were requested to the code and only a part was successfully carried out
 - 0.25 the student only demonstrated knowledge in small or limited parts of the work
 - 0.00 completely unsuccessful
 - Delay number of hours delayed
- Grouping of students
 - Communication of the student's names of each group:
 - Deadline: 01.11.2018 00:00:00
 - After this date, students who did not communicate their participation in a group should do all the works individually
 - The groups are the same for all works
- Special assessment seasons
 - There is no possibility to submit works in the special seasons, being used the marks obtained in the regular seasons
 - The research assignment may be replaced by an additional question in the written exam, which will be focused on a topic to be announced 15 days before the exam
 - If a grade was obtained for the research assignment component in the regular season, it will be immediately omitted when the question is requested in the special exam
 - Practical work (Android and iOS) has no chance of replacement in the special seasons
- Additional notes

.

- The marks obtained in the practical and research works are valid for all periods of the academic year 2018/2019
- The exam marks are only valid for the evaluation seasons in which they were made

Conditions for Results Improvement

According to the ISEC Assessment Regulation.

Date

Aloaro Nuno Sacelo



Instituto Superior de Engenharia de Coimbra

www.isec.pt

Signature of Teacher: Runhon- Chur-

Informatics Engineering Informatics Engineering (Evening classes) Informatics Engineering (European Computer Science)

Academic Year: 2018/2019

Program Contents

Course Unit Specialization	ORGANIZ (s) INFORM/	ZATIONAL S ATION SYST	STRATEGY FEMS		
Subject type	Specialization	Resear	ch Area	Information sy	vstems
Year 3	Semester	1		ECTS	6
Working Hours				Unaccompanied Working Hour	s
Activity Type		Working Hours Per	Total Hours	Activity Type	Total Hours
Theoretical Lectu Theoretical-Pract Practical-Laborat Tutorial Orientati Project Total of Working Lecturer	ures tical Lectures toty Lectures on g Hours	2 3	28 43	Study Works / Group Works Project Evaluation Additional	30 30 26 4
Activity Type			Name	Qualifications	Category
Theoretical Lectu Theoretical-Prac	ires tical Lectures	Cristina Mar	garida Chuva Costa	PhD	Professor Adjunto
Practical-Laboratoty Lectures Tutorial Orientation Project		Cristina Margarida Chuva Costa		PhD	Professor Adjunto
Responsible(s)	Lecturer (s)	Cristina Mar	garida Chuva Costa		

Signature of Teacher:

Goals

Organizations are currently confronted with choices at various levels, for example: organization of their internal processes, strategies to define, business models to adopt, technology support to use, strategic/technological alignment, selection of target markets/customers and location of their main activities. This course will address organizational strategy from three perspectives: management practice, competitiveness and alignment between strategy and supporting information technologies. In this sense, concepts and tools are presented to understand and analyze the performance of organizations in a global market. It is intended that the students at the end of the course will be able to:

- Analyze the internal context of an organization (processes, structures, cultures, people, and products);
- · Consider the external context of an organization, namely requirements and opportunities;
- · Assist organizations in formulating and implementing their strategy;
- Promote alignment between organization's strategy and its supporting information system.

Skills

Knowledge and Understanding

A.1. Understand the concept of organizational strategy;

A.2. Understand the relationship between organizational strategy and the ability to create/maintain competitiveness;

A.3. Know and select the appropriate tools to support a strategic decision;

A.4. Formulate a strategic plan for an organization;

A.5. Align the strategy with the business and technological context: processes, information systems, people, culture, products, and external environment.

Application of Knowledge

B.1. Apply the acquired knowledge to real world situations;

B.2. Establish the bridge between managers and technicians, especially at the level of process analysis and specification of supporting technologies;

B.3. Implement an organization strategic plan;

B.4. Select the information systems to adopt.

Grounded Decision

C.1. Justify proposed solutions at the level of strategic options (operational and technological).

Make judgments

D.1. Analyze organizational scenarios, applying a critical attitude;

D.2. Evaluate strategic plans, based on a critical attitude.

Communication

- E.1. Prepare documentation for the formulation and implementation of strategic plans;
- E.2. Present and explain clearly the assessments and strategic plan developed.

Program Contents

- 1. Introduction to Strategic Management
 - 1.1. Context of the area
 - 1.2. Historic evolution
 - 1.3. Concept of organizational strategy
 - 1.4. Benefits of strategic management
 - 1.5. Mission, vision, and values
 - 1.6. Objectives: characteristics and types

2. Business models

- 2.1. Definition, typologies, and components
- 2.2. Representation, factors of adoption and evaluation
- 2.3. Business models in networks
- 2.4. Relationship between strategy and business model
- 3. Analysis of the external environment
 - 3.1. Competition in the organizational environment
 - 3.2. Strategic groups
 - 3.3. Competitive analysis
 - 3.4. Analysis tools
- 4. Analysis of the internal environment
 - 4.1. Sources of creation and maintenance of competitive advantage
 - 4.2. Value chain
 - 4.3. Relationship between competitive advantage and profit
 - 4.4. Tools of analysis

- 5. Competitive advantage
 - 5.1. Functional strategies to improve efficiency, quality, and innovation
 - 5.2. Competitive positioning and differentiation
 - 5.3. Business model as a mechanism to gain competitive advantage
- 6. Strategy and technology
 - 6.1. The growing role of ICTs in organizations
 - 6.2. Implications of ICTs strategies
 - 6.3. Alignment between business operations and strategy
 - 6.4. Information systems that support innovation and strategic advantage
 - 6.5. Information systems strategy in organizations
 - 6.6. Business application portfolio management
 - 6.7. Justification and management of investments in ICTs
 - 6.8. Outsourcing
 - 6.9. IT governance and COBIT
 - 6.10. Big data
 - 6.11. Data analytics

Bibliography

- [1] Freire, A. (1997) Estratégia Sucesso em Portugal, Editorial Verbo
- [2] Rodrigues, J. (2012) Estratégia organizacional: do mercado à ética, Escolar Editora
- [3] Santos, A. J. R. (2008) Gestão Estratégica Conceitos, modelos e instrumentos, António J. Robalo Santos, Escolar Editora
- [4] Peppard, J., Ward, J. (2016) The Strategic Management of Information Systems: Building a Digital Strategy, Wiley, 4th edition
- [5] Bocij, P., Greasley, A., Hickie, S. (2014) Business Information Systems: Technology Development and Management for the E-Business, Pearson, 5th edition
- [6] Grant, R. M. (2013) Contemporary Strategy Analysis, John Wiley & Sons, Ltd Publication, 8th edition
- [7] Jonhson, G., Scholes, K. e Whitthington, R. (2008) Exploring Strategy, Printice Hall 8th edition
- [8] Barney, J. B. e Hesterly, I. W. (2010) "Strategic Management and Competitive Advantage: Concepts and Cases", Pearson Education, Inc, 3rd edition

Signature of Teacher Rightmen Ohn

Access Conditions and Attendance Excuse Those described in the literature

Conditions for Exam Admission Those described in the literature

Evaluation Method

- 1. Continuous assessment
- 2. Exam

Continuous assessment

- a. Two individual written tests (each 5 values in 20: 14th of November and 19th of December). The student can use printed material during the test;
- b. Practical work (maximum of 3 students) elaboration of an organization's strategic plan during the semester (5 values it includes report and presentations);
- c. Presentation regarding research work and case studies (5 values carried out by a maximum of 3 students).
- In points b and c the marks may differ between the elements of each group.

Those who obtain, by rounding, a final classification equal or superior to 10 will be approved in continuous evaluation.

The exam consists of a test (20 values). The test will focus on all the subjects addressed during the course. Students are approved for the course unit if they obtain, by rounding, a final mark equal or superior to 10.

Conditions for Results Improvement

Any classification improvement process must fully verify the requirements defined in REACTA.

Date

Signature from the lecturer responsible for the course Rohm. Naugard. Chura (det

19/10/2018



x,

Signature of Teacher:

Licenciatura – BsC Engenharia Informática – Diurno e Pós-

laboral (Português)

Licenciatura – BsC Informatics Engineering – daytime and postwork (Inglês)

Academic Year: 2018/2019

Program Contents

Course Unit INFORMATION SYSTEMS II

Specialization (s) INFORMATION SYSTEMS II

Subjec	t type	Speciality Sciences	Resear	ch Area Informatic	on Systems		
Year	3rd	Semester	1st			ECTS	6
Workin	ng Hours				Unaccompanied Worki	ng Hours	
Activity	Туре		Working Hours Per Week	Total Hours	Activity Type	Тс	tal Hours
Theore Theore Practica Tutoria Project	tical Lecti tical-Prac al-Labora I Orientat	ures tical Lectures toty Lectures ion	2 1 2	28 14 28	Study Works / Group Works Project Evaluation Additional		28 60 2
Total o	of Workin	g Hours		160			
Lectur	er						
Activity Theore Theore Practic Tutoria Project	r Type tical Lect tical-Prac al-Labora I Orientat	ures ctical Lectures itoty Lectures ion		Name Viriato Marques Viriato Marques Viriato Marques	Qualifications Doutoramento Doutoramento Doutoramento	Cates Prof. Coo Prof. Coo Prof. Coo	gory rdenador rdenador rdenador
Respo	nsible(s)	Lecturer (s)	Viriato Maro	uues			

Goals

Global vision about Information Systems Planning and management os ISs Knowledge and application of data warehouses and OLAP modelling and techniques. Basic knowledge about data mining Basic knowledge abour discrete simulation as a decision support tool Particular Information Systems. E-learning, e-commerce, international issues Development of criticizing skills

Skills

Planning and management of IS projects Know when and how to apply Businees Intelligence technologies and models

Program Contents

Baisc knowledge about ERPs and BI SCM and CRM Introducion to data warehouses and OLAP Facts and dimensions Star and snowflake Granularity Hierarquies Drill down, Rollup, pivot tables and other operations ETL OLAP, ROLAP and MOLAP Implementation using Microsoft BIDS (Visual Studio + SQL Server 2008 R2) + Excel Introduction to data-mining General view Algoritms Classification Introduction to classifiers (decision trees, rules, KNN, Bayesian, Neural networks) Performance Clustering (k-means) association (a-priori) Linear regression Implementation using Microsoft BIDS (Visual Studio + SQL Server 2008 R2) Project Management Introduction to requirement analysis IS's life cycle Cascade Prototyping V model Spiral model RAD RUP SCRUM Introduction to Discrete Simulation Concept Applications Architectures **Developing environments** Applications Implementation of simple models using ExtendSIM

Knowledge Management in organizations

Concept Knowledge types Knowledge management cycle Impact of introduction of ISs at the organizations Adaptation and inovation How ISs support knowledge spread inside organizatons Tangible benefits Scandia diagram Key performance indicators (KPI's) Balanced Scorecards Implementation of KPI's using Microsoft BIDS (Visual Studio + SQL Server 2008 R2), Excel, PowerBI-Desktop

Some other topics

Management and security International Systems e-commerce e-learning platforms

Bibliography

Management Information Systems, Laudon & Laudon Business Intelligence, Santos & Ramos Data-mining concepts and Techniques, Han & Camber Desenvolvimento de Sistemas de Informação, Filomena Lopes, Maria P. Morais, Armando Carvalho Planeamento de Sistemas de informação, Amaral & Varajão Comércio Electrónico, Silva, Romão & Conde

Access Conditions and Attendance Excuse

According to the law

Conditions for Exam Admission

Without restrictions

Evaluation Method

Written exam, 14 points

1 presentation about a subject related to ISs (seminar) 2 points

3 practical works: DW e OLAP (2 points), data-mining (1 point) and simulation (1 point). During each scholar year a single version of the practical works will be accepted (see also conditions for result improvement, bellow)

Conditions for Results Improvement

Results improvment is possible on the written exam componente only (total 14 points): so, during the Normal epoch (1st and 2nd call) a single version of the practical works will be accepted. During September or any other special epochs the practical works can also be accepted, but just when no other version of the same work as been presented before.

The seminars are evaluated during the classes and evaluated in that moment.

Date

13/9/2018

Var



Signature of Teacher:

Licenciatura – Engenharia Informática (Diurno, Pós-Laboral e Curso Europeu))

Instituto Superior de Engenharia de Coimbra <u>www.isec.pt</u>

Licenciatura – BsC Informatics Engineering (D,PL,ECS)

Academic Year: 2018/2019

Program Contents

Course Unit Specializatio Subject type	CONPUT on (s) INFORM Specialization	TATIONAL IN ATION SYS ⁻ IS Resear	NTELLIGENCE TEMS (IS) ch Area ^{Artificial I}	Intelligence	
Year 3	Semester	r 1		EC	TS 6
Working Hou	rs			Unaccompanied Working Ho	ours
Activity Type		Working Hours Per Week	Total Hours	Activity Type	Total Hours
Theoretical Le Theoretical-Pr Practical-Labo Tutorial Orient Project	ectures ractical Lectures oratory Lectures tation	3	28 42	Study Works / Group Works Project Evaluation Additional	45 25 18 2
Total of Work	king Hours		160		
Lecturer					
Activity Type			Name	Qualifications	Category
Theoretical Le Theoretical-Pr	ectures actical Lectures	Carlos Pere	ira	Phd	Coordinator Professor
Practical-Labo Tutorial Orient Project	oratory Lectures tation	Carlos Perei	ra	Phd	Coordinator Professor
Responsible(s) Lecturer (s)	Carlos Pere	ira		
Goals					

This curricular unit focus on the advanced concepts of Computational Intelligence, which essentially involve learning mechanisms with neural networks, fuzzy systems, neuro-fuzzy systems and new paradigms of evolutionary computation with applications to real cases.

The main objectives are to:

- Acquire knowledge on the area of Computational Intelligence.

- Provide the application of computational intelligence techniques to real cases - Finance, Web-mining, Robotics, Biomedicine, Bioinformatics, Systems Control, etc.

- Know and apply techniques of data analysis and business intelligence.

- Understand and apply complex problem solving algorithms.

Skills

- Get to know the main paradigms of Computational Intelligence.
- Analyze a problem, identify its characteristics and handle its resolution.
- Recognize the advantages and limitations of using problem solving IC algorithms.
- Promote the autonomous development of new problem solving strategies.

Signature of Teacher:

Program Contents

- 1. Introduction to Computational Intelligence Methodologies and Applications
- 2. Advanced Topics in Neural Networks
- 3. Advanced Topics in Fuzzy and Neuro-fuzzy systems
- 4. New Paradigms of Evolutionary Computing
- 5. Data analysis Business Intelligence Applications Finance, Web-mining, Robotics, Biomedicine, Bioinformatics, Systems Control

Bibliography

- Computational Intelligence: An Introduction, Andries P. EngelBrech
- Neural networks design, Martin T. Hagan, Howard B. Demuth, Mark Beale
- Neural Networks: A Comprehensive Foundation, Simon Haykin
- Computational Intelligence: Concepts to Implementations, Russ Eberhart and Yuhui Shi
- Introduction to Data-mining Pang-Ning Tan, Michael Steinbach, Vipin Kumar
- Timothy Ross, Fuzzy Logic with Engineering Applications, Mc-Graw Hill, 1995.

Access Conditions and Attendance Excuse

Without special conditions

Conditions for Exam Admission Without special conditions

Evaluation Method

Theoretical component– 10 values Written examination Practical Component – 10 values Practical assignment n. 1 (2 values) Practical assignment n. 2 (5 values) Seminar (3 values) (Due dates: 30/10/18, 27/11/18 and 18/12/18)

Conditions for Results Improvement

Without special conditions

17/9/18

Signature from the lecturer responsible for the course



Signature of Teacher:_

A

Instituto Superior de Engenharia de Coimbra www.isec.pt Licenciatura – BsC <u>Engenharia Informática</u>(Português) Licenciatura em <u>Engenharia Informática (pós-la boral)</u>

Licenciatura – BsC <u>Informatics Engineering</u> (Inglês) Licenciatura – BsC<u>Informatics Engineering (Evening Classes)</u>

Academic Year: 2018/2019

Program Contents

Course Unit	DISTRIB	UTED PROC	GRAMMING		
Specializatior	n (s) Applica	TIONS DEV	ELOPMENT		
Subject type	Specialized	Resear	ch Area	Informatio	s Engineering
Year 3	Semester	1		EC	CTS 6
Working Hours	í.			Unaccompanied Working H	lours
Activity Type		Working Hours Per Week	Total Hours	Activity Type	Total Hours
Theoretical Lect	ures ctical Lectures	2	28	Study Works / Group Works	40 48
Practical-Labora Tutorial Orientat Project	itoty Lectures ion	3	42	Project Evaluation Additional	2
Total of Workin	ig Hours		160		
Lecturer					
Activity Type			Name	Qualification	s Category
Theoretical Lect Theoretical-Prac	ures ctical Lectures	José Marinh	0	PhD	Professor Adjunto
Practical-Labora	toty Lectures	José Marinho	0	PhD	Professor Adjunto
Tutorial Orientat Project	ion				
Responsible(s)	Lecturer (s)	José Marinh	0		

Signature of Teacher:

Goals

This curricular unit aims at providing the students the ability to plan and develop object-oriented distributed applications using different programming paradigms/levels of abstraction, i.e., remote communication, remote/distributed objects, and web services. This type of applications requires the ability to understand and deal with issues such as concurrency, synchronization, remote communication, and access to remote objects.

Skills

- The ability to understand the main issues that are inherent to the development of object-oriented distributed applications (e.g., Java RMI, CORBA, Web services, and .Net Remoting middleware technologies, possible architectures / components, underlying communication protocols, multi-threaded solutions).
- The ability to use the presented technologies to solve basic laboratory assignments.
- The ability to autonomously plan and develop object-oriented distributed applications, through the usage of various paradigms and technologies.

Program Contents

- Introduction to distributed systems.
- Introduction to the message passing paradigm.
- Multithreaded and multicast applications with Java.
- Connecting Java applications to databases (JDBC)
- Introduction to middleware platforms for distributed applications and the distributed object-based programming paradigm.
 - o Sun RPC.
 - o Java RMI.
 - o CORBA.
 - o Web services.
 - o .Net Remoting technology.
- Distributed programming with Java sockets.
- Distributed programming with Java RMI.
- Distributed programming with CORBA (Java).
- Distributed programming with RESTful web services (Java).

Bibliography

- MAHMOUD, Qusay Distributed Programming with Java Manning.
- REILLY, David; REILLY, Michael, "Java Network Programming & Distributed Computing", Addison-Wesley.
- GROSSO, William, "Java RMI", O'Reilly Media.
- COULOURIS, George; DOLLIMORE, Jean; KINDBERG, Tim, "Distributed Systems Concepts and Design", Addison-Wesley.
- TANENBAUM, Andrew S.; VAN STEEN, Maarten, "Distributed Systems, Principles and Paradigms", Prentice Hall.
- W. RICHARD STEVENS, "Unix network programming", Prentice Hall.
- Study material prepared by the teachers.



Access Conditions and Attendance Excuse

No requirements defined.

Conditions for Exam Admission

No requirements defined for taking final exams.

Evaluation Method

- Two Laboratory assignments (40% of final grade).
- First laboratory assignment: November the 7th, 12th, and 15th.
- Second laboratory assignment: December the 12th, 17th, and 20th.
- A project assignment (40% of final grade).
- Project delivery deadline: December the 30th.
- A final exam (20% of final grade and minimum grade of 35%).

Conditions for Results Improvement

- Laboratory assignments and final exams can be attempted during retaking exams.
- The project assignment cannot be improved.

Date 12/10/2018

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Signature of Teacher:____

Licenciatura – BsC Licenciatura em Engenharia Informática Licenciatura em Engenharia Informática - Pós-laboral (ramos)

Licenciatura – BsC in Informatics Engineering Licenciatura – BsC in Informatics Engineering, evening classes

Academic Year: 2018/2019

Program Contents

Activity Type			Name		Qualificati	ons	Category
Lecturer					·		•
Total of Workin	g Hours		160				
Project			3		Additional		
Tutorial Orientati	ion	-			Evaluation		5
Practical-Labora	toty Lectures	3	42	6. E	Project		30
Theoretical-Prac	tical Lectures	2	20		Works / Group Works		5
Theoretical Lect	uree	2	28		Study		50
Activity Type		Working Hours Per	Total Hours		Activity Type		Total Hours
Working Hours					Unaccompanied Working	g Hours	-
Year 3rd	Semester	1 ^{SI}				ECIS	6
N.C. and	• • •					FOTO	
Subject type	Mandatory	Resear	ch Area		Informa	atics Engi	neering
Specialization	(S) APPLICA	TION DEVE	LOPMENT				
Course onic	DATA ST	RUCTURES	5				

Activity Type	Name	Qualifications	Category
Theoretical Lectures	Jorge Miguel Sousa Barreiros (<u>imsousa@isec.pt</u>)	PhD	Adjunct Prof.
Practical-Laboratoty Lectures	Jorge Miguel Sousa Barreiros (jmsousa@isec.pt)	PhD	Adjunct Prof.
Project	Jorge Miguel Sousa Barreiros (imsousa@isec.pt)	PhD	Adjunct Prof.
Responsible(s) Lecturer (s)	Jorge Miguel Sousa Barreiros (jmsousa@isec.pt)		

Goals

In this curricular unit, the students gain the necessary competences to use, analyze and design software solutions that use advanced data structures. To that effect, topics include the internal organization of those data structures and the algorithmic analysis of the complexity the algorithms available for those structures

Skills

After attending this curricular unit, students must:

1 - Understand algorithmic complexity analysis techniques and notations

2 - Know the Java Collection API

3 - Apply correctly the Java Collection API

4 – Analyze an algorithm to determine its complexity

5 - Know all the data structures studied in the course according to the topics

6 - Select the appropriate dta structure to a problem according to its complexity profile

7 - Correctly implementing data structures and associated algorithms

Program Contents

1 – Introduction

1.1 - Complexity Analysis

1.2 Generic Programming

1.3 - The Collection API

1.4 - Recursion

2 - Fundamental Structures

And 2 Signature of Teacher:

- 2.1- Stacks, Queues and Trees
 - 2.1.1 Basic Concepts
 - 2.1.2 Application Huffman Tree
 - 2.1.3 Application Expression representation and infix-postfix conversion
- 2.2 Search Trees
 - 2.2.1 Basic concepts and operations
 - 2.2.2 AVL trees
 - 2.2.3 Red-Black trees
 - 2.2.4 Higher Arity B-Trees
- 3- Hash Tables

3.1 - Basic Concepts

- 3.2 Linear and Quadratic Probing
- 3.3 Chaining
- 4- Advanced Structures
- 4.1 Heaps
- 4.2 Splay Tree
- 4.3 Other advanced structures

In lab classes, students will implement, analyze, apply and test the algorithms and data structures studied in theoretical classes, using the JAVA language.

Bibliography

"Data Structures & Problem Solving Using Java", 3rd Ed., Marc Weiss, Pearson Education "Introduction to Algorithms", Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, The MIT Press; third edition edition (July 31, 2009)

Notes and slides used in class (available in moodle)

Access Conditions and Attendance Excuse

Conditions for Exam Admission None Evaluation Method

The assessment method consists of: Written Exam – 10 points Seminar Project – 1.5 points – Students must research and make a presentation about a relevant topic Laboratory Tests – 8.5 points – Two tests conducted during lab classes

Conditions for Results Improvement

Improvement is conducted according to the general dispositions, with the following specificities:

- The lab test grade can be replaced with a practical exam available after the first evaluation period
- The seminar grade cannot be improved

Date 26th September 2018

n/m



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Licenciatura – BsC Eng. Informática Licenciatura – BsC Informatics Engineering Licenciatura – BsC Informatics Engineering (Evening Classes)

Academic Year: 2018/2019

Program Contents

		-T.				
Course	e Unit	NETWOF	RK MANAGE	MENT		
Specia	lization	(s) COMPUT	ER NETWO	RKS AND SYST	EMS	
Subject	t type	Network Management	Researc	h Area	*	
Year	3	Semester	1		ECTS	6
Working	g Hours				Unaccompanied Working Hours	
Activity	Туре		Working Hours Per Week	Total Hours	Activity Type	Total Hours
Theoret	ical Lectu	ures	2	30	Study Works / Group Works	50
Practica	al-Labora	toty Lectures	3	45	Project	40
Tutorial Project	Orientati	on			Evaluation Additional	5
Total of	f Workin	g Hours				
Lecture	er					
Activity	Туре			Name	Qualifications	Category
Theoret	ical Lectu	ures	José Rosado	(PhD	Assistant Professor
Theoret	ical-Prac	tical Lectures				
Practica	al-Labora	toty Lectures	José Rosado		PhD	Assistant Professor
Tutorial Project	Orientati	on			·	
Respor	nsible(s)	Lecturer (s)	José Rosado	1		

Goals

Allow the students the possibility to acquire knowledge in the computer networks management in open and integrated environments, and the knowledge of tools used in the network management world and the OSI model.

Skills

Identify the role of the network manager; Know the several systems used in network management; Understand the functional areas in the network management in agreement with the OSI model; Know and identify the main protocols of network management.

Program Contents

1. Network Management 1.1. Definition

Signature of Teacher:

- 1.2. The role of the Network Manager
- 1.3. Global Network Management Vision
- 2. Models, Standards and Language
 - 2.1. Network Management Standards
 - 2.2. Organizational Model
 - 2.3. Information Model
 - 2.4. Communication Model
 - 2.5. ASN.1
 - 2.6. BER Codification
 - 2.7. Functional Model
- 3. SNMPV1
 - 3.1. SNMP Community
 - 3.2. SNMP PDU
 - 3.3. Lexicographical Order
 - 3.4. Services/Common Management Information Protocol (CMIS/CMIP)
 - 3.5. SNMP MIB Group
 - 3.6. SNMP Messages
 - 3.7. Administrative Model
 - 3.8. SNMP Community
- 4. SNMPV2:
 - 4.1. SNMPv1 versus SNMPv2
 - 4.2. SNMPv2 Internet Group
 - 4.3. New SNMPv2 messages
 - 4.4. SNMPv2 PDU
- 5. SNMPV3
- 5.1. SNMPv3 RFC
- 5.2. SNMP Engine
- 5.3. SNMPv3 Dispatcher
- 5.4. SNMPv3 Message Processing Subsystem
- 5.5. SNMPv3 Security and Access Control
- 5.6. SNMPv3 MIB
- 5.7. SNMPv3 Message
- 6. RMON REMOTE MONITORING
- 6.1. RMON Components
- 6.2. RMON Objectives and Benefits
- 6.3. RMON MIB

Bibliography

- •"Network Management Principles and Practice", Mani Subramanian, Addison Wesley, 2nd edition, 2010
- "Network Management Know It All", Sebastian Abeck, et al., Elsevier, 2009
- "Network Management Fundamentals", Alexander Clemm, Cisco Press, 2007

Signature of Teacher:

Access Conditions and Attendance Excuse

The presence of the students is not mandatory in any of the theoretical and practical classes. However, since there are two practical classes that are dedicated to evaluation of the students, their presence on those classes is required.

Conditions for Exam Admission

Those specified on the ISEC's general evaluation rules.

Evaluation Method

Theoretical exam: 50% of the evaluation;

Practical exam: 50% of the evaluation;

The students that have the status of working student and can't be present at the practical exams class can require that the final theoretical exam be evaluated to 100%.

Conditions for Results Improvement

Those specified on the ISEC's general evaluation rules.

St Germando Kadada Rosudo

Date

Signature from the lecturer responsible for the course

24/09/2018



Lecturer's signature:

Licenciatura – BsC <u>Engenharia Informática</u> Licenciatura – BsC <u>Engenharia Informática – Pós-Iaboral</u>

Instituto Superior de Engenharia de Coimbra <u>www.isec.pt</u>

Licenciatura – BsC Informatics Engineering Licenciatura – BsC Informatics Engineering – Evening Classes

Academic Year: 2018/2019

Program Contents

Course Unit AVAILA	BILITY AND I	PERFORMANCE	• 2		
Specialization (s) NETWC	RK AND SYS	STEM ADMINIST	RATION		
Subject type Specialty	Resear	ch Area Commur	nication Networks		
Year 3 rd Semeste	r 1 st		-	ECTS	6
Working Hours			Unaccompanied Work	ing Hours	
Activity Type	Working Hours Per Week	Total Hours	Activity Type		Total Hours
Theoretical Lectures	2	28	Study		37
Theoretical-Practical Lectures	0	0	Works / Group Works		0
Practical-Laboratoty Lectures	3	- 42	Project	~	48
Tutorial Orientation	0	0	Evaluation		5
Project	0	0	Additional		0
Total of Working Hours		160			
Lecturer					

Activity Type	Name	Qualifications	Category
Theoretical Lectures	Luís Eduardo Faria dos Santos	Master / Expert	Associate teacher
Theoretical-Practical Lectures			
Practical-Laboratoty Lectures	Luís Eduardo Faria dos Santos	Master / Expert	Associate teacher
Iutorial Orientation			
Project			

Responsible(s) Lecturer (s) Luís Eduardo Faria dos Santos

Goals

This course addresses the network-centric theoretical and technical background demanded to improve the information and communication system's performance and availability.

Lecturer's signature:

Skills

- Knowledge and Ability to Understand
- A.1 Describe the main mechanisms to provide redundancy on local area networks;
- A.2 Describe the main mechanisms to provide load balancing on local area networks;
- A.3 Describe the main mechanisms to control the quality of service levels on local area networks;

Application of Knowledge and Understanding

- B.1. Plan and configure network topologies and equipment to achieve resilient networks;
- B.2. Plan and configure network-based load balancing mechanisms;
- B.3. Plan and configure network topologies and equipment to enforce the desired quality of service levels;

Conduct of Judgment / Decision Making

C.1. Justify the solutions proposed at the level of the projects developed.

Communication

- D.1. Produce technical reports and/or presentations to introduce the developed projects.
- D.2. Present and substantiate the main project decisions.

Self-Learning Skills

E.1. Autonomous development of small projects focused on course's related cutting-edge technologies.

Program Contents

- 01. Availability theory
- 02. First Hop redundancy protocols
- 03. Link aggregation
- 04. Load balancing
- 05. Introduction to Quality of Service (QoS)
- 06. Differentiated services model (DiffServ)
- 07. Integrated services model (IntServ)
- 08. Traffic classification and marking tools
- 09. Traffic admission control tools
- 10. Traffic policying and shapping
- 11. Congestion prevention and avoidance
- 12. Point-to-point specific QoS tools

Bibliography Evan Marcus, Hal Stern, "Blueprints for high availability: designing resilient distributed systems", 2nd edition, John Wiley & Sons, Inc. New York, NY, USA, 2003, ISBN: 0-471-43026-9;

Chandra Kopparapu, "Load Balancing Servers, Firewalls, and Caches, John Wiley & Sons", Inc. New York, NY, USA, 2002, ISBN 0-471-41550-2;

Kishor Shridharbhai Trivedi, "Probability and statistics with reliability, queuing and computer science applications", 2nd edition, John Wiley and Sons Ltd. Chichester, NY, USA, 2002;

End-to-End QoS Network Design: Quality of Service in LANs, WANs, and VPNs (Networking Technology), Cisco Press 2004, ISBN: 1-58705-176-1;

Cisco IOS Quality of Service Solutions Configuration Guide, Release 12.4T, Cisco Systems, Inc.

Access Conditions and Attendance Excuse

Lecturer's signature:

Students can miss the course attendance if they fulfill specific conditions anticipated by rules or legislation that apply. Students can miss the course attendance if they attended the course in previous editions. For the regular students course attendance is mandatory (Theoretical Lectures: at least 18 hours; Practical-Laboratoty Lectures: at least 27 hours).

Conditions for Exam Admission

Enrolled students that fulfill the access conditions can present themselves to the course final exams. The presentation of content that resembles some plagiarism practice prevents the involved students to present themselves to the course final exams and result in course fail during the current course edition no matter the previous achieved results.

Evaluation Method

Written exam weight: 65%; the written exam must be completed on the scheduled dates. Project weight: 35%; Prepare a workshop on a subject related but not covered by the course. Students must reach a minimum of 35% on each assessed component to succeed on the course.

Conditions for Results Improvement

Enrolled students that fulfill the access conditions and related rules or legislation can apply for result improvement on written exams. Result improvement on project demands to develop a new project on a different subject, not covered on the current course edition, and approved by the responsible lecturer.

On a given assessment season students can request that previous result of a given component becomes reused.

Date

14-09-2018

Signature from the lecturer responsible for the course



Instituto Superior de Engenharia de Coimbra www.isec.pt

Informatics Engineering Informatics Engineering (Evening Classes) Academic Year: 2018/2019

			Pro	ogram Contents
Course Unit - Network Servi	ices II			
Specialization (s) Networks	and Systems	Administration		
Subject type Specialty	R	esearch Compute	er Engineering Area	
Year 3 Semeste	r 1		ECT	S - 6
Working Hours		Unaccompanied Working Hours		
Activity Type	Working Hours Per Week	Total Hours	Activity Type	Total Hours
Theoretical Lectures Theoretical-Practical Lectures Practical-Laboratoty Lectures Tutorial Orientation	2	28 42	Study Works / Group Works Project Evaluation	28 58 4
Project Total of Working Hours			Additional	
Lecturer				
Activity Type		Name	Qualifications	Category
Theoretical Lectures	Pedro Geirir	nhas	Master and Specialist	Assistant teacher
Theoretical-Practical Lectures			Master and	
Practical-Laboratoty Lectures	Pedro Geirin	has	Specialist	Assistant teacher
Tutorial Orientation Project				
Responsible(s) Lecturer (s)	Pedro Migu	el Geirinhas		

Lecturer's signature:__

Goals

Students are expected to acquire planning and configuration skills in the Windows Server and Linux environment of the following network services:

- Authentication and centralized management services (Open and Active Directory);
- Information sharing (FTP, HTTP, HTTPS and directories sharing);
- E-mail (SMTP, POP3, IMAP4 and anti-spam);
- Printing services;
- Backup, disaster recovery and information systems.

Skills

A. Knowledge and understanding

- A.1 Identify the fundamental concepts and definitions of advanced network services.
- A.2 Identify and configure advanced network services.
- A.3. Identify and configure remote access services to local area networks.
- A.4. Identify the concepts underlying the planning and security of network services.

B. Application of knowledge

- B.1. Install and configure the directory service in Windows environments.
- B.2. Install and configure file sharing service in Windows and Linux environments
- B.3. Install and configure the mail service in Windows and Linux environments
- B.4. Install and configure the centralized print service in Windows environments.
- B5. Install and configure Information backup and restore systems

C. Decisive decision-making

- C.1. Justify the options taken at the design level of an integrated solution for advanced network services.
- C.2. Justify the options taken at the project design level of an internal network service optimization solution.

D. Judgment realization

D.1. Evaluate the design and design of a network services system, demonstrating a critical attitude.

E. Communication

E.1. Present and explain the projects developed in a clear way.

F. Self-learning skills

F.1. To develop an innovative project, with a high degree of autonomy, where it is not limited to apply concepts learned in class.

Program Contents

Theoretical Component

Learning of the theoretical and protocol aspects of network and configuration services in different environments of the following network services:

- · Authentication and centralized management services (Open and Active Directory);
- Information sharing (FTP, HTTP, HTTPS and folder sharing);
- E-mail (SMTP, POP3, IMAP4 and anti-spam);
- Printing services;
- Information backup and restore systems.

Practical / Laboratory Component

Practical configuration of the following network services:

- Study and install a company's active directory
- Study and design a file sharing system for the same company (shared folders and an FTP server).
- Configure the company's http and https server
- Set up your company's email system
- • Install the print service.
- Install the backup and restore service.

Lecturer's signature:

Bibliography

Windows

Windows

- Dan Holme, "MCSE Self-Paced Training Kit (Exams 70-290, 70-291, 70-293, 70-294) : Microsoft Windows Server 2003 Core Requirements", Microsoft Press, 2004
 - Cota: 1A-3-197/201
- Rand H. Morimoto, "Microsoft Windows server 2003 insider solutions", Sams, 2003
 - Cota: 1A-3-192
- Windows Server 2008, 2012 e 2016
 - Site da Microsoft
- Aidan Finn...[et al.] "Windows server 2012 : Hyper-V installation and configuration guide", Indianapolis, Indiana : Sybex, cop. 2013
 - Cota 1A-3-244
- Microsoft "Windows Server 2016 Essentials", Microsoft
- António Rosa, "Windows Server 2012", FCA
- William R. Stanek "Windows Server 2012", Bookman

Linux

 Jorge Granjal, "Gestão de Sistemas e Redes em Linux", FCA Cota: 1A-6-201

Access Conditions and Attendance Excuse

Exemption in the cases provided by law. Exemption if obtained frequency in previous years.

Conditions for Exam Admission

There is no minimum grade for access to exams (standard, resource and special). However, the mark of the practical component will always be that obtained in the continuous component, so that the exams will be corrected to 11 values.

Evaluation Method

Theoretical assessment (11 points) - Written exam without consultation

There is no minimum grade of access to exams.

The mark of the practical component will always be that obtained in the continuous evaluation, so the exams will be corrected to 11 values. There is also no minimum value for access to times of examination.

Practical evaluation (9 points) - • Mini tests / individual assignments at the end of each topic and to be carried out in class (3 values each.

Conditions for Results Improvement

The improvement of the marks obtained in the examinations can be obtained only by accomplishment of new written test in the time of appeal or in another time regulated for the purpose. The grade of the practical component is obtained in the evaluation carried out in the respective classes.

Date

Signature from the lecturer responsible for the course

17-09-208



www.isec.pt

Signature of Teacher:

Licenciatura – BsC Engenharia Informática Licenciatura – BsC Engenharia Informática Pós-Laboral

Licenciatura – BsC Informatics Engineering Licenciatura – BsC Informatics Engineering Evening Classes

Academic Year: 2018/2019

Program Contents

						-
Course Unit	LINK LAYER TECHNOLOGIES					
Specialization (s)	NETWOF	RKS AND SY	STEMS ADMINIST	RATION		
Subject type	Technical	Sciences	Researc	h Area Inform	natics Engineerin	g
Year 3	Semester	1			ECTS	6
Working Hours Unaccompanied Working Hours			S			
Activity Type		Working Hours Per Week	Total Hours	Activity Type		Total Hours
Theoretical Lectures	Lectures	2	28	Study	Morko	53
Practical-Laboratoty Tutorial Orientation Project	Lectures	3	42	Project Evaluation Additional) WORKS	34 3
Total of Working Ho	ours		160			
Lecturer						
Activity Type			Name		Qualifications	Category
Theoretical Lectures Theoretical-Practical	Lect <mark>ures</mark>		Amâncio Santos		MSc	Professor Adjunto
Practical-Laboratory Tutorial Orientation Project	Lect <mark>ures</mark>		Amâncio Santos		MSc	Professor Adjunto
Responsible(s) Lec	turer (s)			Amâncio Santo	S	

Goals

The data routing course unit provides the necessary skills involved in the selection, dimensioning and configuration of general active equipment belonging to the link layer of the OSI model.

Skills

Describe and distinguish composition, internal architecture and working modes of hubs, switches, routers and terminals. Develop the overhaul configuration of switches and routers based on IOS. Describe the operation of virtual local area networks (VLAN) and the corresponding routing. Apply security measures to switches. Understand and configure several protocols used on switches. Identify several link-state technologies in wide area networks (WAN). Project and configure a network according to specific requirements of a particular project, applying debugging strategies used on data networks.

Signature of Teacher:_

Program Contents

Concepts about Packet switching Switch Configuration VLAN, VTP and DTP VLAN routing STP and RSTP Switch Security and Monitoring PPP Frame Relay Q-in-Q MPLS Concepts and Configuration of Wireless LANs Configuration of Wireless LAN Controller Modules

Bibliography

Wendell Odom, CCNA Official Exam Certification Library (CCNA Exam 640-802), 2nd Edition, Cisco Press, 2007. Todd Lammle, CCNA Cisco Certified Network Associate Study Guide, 7th Edition, Wiley Publishing, Inc., 2011. Richard Stevens, TCP/IP Illustrated, Volume 1: The Protocols (2nd Edition), Addison-Wesley, 2011. Cisco Certified Network Associate (CCNA) – Cisco Academy, <u>http://moodle.isec.pt/moodle/course/index.php?categoryid=100</u>.

Access Conditions and Attendance Excuse

Students must attend at least 75% of the classes, in this or in a previous academic year. Students subject to the special regimes provided by law are exempt from the previous condition.

Conditions for Exam Admission

All students duly enrolled in this course unit are admitted to the exam.

The presentation of plagiarized and non-original works will prevent students from proceeding with the assessment in the current academic year due to the lack of classification in this component.

Evaluation Method

A written exam, with a weighting of 60%.

A original planning and configuration project of a campus LAN properly developed and configured in GNS3, with a weighting of 40%. The report should include the most relevant aspects of the project: logical topology, proposed address map, routing protocols, equipment configuration. The projects presentation should be in the week after the end of classes and during a maximum of 20 minutes.

Both the written test and the individual project must achieve a minimum grade of 10 values.

Conditions for Results Improvement

At student request, the evaluation achieved in a previous academic year, either in the written exam or in the project, can be considered in this unit, as long as it exceeds the minimum grade of 10 values.

Date

12/09/2018



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Justion Freis Signature of Teacher:_

Licenciatura em Engenharia Informática Licenciatura em Engenharia Informática - Curso–Pós-Laboral Licenciatura em Eng.ª Informática – Curso Europeu

BSc in Informatics Engineering BSc in Informatics Engineering – Evening Classes BSc in Informatics Engineering - European Computer Science

Academic Year: 2018 / 2019

Program Contents

Course UnitWEB PRSpecialization (s)COMMO	ogramming N to all	3		
Subject type Mandatory	Researc	h Area Informatics	Engineering	
Year 3 Semester	1		ECTS	6
Working Hours 70			Unaccompanied Working Hours	90
Activity Type	Working Hours Per Week	Total Hours	Activity Type	Total Hours
Theoretical Lectures	2	28	Study	28
Practical-Practical Lectures Practical-Laboratory Lectures Tutorial Orientation Project	3	42	Vvorks / Group Vvorks Project Evaluation Additional	60 2

Total of Working Hours 160

Lecturer

Activity Type	Name	Qualifications	Category
Theoretical Lectures	Cristiana Manuela Afonso Areias	Master	Adjunct Professor
Theoretical-Practical Lectures			
Practical-Laboratory Lectures	Cristiana Manuela Afonso Areias Francisco Fernando Vasconcelos B. Barros Leite Inês Campos Monteiro Sabino Domingues	Master Master PhD	Adjunct Professor Invited Assistant Invited Assistant
Tutorial Orientation			
Project			

Responsible(s) Lecturer (s) Cristiana Manuela Afonso Areias

Goals

The main goal of this unit is to develop student's skills in the development of web applications, with focus in the construction of dynamic websites. In this context, the ASP.NET platform and the C # programming language will be explored as it is one of the technologies heavily used in the industry to build dynamic websites.

Skills

Knowledge and Understanding

A.1. Know some of the technologies used in the development of dynamic websites.

A.2 Understand the details in developing dynamic websites.

Application of Knowledge

B.1. Develop dynamic websites.

Grounded Decisions

C.1. Justify the options adopted in the design of the implemented components.

Judgment Achievement

D.1. Evaluate in a reasoned way the options adopted in similar contents.

Communication

E.1. Present and justify in a clear and consistent way the developed components.

E.2. Adequately justify the limitations of the development.

Self-Learning Skills

F.1. Develop projects with a high degree of autonomy, without being limited to the concepts learned in class. This competence implies a critical capacity to properly assimilate and apply new concepts and techniques.

Program Contents

- I. Development of dynamic websites Introduction
- II. Websites development with ASP.NET
 - II.1. Introduction to ASP
 - II.2. ASP.NET templates
 - II.3. Windows Form vs ASP.NET MVC
- III. The C # programming language
- IV. LINQ Language
- V. Building websites in ASP.NET MVC
 - V.1. Introduction to MVC pattern
 - V.2. Structure of an ASP.NET MVC application
 - V.3. Forms and HTML Helpers
 - V.4. Razor Views
 - V.5. Validations
- VI. Data Manipulations
- VI.1. CRUD Operations
 - VI.2. Entity Framework
- VII. Security in Web Applications
 - VII.1.Software Security Web Applications Vulnerabilities
 - VII.2. Developing Secure Web Applications
 - VII.3. Detecting Vulnerabilities in Web Applications
 - VII.4. Authentication and Authorization in ASP.NET MVC Identity

Bibliography

- Jon Galloway, Brad Wilson, K. Scott Allen, David Matson, "Professional ASP.NET MVC 5", ISBN: 978-1-118-79475-3, WROX.
- Adam Freeman, "Pro ASP.NET MVC 5", ISBN: 978-1-4302-6530-6, Apress.
- Andrew Troelsen Philip Japikse," C# 6.0 and the .NET 4.6 Framework", ISBN: : 978-1-4842-1333-9, APress.
- Christian Nagel, Bill Evjen, Jay Glynn, Karli Watson, Morgan Skinner, "Professional C# 2012 and .NET 4.5", WROX.
- Benjamin Perkins, Jacob Vibe Hammer, Jon D. Reid, "Beginning C# 6 Programming with Visual Studio 2015", ISBN: 978-1-119-09668-9, WROX.
- Henrique Loureiro, "C# 6.0 com Visual Studio", FCA.
- Generic:

Signature of Teacher: Rushantfunco

http://www.codeproject.com http://www.asp.net/

Access Conditions and Attendance Excuse

No special conditions.

Conditions for Exam Admission

No special conditions.

Evaluation Method

The final classification will be obtained by the grades of the Exam and the Practical Assignment (PA), using the following formula:

Exam – 12 Values

- Written exam that will focus the contents taught in theoretical and practical classes. Students can bring a single A4 sheet of paper, handwritten, for support.
- The exam will be held in the periods destined for the exam periods.
- It is mandatory to obtain a minimum of 35% to be approved in the course unit.
- No informal improvement processes are allowed between examination periods. The improvement process must comply with the conditions of the evaluation regulation being in used in ISEC / IPC.

Practical Assignment – 8 Values

- To be implemented based on the ASP.NET MVC framework, Entity and Identity Framework, and the C # programming language.
- Students should organize themselves in groups of two elements. Any change to this rule will only be possible upon a timely requested and if the responsible lecturer agrees.
- The practical statement will be available in Moodle, detailing the minimum requirements for its development.
- There are no minimums in the practical assignment.
- The evaluation of the practical assignment is mandatory, will last approximately 30 minutes and will be done on a date to be defined. Failure to appear, without valid justification implies the annulment of the work and the consequent non-approval of the curricular unit.
- The practical assignment will be considered for all the exam periods and all other periods to which students with special status have access.
- It will be available only a single practical assignment for all academic year.
- The deadline for the practical assignment is 23:59 on December 30, 2018.

Conditions for Results Improvement

The practical assignment cannot be reviewed after being assigned a classification.

The process of improving the classification of the written exam must fully verify the requirements defined in the evaluation regulation in ISEC / IPC.

Date 12/09/2018

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Signature of Teacher:

Licenciatura – BsC Engenharia Informática Licenciatura – BsC Informatics Engineering

Licenciatura – BsC Engenharia Informática (Pós-Laboral) Licenciatura – BsC Informatics Engineering (Evening Classes)

Licenciatura – BsC Engenharia Informática –Curso Europeu Licenciatura – BsC European Computer Science

Academic Year: 2018/2019

Course Speciali	Unit zation	ADVANC	ED PROGR	AMMING ent		
Subject t	ype	Speciality sciences		Research Area	Informatics Engineering	
Year	2	Semester	2		ECTS	5
Working	Hours				Unaccompanied Working Hour	s
Activity T	уре		Working Hours Per Week	Total Hours	Activity Type	Total Hours
Theoretical Lectures 1			1	14	Study	26
Practical-Practical Lectures Practical-Laboratoty Lectures Tutorial Orientation Project		4	56	Project	31,5	
			2	Evaluation Additional	4	
Total of V	Vorkin	g Hours		133,5		
Lecturer						
Activity T	уре			Name	Qualifications	Category
Theoretica Theoretica Practical-	al Lectu al-Prac Labora	ures tical Lectures toty Lectures	Maria Arm	anda Correia	Master	Prof. Adjunta
		-	João Cost	а	PhD	Prof. Adjunto
			João Durã	es	PhD	Prof. Adjunto
			José Marir	ho	PhD	Prof. Adjunto
Tutorial O Project	rientati	ion	Maria Arm	anda Correia	Master	Prof. Adjunta
Respons	ible(s)	Lecturer (s)	Maria Arm	anda Correia		

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Signature of Teacher: UACoses>

Goals

Theoretical component

Learning object oriented programming in Java language and application of design patterns.

Students must acquire the ability to develop autonomous applications, for console, and also for graphic environment, based in events. It is also intended that students evolve in the ability to organize data structures and be able to correctly implement medium-sized applications by structuring them in an extensible and rational way. For this purpose, paradigms such as the MVC standard (model-view-control) and object oriented state machine are explored.

Laboratory component

It is intended that students acquire skills in the development of Java applications, for console and graphics interface, applying the subject taught in the theoretical component.

Skills

- Knowledge and understanding
 - A1. Define classes and create objects in Java.
 - A2. Define and create arrays.
 - A3. Know the concept of package.
 - A4. Know the concepts related to inheritance and polymorphism in Java.
 - A5. Know the meaning of exceptions.
 - A6. To demonstrate basic knowledge about the use of files.
 - A7. Demonstrate knowledge about the use of design patterns.

A8. Demonstrate knowledge about the organization of an application in graphic environment and concepts involved.

Knowledge Application

B1. Develop applications in Java, in a graphical environment, defining classes and relating them to each other using the composition and inheritance mechanisms. Classes that represents the problem logic must be independent of the classes that are responsible for visual representation.

Decision Making

C1. Justify the classes defined under an application and their relationships.

Evaluating a Solution

D1. Evaluate the class structure proposed to a problem, demonstrating critical attitude.

- <u>Communication</u>
 - E. 1. Produce technical and user manual reports for the developed applications.

E. 2. To present and explain the projects developed in a clear way.

- Self-learning skills
 - F1. Explore unteached aspects related to the development of practical work.
 - F2. Develop new applications from incomplete information.

Program Contents

Introduction

Java Bytecode and virtual machine Java Applications and applets Key features of Java language A simple Java application C/C++ transition to Java Primitive types Arrays of primitive types Operators Execution Control Instructions

Classes

Objects and references

Scope of objects and references Garbage collector Overloaded methods

Signature of Teacher:

Constructors The keyword this Static members The Finalize () method Initialization **Object arrays** Interior Classes Packages Composition and Inheritance Composition Inheritance The super keyword The final keyword Polymorphism Upcasting The Object class Abstract Classes Interfaces Collections Some Interfaces derived from Collection Some concrete implementations Exceptions Files Graphical Interface The Swing Library Applets Applications with graphical interface Components, events, and listeners Lavout managers Some Swing components Draw geometric shapes Images Sounds Threads The Timer class Model View Control Object-oriented state machine design pattern Factory Method design pattern Command design pattern

Bibliography

4

- · ECKEL, B. Thinking in Java, 4/e, Prentice Hall, 2006. ISBN: 9780131872486
- DEITEL, H.;DEITEL, P. Java™ How to Program, 7/e, Prentice Hall, 2007. ISBN-10: 0132222205
- SAVITCH, W.; CARRANO, F.- Java: An Introduction to Problem Solving and Programming 5/e, Prentice Hall, 2008, ISBN #0-13-149202-0
- ARNOLD, K.; GOSLING, J.; HOLMES, D. The Java™ Programming Language, 4/e, Addison-Wesley, 2005, ISBN #0-32134980-6
- HORSTMANN, C. Java Concepts 5e, John Wiley and Sons, 2007, ISBN #0470105550
- GAMMA, E.; HELM, R.; JOHNSON, R.; VLISSIDES, J. Design Patterns: Elements of Reusable Object Oriented Software, Addison-Wesley, 1995, ISBN-13: 978-0-201-63361-0
- GRAND, M. Patterns in Java Volume 1, John Wiley and Sons, 1998, ISBN 0-471-25839-3
- FREEMAN, E., FREEMAN, E., Head First Design Patterns, O'Reilly Media, 2004, ISBN: 978-0-596-00712-6.



Instituto Superior de Engenharia de Coimbra www.isec.pt Signature of Teacher:_

Licenciatura – BsC Engenharia Informática Licenciatura em Engenharia Informática Pós-Laboral Licenciatura em Engenharia Informática Curso Europeu

Licenciatura – BsC Informatics Engineering Informatics Engineering - post-work European Computer Science

> Academic Year: 2018/2019 Program Contents

Course Unit	KNOWLDGE AND REASONING	

Specialization (s) 1) APPLICATION DEVELOPMENT 2) INFORMATION SYSTEMS

Subjec	t type	Speciality	Resear	ch Area Informatics			
Year	2nd	Semester	2no	d		ECTS	5
Workin	g Hours				Unaccompan	ied Working Hour	s
Activity	Туре		Working Hours Per Week	Total Hours	Activity Type		Total Hours
Theore Theore Practic	tical Lectu tical-Prac	ures tical Lectures toty Lectures	2	28	Study Works / Group Project	Works	28 46
Tutoria Project	l Orientati	ion	2	28	Evaluation Additional		3.5
Total of Working Hours		56		77.5			
Lectur	er		-				
Activity	Туре			Name		Qualifications	Category
Theore	tical Lect	ures		Viriato Marques		PhD	Coordinator Prof
Theore Practic	tical-Prac al-Labora	tical Lectures		Anabela Simões		PhD	Auxiliary Prof.
Tutoria	l Orientat	ion		Inês C.M.S. Domingu	es	MsC	Invited Prof.
Designed							
Project							

Goals

To know and understand the tools for developing expert systems, case based reasoning, uncertainty representation, neural and Bayesian networks. To implement systems based on these models.

Skills

Capacity for using the tools above described within a short time period. Capacity for identifying problems that can be solved with these kind of systems in real situations. Knowledge acquisition. Understanding the application of expert systems, case based reasoning, fuzzy systems, probability based systems, neural and Bayesian networks.

Signature of Teacher:_

Program Contents

Neural Networks Perceptron, Linear, sigmoid and hyperbolic tangent activation functions Training Rule, Gradient Descent and Delta-Rule Neural networks (feedforward) BackPropagation Application examples Introduction to ES's Basic Principles Block Diagram Inference Engine Forward and Backward Chaining RETE WHY and HOW modules Case Based Reasoning Paradigm and Aamodt & Plaza cicle Case representation and memory models Similarity functions Relevance and learning Case adaptation Some prototypes Uncertainty 1 Certainty factors and MYCIN Introduction to Dempster-Shaffer Fuzzy sets and fuzzy numbers Computing with words Mamdani inference Development tools NASA CLIPS, ExSys Corvid, MyCBR, MatLab Bayesian Networks Bayes Theorem Project of Bayesian networks Application to Dempster-Schaffer theory Knowledge Representation OAV, semantic nets, frames, classic logic, rules, cases and others Experts and knowledge acquisition. Methodologies.

Practical Classes: Problems about all the subjects

Labs: Practical works woth Matlab, Drools and GENIE Final Practical evaluation work

Bibliography

Classes Powerpoint slides (Viriato Marques) Solved Problems (Viriato Marques) Solved past exams resolvidos (Viriato Marques)

Artificial Intelligence – A Modern Approach, 2nd edition Russel & Norvig, 2002

Machine Learning Tom Mitchel, 2001

Expert Systems Principles and Programming, 3rd edition Giarratano & Riley 1998

Introduction to Expert Systems, 3rd edition Peter Jackson, 1998

Applying Case Based Reasoning Ian Watson, 1997

Signature of Teacher:

Fuzzy Set Theory and Its Applications, 4th edition Zimmerman, 2001

Access Conditions and Attendance Excuse

According to law

Conditions for Exam Admission

No restricitons

Evaluation Method

Final Exam – 10 points Final Practical Work – 10 points DEAD LINE for FINAL VERSION PRESENTATION: 1 week before 1st call exam

Conditions for Results Improvement

Access to 2nd exam call for improvement of classification of the 1st exam call

The final practical exam is unique, i.e., we can accept a single version of the work without possibility of improvement. For special epoch exams there is the possibility of a new practical work, but with a theme different from that used in the normal epoch(s).

Date

2013/11-4

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Instituto Superior de Engenharia de Coimbra www.isec.pt Signature of Teacher:___

Licenciatura – BsC Engenharia Informática Licenciatura – BsC Informatics Engineering

Int

Regular schedule + evening schedule

Academic Year: 2018 / 2019

Program Contents

Course Unit Specialization	OPERAT (s) NETWOR APPLICA	TING SYSTEI RK AND SYS ATIONS DEV	MS II STEMS ADMINISTR ELOPMENT	ATION		
Subject type	Mandatory	Resear	ch Area Informatics			
Year 2	Semester	2			ECTS	5
Working Hours				Unaccompani	ed Working Hours	5
Activity Type		Working Hours Per Week	Total Hours	Activity Type		Total Hours
Theoretical Lectu	ires	2	28	Study	VA/	32
Practical-Laborat	toty Lectures	2	28	Project	VVORKS	40
Tutorial Orientati Project	on			Evaluation Additional		5,5
Total of Working	g Hours		133,5			
Lecturer						
Activity Type			Name		Qualifications	Category
Theoretical Lectu Theoretical-Prac	ıres tical Lectures		João Durães		PhD	Prof. Adjunto
Practical-Laborat	toty Lectures		Ana Alves Ricardo Poroira		PhD MaC	Prov. Adjunta
Tutorial Orientati Project	on				IVISO	
Responsible(s)	Lecturer (s)			João Durães		

Goals

The curricular unit aims to provide students with a) Complementary theoretical knowledge about the operation of current operating systems, and b) practice of operation and development for systems of the Windows family.

Skills

Skills to be achieved by students in this discipline:

- Understand, explain and justify the internal operation of modern operating systems, including, without prejudice to other topics: security and authentication mechanisms, concurrency and deadlocks, I / O layer, and file systems.
- Understand, explain and plan the operation and management of Windows systems.
- Understand, plan, explain, and justify the development of C / C ++ applications for Windows.

Signature of Teacher:

1-B

Program Contents

1. Theoretical Component

- a. The. Windows NT Architecture. Micro-kernel architecture. Executive NT. Sub-systems. Win32 sub-system. Win32 applications and UAP platform.
- b. Win32 Programming Model Part I
 - I. Introduction to Unicode programming.
 - II. Types of applications in Windows NT.
 - III. Creation and management of processes.
 - IV. Creating dynamic link libraries DLL. Principles of dynamic libraries and low-level operation. Explicit binding and implicit binding.
 - V. Thread creation and management. Multi-threaded programming model. Application and advantages. Examples of parallel thread programming.
- c. Synchronization Models and mechanisms
 - I. Key synchronization issues. Mutual exclusion. Competition and cooperation.
 - II. Algorithmic and system solutions. Logical latches. Mutexes. Traffic lights. Indivisible operations. Test and Set operations.
 - III. Synchronization mechanisms in Win32. API. Mutexes, Critical Sections, Semaphores. Timers. Waitable events. Asynchronous API.
 - IV. Synchronization in multi-thread programming for Win32
 - V. Deadlocks and livelocks. Main concepts. Strategies for prevention and avoidance. Algorithm of the banker.
- d. Win32 Programming Model Part II Communication Models and Mechanisms
 - I. Named pipes. Client-server model with named pipes in Win32.
 - II. Files mapped in memory.
- e. Security model and mechanisms. Concrete case and Win32 platform API. Privileges, rights. DACL.
- f. Win32 Programming Model Part III Graphical UI, event programming and resources
 - I. Win32 graphical application framework
 - II. Windows as a structuring element of applications. Callback functions. Events. Event-oriented programming. MVC paradigm and data-view relationship.
 - III. Encapsulation of API in C ++. Concrete example of window encapsulation.
 - IV. Resources in the Win32 computational model. Examples of icons, menus, dialog-boxes, and string tables.
- g. I / O layer in systems. Structure. Device drivers.
- h. File systems on mass storage peripherals
 - I. Fundamental concepts of file systems
 - II. Case studies: FAT (variants), EXT2FS-EXT4FS (Variants), NTFS.

2. Laboratory component

The practical classes follow the programming language for the Windows platform

- a. The. Development practice for Windows platform on Win32. Deepening the concepts given in theory, including
 - I. Unicode applications.
 - II. Creation and management of processes.
 - III. Registry.
 - IV. Multithreaded programming
 - V. Synchronization mechanisms
 - VI. Mechanisms of communication. Named pipes. Client-server applications. API for overlapped I/O.
 - VII. Memory-mapped files
 - VIII. Dynamic Libraries DLL
 - IX. Security mechanisms API.
 - X. NT Services.
 - XI. Creation of applications with graphic interface. Events and event loop. Interface elements. Dialog boxes. Menus. Resources.

Signature of Teacher:__

Bibliography

- Windows System Programming (4th edition) Johnson M. Hart, Addison-Wesley, 2010
- Operating Systems Concepts (6th Ed.), Silberschatz & Galvin, Addison-Wesley
- Fundamentos de Sistemas Operativos (3ª Ed.), José Alves Marques; Paulo Guedes, Editorial Presença
- Inside Windows NT (2nd Ed.), David A. Solomon, Microsoft Press; 1998
- · Windows NT 4 Programming, Herbert Schildt, Osborne McGraw Hill; 1997

Access Conditions and Attendance Excuse

Class attendance is not compulsory. As such does not apply to the figure of obtaining or dispensing of frequency. The approval in the discipline is described in the evaluation methodology.

Conditions for Exam Admission

There is no evaluation component during the semester that may affect access to the exam.

However, in addition to the general requirements in force in the school, it is foreseen the previous and obligatory registration in the examination via moodle. This registration has nothing to do with the registration in the discipline at the school registrar, which is always mandatory.

Registration in moodle aims to manage the resources needed for the exam. In accordance with the regulations of the school, the teacher may deny access to the examination to students who have not registered. It should be noted again that this registration has nothing to do with registration at the school registrar (always necessary).

Evaluation Method

The evaluation shall consist of the following elements:

- A written test of 14 values in 20, compulsory. This test consists of:
 - o Practical part: with consultation controlled / provided by teachers.
 - Theoretical part: without consultation.

The written test:

- o It has a minimum of 30%.
- The written test is indivisible. The grades of one part cannot be used to complement the other part at another time.
- A practical work of 6 values in 20 with the following characteristics:
 - The work can be done individually or in groups of two students and is subject to individual defense.
 Defense is mandatory. The authenticity of the authorship of the work will be put to the test. In case of fraud the student will lose the grade of the work and the situation will be known to the presidency for application of additional measures considered appropriate.
 - o The work is structured in two goals whose details and delivery dates are defined in the work statement
 - In goal 2 the work is evaluated in its entirety. The goal 1 grade conditions the final grade of the work as follows: the goal 1 grade ranges from 0.8 to 1.0, with the final grade on goal 2 multiplied by the goal 1 grade.
 - The work has a minimum of 30%, is mandatory, and is not replaceable by additional questions in the written test (the exam is always for 14 values).
 - The work is done during the semester and delivered in goals 1 and 2. There are no alternative calls or epochs to hand in the work. The grade obtained is valid for all calls of the school year.
 - The work grades for the academic year 2017/18 can be used as long as they have a mark of 50% or more. This use is not automatic and presupposes the explicit expression of interest by the interested students via moodle in due time

Conditions for Results Improvement

The general rules in force in the school, plus the result of what was described in the topic Evaluation Methodology

Date 21 / 01 / 2019

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Signature of Teacher:

Licenciatura – Engenharia Informática (Diurno, Pós-Laboral e Curso Europeut

Licenciatura – BsC Informatics Engineering, Informatics Engineering – evening classes, European Computer Science

Academic Year: 18/19

Program Contents

Course U	nit	MODELI	NG AND DE	SIGN		
Specializa	ation (s) APPLICA	TIONS DEV	ELOPMENT; INF	ORMATION SYSTEMS	
Subject ty	/pe	Specialization	Resear	ch Area Software	Engineering	
Year	2	Semester	2		ECT	S 5
Working H	lours				Unaccompanied Working Ho	urs
Activity Typ	pe		Working Hours Per Week	Total Hours	Activity Type	Total Hours
Theoretical		es el l'octuros	2	28	Study Works / Group Works	40
Practical-La	aborato	ry Lectures	2	28	Project	50,5
Tutorial Ori Project	ientatior	1			Evaluation Additional	2
Total of Working Hours		Hours	133,5			
Lecturer						
Activity Typ	pe			Name	Qualifications	Category
Theoretical Lectures		es	Carlos Pereira		Phd	Coordinator Professor
Theoretical	l-Practic	al Lectures				
Practical-Laboratory Lectures		Maria Armanda Correia Francisco Leite		MSc MsC	Adjoint Professor Assistant Professor	
Tutorial Ori Project	ientatior	1				
Responsib	ole(s) Le	ecturer (s)	Carlos Pere	ira		

Goals

This curricular unit focus on the various paradigms of programming and analysis, in particular object-oriented analysis represented through appropriate diagrams and documents. Students should learn how to model the organization business requirements, information system and its functional and non-functional requirements, using the UML modeling language.

Skills

- Describe and understand the evolution of paradigms of software analysis and construction using the UML 1. diagrams - to describe organizations, processes, static structure of software and dynamic behavior of the system.
- Correctly interpret UML diagrams 11.
- III. Perform an object-oriented analysis of a system
- IV. Identify and correctly represent the requirements of an organization using appropriate diagrams.
- Construct UML diagrams suitable for the detailed description of a software solution. V.
- VI. Evaluate the implications of architectural options in software development.
- VII. Creating UML diagrams suitable for general analysis of a system

VIII. Develop innovative projects with a reasonable degree of autonomy.

Signature of Teacher:_

Program Contents

- 1. Introduction to Software Engineering Software Development Processes Requirements Engineering Development Verification and Validation Object Oriented Analysis
- 2. Introduction to the UML
- 3. Use Cases Diagrams
- 4. Activity Diagrams
- 5. Class Diagrams
- 6. Object Diagrams
- Sequence Diagrams
- 8. Communication Diagrams
- 9. Component Diagrams
- 10. Installation Diagrams
- 11. Software Patterns

Bibliography

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- UML Distilled, Martin Fowler, 3^a Edição, 2004;
- UML Metodologias e Ferramentas CASE, A. Silva, C. Videira, 2ª edição, 2008;
- Fundamental de UML / Mauro Nunes, Henrique O'Neill, 5º edição, Lisboa : FCA Editora de Informática, 2004;
- UML : guia do usuário / Grady Booch, James Rumbaugh, Ivar Jacobson, Editora Campus, 2000;
- Patterns in Java : a catalog of reusable design patterns illustrated with UML / Mark Grand, New York : John Wiley, 1998;
- Slides das aulas teóricas e laboratoriais.

Access Conditions and Attendance Excuse

Without special conditions

Conditions for Exam Admission Without special conditions

Evaluation Method

Theoretical component– 10 values (Written examination) Practical Component – 10 values (Software Project)

Conditions for Results Improvement

Without special conditions



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Signature of Teacher:______

Licenciatura – BsC Engenharia Informática Licenciatura – BsC Informatics Engineering

Licenciatura – BsC Engenharia Informática (Pós-Laboral) Licenciatura – BsC Informatics Engineering (Evenning Classes)

Licenciatura – BsC Engenharia Informática –Curso Europeu Licenciatura – BsC Informatics Engineering (European Computer Science)

Academic Year: 2018/2019

Program Contents

Course Unit Specialization (s)	OBJECT	ORIENTED	PROGRAMMING		
Subject type Spec	ciality nces		Research Area	Informatics Engineering	
Year 2	Semester	1		ECTS	5
Working Hours		Working		Unaccompanied Working Hours	
Activity Type		Hours Per Week	Total Hours	Activity Type	Total Hours
Theoretical Lectures	ectures	1	14	Study Works / Group Works	36 18 5
Practical-Laboratoty L	ectures	4	56	Project	10,0
Tutorial Orientation Project			2 3	Evaluation Additional	4
Total of Working Ho	urs		133,5		
Lecturer					
Activity Type			Name	Qualifications	Category
Theoretical Lectures		Maria Arm	anda Correia	Master	Prof. Adjunta
Theoretical-Practical	Lectures				
Practical-Laboratoty L	Lectures	Ana Alves		PhD	Prof Adjunta
		Francisco	Pereira	PhD	Prof. Adjunto
		João Durã	es	PhD	Prof. Adjunto
		Maria Arm	anda Correia	Master	Prof. Adjunta
Tutorial Orientation Project					
Responsible(s) Lect	urer (s)	Maria Arm	anda Correia		

Goals

Learning object-oriented programming in C ++, correctly using the encapsulation, inheritance and polymorphism mechanisms and the fundamental concepts of the STL library.

Development of C ++ programs, applying the mechanisms of object-oriented programming, taught in the theoretical component.

Skills

Knowledge and understanding

A1. Identify the concept of class, variable members, member functions, access levels, constructors, and destructors.

A2. Identify the problems raised about classes that have members that are pointers to dynamic memory.

- A3. Understanding the concept of compositionI
- A4. Understand the concept of inheritance.
- A5. Understand the concept of polymorphism.
- Knowledge Application

B1. Analyze real situations and correctly identify existing entities and the relationship between them, materializing them in C++ classes.

B2. Develop applications in C++ defining the necessary classes and relating them using the mechanisms of composition, inheritance and polymorphism.

Decision Making

C1. Justify the classes defined under an application and their relationships.

Evaluating a Solution

D1. Evaluate the class structure proposed to a problem, demonstrating critical attitude.

Communication

E. 1. Produce technical and user manual reports for the developed applications.

E. 2. To present and explain the projects developed in a clear way.

- Self-learning skills
 - F1. Explore unteached aspects related to the development of practical work.
 - F2. Develop new applications from incomplete information.

Program Contents

General Introduction to C++ language Standard input and output Predefined types Cast

References Constants

Functions

Inline functions Overloaded functions Functions with default arguments Situations of ambiguity

Classes

Structures Member functions Accessibility levels Constructors Destructors Inline Members functions Static members Constant member functions Friend functions Objects in dynamic memory Overloaded Operators Conversions

Constructors and conversions Conversion operator Classes with members that are pointers to dynamic memory and composition Destructor Assignment operator Copy construcor Composition of objects Inheritance Polymorphism Upcasting Virtual functions Abstract classes and pure virtual functions Overloaded and redefined virtual functions in derived classes Virtual Destructors Exceptions Introduction to templates and STL library

Bibliography

- ECKEL, B., Thinking in C++ Volume 1, (2nd edition), 2000, Prentice Hall Inc., http://www.bruceeckel.com/
- STROUSTROUP, B., The C++ Programming Language, 2000, Addison Wesley Professional
- LIPPMAN S.B.; LAJOIE J.; MOO B:E:, C++ Primer (4th edition), 2005, Addison-Wesley
- DEITEL H. and DEITEL P., C++ How to Program, 2005, (5th edition), Prentice Hall Inc.
- BROKKEN F. B., C++ Annotations Version 5.2.2, 2003, Published at the University of Groningen

Access Conditions and Attendance Excuse

Do not exist because there is no frequency requirement for classes

Conditions for Exam Admission

They don't exist. All students have access to exam

Evaluation Method

The final classification results from the weighted average of a written component and a practical component, with weights of 70% (14 values in 20) and 30% (6 values in 20), respectively.

The written component is a "closed book" exam.

A grade equal or higher than 35% is required in the exam. A grade less than 35% in the exam implies the failure to the discipline.

It is given the chance to replace 1 value of the 14 attributed to the written exam by the realization of a practical test, in the laboratory classes, in the week of November 5 to 9. In this case, the exam has a weight of 13 values in 20 and the practical tests have the weight of 1 values in 20.

The practical component results from the classification obtained in practical work delivered in two phases (November 25, 2018 and January 1, 2019).

The defense of the practical work is mandatory in the two phases.

The grade of the practical work done during the semester will be considered in all the exam periods in the academic year of 2018/2019.

Conditions for Results Improvement

No restriction is placed, and the improvement of the grade to the discipline is possible according to the legislation.

Date

19/10/2018

Paria Annando baspan Mayeres Costars



Instituto Superior de Engenharia de Coimbra www.isec.pt Licenciatura – Engenharia Informática (Diurno, Pós-Laboral e Curso Europeu))

Licenciatura – BsC Informatics Engineering (D,PL,ECS)

Academic Year: 2018/2019

Program Contents

Course Unit INTROD	UCTION TO	ARTIFICIAL INTI	ELLIGENCE	
Specialization (s) COMMO	N CORE			
Subject type Core	Researc	Artificial Artificial	Intelligence	
Year 2 Semester	• 1		ECTS	5 5
Working Hours	Working		Unaccompanied Working Hou	rs
Activity Type	Hours Per Week	Total Hours	Activity Type	Total Hours
Theoretical Lectures Theoretical-Practical Lectures	2	28	Study Works / Group Works	45 30.5
Practical-Laboratory Lectures Tutorial Orientation Project	2	28	Project Evaluation Additional	2
Total of Working Hours		133,5		
Lecturer				
Activity Type		Name	Qualifications	Category
Theoretical Lectures	Carlos Perei	ra	Phd	Coordinator Professor
Theoretical-Practical Lectures Practical-Laboratory Lectures Tutorial Orientation Project	Anabela Simo Nuno Martine	ões s	Phd MsC	Adjoint Professor Adjoint Professor
Responsible(s) Lecturer (s)	Carlos Perei	ra		
Goals				

This curricular unit focuses on the introductory concepts of Artificial Intelligence field. The main objectives are:

- Acquire knowledge on the area of Artificial Intelligence.

- Provide an overview of the application of artificial intelligence techniques in real life.

- Understand and apply complex problem solving algorithms.

Skills

- Identify the main paradigms of artificial intelligence.
- Analyze an optimization problem, identify its characteristics and identify the basic methodologies for its resolution.
- Recognize the advantages and limitations of using problem-solving algorithms.
- Justify the main options taken during the development of intelligent algorithms.
- Enhance the autonomous development of new problem-solving strategies.

Program Contents

- I. Artificial Intelligence Overview
- II. Rational Agents and Problem Solving
- III. State Space Search Methods
 - Uninformed Research
 - Heuristic Search
- IV. Solution Space Search Methods
- V. Evolutionary Computing Algorithms
- VI Game Playing Algorithms
- VII Learning with Neural Networks

Bibliography

- S. Russell e P. Norvig: "Artificial Intelligence: A Modern Approach", Second edition, Prentice-Hall, 2003.
- E. Costa e A. Simões: "Inteligência Artificial: Fundamentos e Aplicações", 2ª edição, FCA Editora de Informática, 2008.
- Nils J. Nilsson, Artificial intelligence : A new synthesis, San Francisco, CA : Morgan Kaufmann Publishers, Inc., cop. 1998

Complementary references:

- Tom Tom M. Mitchell, Machine learning , New York : McGraw-Hill, 1997
- Z. Michalewicz e D. Fogel: "How to Solve It: Modern Heuristics", Second edition, Springer, 2004.
- Simon Haykin, Neural networks : a comprehensive foundation Macmillan College Publishing Company, cop. 1994
- E. Aiben, J. Smith: "Introduction to Evolutionary Computing", Springer, 2003.
- R. Poli, W. Langdon e N. McPhee: "A Field Guide to Genetic Programming", 2008.

Access Conditions and Attendance Excuse

Without special conditions

Conditions for Exam Admission

Without special conditions

Evaluation Method

Theoretical-Practical component– 12 values Written examination Laboratorial Component – 8 values Practical assignment n. 1 – Rational Agents (2 values) Practical assignment n. 1 –Genetic Algorithms (6 values) (Due dates: 22/10/18 and 01/01/19)

Conditions for Results Improvement

Without special conditions

Date

17/9/18

Jon Cr



Signature of Teacher:_____

Instituto Superior de Engenharia de Coimbra www.isec.pt Licenciatura – BsC Engenharia Informática / Engenharia Informática Pós Laboral / Engenharia Informática Curso Europeu

Licenciatura – BsC Informatic Engineering, Informatic Engineering *pos-laboral*, Informatic Engineering European Course

Academic Year: 2018 / 2019

Program Contents

Course Unit	OPERAT	ING SYSTEI	MS		
Specialization	(s) COMMO	N TO ALL			
Subject type	Mandatory	Researc	ch Area	Informatic Engi	neering
Year 2	Semester	1		ECTS	5
Working Hours				Unaccompanied Working Hours	
Activity Type		Working Hours Per Week	Total Hours	Activity Type	Total Hours
Theoretical Lectu Theoretical-Pract	ires ical Lectures	2	28	Study Works / Group Works Project	23,5 50
Tutorial Orientation Project	on	2	20	Evaluation Additional	4
Total of Working	g Hours		133,5		
Lecturer					
Activity Type			Name	Qualifications	Category
Theoretical Lectu Theoretical-Pract	ires ical Lectures		João Durães	PhD	Prof. Adjunto
Practical-Laborat	oty Lectures		José Luis Nunes Luis Santos	Lic (pre-Bologna) MsC	Assistante Conv Prof. Adjundo.
Tutorial Orientation Project	on				
Responsible(s)	Lecturer (s)		João Durães	•	

Goals

The aim of the course is to provide students with knowledge about the operation of current operating systems, with particular emphasis on Unix systems and operating and development practice for these systems.

Skills

Skills to be achieved by students in this discipline:

- Understand, explain and justify the internal operation of modern operating systems
- Understand, explain and plan the operation and management of Unix / Linux systems
- Understand, plan, explain, and justify the development of C applications for the Unix platform

Signature of Teacher:____

Program Contents

The program of the course is organized into four themes:

- Introduction and operation of the system and Unix environment.
- Unix and programming in Bash commands.
- Development Unix applications in C.
- Theoretical foundations operating systems.

The order of the topics is as follows.

Theoretical classes: Introduction and operation of the system and Unix environment. Development of Unix applications in C. Theoretical foundations operating systems. Unix and programming in Bash commands.

Practical classes: Development of Unix applications C preceded by a brief introduction to Unix commands for file system, Unix commands and programming in Bash.

Description of the thematic content

Introduction and operation of the system and Unix

Basic concepts and mechanisms underlying the operation of the Linux configuration point of view.

- Startup and operation of the system: firmware, BIOS, disk and loader.
- Standard BIOS / MBR and UEFI / GPT. Partitioning and multi-boot. execution sequence in the boot process.
- Partitions and file systems. Swap partition.
- Typical Unix system files.
- Protection and file permissions in Unix. Users, and groups. Files etc / passwd, etc / shadow and etc / group. Key aspects in the
 protection of files and users.
- sudo mechanisms. Setuid bit.
- Configuration basics of Linux. file systems, task scheduling, sudoers, system startup. Customizing the console on the desktop. Fstab file, crontab, sudoers, .profile and .bashrc.

Unix commands and programming in Bash

Introduction to the system and topics of using the Unix / Linux on the user's point of view and administrator command line system.

- The Unix system the user's point of view. i) architecture and key components, ii) System startup, iii) the login process, iv) File System
- Unix commands to i) manipulation of files and directories, ii) management processes, iii) Management of users iv) extraction and manipulation of information in text files structured, v) Domain.
- Programming Script Shell (Bash)

Development Unix applications in C.

Introductory aspects and fundamental nature of application development for Unix environment.

- Build process. Source files, object library and executable. library functions and system.
- Programs and processes. Creation processes. fork and exec mechanisms. Processes management. PID.
- Signals. simple synchronization mechanisms with signs. Application Examples
- IO Unix. Files and file table. Domain and anonymous pipes.
- Unix named pipes. Applications on client server model. Synchronous and asynchronous operation.
- Multithreaded programming in Unix
- Simple synchronization with binary semaphores

Theoretical foundations operating systems.

theoretical concepts of operating systems including 1) topics of a general nature, 2) architecture, 3) implementation of topics, 4) management processes, 5) memory management.

Signature of Teacher:_____

- 1 General concepts.
 - Objectives of operating systems.
 - Programs, processes and threads.
 - Types of systems: parallel, distributed, virtual and real time.
 - Architecture operating systems: monolithic systems, layered, client server. Virtual machine. Layering separation of duties and responsibilities. Features, advantages and disadvantages.
 - · Core operating systems. Structure and assigned responsibility.

2 multi-task programming topics and exisitng

- multi-threaded programming. Computational model.
- Synchronization: problems and solutions. Logical latches and binary semaphores.

3 implementation Topics systems

- Implementation processes.
- · execution modes. Core space and user space
- Interruptions control. Types of interruptions: exceptions, traps and interrupts, and their implementation.
- System calls. Implementation of system calls.
- Unix signals implementation.
- · Implementation of logic latches and semaphores

4 Management processes

- Historical overview of the types of system and type of scheduling: batch systems, spooling, multi-programmed cooperative, multiprogrammed pre-emptive.
- · Preemptive systems and not preemptive systems.
- State and lifecycle processes.
- Performance indicators.
- Scheduling algorithms: round robin, priorities, Multilist, static and dynamic priority, shortest job next, Scheduling by guarantee, parameterization, by scaling levels. Scalability.

5 Memory Management

- Fundamental concepts of memory management.
- Real address. Problems and solutions. Limitations of these solutions.
- virtual addressing. segmented address, paged, segmented-paged and paged through levels.
- Protection and insulation between processes. Mapping files and libraries. internal and external fragmentation size of programs.
- Memory allocation algorithms pages and segments. Algorithms First-fit, next-fit., Best-fit., Worst-fit. Buddy-Binary.
- transfer algorithms: application need and anticipation.
- Replacement Algorithms. optimal algorithms, FIFO, NRU, LRU and variants.
- The workspace model and performance improvement techniques.

Bibliography

- Operating Systems Concepts, Silberschatz & Galvin,
- Operating Systems: Internals and Design Principles (3rd Ed.), William Stallings, Prentice-Hall;

- Fundamentos de Sistemas Operativos (3rd Ed.), José Alves Marques; Paulo Guedes. Editorial Presença
- Sistemas Operativos (3rd Ed.), José Alves Marques, Paulo Ferreira, Carlos Ribeiro, Luís Veiga, Rodrigo Rodrigues, FCA, 2009
- Beginning Linux Programming, 4th Ed., Neil Matthew, Richard Stones, Alan Cox
- The Linux System Administrators' Guide, Lars Wirzenius, The Linux Documentation Project

Access Conditions and Attendance Excuse

Class attendance is not compulsory. The figure of obtaining or dispensing of frequency does not apply. The approval in the subject is described in the evaluation methodology

Conditions for Exam Admission

In addition to the general requirements in force in the school, it is obligatory to register in the examination via moodle. This registration has nothing to do with the registration in the discipline and in the evaluation periods made at the office, which is always mandatory.

Registration in moodle aims to manage the resources needed for the exam. In accordance with the regulations of the current school, the teacher may deny access to the examination to students who have not registered. It should be noted that this registration has nothing to do with registration at the office (always necessary).

Evaluation Method

The assessment consists of written examination and practical work:

- Written test: weight of 15 values, mandatory.
 - o There may be consultation, which will be indicated by the teachers via moodle.
 - o The exam has a minimum of 35%. Failure to obtain the minimums implies failure in the course.
 - The grade of the written test of an epoch can be used for other times of the same school year if you have obtained the minimums.
 - The exam is always quoted for 15 values.
- Practical work: weight of 5 values
 - The work can be done individually or in groups of two students and is subject to a mandatory individual defense. The defense can greatly affect the grade of the work.
 - The work is organized in 3 deliveries. Failure to meet the objectives stipulated for a delivery will implies the loss of the value given for that delivery.
 - o Dates for each delivery/goal are: 1: 28 / Oct / 2018 2: 2 / Dec / 2018, 3 1 / Jan / 2019.
 - The works of the year 17/18 that have obtained the classification of obtained 50% or more are accepted.
 - The use of the work of 17/18 will only be done upon the request expressed by interested students via moodle mechanism in date and term to be announced. After the closure of this mechanism, no further applications are accepted.
 - The delivery and correction of 18/19 work automatically excludes a 17/18 work, even if the grade of the new work is lower.
- Practical work in the various evaluation periods:
 - o Practical work can only be done during the semester and is delivered to the regular season.
 - o The exam is always quoted to 15, regardless of whether or not the student has the practical work.
 - The work done at the normal time is valid for all times this school year.
- The detection of fraud in the practical work (plagiarism or work done by third parties) will imply the loss of work and the possibility of doing so throughout the entire school year.
- Once done, the work is valid for the remaining epochs of the academic year

Conditions for Results Improvement

The general rules in force in the school, added with the conditions resulting from what was described in the topic Evaluation Methodology.

Date

Signature from the lecturer responsible for the course

10/09/2018



Rúbrica Docente:

Licenciatura em Engenharia Informática Licenciatura em Engenharia Informática – PL

Licenciatura em Engenharia Informática – CE

Ano Letivo 2018/2019

Ficha de Unidade Curricular

Unidade Curricular BASES DE DADOS Ramo(s) Área Científica Informática e Sistemas Natureza Curricular Obrigatória Ano 2 Semestre ECTS 5 1 Horas de Contacto 70 Horas de Trabalho não Acompanhado 63,5 Tipo de Actividade Horas Semanais **Total de Horas** Tipo de Actividade **Total de Horas** Teórico 2 28 Estudo Teórico-Prático Trabalhos / Trabalhos de Grupo 1 14 2 28 Prático / Laboratorial Projecto Avaliação Orientação Tutória Projecto Outra Total de Horas de Trabalho 133.5 Docentes Tipo de Atividade Habilitações Nome Categoria Teórico Fernanda Maria Brito Correia Mestrado **Professor Adjunto** Fernanda Maria Brito Correia Teórico-Prático Mestrado Professor Adjunto Prático e Laboratorial **Professor Adjunto** Fernanda Maria Brito Correia Mestrado Professor Adjunto João Pedro Costa Professor Adjunto Doutoramento Orientação Tutória Projecto **Docente Responsável** Fernanda Maria Brito Correia

Objetivos

Leccionar os conhecimentos básicos de bases de dados relacionais. Pretende-se que os alunos saibam fazer correctamente a especificação e a análise de uma base de dados, bem como desenvolver código SQL que permite a interação (consulta e alteração) de dados salvaguardados em bases de dados relacionais.

Competências

Objectivos/metas de aprendizagem Conhecimento e Compreensão

A.1. Identificar os conceitos normalização de dados.

A.2. Identificar os conceitos subjacentes às bases de dados relacionais.

Aplicação de Conhecimentos

B.1. Desenvolver código de interrogar com bases de dados.

B.2. Interrogar dados existentes em bases de dados

Tomada de Decisões Fundamentadas

C.1. Justificar as soluções propostas ao nível do projeto de análise de dados.

C.2. Justificar as soluções propostas ao nível interrogação de bases de dados.

Realização de Julgamento

D.1. Avaliar soluções usadas em bases de dados, demonstrando atitude crítica. *Comunicação*

E.1. Elaborar documentação apropriada no âmbito da análise de dados.

E.2. Produzir relatórios técnicos de interação com bases de dados relacionais.

E.3. Apresentar e explicar os projetos desenvolvidos de um modo claro.

Competências de Auto-aprendizagem

F.1. Desenvolver projectos inovadores, com elevado grau de autonomia, onde não se limitam a aplicar conceitos apreendidos nas aulas.

Objectivos do Trabalho

Conhecimento e Compreensão

A.1. Compreender as necessidades de informação e o fluxo de dados de um processo de negócio

A.2. Elaborar uma análise de dados de suporte para um processo de negócio

Aplicação de Conhecimentos

B.1. Desenvolver código de interrogar com bases de dados.

B.2. Interrogar dados existentes em bases de dados

Tomada de Decisões Fundamentadas

C.1. Justificar as soluções propostas ao nível do projeto de análise de dados.

Comunicação

E.1. Elaborar documentação apropriada no âmbito da análise de dados.

E.2. Produzir relatórios técnicos de interação com bases de dados relacionais.

E.3. Apresentar e explicar os projetos desenvolvidos de um modo claro.

Conteúdos Programáticos

1. Introdução às bases de dados.

Um exemplo.

Definição de um sistema de bases de dados.

Definição de bases de dados.

Independência dos dados.

Sistemas relacionais e outros.

2. Uma arquitectura para um sistema de gestão de bases de dados.

Os três níveis de arquitectura. O nível externo. O nível conceptual. O nível interno. O administrador da base de dados. O sistema de gestão de bases de dados.

3. Uma introdução às bases de dados relacionais.

Uma introdução às bases de dados relacionais. Sistemas relacionais. O modelo relacional. Optimização. O dicionário de dados. Tabelas base e vistas.

4. Domínios e relações.

Tipos de relações. Relações e predicados. Domínios e relações nas bases de dados relacionais.

5. Integridade dos dados relacionais.

Chaves candidatas, primárias e chaves alternativas. Chaves estrangeiras. Nulos. Chaves candidatas e nulos. Chaves estrangeiras e nulos.

6. Vistas.

7. A linguagem SQL

Noções básicas de SQL. Junção. Funções SQL. Ordenação e agrupamento. Subqueries. Gestão de tabelas. Constraints. Restrições de integridade. Manipulação de dados. Vistas.

8. O modelo entidade/relacionamento.

9. Dependências Funcionais.

Definições básicas. Dependências triviais e não triviais. Fecho de um conjunto de dependências Fecho de um conjunto de atributos. Conjunto irredutíveis de dependências.

10. Normalização: 1FN, 2NF, 3FN, BCNF

Decomposição sem perda e dependências funcionais. Primeira, segunda e terceira formas normais. Preservação da dependência. Forma normal Boyce/Codd

11. Recuperação e Concorrência.

Recuperação. Concorrência.

Bibliografia

CORREIA, Fernanda Brito - Apontamentos de Bases de Dados, 2018 – <u>http://moodle.isec.pt</u> CONNOLLY, Thomas M., BEGG, Carolyn E. - *Database Systems: A Practical Approach to Design, Implementation and Management*, 2009 COUCHMAN, J. S.; MARISETTI, S. N. - *Oracle9i database: fundamentals I exam guide*, Osborne/McGraw-Hill, 2002 DAMAS, L. - *SQL*, FCA, 2005 DATE, C. J. - *An Introduction to Database Systems*, Addison- Wesley Publishing Company, 2004 ELMASRI, R.; NAVATHE, S.B. - *Fundamentals of Database Systems*, Addison-Wesley Publishing, 2010 GOUVEIA, F., Fundamentos de Bases de Dados, FCA, 2015 RAMAKRISSHNAN, R. - *Database Management Systems*, McGraw-Hill, 2009 RODRIGUES, António - *Oracle 10g e 9i : fundamentos para profissionais*, FCA, 2005 VELPURI, R. - *OCP Oracle9i database: fundamentals II exam guide*, Osborne/McGraw-Hill, 2002 LINKS ÚTEIS: a. Curso de SQL. - <u>www.sqlcourse.com</u> b. Curso de SQL avançado. - <u>www.sqlcourse2.com</u>

- c. Informações sobre o Oracle.- http://www.oracle.com/technology/index.html
- d. Informações sobre o Power Designer.http://www.sybase.com/products/enterprisemodeling/powerdesigner/techsupport

Condições de Obtenção e Dispensa de Frequência

Não aplicável.

Condições de Acesso a Exame

Todos os alunos têm acesso a exame, obtendo aprovação desde que cumpram os requisitos descritos em Metodologia de Avaliação.



Metodologia de Avaliação

A disciplina de Bases de Dados é constituída por 3 módulos:

i) SQL (7 valores) – de 0 a 20 valores

ii) Modelo Entidade-Relacionamento (4 valores) – de 0 a 20 valores

iii) Normalização; Recuperação e Concorrência; restante matéria (5 valores) – de 0 a 20 valores

A avaliação de Bases de Dados I, poderá ser feita por partes ou num todo:

- a) Exame Escrito: 16 valores de 0 a 20 valores
- b) Trabalho Prático: 4 valores (mínimo 50%) de 0 a 20 valores
- c) As presenças nas aulas laboratoriais são obrigatórias tendo como limite mínimo dois terços do número de aulas total (excepto situações previstas na lei).

No final de cada módulo i) e ii) haverá um teste de avaliação.

- d) Teste 1 (Entidade-Relacionamento): 4 valores de 0 a 20 valores
- e) Teste 2 (SQL): 7 valores de 0 a 20 valores

Os exames escritos englobam a matéria toda. Os alunos que tiverem nota nos testes poderão ser dispensados de fazer esse módulo nos exames.

A última nota obtida em cada módulo prevalece sobre as notas anteriores (mesmo que seja inferior).

Os itens de avaliação a), b) e c) são obrigatórios para obter aprovação na disciplina. O exame escrito é sem consulta.

O trabalho prático é válido apenas para um ano lectivo.

A classificação obtida no trabalho prático será utilizada em todos as avaliações do ano lectivo (normal, recurso, especial e outras). **Não há novas edições nem melhoria de nota no trabalho prático**.

Existem documentos sobre a avaliação e trabalho prático. Existem modelos de relatórios para o trabalho prático.

Prazos a Cumprir

30/09/2018 – Entrega da constituição dos grupos e a proposta dos temas com uma especificação preliminar de ½ página por tema.

14/10/2018 – Entrega da especificação inicial e protótipos.

04/11/2018 - Checkpoint 1

20/11/2018 – Teste ER.

02/12/2018- Checkpoint 2

18/12/2018 – Teste SQL.

03/01/2019 – Entrega da documentação do trabalho.

Condições de Melhoria de Classificação

Para melhoria de nota apenas será considerado o exame escrito mantendo-se a nota obtida no trabalho prático em todas as épocas de exame.

Data

Assinatura do Docente Responsável pela Unidade Curricular

17/09/18

ferrade Janie Bot Conny



Instituto Superior de Engenharia de Coimbra www.isec.pt Signature of Teacher:__

Licenciatura – BsC Engenharia Informática (Português) Licenciatura – BsC Engenharia Informática- PL Licenciatura – BsC Engenharia Informática - CE

Licenciatura – BsC Informatics Engineering (Inglês) Licenciatura – BsC Engenharia Informática- PL Licenciatura – BsC Engenharia Informática - CE

Academic Year: 2018/2019

Program Contents

000

Course Specia	Unit Iization	DATABA: (s)	SES				
Subject	type	mandatory	Resear	ch Area		Informatics	
Year	2nd	Semester	1st			ECTS	5 5
Working	g Hours				Unaccompan	ied Working Hou	s
Activity	Туре		Working Hours Per Week	Total Hours	Activity Type		Total Hours
Theoreti Theoreti Practica Tutorial Project	ical Lectu ical-Pract I-Laborat Orientatio	res ical Lectures ory Lectures on	2 1 2	28 14 28	Study Works / Group Project Evaluation Additional	Works	
Total of	Working	Hours		133.5			
Lecture	r						
Activity	Туре			Name		Qualifications	Category
Theoreti Theoreti	ical Lectu ical-Pract	res i cal Lectures	Fe Fe	rnanda Maria Brit rnanda Maria Brit	o Correia o Correia	Mestrado Mestrado	Professor Adjunto Professor Adjunto
Practica	I-Laborat	ory Lectures	Fe	rnanda Maria Brit João Pedro Co	o Correia osta	Mestrado Doutoramento	Professor Adjunto Professor Adjunto Professor Adjunto
Tutorial Project	Orientatio	on					
Respon	lsible(s)∣	Lecturer (s)	Fernanda M	aria Brito Correia	(fernanda@isec.pt)		

Goals

Signature of Teacher:

Teaching the basics of relational databases. It is intended that students know how to do correctly the specification and analysis of a database, as well as develop SQL code that enables the interaction (query and change) of relational databases data.

Skills

Objectives/learning goals

Knowledge and understanding

A.1. Identify the concepts of data normalization.

A.2. Identify the concepts behind relational databases.

Application of knowledge

B.1. Develop code to interrogate databases.

B.2. Search existing data in databases.

Informed decision-making

C.1. Justify the solutions proposed at the level of the data analysis project.

C.2. Justify the proposed solutions to the database level queries.

Making of Judgment

D.1. Evaluate solutions used in databases, demonstrating critical attitude.

Communication

E.1. Prepare appropriate documentation in the field of data analysis.

E.2. Produce technical reports of interaction with relational databases.

E.3. Present and explain the projects clearly.

Auto-learning skills

F.1. Develop innovative projects, with high degree of autonomy, where not limited to apply concepts learned in class.

Objectives of the Work

Knowledge and understanding

A.1. Understand the needs of information and the data flow of a business process.

A.2. Develop a data analysis to support a business process.

Application of knowledge

B.1. Develop code to query databases.

B.2. Interrogating existing data in databases.

Informed decision-making

C.1. Justify the solutions proposed at the level of the data analysis project.

Communication

E.1. Prepare appropriate documentation in the field of data analysis.

E.2. Produce technical reports of interaction with relational databases.

E.3. Present and explain the projects clearly.

Program Contents

1. Introduction to databases.

- An example.
- Definition of a database system.
- Database definition.
- Data independence.
- Relational systems and others.

2. An architecture for a of database management system.

- The three architecture levels.
- The external level.
- The conceptual level.
- The internal level.
- The database administrator.
- The database management system.
- 3. An introduction to relational databases.
 - Relational databases.
 - Relational systems.

Signature of Teacher:

- Relational model.
- Optimization.
- The data dictionary.
- Base tables and views.

4. Domains and relations.

- Types of relations.
- Relations and predicates.
- Domains and Relations in relational databases.

5. Integrity of relational data.

- Candidate keys, primary keys and alternative keys..
- Foreign keys.
- Nulls.
- Candidate keys and nulls.
- Foreign keys and nulls.

6. Views.

7. The SQL language.

- SQL basic notions.
- Joins.
- SQL functions.
- Ordering and grouping.
- Subqueries.
- Tables management.
- Constraints. Integrity restrictions.
- Data manipulation.
- Views.

8. The entity relationship model.

9. Functional dependencies.

Basic definitions.

- Trivial and non-trivial dependencies.
- Closure of a dependency set.
- Closure of an attribute set.
- Irreducible set of dependencies.

10. Normalization: 1NF, 2 NF, 3 NF, BCNF

- Decomposition without loss and functional dependencies.
- First, second and third normal forms.
- Dependency preservation.
- Boyce Codd normal form.

11. Recovery and Concurrency.

- Recovery.
- Concurrency.

Bibliography

Signature of Teacher:_

CORREIA, Fernanda Brito - Apontamentos de Bases de Dados, 2018 - http://moodle.isec.pt

CONNOLLY, Thomas M., BEGG, Carolyn E. - Database Systems: A Practical Approach to Design, Implementation and Management, 2009

COUCHMAN, J. S.; MARISETTI, S. N. - Oracle9i database: fundamentals I exam guide, Osborne/McGraw-Hill, 2002 DAMAS, L. - SQL, FCA, 2005

DATE, C. J. - An Introduction to Database Systems, Addison- Wesley Publishing Company, 2004

ELMASRI, R.; NAVATHE, S.B. - Fundamentals of Database Systems, Addison-Wesley Publishing, 2010

GOUVEIA, F., Fundamentos de Bases de Dados, FCA, 2015

RAMAKRISSHNAN, R. - Database Management Systems, McGraw-Hill, 2009

RODRIGUES, António - Oracle 10g e 9i : fundamentos para profissionais, FCA, 2005

VELPURI, R. - OCP Oracle9i database: fundamentals II exam guide, Osborne/McGraw-Hill, 2002 LINKS ÚTEIS:

- a. SQL course. www.sqlcourse.com
- b. Advanced SQL course. www.sqlcourse2.com
- c. Oracle information.- http://www.oracle.com/technology/index.html

Power Designer information - <u>http://www.sybase.com/products/enterprisemodeling/powerdesigner/techsupport</u> Access Conditions and Attendance Excuse

Signature of Teacher:

Non applicable.

Conditions for Exam Admission

All students have access to the exam, obtaining approval if they fulfil the requirements described in the next section. All students have access to exam, obtaining approval provided they comply with the requirements described in the enxt section Evaluation Methodology.

Evaluation Method

Databases course consists of 3 modules:

i) SQL (7 values) – from 0 to 20 values

ii) Entity – Relationship Model (4 values) – from 0 to 20 values

iii) Normalization; Recovery and Concurrency; remaining subjects (5 values) - from 0 to 20 values

Databases can be done as a whole or by modules (except the practical work):

- a) Written exam: 16 values from 0 to 20 values
- b) Practical work: 4 values (minimum 50%) from 0 to 20 values
- c) Attendance of 2/3 of practical classes.

Assessment tests for modules i) and ii)

- d) Test 1 (Entity Relationship): 4 values from 0 to 20 values
- e) Test 2 (SQL): 7 values from 0 to 20 values

Exams are about all subjects. Tests grades can replace part of the exams.

Counts the last grade obtained in each module.

a), b) and c) are mandatory to get approval in this course. Written exam is without consultation..

Practical work is valid only for this academic year.

Only one edition of the practical work and cannot be improved.

There are documents about assessment and about the practical work. There are report models for the practice work.

Deadlines

30/09/2018 – Groups and themes proposal with a preliminar specification of ½ page by theme. 04/11/2018 - Checkpoint 1 20/11/2018 – ER test. 02/12/2018 – Checkpoint 2 18/12/2018 – SQL test. 03/01/2019 – Final documentation.

Conditions for Results Improvement

To improve the results it will only be considered the written exam (without the practical work) in all the exams of this academic year.

Date 17/9/18

famile fani Bilo Primi



Instituto Superior de Engenharia de Coimbra

www.isec.pt

Licenciatura em Engenharia Informática BsC in Informatics Engineering Licenciatura em Engenharia Informática – Pós-Iaboral BsC in Informatics Engineering (Evening Classes)

AR-

Academic Year: 2018/2019

Program Contents

Course Unit	OPERATIO	NS RESEAR	СН			-
Specialization (s)	NETWOR APPLICAT INFORMA	KS AND SY TION DEVE TION SYST	STEMS ADMIN LOPMENT 'EMS	ISTRATION		-
Subject type Basi	c Sciences	Researc	h Area Informa	atics Engineering		
Year 2 nd S	emester	1 st			ECT	S 5
Working Hours				Unaccompa	nied Working Hou	urs
Activity Type	H	Working Hours Per Week	Total Hours	Activity Type		Total Hours
Theoretical Lectures Theoretical-Practical Le Practical-Laboratoty Le Tutorial Orientation Project	ectures	2 1 2	28 14 28	Study Works / Grou Project Evaluation Additional	p Works	61,5 2
Total of Working Hou	rs		133,5		-	
			Nomo		Qualificationa	Catagoni
Activity Type Theoretical Lectures Theoretical-Practical Lectures Practical-Laboratoty Lectures		Teresa Raquel Corga Teixeira da Rocha Teresa Raquel Corga Teixeira da Rocha Pedro Nuno Castelo Madeira Afonso Joaquim José de Oliveira Sousa		PhD PhD PhD PhD PhD PhD	Assistant Prof. Assistant Prof. Coordinating Prof. Assistant Prof.	
Tutorial Orientation Project			×			
Responsible(s) Lectu	rer (s)	Teresa Raqu	el Corga Teixeira	da Rocha		

Goals

The main goals of this course is that students learn to translate simple decision and optimization problems into mathematical models of linear programming; to determine the optimal solution(s) of these models by applying one of the linear programming algorithms; and to interpret the solution(s) obtained from the mathematical model in the light of the real problem. It is also intended that students become able to implement computationally linear programming algorithms.

Skills

After attending this course, students must:

1 - Be able to translate simple optimization and decision problems into mathematical models of linear programming (LP);

2 - Understand the PL algorithms and know to apply the appropriate ones to solve this kind of problems;

3 - Be able to interpret the solutions obtained by the application of these algorithms to the mathematical models; 4 - Be able to computationally implement PL algorithms.

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Program Contents

Theoretical content:

- 1 Introduction to operations research
- 2 The linear programming (LP) model Examples of linear programming problems Formulating the mathematical model Graphical representation Particular cases
- 3 The Simplex method Introductory concepts Algorithm of the method in the tabular form The "Big M" and "Two Phases" methods Particular cases of the Simplex method
- 4 Duality and the dual Simplex method The dual problem Fundamental properties of duality The dual Simplex method
- 5 Particular problems of linear programming The problem of transportation

Theoretical-practical/practical content:

- Resolution of theoretical-practical exercises about the chapters that compose the theoretical program
- Computational implementation of PL algorithms using MatLab

Bibliography

Hillier, F.S., Liberman, G.J. "Introduction to Operations Research" - 10th Edition McGraw-Hill, 2014 (Pdf version available online)

Hamdy A. Taha. "Operations Research: an introduction" - 8th Edition Pearson Prentice Hall, 2007 (Pdf version available online)

Documents that support theoretical and practical classes (available on Moodle).

Access Conditions and Attendance Excuse

Not applied.

Conditions for Exam Admission

For accessing exam students should be properly enrolled in it.

Evaluation Method

The assessment consists in a final exam (20 points).

NOTE:

- · For the exam students can take a guery sheet consisting of an A4 page, with any information they consider to be relevant. The sheet is personal, so each student should build its own. It will not be allowed to share sheets during examinations.
- · The use of non-graphing calculators will be allowed during exams.

Conditions for Results Improvement

According to the current rules of our institution.

Date

10/09/2018

Tass Ragel C.T. Rocha



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Instituto Superior de Engenharia de Coimbra www.isec.pt Licenciatura – BsC <u>Engenharia Informática (Português)</u> Licenciatura – BsC <u>Engenharia Informática (Pós-Laboral)</u> Licenciatura – BsC <u>Engenharia Informática (Curso Europeu)</u>

Licenciatura – BsC <u>Informatics Engineering</u> (Inglês) Licenciatura – BsC<u>Informatics Engineering (Evening Classes)</u> Licenciatura – BsC <u>Informatics Engineering</u> (European Computer Science)

Academic Year: 2018/2019

Program Contents

Course Unit	INTRODU	JCTION TO	ON TO DATA NETWORKS			
Specialization	(s)					
Subject type	Specialized	Resear	ch Area	Informa	tics Engineering	
Year 2	Semester	1	a.	I	ECTS 5	
Working Hours				Unaccompanied Working	Hours	
Activity Type		Working Hours Per Week	Total Hours	Activity Type	Total Hours	
Theoretical Lectu Theoretical-Prac Practical-Labora Tutorial Orientati Project	ures tical Lectures toty Lectures ion	2	28 28	Study Works / Group Works Project Evaluation Additional	57.5 18 2	
Total of Working Hours		133.5				
Lecturer						
Activity Type			Name	Qualifications	Category	
Theoretical Lectu Theoretical-Prac	ures tical Lectures	José Ma	rinho	PhD	Professor Adjunto	
Practical-Laboratoty Lectures		José Rosado Diserdo Dereiro		PhD	Professor Adjunto	
Tutorial Orientati Project	ion	Theardo T	Ciciia	INISC	Assistence Convidado	
Responsible(s)	Lecturer (s)	José Ma	rinho			

Goals

This course aims at giving a global vision and understanding of the main characteristics and issues of data networks. It covers a wide range of subjects, from data transmission media and local area network technologies to TCP/IP distributed applications.

Skills

- The ability to identify the main concepts of data networks and explain and illustrate how data flows through the protocol stacks.
- The ability to understand and explain how local area networks can be built and well structured according to specific standards.
- The ability to understand and explain the internal details of most common TCP/IP application layer protocols.
- The ability to plan, implement and debug basic distributed applications that are based on the BSD sockets and run on Unix-based platforms.

Program Contents

- Standards in data communications
- The TCP/IP protocol stack
- Data transmission media.
- Structured cabling principles
- Ethernet technologies.
- Wired local area network technologies
- Wireless local area network technologies
- Designing and implementing distributed applications for TCP/IP networks using BSD sockets and the C programming language.

Bibliography

- Fernando Boavida, Mário Bernardes, TCP/IP TEORIA E PRÁTICA, FCA, 2012
- W. Richard Stevens, Bill Fenner, Andrew M. Rudoff, UNIX NETWORK PROGRAMMING, VOLUME 1: THE SOCKETS NETWORKING API, 3rd Edition, Addison-Wesley Professional Computing Series, 2003
- Edmundo Monteiro, Fernando Boavida, ENGENHARIA DE REDES INFORMÁTICAS, 10ª edição, FCA
- W. Richard Stevens, TCP/IP ILLUSTRATED VOLUME 1 (THE PROTOCOLS), Adison-Wesley, 1994
- Andrew S. Tanenbaum, COMPUTER NETWORKS, 4th edition, Prentice Hall, 2002
- Fred Halsall, DATA COMMUNICATION, COMPUTER NETWORKS AND OPEN SYSTEMS, Adison-Wesley, 1996
- JAMES F. KUROSE; KEITH W. ROSS, Computer Networking A Top-Down Approach, 6th Edition, Pearson, 2012
- Study material prepared by the teachers

Access Conditions and Attendance Excuse No requirements defined.

Conditions for Exam Admission

No requirements defined for taking final exams.

Evaluation Method

- A final theoretical exam (60% of final grade and minimum grade of 35%)
- Two laboratory assignments (40% of final grade)
- First laboratory assignment: October the 29th November the 2nd
- Second laboratory assignment: December the 17th December the 21st

Conditions for Results Improvement

Laboratory assignments and final exams can be attempted during retaking exams.

Date 12/10/2018

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Signature of Teacher:

Licenciatura – Engenharia Informática (Curso Europeu)

Bachelor – BsC European Computer Science

Academic Year: 2018/2019

Program Contents

Course Specia	e Unit lization	MATHEN (s)	IATICAL AN	ALYSIS II			
Subject	t type	Basic Science	Resear	ch Area		Mathematics	3
Year	1st	Semester	2nd			ECT	S 6
Working	g Hours				Unaccompani	ed Working Hou	Irs
Activity	Туре		Working Hours Per Week	Total Hours	Activity Type		Total Hours
Theoreti Theoreti Practica	ical Lectu ical-Pract	ires tical Lectures	2 2 1	28 28 14	Study Works / Group Project	Works	60 25
Tutorial Project	Orientatio	on	·	14	Evaluation Additional		5
Total of	Working	g Hours		160			
Lecture	er						
Activity	Туре			Name		Qualifications	Category
Theoreti	ical Lectu	ires	Arménio Ant	ónio da Silva Correia		Master	Adjunct Professor
Theoreti	ical-Pract	tical Lectures	Arménio António da Silva Correia Nuno Filipe Jorge Lavado Nuno Miguel dos Santos Baeta			PhD Master	Adjunct Professor Invited Assistant
Practical-Laboratoty Lectures		Arménio António da Silva Correia Nuno Filipe Jorge Lavado Nuno Miquel dos Santos Baeta					
Tutorial Project	Orientati	on					
Respon	sible(s)	Lecturer (s)	Arménio Ant	ónio da Silva Correia			

Goals

This course aims to teach:

- The role of mathematics as the fundamental science in engineering;

- The use of mathematical software, such as, Matlab, GeoGebra, Maple and MuPad;

- The use of mathematics as a tool for analytical reasoning in engineering.

Skills

At the end of this course, the student is expected to be able to:

- Develop skills of abstraction, demonstration, 3D visualization and representation, algorithm design and programming of numerical methods with Matlab;

- Understand and apply the studied topics of this course.

Signature of Teacher:

Program Contents

1st Part

Taylor polynomial and Lagrange's remainder: definition, applications and computational treatment in GeoGebra and Matlab. Introduction to Numerical Methods using Matlab. Brief reference to error theory: absolute and relative errors; rounding errors, truncations and others. Solutions of equations in one variable: the bisection method; Newton's method. Interpolation and Polynomial Approximation: divided differences. Numerical differentiation and integration: trapezoid rule and Simpson rule. Initial-Value Problems for Ordinary Differential Equations: Euler's Method and Runge-Kutta Methods.

2nd Part

Three-Dimensional Space. Rectangular coordinates in 3D-space; Magic Cube – viewport 3D; points; vectors; planes; spheres; cylindrical surfaces; quadric surfaces.

Real functions of two or more variables. Limits and continuity. Partial derivatives. Differentiability and chain rules. Tangent planes. Total Differentials. Directional derivatives and gradients. Maxima and minima of functions of two variables. Lagrange multipliers.

Multiple Integrals. Double integrals: double integrals over nonrectangular regions; double integrals in polar coordinates. Applications: area and surface area. Triple integrals. Applications: volume of solids; centroid; center of gravity. Triple integrals in cylindrical and spherical coordinates. Change of variables in multiple integrals..

Throughout the semester students learn to program in Matlab, including GUI's programming.

Bibliography

Correia, Arménio A. S., Sebenta de Análise Matemática II, ISEC, 2014 Glyn James, Modern Engineering Mathematics, Addison – Wesley Stanley, J., An Introduction to Differential Equations and Their Applications. McGraw-Hill Burden, Richard L., J. Douglas, Numerical Analysis, Pws-Kent Publishing Company Fausett, L.V., Applied Numerical Analysis Using Matlab, Prentice Hall Kreyszig, E., Advanced Engineering Mathematics, John Wiley & Sons

Access Conditions and Attendance Excuse

Not applicable. In addition to face-to-face classes, an e-Learning platform is used to provide content, discussion forums, training and evaluation lessons, as well as other activities and resources. The work developed complements the so-called "traditional" methods with the use of ICT: mathematical software, LMS platforms, cloud storage (e.g., box.net), GeogebraTube and ArmenioCorreia facebook page. Students are encouraged to use the available tools and collaborate actively and constructively in the MA2 learning community.

Conditions for Exam Admission

Access to the examination is allowed to all students enrolled in the curricular unit, according to the ISEC's rules of procedure (REACTA document).

Evaluation Method

There are two options:

First option: distributed assessment methodology

A midterm exam and/or a final written exam worth 60% of the final grade

Theoretical-Practical activities (written assignments and programming of mathematical methods) distributed over the semester worth 40% of the final grade

Second option: A midterm exam and/or a final written exam worth 100% of the final grade.

For purposes of calculating the final grade, weighted average of the tests and works, the student must have a minimum score of 6.0 (out of 20) on the exam. If students attend more than 70% of classes, 0.5 points are added to the final grade. If students attend office hours and/or participate in forums offered through e-learning platform more than 70% of classes, 0.5 points are added to the final grade. Students receiving a grade higher than 18 (on a grading scale of 1 to 20) a re required to do an extra written and/or oral test. If students choose not to do this extra test, the final grade will remain 18.

Conditions for Results Improvement

The conditions for results improvement are defined in the ISEC's REACTA document.

Date 21/01/2019



Licenciatura – BsC Engenharia Informática

Licenciatura – BsC Informatics Engineering

Academic Year: _2018 / 2019



Course Unit Specialization (s	ELECTRON NETWORK SYSTEMS	NICS S AND SYSTEM	IS ADMINISTRATIO	N, APPLICATIONS DE	VELOPMENT AND	INFORMATION
Subject type A	nalog Electron	ics Researc	Analog Ele ch Area Analysis	ectronics and Circuit		
Year 1	Semester	2			ECTS	6 4
Working Hours				Unaccompani	ed Working Hou	rs
Activity Type		Working Hours Per Week	Total Hours	Activity Type		Total Hours
Theoretical Lectures	S	1	14	Study		68
Practical-Practical Practical-Laboratory Tutorial Orientation Project	a Lectures / Lectures	2	28	Works / Group Project Evaluation Additional	Works	2
Total of Working H	lours		107			
Lecturer						
Activity Type			Name		Qualifications	Category
Theoretical Lectures	S		Acácio Amaral		Phd	Associate Professor
Practical-Laboratory	/ Lectures		Acácio Amaral		Phd	Associate Professor
Practical-Laboratory	/ Lectures		Amâncio Santos	5	Msc	Associate Professor
Practical-Laboratory	/ Lectures		Filipe Sá		Phd	Assistant Teacher
Practical-Laboratory	/ Lectures		Simão Paredes		Phd	Associate Professor
Practical-Laboratory	/ Lectures		Eunice Ribeiro		Phd	Assistant Teacher



Instituto Superior de Engenharia de Coimbra <u>www.isec.pt</u>

Goals

In the theoretical component students are expected to begin the study of several basic electrical quantities, using elementary electrical circuit analysis. Some techniques of circuit analysis are to be apprehended. The concepts of inductance and capacitance are introduced. Students will also study semiconductors in order to acquire knowledge about analysis of circuits with diodes, bipolar junction transistors and operational amplifiers.

Regarding the laboratory component, students are expected to acquire some competences resulting from the manipulation of electrical and electronic components in practical applications. Similarly, they should acquire skills in the manipulation of some electrical circuit simulation tools.

Skills

Knowledge and understanding

- A 1. Electrical quantities in DC and AC.
- A.2. DC circuit analysis techniques.
- A.3. Compute the transfer function of circuit with diodes.
- A.4. Analyze circuits with transistors, either in DC or AC.
- A.5. Analyze circuits with operational amplifiers and describe the process of converting a digital signal to an analog one.

Application of knowledge

- B.1. Handle electrical circuits (DC and AC).
- B.2. Design electronic circuits with diodes and transistors.
- B.3. Design analogic circuits that are able to process data.
- B.4. Use simulation software for electrical and electronic circuits.

Decisive decision-making

C.1. Design electrical and electronic circuits.

Judgment realization

D.1. Evaluate solutions used in an electronic assembly.

Communication

E.1. Produce technical reports.

E.2. Present and explain the projects developed in a clear way.

Self-learning skills

F.1. To develop innovative projects with a high degree of autonomy.

Program Contents

- 1. Introduction
 - · Definitions of basic electrical quantities: electric charge, current, voltage and power.
 - Fundamental elements of a circuit: sources, resistance, capacitor and inductor.
 - Electrical resistance, Ohm's law, Joule effect and superconductors.
 - Laws of Kirchhoff.
 - Analysis of elementary circuits: association of resistors and sources, voltage and current dividers.
- 2. Circuit analysis techniques
 - · Methods of Analysis:
 - Mesh analysis.
 - · Nodal analysis.
 - Supermesh currents.
 - Supernode.
 - Network Theorems:
 - · Superposition theorem.
 - Thevenin's theorem.

3. Inductors and Capacitors

- Inductors
 - Inductance.
 - Lenz's law.
- Capacitors
 - · Capacitance.
 - · Types of capacitors.

4. Semiconductors

- The atom.
- · Materials used in Electronics.
- Electron and hole.
- · Extrinsic and intrinsic semiconductors.
- N-Type semiconductor.
- P-Type semiconductor.
- PN junction Diode.

5. Diode

- Diode operation.
- V-I characteristic.
- · Diode model.
- · Circuit analysis.
- · Diode applications: rectifiers and diode limiting circuits.
- Special-purpose diodes: Zener diode.
- · Simple linear power supply with Zener diode.

6. Bipolar junction transistor

- Structure.
- · Basic operation.
- · Characteristic and operation.
- BJT as an amplifier.
- BJT AC models.
- Common-emitter amplifier.
- · Common-collector amplifier.
- Common-base amplifier.
- · Circuit analysis.

7. Operational amplifier

- · Differential amplifier.
- · Integrated circuits.
- Characteristics of amp-ops and schematic symbol.
- Circuit model.
- Characteristics of an Ideal amp-op.
- Ideal amp-op analysis.
- · Different types of feedback.
- Mathematical operations.
- Amp-op versus analog computer.

Bibliography

Acácio Amaral, Electrónica Analógica: Princípios, Análise e Projectos, Edições Silabo, 2017.

Acácio Amaral, Análise de Circuitos e Dispositivos Electrónicos, Publindústria, 2015 (2.ª edição).

Nilsson, Riedel, Electric Circuits, Pearson Prentice Hall, 2008.

Malvino, Princípios de Electrónica, McGraw-Hill, 2000.

Santos, Análise de Circuitos Eléctricos, Minerva, 1997.

Boylestad, Dispositivos Electrónicos e Teoria dos Circuitos, PHB, 1998.

Hayt, Kemmerly, Engineering Circuit Analysis, McGraw Hill, 1993.

J. Millman and A. Grabel. Microelectronics, Second Edition. McGraw-Hill International Editions, 1987.

Access Conditions and Attendance Excuse

It is not applied any restriction.

Conditions for Exam Admission

It will be necessary to obtain a minimum grade of 40% in the practical component.

Evaluation Method

In the final grade two components are considered:

- 1. Practical component:
 - · 6 practical assignments;
 - will have a weight of 30% in the final grade;
 - a minimum grade of 40% will be required.
- 2. Written component (a final exam or continuous assessment). It is not allowed to consult support material; however, students may use a calculator.
 - will have a weight of 70% in the final grade.
 - a minimum classification of 40% will be required.

Continuous assessment:

- It consists of two tests carried out during the semester, each one with a weight of 50% on the written component.
- a minimum grade of 40% will be required in the average of the two tests.
- The first test will be held on the 10th of April 2019 and will cover the first half of the program content.

• The second test will be held on the same day as the final exam (regular one) and will cover the second half of the program content.

Conditions for Results Improvement

There are no restrictions to improve the grade in the written exam.

Date 21/1/2019

Signature from the lecturer responsible for the course



Signature of Teacher:_



Instituto Superior de Engenharia de Coimbra www.isec.pt Licenciatura – BsC em Engenharia Informática – Ramos (Português)

Licenciatura – BsC Computer Science (Inglês)

Academic Year: 2018/2019

Program Contents

Course Unit COMP	OMPUTER TECHNOLOGIES AND ARCHITECTURES						
Specialization (s)							
Subject type	Research Area	Computer Science					
Year 1 Semest	er 2	ECT	`S 5				
Working Hours		Unaccompanied Working Hou	urs				
Activity Type	Working Hours Per Total Hours Week	Activity Type	Total Hours				
Theoretical Lectures Theoretical-Practical Lectures Practical-Laboratory Lectures	2	Study Works / Group Works Project	56 19				
Tutorial Orientation Project		Evaluation Additional	2,5				
Total of Working Hours	133,5						
Docentes							
Activity Type	Name	Qualifications	Category				
Theoretical Lectures Theoretical-Practical Lectures	Francisco Duarte	Master	Associate professor				
Practical-Laboratory Lectures	Cristina Chuva	PhD	Associate professor				
	Cristiana Areias	Master	Associate professor				
	José Luis Nunes	Master	Assistant				
Tutorial Orientation Project							
Docente Responsável	Francisco Duarte						

Signature of Teacher:

Goals

The Computer Technologies and Architectures course has the purpose, on the one hand, to give continuity to the discipline of Digital Systems explaining and concretizing the applicability of a set of technologies studied in said unit, progressing to more advanced concepts of which stand out for example programmable logic devices. On the other hand, the goal is to make known the main technologies underlying the various computational elements. The main performance measures of the various computational elements as well as the main computer architectures are also studied. It is studied not only the physical part, Hardware, but also the logical component, Software, necessary to communicate the various elements, using the Assembly language. It is also studied the whole process of digital representation of information (Numbering Systems).

Skills

Knowledge and Understanding

1. Identify the underlying concept of Programmable Logic Devices.

A.2. Identify the components of a computer.

A.3. Explain the technologies, composition, and performance measures of key components of a computer,

including main memories, secondary memories, and processors.

A.4. Explain the reading and writing process in main memories and secondary memories.

A.5. Understand how a processor's instruction set affects the complexity of its construction and its performance. A.6. Understand and interpret the process of digital representation of information - Numbering Systems.

A.7. Explain how the computer works at the lowest level, particularly how the processor processes, interprets, and executes instructions using the Assembly language.

A.8. Define the most important characteristics of a particular computational component.

Application of Knowledge

B.1. Analyze the elements of a PC, in order to exemplify the advantages and disadvantages of the technologies of each other.

B.2. Develop and test solutions in Assembly.

Grounded Decisions

C.1 Justify proposals for solutions regarding the components and respective technologies that should equip a given computer, against a set of existing features or desirable functionalities.

project evaluation

D.1. Evaluate solutions used in different computers, demonstrating critical attitude.

Communication

E.1. Prepare appropriate documentation, related to market studies, concerning various components of a computer.

- E.2. Produce technical reports and user manuals for developed applications.
- E.3. Present and explain the projects developed in a clear way.

Self-learning skills

F.1. To develop projects, with a high degree of autonomy, with the application of concepts beyond those learned in class.

F.2. To follow and understand the technological evolution of the various computational elements and especially of the processors

Program Contents

Theoretical Component:

- I. Programmable Logic Devices (PLDs)
- I.1. Main types and technologies. Characteristics. Structure and organization.
- II. Primary Memory
- II.1. Types.
- II.2. Technologies.
- II.3. Structure and composition.
- II.4. Process of reading and writing information.
- II.5. Operation.
- II.6. Storage formats.
- III. Secondary Memories
- III.1. Types.
- III.2. Technologies.
- III.3. Structure and composition.

Signature of Teacher:___

- III.4. Process of reading and writing information.
- III.5. Operation.

III.6. Storage formats.

- IV. Processors
- IV.1. Technologies.

IV.2. Structure and composition.

- IV.3. Operation.
- IV.4. The evolution of processors, main technologies, characteristics, differences and performance measures.
- V. Computer Architectures

Practical Component:

I. Digital representation of information - Numbering Systems

I.1. Conversions Between Bases.

I.2. Binary Arithmetic.

I.3. Representation of negative numbers - Bipolar codes: Signal code and absolute value, Code of Complements of 1 and Code of Complements of 2.

I.4. ASCII code.

I.5. Decimal Number Format: Floating Point (IEEE Standard 754-185).

II. Levels of software representation

II.1. Programming Languages: Machine Languages, Assembly Languages and High Level Languages. Translators. Compilers and Linkers.

III. Assembly Language for the 8086

III.1. Organization of memory: Registries, Segments, Address Normalization and Addressing Modes.

- III.2. Declaration of variables.
- III.3. Instruction Set
- III.4. MASM: Directives and Pseudo-Opcodes.
- III.5. Procedures and Functions.
- III.6. The video memory

Bibliography

[1] Tecnologias dos Equipamentos Informáticos, Monteiro, R., Neves, F., Pereira, J., Rodrigues, N. e Martinho, R., FCA, 2004, ISBN 972-722-419-9.

[2] Computer Organization & Design: the Hardware/Software Interface, Patterson, D. and Hennessy, J., 3ª edição, Morgan Kaufmann, 2004, ISBN 1558606041 (Cota 1A-2-90).

[3] Structured Computer Organization, Tanenbaum, A., New Jersey: Prentice-Hall, 1999, ISBN 0-13-020435-8 (Cota 1A-2-62).

[4] How Computer works, White, R., Indianapolis: QUE, 2002, ISBN 0-7897-2549-5 (Cota 1A-2-78).

[[5] Electrónica Digital 2 (Memórias, Interfaces e Dispositivos Lógicos Programáveis), Branco, E. e Silva, F., Dinalivro, 1995, ISBN 972-576-090-5 (Cota 1A-8-60).

[6] Programmable Logic Handbook – PLDs, CPLDs & FPGAs, Sharma, A., New York: McGraw-Hill, 1998. ISBN: 0-07-057852-4 (Cota 1A-8-41).

[7] The 80x86 IBM PC and Compatible Computers: Assembly Language, Design and Interfacing (Volumes I & II), Mazidi, M. A. and Mazidi , J. G., Upper Saddle River, NJ: Prentice Halll, 2000, ISBN 0-13-016568-9 (Cota 1A-2-66)

Access Conditions and Attendance Excuse

Not apply

Conditions for Exam Admission

In order to have access to the exam it is necessary to attend at least 2/3 of all practical classes

Signature of Teacher:

The course final grade is obtained by exam, weighing 12 values (7 values for the theoretical component and 5 values for the practical component) and a practical work with weight of 4 values and two intermediate tests with weight of 2 values each. 1st Test date: March 6, 2018; 2nd Test date: May 8, 2018; project deadline: July 1, 2018.

The exam grade is considered in its entirety and it is not possible to reserve partial marks between different examination periods. To obtain approval in the subject it is necessary to obtain at least 35% in each one of the exam components (theoretical and practical)

Students who have carried out practical work on Computer Technologies and Architectures in the academic year 2017/2018 will be able to keep their grade.

Conditions for Results Improvement

Those provided by law.

Date

21/01/2019

uno.



Instituto Superior de Engenharia de Coimbra www.isec.pt Signature of teacher: NUMO (id) ZITINS

Licenciatura – BsC – Engenharia Informática

Licenciatura – BsC – Informatics Engineering

Academic Year: 2018/2019

Program contents

Course unit	FUNDAM	ENTALS OF (COMPUTER GR	APHICS		
Specialization	NETWOR (s) APPLICA ⁻ INFORMA	KS AND SYS TIONS DEVE TION SYSTE	TEMS ADMINIS LOPMENT MS	TRATION		
Subject type	Specialty Scie	ences F	Research area		Computer Eng	gineering
Year 1º	Semester	2°			ECTS	5
Working Hours	5			Unaccompa	anied working hou	rs
Activity Type	v	orking hour	^s Total hours	Activity type	9	Total hours
Theoretical Lec Theoretical-Pra	tures ctical	2	28	Study Works / Gro	up Works	40.0 30.0
Practical-labora	itory	2	28	Project		
Tutorial Orienta Project	tion		6	Evaluation Additional		1.5
Total of workir	ng hours	1	33.5			
Lecturer						
Activity type			Name		Qualifications	Category
Theoretical Lec	tures	Nunc	Alexandre Cid N	lartins	Master	Professor Adjunto
Theoretical-prac Lectures	ctical					
Teresa Practical-laboratory Lectures Co N		Teresa Raq César Nuno	uel Corga Teixei Paulo das Dores Alexandre Cid N	ra da Rocha s Páris Iartins	Ph.D. Master / Specialist Master	Professor Adjunto Professor Adjunto Professor Adjunto
Tutorial orientat Project	tion					

Responsible(s) lecturer (s) Nuno Alexandre Cid Martins

Goals

The proposed contents are designed to provide a general education in computer graphics. Thus, includes obtaining knowledge in software resources, and use it for developing 3D graphics presentation solutions.

It is intended to give general knowledge on various topics of computer graphics, which supports the creation, manipulation and visualization of three-dimensional graphical models of geometric objects, with the application of textures and lighting, as well as its animation.

The exemplification of all concepts will be done using specialized software in modelling and 3D graphic presentation.

Signature of teacher: NUMO Gid Martin

Skills

Knowledge and understanding

A.1. Knowing the general concepts of computer graphics;

A.2. Understand the basic geometric transformations;

A.3. Understand the visualization process;

A.4. Knowing the different modelling techniques;

A.5. Understanding the basics of lighting;

A.6. Understanding the basics of shading;

A.7. Understanding the mechanisms of animation.

Application of knowledge

B.1. Build graphical presentations, using tools for modelling, visualization, lighting, shading and animation. Judgment

C.1. Analyse a graphical problem and identify the resolution options.

Decision-making

D.1. Deciding between possible alternatives for solution of a graphical problem;

Communication

E.1. Present and explain their work;

E.2. Clarifying questions clearly.

Self-learning

F.1. Adapting specific techniques to the work;

F.2. Complement the development of work with resulting knowledge of literature.

Program contents

1. Theoretical component

Introduction to computer graphics; Geometric objects and transformations; Curves and surfaces; Concepts of modelling; Viewing; Colours; Discrete techniques; Lighting and materials.

2. Laboratory component

Modelling; Shading: Lighting and Materials; Animation; Rendering; Game interaction.

Bibliography

- DAVID J. ECK (2016), INTRODUCTION TO COMPUTER GRAPHICS, HOBART AND WILLIAM SMITH COLLEGES;
- HUGHES, J. F. (2014). COMPUTER GRAPHICS: PRINCIPLES AND PRACTICE. PEARSON EDUCATION.
- JAMES D. FOLEY ET AL. (2013), COMPUTER GRAPHICS: PRINCIPLES AND PRACTICE (3RD ED.), EDDISON-WESLEY PUBLISHING COMPANY;
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- BARRY G. BLUNDELL (2008), AN INTRODUCTION TO COMPUTER GRAPHICS AND CREATIVE 3-D ENVIRONMENTS, SPRINGER LONDON LTD (ISBN 978-1-84800-041-4);
- JONAS GOMES, LUIZ VELHO (2003), FUNDAMENTOS DA COMPUTAÇÃO GRÁFICA, IMPA;
- EDUARDO AZEVEDO (2003), COMPUTACAO GRÁFICA: TEORIA E PRATICA, EDITORA CAMPUS;
- DONALD HEARN, M. PAULINE BAKER (1996), COMPUTER GRAPHICS, PRENTICE-HALL;

Signature of teacher:

- ALAN WATT (1993), 3D COMPUTER GRAPHICS, EDDISON-WESLEY PUBLISHING COMPANY;
- BAS VAN DIJK (2016). BLENDERCOURSE BASICS V2 FOR BLENDER 2.78A, E-BOOK;
- JASON VAN GUMSTER (2015), BLENDER FOR DUMIES, JOHN WILEY & SON;
- FELINTO, D. AND PAN, M. (2013), GAME DEVELOPMENT WITH BLENDER, ISBN: 14354566299781435456624, DELMAR LEARNING;
- PEDRO BASTOS (2010), PRODUÇÃO 3D COM BLENDER PARA ARQUITECTURA E PERSONAGENS, EDITORA LIDEL, FCA;

- SUPPORT CLASSROOM DOCUMENTATION.

Access conditions and attendance excuse

Not exist. The attendance is no compulsory.

Conditions for exam admission

Do not exist. All students can take the exam that evaluates only the theoretical component.

Evaluation method

- The planned assessment will consist of a theoretical exam (with a total weight of 35% of the final grade), without consultation, and by the presentation and defence of an individual practical work divided into two parts creation of a film and the development of a game (with a total weight of 50% of the final grade for the film and 15% of the final grade for the game). More specifically:
 - 1. Learning outcomes A.1 to A.7 will be assessed through an individual theoretical exam:
 - That counts 7 values of the final grade;
 - And it is not obligatory for the student to have a minimum classification.
 - 2. Learning outcomes B.1, C.1, D.1, E.1 to E.2 and F.1 to F.2 will be assessed through a practical work:
 - That counts 13 values of the final grade (10 values for the creation of the film and 3 values for the development of the game), if the student chooses to implement assignment A. The practical work can be delivered until 17/06/2019 (11h00), after which it will not be accepted;
 - That counts 7 values of the final grade (5.5 values for the creation of the film and 1.5 values for the development of the game), if the student chooses to implement the assignment B. The 3D modelling and shading components will have to be delivered until 29/04/2019 (9h30), while the components of animation, rendering and interaction (the game) will have to be delivered until 11/06/2019 (8h30). After any of the final delivery deadlines, the work will not be accepted;
 - Students may at any time change their choice of the assignment to implement (from assignment A to assignment B or from assignment B to assignment A), provided they meet the delivery dates defined in the respective assignments;
 - And it is not obligatory for the student to have a minimum classification.
- All students who attend to theoretical classes more than 80% of them will have a bonus of 1 value.
- To be approved in the course, students must achieve an average weighed equal or superior than 10 values of the final grade.
- All students caught copying, either in the practical work or in the exam, will have a grade of zero.

Conditions for results improvement

The evaluation obtained in the practical work cannot be improved.

Date

Signature from the lecturer responsible for the course

11/02/2018

(Nuno Alexandre Cid Martins)





Licenciatura - BsC em Engenharia Informática (Pós-Laboral)

Instituto Superior de Engenharia de Coimbra www.isec.pt

Licenciatura – BsC in Informatics Engineering (Evening Classes)

Academic Year: 2018/2019

Program Contents

Course	e Unit	STATIST	ICAL METH	ODS		
Specia	lization	(s)				
Subject	t type	Basic Science	Resear	ch Area _{Mathemati}	cs	
Year	1st	Semester	2nd		ECTS	S 5
Working	g Hours		\ A /		Unaccompanied Working Hou	rs
Activity	Туре		Working Hours Per Week	Total Hours	Activity Type	Total Hours
Theoreti Theoreti	ical Lectu ical-Pract	ires tical Lectures	2	28	Study Works / Group Works	74,5
Practica Tutorial Project	I-Laborat Orientati	oty Lectures on	2	28	Project Evaluation Additional	3
Total of	f Working	g Hours		133, <mark>5</mark>		
Lecture	r					
Activity	Туре			Name	Qualifications	Category
Theoreti	ical Lectu	ires tical Lectures	Maria do Cé	u Lourenço Marques	PhD	Prof. Adjunto
Practica Tutorial Project	Il-Laborat Orientati	oty Lectures on	Maria do Céu	ı Lourenço Marques		
Respon	sible(s)	Lecturer (s)	Maria do Cé	u Lourenço Marques		

Goals

The main goals of this course unit are: to supply students with fundamental knowledge in Probability Theory and Statistical Inference; to understand the statements and use the results of Probability Theory and Statistical Inference, according to the subjects of the study plan; to help students to develop their problem solving and critical reasoning skills and prepare them to further study in engineering.

Skills

At the end of this course unit the learner is expected to be able to: know and apply the main properties of a probability; know and use the main theoretical distributions (discrete and continuous); acquire skills in data analysis: data organization, statistical analysis, statistical inference.

Program Contents

1-Probabilities: Randomness, probability space, events, probability measure, conditional probability, independence, Bayes' theorem.

2-Discrete random variables and probability distributions: Probability mass and cumulative distribution functions, expected value, variance and standard deviation; Bernoulli, Binomial, Hypergeometric and Poisson distributions; Two discrete random variables: joint probability distributions, marginal probability distributions, conditional probability

distributions, independence, covariance and correlation.

3-Continuous random variables and probability distributions: Probability density and cumulative distribution functions, expected value, variance and standard deviation; The continuous Uniform, Exponential, Normal, t- distribution and Chi-Square distributions.

4- Random sampling and sampling distributions. Random sample. Statistics. Sampling distribution of the mean. Sampling distribution of the variance.

5- Estimation: Fundamental concepts in point and interval estimation; Confidence intervals for population parameters.

6-Test of Hypotheses: Fundamental concepts; Test of hypotheses for population parameters.

Bibliography

- Acetatos e caderno de exercícios de apoio às aulas (in portuguese: available in moodle)
- GUIMARÃES, R.C., CABRAL, J.A.S Estatística, McGraw Hill, 2007.
- MONTGOMERY, D., RUNGER, G. Applied Statistics and Probability for Engineers, Wiley, 2003.
- MURTEIRA, B.J.F. Probabilidade e Estatística, Volumes I e II, McGraw Hill, 1993.
- PEDROSA, A. C., GAMA, S. M.A. Introdução Computacional à Probabilidade e Estatística, Porto Editora, 2004.
- REIS, Elizabeth et al. Estatística Aplicada, Volumes I e II, Edicões Sílabo, 2001.

Access Conditions and Attendance Excuse

Not applicable.

Conditions for Exam Admission

The student must be officially enrolled in the course unit and in the exam period as well (Secretaria Virtual). In addition, and when requested by the teacher, the student must be also enrolled in the evaluation in the moodle platform.

Evaluation Method

Evaluation can be either distributed or by a final exam.

Distributed evaluation consists of two written tests, each with a maximum score of 10.0 points. The first test, T1, is related with chapters 1 and 2 (date: March 27), and the second test, T2, is related with other chapters (date: 1st or 2nd exam period). The final mark of the distributed evaluation is equal to Fm = mark(T1) + mark(T2). The student is only approved if Fm \ge 9.5 and mark(T1) \ge 4 and mark(T2) \ge 4. If mark (T1) <4, the student has to take a final exam; if mark(T1) \ge 4, the student can perform T2 during the 1st and/or 2nd exam period.

Alternatively, or in the case the student did not succeed the distributed evaluation, the evaluation is made through a final written exam (100%), during the 1st or 2nd exam period.

Material and equipment for consultation: course unit form and calculating machine.

Conditions for Results Improvement

Rules of REACTA.

Date

Signature from the lecturer responsible for the course

21/01/2019

Maria do Cen Lorenç Maques





Licenciatura – BsC em Engenharia Informática

Licenciatura - BsC in Informatics Engineering

Academic Year: 2018/2019

Program Contents

Course Unit	STATIST	ICAL METH	ODS		
Specialization (s)				
Subject type	Basic Science	Researc	c h Area _{Mathematic}	s	
Year 1st	Semester	2nd		ECTS	5
Working Hours				Unaccompanied Working Hours	
Activity Type		Working Hours Per Week	Total Hours	Activity Type	Total Hours
Theoretical Lecture	es al l'actures	2	28	Study Works / Group Works	74,5
Practical-Practic Practical-Laborato Tutorial Orientation Project	ty Lectures	2	28	Project Evaluation Additional	3
Total of Working	Hours		133,5		
Lecturer					
Activity Type			Name	Qualifications	Category
Theoretical Lecture Theoretical-Practic	es cal Lectures	Maria do Cé	u Lourenço Marques	PhD	Prof. Adjunto
Practical-Laborato	ty Lectures	Deolinda Dias	s Rasteiro	PhD	Prof. Adjunto
		João Ricardo	de Oliveira Branco	PhD	Prof. Adjunto
Tutorial Orientation Project	n		Louienço marques		
Responsible(s) L	ecturer (s)	Maria do Cé	u Lourenço Marques		

Goals

The main goals of this course unit are: to supply students with fundamental knowledge in Probability Theory and Statistical Inference; to understand the statements and use the results of Probability Theory and Statistical Inference, according to the subjects of the study plan; to help students to develop their problem solving and critical reasoning skills and prepare them to further study in engineering.

Skills

At the end of this course unit the learner is expected to be able to: know and apply the main properties of a probability; know and use the main theoretical distributions (discrete and continuous); acquire skills in data analysis: data organization, statistical analysis, statistical inference.



Instituto Superior de Engenharia de Coimbra www.isec.pt Signature of Teacher:

Licenciatura – BSc Engenharia Informática (Português) Licenciatura – BSc Engenharia Informática – Pós-laboral (Português) Licenciatura–BSc Engenharia Informática–Curso Europeu (Português)

Licenciatura – BSc Informatics Engineering (Inglês) Licenciatura – BSc Informatics Engineering (Evening Classes) (Inglês) Licenciatura – BSc Informatics Engineering (European Computer Science) (Inglês)

Academic Year: 2018/2019

Program Contents

Course Unit Specialization	PROGRA	MMING				
Subject type	Mandatory	Researc	h Area		Informatics	
Year 1	Semester	2			ECTS	5
Working Hours				Unaccompan	ied Working Hours	
Activity Type		Working Hours Per Week	Total Hours	Activity Type		Total Hours
Theoretical Lectr Theoretical-Prace Practical-Labora Tutorial Orientati Project Total of Workin	ures tical Lectures toty Lectures ion g Hours	2 0 2 0 0	28 0 28 0 0 133.5	Study Works / Group Project Evaluation Additional	o Works	25 50 0 2.5 0
Lecturer						
Activity Type			Nam	e	Qualifications	Category
Theoretical Lector Theoretical-Prace	ures tical Lectures	Francisco Pe	reira		Ph.D.	Assistant Prof.
Practical-Labora	tory Lectures	Álvaro Santos Francisco Per Leonor Melo	eira		M.Sc. Ph.D. M.Sc.	Assistant Prof. Assistant Prof. Teaching Assistant
Tutorial Orientat Project	ion					. loololagt
Responsible(s)	Lecturer (s)	Francisco Pe	reira			

Signature of Teacher:___

Goals

In this course the students learn how to implement complete programs in C. All main features of C are examined in order to give the students a comprehensive knowledge of this programming language. This knowledge is essential to develop programs that are able to solve real-world problems.

The most important topics discussed in this course are file manipulation and dynamic memory management. The students also learn how to develop programs that operate on fundamental data structures, such as queues, heaps, linked lists and binary trees.

Skills

Identify and select the best data structures for a given situation. Create C programs dealing with files and dynamic structures. Develop algorithms for non-trivial problems.

Program Contents

- 1. Pointers
- 1.1. Introduction. Pointers and addresses
- 1.2. Pointers and functions
- 1.3. Pointers and arrays
- 1.4. Pointer arithmetic

2. Header files

2.1. Dividing the source code into multiple files

2.2. Using header files

- 3. Structures
- 3.1. Definition
- 3.2. Arrays of structures
- 3.3. Unions and enumerations

4. Files

- 4.1. Text files and binary files
- 4.2. Standard operations
- 4.3. Non-sequential access to files

5. Dynamic structures

- 5.1. Dynamic storage allocation
- 5.2. Linked lists
- 5.3. Other dynamic structures

6. Recursive functions

- 6.1. Writing recursive functions
- 6.2. Binary trees

Bibliography

- K. N. King (2008). C Programming: A Modern Approach, second edition, W. W. Norton & Company.
- Pedro Guerreiro (2006). Elementos de Programação em C, 3ª edição, FCA- Editora de Informática
- R. Sedgewick (1997). Algorithms in C: Fundamentals, Data Structures, Sorting, Searching, Addison-Wesley.

Signature of Teacher:

Access Conditions and Attendance Excuse

No special conditions.

Conditions for Exam Admission

No special conditions.

Evaluation Method

Evaluation consists in:

- 1 written exam weighting 65% of the final grade (mandatory minimum of 35% of the grade); -_
 - 1 individual practical assignment weighting 35% of the final grade:
 - The deadline for delivering the assignment is June 2, 2019 (tentative date). The presentation of the work is 0 mandatory.

Conditions for Results Improvement

No special conditions.

21/1/2019

Date

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Instituto Superior de Engenharia de Coimbra www.isec.pt



Licenciatura – Engenharia Informática

Bachelor – BsC Informatics Engineering

Academic Year: 2018/2019

Program Contents

Course Un	it MATHEN	IATICAL AN	ALYSIS II			
Specializa	tion (s)					
Subject typ	e Basic Science	Resear	ch Area	Math	nematics	
Year 1s	st Semester	2nd			ECTS	6
Working Ho	ours			Unaccompanied Work	ing Hours	
Activity Typ	e	Working Hours Per Week	Total Hours	Activity Type		Total Hours
Theoretical I Theoretical-	Lectures Practical Lectures	2	28 28	Study Works / Group Works		60 25
Practical-La Tutorial Orie Project	boratoty Lectures Intation	1	14	Project Evaluation Additional		5
Total of Wo	rking Hours		160			
Lecturer						
Activity Typ	e		Name	Qualific	ations	Category
Theoretical	Lectures	Arménio An	tónio da Silva Correia	Mas	ter A	djunct Professor
Theoretical-	Arménio António da Silva Correia Theoretical-Practical Lectures Nuno Filipe Jorge Lavado Nuno Miguel dos Santos Baeta		Ph Mas	D A ter I	djunct Professor nvited Assistant	
Practical-La	boratoty Lectures	Armenio An Nuno Filipe Nuno Migue	lonio da Silva Correia Jorge Lavado I dos Santos Baeta			
Tutorial Orie Project	entation	- John Harr (1996) 🖉 The				
Responsibl	e(s) Lecturer (s)	Arménio An	tónio da Silva Correia			

Goals

This course aims to teach:

- The role of mathematics as the fundamental science in engineering;

- The use of mathematical software, such as, Matlab, GeoGebra, Maple and MuPad;

- The use of mathematics as a tool for analytical reasoning in engineering.

Skills

At the end of this course, the student is expected to be able to:

- Develop skills of abstraction, demonstration, 3D visualization and representation, algorithm design and programming of numerical methods with Matlab;

- Understand and apply the studied topics of this course.

Horn Signature of Teacher:

Program Contents

1st Part

Taylor polynomial and Lagrange's remainder: definition, applications and computational treatment in GeoGebra and Matlab. Introduction to Numerical Methods using Matlab. Brief reference to error theory: absolute and relative errors; rounding errors, truncations and others. Solutions of equations in one variable: the bisection method; Newton's method. Interpolation and Polynomial Approximation: divided differences. Numerical differentiation and integration: trapezoid rule and Simpson rule. Initial-Value Problems for Ordinary Differential Equations: Euler's Method and Runge-Kutta Methods.

2nd Part

Three-Dimensional Space. Rectangular coordinates in 3D-space; Magic Cube – viewport 3D; points; vectors; planes; spheres; cylindrical surfaces; quadric surfaces.

Real functions of two or more variables. Limits and continuity. Partial derivatives. Differentiability and chain rules. Tangent planes. Total Differentials. Directional derivatives and gradients. Maxima and minima of functions of two variables. Lagrange multipliers.

Multiple Integrals. Double integrals: double integrals over nonrectangular regions; double integrals in polar coordinates. Applications: area and surface area. Triple integrals. Applications: volume of solids; centroid; center of gravity. Triple integrals in cylindrical and spherical coordinates. Change of variables in multiple integrals..

Throughout the semester students learn to program in Matlab, including GUI's programming.

Bibliography

Correia, Arménio A. S., Sebenta de Análise Matemática II, ISEC, 2014 Glyn James, Modern Engineering Mathematics, Addison – Wesley Stanley, J., An Introduction to Differential Equations and Their Applications. McGraw-Hill Burden, Richard L., J. Douglas, Numerical Analysis, Pws-Kent Publishing Company Fausett, L.V., Applied Numerical Analysis Using Matlab, Prentice Hall Kreyszig, E., Advanced Engineering Mathematics, John Wiley & Sons

Access Conditions and Attendance Excuse

Not applicable. In addition to face-to-face classes, an e-Learning platform is used to provide content, discussion forums, training and evaluation lessons, as well as other activities and resources. The work developed complements the so-called "traditional" methods with the use of ICT: mathematical software, LMS platforms, cloud storage (e.g., box.net), GeogebraTube and ArmenioCorreia facebook page. Students are encouraged to use the available tools and collaborate actively and constructively in the MA2 learning community.

Conditions for Exam Admission

Access to the examination is allowed to all students enrolled in the curricular unit, according to the ISEC's rules of procedure (REACTA document).

Evaluation Method

There are two options:

First option: distributed assessment methodology A midterm exam and/or a final written exam worth 60% of the final grade Theoretical-Practical activities (written assignments and programming of mathematical methods) distributed over the semester worth 40% of the final grade

Second option: A midterm exam and/or a final written exam worth 100% of the final grade.

For purposes of calculating the final grade, weighted average of the tests and works, the student must have a minimum score of 6.0 (out of 20) on the exam. If students attend more than 70% of classes, 0.5 points are added to the final grade. If students attend office hours and/or participate in forums offered through e-learning platform more than 70% of classes, 0.5 points are added to the final grade. Students receiving a grade higher than 18 (on a grading scale of 1 to 20) a re required to do an extra written and/or oral test. If students choose not to do this extra test, the final grade will remain 18.

Conditions for Results Improvement

The conditions for results improvement are defined in the ISEC's REACTA document.

Date 21/01/2019

Avmenio Antimio Silve Co



Instituto Superior de Engenharia de Coimbra <u>www.isec.pt</u> Signature of Teacher:

BsC Informatics Engineering

BsC Informatics Engineering (Evening Classes)

Academic Year: 2018/2019

Program Contents

Course Unit	MANAGE	MENT				
Specialization	(s) N.A.					
Subject type	Mandatory	Resear	ch Area		Engineering a Management	nd Industrial
Year 1.º	Semester	1.°			ECTS	5.0
Working Hours				Unaccompan	ied Working Hour	S
Activity Type		Working Hours Per Week	Total Hours	Activity Type		Total Hours
Theoretical Lectu Theoretical-Pract Practical-Laborate	res ical Lectures oty Lectures	2 2	28 28	Study Works / Group Project	Works	50 24
Tutorial Orientation Project	n			Evaluation Additional		3.5
Total of Working	Hours		56			- 77.5
Lecturer						
Activity Type			Name		Qualifications	Category
Theoretical Lectu	res	Elsa Pedroso / Ricardo Ferraz			PhD	Invited Assistant Professor
Theoretical-Pract	ical Lectures	Els	a Pedroso / Ricard	o Ferraz	PhD	Invited Assistant Professor
Practical-Laborate Tutorial Orientatic Project	oty Lectures on					

Responsible(s) Lecturer (s) Elsa Pedroso

Goals

- Develop knowledge and comprehension skills in Management, comprising the different functional areas existing in a company;
- Apply theoretical concepts to the real world, by creating the ability to analyse the reality from the manager's point of view;
- Acquire knowledge that allows to communicate, as Computer Engineers, with the managers, as well as, a critical, constructive and creative vision in future development projects in their area;
- Know the reality of management positions;
- · Be able to apply the acquired knowledge in solving specific problems of business life, supported by self-argument;
- Develop the creative and entrepreneurial side.

Skills

- Identify and evaluate the relationships between the Organization and the external environment and how they influence each other.
- Identify and interpret the different functional areas of an Organization.
- Understand and apply the main strategic analysis methods of an Organization.
- Understand Marketing and its strategic importance to an Organization.
- Understand the factors that determine the motivation of the various stakeholders in an organization.
- Getting to build a business plan applied to an idea
- Show a critical attitude towards a practical case of an Organization
- Communicate opinions and ideas in a clear and simple way
- Develop the capacity for autonomous and group work

Program Contents

- Organization and company
- Organizational Theories
- o Social Responsibility and Business Ethics
- Structure of companies
- o Human Resources
- Leadership and motivation
- o Marketing
- Negotiation
- o Business strategy
- Introduction to Accounting

Bibliography

- Introdução à Gestão das Organizações, F. Almeida e outros, Escolar Editora, 2016 (ou Introdução à Gestão das Organizações, J. Lisboa e outros, Vida Económica, 2013).
- Estratégia Sucesso em Portugal, A. Freire, Verbo, 1997.
- Gestão Estratégica Conceitos, modelos e instrumentos, A. J. Robalo Santos, 2008.
- Management, S. Robbins e M. Coulter, Prentice Hall, 2001.
- Strategic market management, David A. Aaker (1998).
- Marketing Management, 11th edition, P. Kotler, Prentice Hall, 2003.
- Contabilidade para Todos. D. Rocha; G. Azevedo; A.M.G. Rodrigues. Almedina, 2.ª edição, 2016.
- Elementos de Contabilidade Geral (26.ª edição), António Borges e outros, Áreas Editora, 2014.
- Fundamentos de Marketing, Bruno Ferreira e outros, Edições Sílabo, 3ª Ed. 2015.
- Negociação nas Organizações, Eduardo Simões, Editora RH, 2008.

Access Conditions and Attendance Excuse

Those provided in the legislation. Students are advised to systematically follow classes as a prerequisite to school achievement and to the correct understanding of the subjects.

Conditions for Exam Admission

Evaluation Method

Students may choose one of the following evaluation systems:

Distributed evaluation system

It consists of one workgroup (30%) and one written test (70%).

The groups should consist of 5 students. The work consists of the strategic analysis of a company chosen by the group and approved by the teacher of their practical class. The group work will be presented and defended in the practical classes. Students will have to participate in the

presentation / defense of their work.

<u>The final grade will be calculated as follows:</u> Final grade = 0.3 Note of the workgroup + 0,7 Note of the written test

The note of the workgroup will be valid for all examination periods, from the 2018/2019 academic year. In this evaluation system, the minimum grade of 7.5 values (in 20) is required in the written test. If the minimum grade is not reached, the final grade of the student will correspond to the grade obtained in the written test (in 20 values).

General evaluation system It consists of one exam.

Conditions for Results Improvement

Those provided in the legislation and cannot be carried out in the Normal Season.

Date

Acdnoso

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Instituto Superior de Engenharia de Coimbra

www.isec.pt

Signature of Teacher:_

Licenciatura em Engenharia Informática Licenciatura em Engenharia Informática – Curso Pós-Laboral Licenciatura em Engenharia Informática - Curso Europeu

Licenciatura – BsC Informatics Engineering Licenciatura – BsC Informatics Engineering (Evening Classes) Licenciatura – BsC Informatics Engineering (European Computer Science)

Academic Year: 2018/2019

Unaccompanied Working Hours

Program Contents

4

ECTS

Course Unit WEB TECHNOLOGIES

Specialization (s) Networks and Systems Administration; Applications Development; Information Systems

Subject type	Research Area	Informatics Engineering

1

Year 1 Semester

Working Hours

-	Working			
Activity Type	Hours Per Week	Total Hours	Activity Type	Total Hours
Theoretical Lectures Theoretical-Practical Lectures	1	14	Study Works / Group Works	30 32.8
Practical-Laboratory Lectures Tutorial Orientation Project	2	28	Project Evaluation Additional	2

Total of Working Hours

106.8

Lecturer

Activity Type	Name	Qualifications	Category
Theoretical Lectures	Simão Pedro Mendes Cruz Reis Paredes	Phd	Assistant Professor
Theoretical-Practical Lectures			
	Cristiana Manuela Afonso Areias	Msc	Assistant Professor
Practical-Laboratoty Lectures	César Paulo das Dores Páris	Msc	Assistant Professor
	Simão Pedro Mendes Cruz Reis Paredes	Phd	Assistant Professor
Tutorial Orientation			
Project			

Responsible(s) Lecturer (s) Simão Pedro Mendes Cruz Reis Paredes

Goals

The main objective of this course unit is to explore some of the technologies used in the implementation of web applications. Technologies will be explored according to the layers model (structure, presentation and behavior). Additionally, some concepts of Human Computer Interaction will also be depicted.

Skills

Knowledge and Understanding

A.1 Knowledge of some of the main technologies applied in the implementation of web sites.

Knowledge Application

B.1 Implementation of web applications.

Making decisions

C.1 Justify the options adopted in the implementation of web sites.

Nay.

D.1 Evaluate technological options adopted in similar content.

Communication

Assessment

E.1 Present and explain the developed web elements.

Self-learning skills

F.1 Develop projects with some autonomy

Program Contents

Theoretical Component:

- I. World Wide Web
 - I.1. Multimedia
 - Hypertext / Hypermedia
 - I.2. World Wide Web
- II. Web Technologies- Structure
 - II.1. HTML
- III. Web Technologies Presentation
 - III.1. CSS
 - III.2. SASS
- IV. Web Technologies Behaviour
 - IV.1. Javascript
 - IV.2. DOM
 - IV.3. jQuery
 - IV.4. Ajax
- V. Human Computer Interaction (HCI)

Practical Component:

- I. HTML
- II. CSS
- III. JavaScript
- IV. jQuery

Bibliography

[1] Abreu L., HTML5, 2th Edition, ISBN: 978-922-722-739-6, FCA, 2012.

- [2] Ducket Jon, Javascript & Jquery Inteactive front-end Web Development, ISBN:978-1-118-53164-8, Wiley, 2014.
- [3] Delamater M., Ruvalcaba Z., Murach's JavaScript and jQuery 3rd ed., ISBN 978-1-943872-05-3, Mike Murach & Associates, Inc., 2017.
- [4] Nixon, R., PHP, MySQL, JavaScript & CSS, ISBN: 978-1-449-31926-7, O'Reilly, 2012.
- [5] Robbins, J., Learning Web Design, 4th Edt, ISBN: 978-1-449-31927-4, O'Reilly, 2012.

Access Conditions and Attendance Excuse

Students must attend to a minimum of 7 practical lectures. This condition is valid for all exams to be performed in the academic year of 2018/2019.

Conditions for Exam Admission

The access to the exam depends on the verification of the frequency criteria described in the previous item. This condition is valid for all exams to be performed in the academic year of 2018/2019.

Signature of Teacher:

Evaluation Method

All the grades are defined by a scale of 0 - 20 values.

The final grade is obtained through the following expression:

Final grade = 0.6 * Final Exam + 0.4 * Practical work (PW)

Thus, the components have different weights in the final grade: Exam: 12 Values; PW: 8 values.

Exam:

- · Written exam, which will focus on the content taught in lectures and practices.
- A grade equal to or higher than 35% is required. A grade less than 35% implies the failure to the discipline.

Practical Work (PW):

- To be implemented based on HTML, CCS and JavaScript/jQuery.
- The defense of the project is mandatory.
- A minimum grade of 35% is required.
- The grade of the practical work will be considered in all exams to be performed in the academic year of 2018/2019.

Conditions for Results Improvement

The grade improvement process must verify the requirements defined in the regulation REATA/ISEC.

Date 14/09/2018

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Signature of Teacher: And Man 3.

Instituto Superior de Engenharia de Coimbra www.isec.pt Licenciatura – BsC Licenciatura em Engenharia Informática Licenciatura em Engenharia Informática - Pós-laboral Licenciatura em Engenharia Informática – Curso Europeu Alunos de Programas Mobilidade (Português)

Licenciatura – BsC in Informatics Engineering Licenciatura – BsC in Informatics Engineering (Evening classes) Licenciatura – BsC in Informatics Engineering (European Computer Science) Mobility Program Students

Academic Year: 2018/2019

Program Contents

Course Unit IN	ITRODUC	TION TO PROC	BRAMMING				
Specialization (s) IN	IFORMAT	ON SYSTEMS					
Subject type Mandatory		Research Area			Informatics Engineering		
Year 1 st Se	mester	1 st			ECTS	5	
Working Hours				ied Working Hours			
Activity Type	V H	Vorking ours Per Tota Week	I Hours	Activity Type		Total Hours	
Theoretical Lectures	-turne	2	28	Study Works / Group	Works	00	
Theoretical-Practical Lectures Practical-Laboratoty Lectures Tutorial Orientation Project		3 42 Project Evaluation Additional				3,5	
Total of Working Hour	S	133,	5				
Lecturer						Notes and skie	
Activity Type		Name			Qualifications	Category	
Theoretical Lectures		Ana Rosa Pereira Borges (arborges@isec.pt)			PhD	Coordinator Proi.	
Theoretical-Practical Lectures Practical-Laboratoty Lectures Practical-Laboratoty Lectures		Ana Rosa Pereira Cristina Margarida	Borges (<u>arborges</u> a Chuva Costa (<u>ch</u>	PhD PhD	Coordinator Prof. Assistant Prof.		
Practical-Laboratoty Lectures		Francisco Fernando Vasconcelos Barbosa Barros			Master	Lecturer	
Practical-Laboratoty Lectures		João Nuno Gonçalves Costa Cavaleira Correia			Master	Guest lecturer	
Practical-Laboratoty Lectures		Paulo Miguel Gouveia Mariano (pmariano@isec.pt)			PhD	Lecturer	
Practical-Laboratoty Lectures		Teresa Raquel Co (teresa@isec.pt)	orga Teixeira Rocl	PhD	Assistant Prof.		
Tutorial Orientation Project		~					

Responsible(s) Lecturer (s)

Ana Rosa Pereira Borges (arborges@isec.pt, office G01 - DEIS)

Goals

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In this introductory Curricular Unit of programming the students learn how to construct modular and reused software application throught a structured way (using a procedural language), giving special importance to the problem specification, as well as the development of the algorithm and implementation.

In order to put in practice and to consolidate the acquired knowledge, the students learn the basic concepts of C language (which enables the implementation of simple programs).

It is intended to foster in students the minimum competencies that allow them to develop simple computer application. The examples implement are focused on practical aspects of experimentation and application development.

Skills

After attending this curricular unit, students must:

1 - Identify and understand the different phases normally used to construct modular programs.

- 2 Be familiar with types, operator e expressions of C language
- 3 Know the different control mechanisms of C language
- 4 Understand and know how to use the standard input-output functions of C language.

5 - Understand the need to use functions and learn to identify situations in which they must be used.

6 - Explain the advantages of the use of arrays and know to identify situations where they become necessary.

7 - Understand and know how to use the String type (as well as, the main functions that operate in Strings)

8 - Develop simple applications using the C language, having always in the mind different phases to construct a program (problem specification, analysis, algorithm and implementation.

9 - The concepts apprehended in this discipline must instil in students the interest and the possibility to apply them in the resolution of similar and more complex applications, in a professional context.

Program Contents

- Introduction to the C language

- Types, Operators and Expressions
- Control mechanisms
- Input and output data
- Functions and Structure of a program
- Strings and Arrays

- Different stages in the development of programs, computational implementation of simple problems.

Bibliography

- KING, K. N. - C programming: A Modern Approach, New York [etc.] : W.W.Norton & Company, cop. Second Edition. ISBN: 978-0-393-97950-3

- SCHILDT, H. - Teach yourself C, 3rd ed, Berkeley : McGraw-Hill, 1998. ISBN: 0-07-882311-0

- KERNIGHAN, B.; RITCHIE, D. - The C programming language, 2rd ed, Prentice Hall Software Series, 1988. ISBN: 0-13-110362-8. 0-13-110370-9

Notes and slides used in class (available in moodle)

Access Conditions and Attendance Excuse

To be successful in the curricular unit is required a minimum number of 6 (six) practical/laboratory classes attendance.

Conditions for Exam Admission

Enrollment in practical/laboratory classes is mandatory. Students can only attend the class in which they are enrolled, including for the evaluation tests.

All students must attend at least 6 (six) practical/laboratory classes (in the class where they are enrolled) in order to have access to the exams.

The justifications of absences to the classes should be presented to the teacher of the respective class, within a maximum period of 10 working days after the occurrence; otherwise, they will not be accepted. These justifications will only accepted once validated by the different curricular unit teachers.

Signature of Teacher: Ane Au by

Evaluation Method

The assessment method consists of:

a) two (2) Evaluation Tests to be carried out during the semester

5,0 points (= 2,0 points + 3,0 points)

b) Final Evaluation covering all subjects, 15,0 points.

Comments:

Final evaluation exam and evaluation tests are "closed book".

. The tests will be carried out in the practical / laboratory classes.

The 1st evaluation test will be held in practical/laboratory classes of the week of 12/11/2018 to 16/11/2018.

• The 2nd evaluation test will be held in practical/laboratory classes of the week of 10/12/2018 to 14/12/2018.

Failure to carry out one of the evaluation tests implies assigning the classification of zero values in this test.

The Final Grade is the sum of the marks obtained in both evaluation tests and in the Final Evaluation.

• The approval in the curricular unit requires a grade greater than or equal to 9,5 ([0, 20]) and a minimum number of six (6) practical/laboratory classes attendance.

• This Assessment Methodology applies to all students, regardless of status, and to all Evaluation times (1st Call, or 2nd Call).

Test scores obtained in previous years by the students are not considered.

Conditions for Results Improvement

The Assessment Methodology is the same for all students, including students who wish to improve grade: final exam (15 points) + 2 tests (total 5 points).

Students who have passed the previous school year, and wish to improve their grade this school year, must repeat the 2 evaluation tests during the semester in the practical/laboratory classes. Class attendance is not mandatory for these students. They should choose a practical/laboratory group and in advance speak with the teacher of this class to know if there is a place to carry out the tests.

Date

14th September 2018

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Instituto Superior de Engenharia de Coimbra www.isec.pt

Licenciatura – BsC Engenharia Informática Pós-Laboral (Português)

Licenciatura – BsC Informatics Engineering (Inglês)

Academic Year: 2018/2019

Program Contents

Course Unit LINEAR	ALGEBRA									
Specialization (s)										
Subject type Basic Sciences Research Area Mathematics										
Year 1 Semester	1			ECTS	5					
Working Hours	Unaccompani	companied Working Hours								
Activity Type	Working Hours Per Week	Total Hours	Activity Type		Total Hours					
Theoretical Lectures Theoretical-Practical Lectures Practical-Laboratoty Lectures	2 2	28 28	Study Works / Group Project	Works	74.5					
Tutorial Orientation Project			Evaluation Additional		3					
Total of Working Hours		133.5								
Lecturer										
Activity Type		Name		Qualifications	Category					
Theoretical Lectures	João António Ribeiro Cardoso			PhD	Coordinator Prof.					
Theoretical-Practical Lectures João Antóni		o António Ribeiro (Cardoso	PhD	Coordinator Prof.					
Practical-Laboratoty Lectures Tutorial Orientation Project										
Responsible(s) Lecturer (s)	João António									

Goals

Perform basic matrix operations.

Compute matrix determinants, eigenvalues and eigenvectors.

Understand and apply concepts related to vector spaces and linear transformations.

Solve and interpret linear systems using matrix theory.

Understand the importance of linear algebra in computer science and informatics engineering.

Recognize the importance of the algorithms in linear algebra.

Solve real problems which are modeled by matrices and systems.

Develop algorithms using a logical and structured reasoning.

Base problem solving on mathematics.

Compare, with criticism, the results obtained by analytical means with the ones obtained by computational means.

Select appropriately the accessible information (from monographs, textbooks, web, ...).

Explain the concepts and problems' solution in an appropriated way.

Skills

The syllabus defined allow, in particular, that the students become aware of the importance of mathematics and its pivotal role as a basic science and supporting tool to a logical and structured reasoning indispensable to computer science and computer engineering. They also contribute to develop skills of abstraction, demonstration and of designing algorithms on the subjects taught, namely on theory of matrices, systems of linear equations, applications in analytical geometry and also on specific problems of computer engineering.

Program Contents

0. A brief revision of complex numbers.

1. Matrices and Linear Systems.

Introduction; Matrix operations and their properties; Row echelon form and rank; Classification and geometry of linear systems; Gaussian elimination; Homogeneous systems; Matrix inversion: Gauss-Jordan method; Block matrices; 2. Determinants

Definition and properties; Adjugate matrix and the inverse; Applications to Cryptography.

3. Vectors in R[^]n

Vectors and lines in the plane; Vectors in 3D-space; Cross product; Lines and planes in 3D-space; Linear transformations: application to Computer Graphics; Vectors in R^n: Properties; Subspaces; Linear combinations; Linear expansion; Linear independence; Basis and dimension.

4. Eigenvalues

Eigenvalues, eigenvectors and their properties; Diagonalization; Cayley-Hamilton Theorem.

(Remark: The software MATLAB and GNU OCTAVE is used throughout the course)

Bibliography

Cardoso, João, Apontamentos de Álgebra Linear, DFM, ISEC, 2018 Kolman, B. e Hill, D.R., Introductory Linear Algebra – an applied first course, 8ª Ed., Pearson-Prentice Hall, 2005 Leon, Steven J., Ágebra Linear com Aplicações, 4ª Ed, Livros Técnicos e científicos, Rio de Janeiro, 1999 Magalhães, Luis T., Álgebra Linear: como Introdução a Matemática Aplicada, Texto Editora, 1993 Meyer, Carl D., Matrix Analysis and Applied Linear Algebra, SIAM, Philadelphia, 2000 (More material is available in the MOODLE platform)

Access Conditions and Attendance Excuse

The attendance of lectures/problem solving is not mandatory

Conditions for Exam Admission

Every student enrolled in this course can attend the continuous evaluation, and the first and second call of final exams

Evaluation Method

This course unity is essentially formative and attempts to coordinate the theoretical foundations with the developments needed in the subsequent course unities included in the curriculum. At this level, the intuitive understanding of the concepts and calculation skills are promoted. In Theoretical-Practical lessons the expository and interrogative method is used during the explanation of the theoretical subjects and exercises are solved in groups or individually. Assessment

Continuous Assessment: There are two examination tests, where each one is rated to 10 points. To be successful in this unit course, students need to get a minimal score of 3.25 points in the second test and the sum of the classifications has to be greater than or equal to 9.5.

Assessment by Final Examination: There is a final exam, rated for 20 points, where the approval requires a score greater or equal than 9.5 points.

Conditions for Results Improvement

Results improvements is only possible in the second call examination

Date 12/09/2018

Signature from the lecturer responsible for the course



Jost Anton Ribeins Candha


Instituto Superior de Engenharia de Coimbra www.isec.pt Signature of Teacher:_

Licenciatura – BsC Engenharia Informática Licenciatura em Engenharia Informática (pós laboral)

Licenciatura – BsC Informatics Engineering Licenciatura – BsC Informatics Engineering (Evening Classes)

Academic Year: 2018/2019

Program Contents

					0		
Course Unit	DIGITAL	SYSTEMS					
Specialization (s)	REDES I DESENV SISTEM	E ADMINISTRAÇÃO DE SISTEMAS VOLVIMENTO DE APLICAÇÕES IAS DE INFORMAÇÃO					
Subject type Basic science		Re Ar	search ea	Informatics Engineering			
Year 1º	Semester	1°			ECTS		
Working Hours				Unaccompanied Working Hours			
Activity Type		Working Hours Per Week	Total Hours	Activity Type		Total Hours	
Theoretical Lectures Theoretical-Practical L Practical-Laboratoty L Tutorial Orientation Project	ectures. ectures	2	28 28	Study Works / Group Works Project Evaluation Additional	S	50,5 25 2	
Total of Working Hours		133,5					
Lecturer							
Activity Type Theoretical Lectures Theoretical-Practical Lectures		Name Francisco Duarte		Qual N	Qualifications Cate Master		
Practical-Laboratoty Lectures		Francisco Duarte Acácio Amaral Anabela Gomes Leonor Melo		N	1aster PhD PhD /laster	Prof. Adjunto Prof. Adjunto Prof. Adjunto Prof. Adjunto	
Tutorial Orientation Project							
Responsible(s) Lect	urer (s)	Francisco D	uarte				

Goals

Students are expected to acquire skills that allow them to understand the elements that make up the computer at the scale of digital electronic circuits.

Signature of Teacher:

In particular, they are intended to understand the basic concepts of combinational and sequential circuits, as well as techniques for analyzing and synthesizing them.

Skills

Understand basic concepts such as Boolean algebra, Karnaugh maps, binary numbering system and binary codes; Know basic physical components, such as, logic gates, dedicated combinational circuits and flip-flops; Design low-complexity combinational / sequential circuits using formal analysis / synthesis techniques;

Program Contents

Basic concepts

- Boolean algebra, truth tables, Karnaugh maps, logic gates, logic families, binary system, binary codes and binary arithmetics.

Combinatory circuits

- Analysis and synthesis of combinatory circuits
- Dedicated combinatory circuits: Multiplexers, Demultiplexers, Encoders, Decoders, Adders, Comparators

Sequential circuits

- Generic model of sequential circuits, synchronous and asynchronous circuits, elementary memory cells

Analysis and synthesis of sequential circuits

Binary counters

Bibliography

- Ronald J. Tocci, Neal S. Widmer, Sistemas digitais: princípios e aplicações, 7^a Edição, LTC Editora, 2000. ISBN: 85-216-1179-X
- John F. Wakerly, Digital Design Principles and Practices, 3rd Edition, Prentice Hall, 2000. ISBN: 0-13-082599-9
- Morgado Dias, Sistemas Digitais Princípios e Prática, FCA Editora de Informática, Lda., 2010. ISBN:978-972-722-650-4
- L. Cuesta, A. Gil Padilla, F Remiro, Electrónica digital, McGraw-Hill, 1994. ISBN:972-9241-64-3
- E. J. McCluskey, Logic Design Principles, Prentice Hall, 1986. ISBN: 0-13-539768-5
- A. Amaral, Sistemas Digitais: Princípios, Análise e Projectos, Edições Sílabo, 2014, ISBN 978-972-818-767-7
- notes to support theoretical classes.

Access Conditions and Attendance Excuse • Mandatory attendance in 2/3 of the practical classes;

Signature of Teacher:___

Conditions for Exam Admission

Attendance to practical classes (defined in the previous point);

Evaluation Method

The evaluation has two components:

Practical component - 3 practical assignments • will have a weight of 6 in the final grade

Written component - final exam

• will have a weight of 14 points in the final grade

• a minimum classification of 35% in each components

Practical Component Assessment Dates

	Practical 1	Practical 2	Practical 3
Class P1	23 de October	13 November	11 December
Class P2	23 October	13 November	11 December
Class P3	18 October	15 November	13 December
Class P4	23 October	13 November	11 December
Class P5	25 October	15 November	13 December
Class P6	09 November	16 November	14 December
Class P7	11 November	23 November	21 December
Class P8	18 October	15 November	13 December
Class P9	22 October	12 November	10 December
Class P10	22 October	12 November	10 December
Class P11	24 October	14 November	12 December
Class P12	22 October	12 November	10 December
Class P13	23 October	13 November	11 December

Conditions for Results Improvement

• The grade obtained in the practical component in 2018/2019 can not be improved;

• The improvement of the writing component (exam) does not impose any restriction.

Date

Signature from the lecturer responsible for the course

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Licenciatura – BsC __Engenharia Informática(D+PL)___(Português)

Licenciatura – BsC Informatic Engineering (D+PL)

(Inglês)

Academic Year: 2018/2019

Program Contents

Course Speciali	Unit zation (s)	MATHEM	IATICAL AN	ALYSIS	1			
Subject (type In	tegral and D	ifferential Calo	culus	Research	Area	Mathematics	
Year	1st	Semester	1st				ECTS 6	
Working	Hours		Working			Unaccompan	ied Working Hours	
Activity I	уре		Hours Per	Iotal	Hours	Activity Type		I otal Hours
Theoretic Theoretic Practical	al Lect <mark>ures</mark> al-Practical	Lectures	28 28 14	2	2	Study Works / Group Project	Works	70 14
Tutorial C Project	Drientation	Leoturos	14			Evaluation Additional		6
Total of V	Working Ho	ours		7	0			90
Lecturer								
Activity T	уре				Name		Qualifications	Category
Theoretic	al Lectures		Maria Emília	Bigotte	de Almeida		Master	Adjunt
Theoretical-Practical Lectures M N		Maria Emília Bigotte de Almeida João Ricardo Branco Maria Clara Rocha				Master PhD Master	Adjunt Adjunt Adjunt	
Practical-Laboratoty Lectures		Maria Emília Bigotte de Almeida João Ricardo Branco Maria Clara Rocha				Master PhD Master	Adjunt Adjunt Adjunt	
Tutorial C Project	Drientation							-
Respons	sible(s) Lec	turer (s)	Maria Emília	Bigotte	de Almeida			

Goals

The main aims of this course unit are: Knowledge of the basics of mathematical analysis; knowledge of real functions of one real variable; Understand and apply theoretical development of differential and integral calculus; Understand the basic concepts of ordinary differential equations and solve some simple first order differential equations; Solve and interpret real problems.

Skills

At the end of this course unit the learner is expected to be able:

To explain the concepts, discuss and present each problem solution in an appropriate way;

To solve practical problems with an increasing autonomy, using the subjects treated in the classroom and other related topics;

To find and select relevant information from different sources such as monographs textbooks and the web.

Program Contents

Real functions of one real variable: Limit and continuity; Basic theorems; Trigonometric and inverse trigonometric functions; Basic properties of the Logarithm and the Exponential. Integral calculus:

Primitives, integration by parts, integration by substitution and integration of rational functions; Definite integral (Riemann's



integral) and the fundamental theorem of calculus; Applications of integration to the calculation of area, volume and length; Indefinite integrals and improper integrals.

An introduction to ordinary differential equations: Terminology; First-order differential equations: First-order linear differential equation and separable equation.

Bibliography

LARSON, HOSTETLER, EDWARDS – Cálculo, volume 1, McGraw-Hill de Portugal, ISBN: 85-86804-82-7 SWOKOWSKI, Earl W.- Cálculo com Geometria Analítica, volume 1 STEWART, J. – Cálculo, Thomson Learning LARSON, R., HOSTETLER, R., EDWARDS, B. – Cálculo, McGraw-Hill APOSTOL, T. – Calculus, John Wiley & Sons KREYSZIG, E. – Advanced Engineering Mathematics, John Wiley & Sons FAULHABER, C.- "Apontamentos teóricos e exercícios práticos de Análise Matemática I"-Curso de electromecânica RODRIGUES, R.-"Notas teóricas de Análise Matemática".

Access Conditions and Attendance Excuse

The frequency of the course is optional, although attendance is recorded

Conditions for Exam Admission

There are no conditions

Evaluation Method

Intermediate Testes (14.11.2018; 19.12.2018)) or final written exam. It is approved any student who obtains as final classification, note greater than or equal to 9,5 values.

Conditions for Results Improvement

To apply the evaluation regulation of the ISEC

Date 12/09/2018

Signature from the lecturer responsible for the course