

Polytechnic Institute of Viseu

School of Technology and Management of Lamego

International Semesters for students

INFORMATICS AND TELECOMMUNICATIONS ENGINEERING

Fall Semester

Semester title	INFORMATICS AND TELECOMMUNICATIONS ENGINEERING	Semesters	Fall
Person responsible	Fernando Miguel Soares Mamede Santos Ricardo Luís da Costa Gama	E-mail address	fsantos@estgl.ipv.pt rgama@estgl.ipv.pt
Coordinator	Isabel Oliveira	E-mail address	lioliveira@estgl.ipv.pt
Language of instruction	English	ECTS points total	30
Course type	Course title	Name of the lecturer	ECTS points
Compulsory	Operational Research	Miguel Mota	6
Compulsory	Algorithms and Data Structures	Carlos Costa	6
Compulsory	Network Planning and Management	José Lopes	6
Compulsory	Database Systems	José Lousado	6
Compulsory	Telecommunication Systems	Jorge Duarte	6

Course title	Operational Research		
Teaching method	Classes are theoretical and practical (TP) with a theoretical and a practical application of theory. The theoretical concepts are accompanied by concrete examples/exercises of application. Students are encouraged to solve other exercises. Individual study must be complemented with the indicated. The course evaluation is done in the case of continuous assessment, a component of evaluation theory and practice performing two written evaluations, complemented with exercises solved in the context of class participation and attendance. In the assessment model will only end with the completion of a final exam.		
Person responsible for the course	Miguel Mota (PhD)	E-mail address:	mmota@estgl.ipv.pt
Language of instruction	English	ECTS points	6
Semester	fall	Type of course	compulsory
Hours per week	4	Hours per semester	HT: 162 TP: 60
Objectives of the course	Provide students the ability to apply the IO as Technical Decision, through the following phases: - Formulation of the problem; - Construction of a model; - Preparation of solution; - Validation of the model and test of the solution; - Implementation of the solution. Create and develop skills to enable: - The formulation and problem solving, so that the student is able to structure and solve the problems that arise in their professional lives, through the use of techniques adapted to each situation; - The interpretation and critical analysis of results; - Understand the need of critical analysis in the process of decision making; - Motivate students to research and investigation.		
Entry requirements	There aren't any.		
Course contents	Introduction to Operational Research. Linear Programming (LP). Troubleshooting PL: Graphics Resolution; Simplex Method. Duality. Transport Issue. Allocation Problem. Planning and control of projects.		
Assessment methods	Written test (s) (100%)		
Recommended readings	Santos, M.M.; Magalhães-Hill, M.; Investigação Operacional - Vol. I, Programação Linear (2ª Edição), Edições Sílabo, 2009 Santos, M.M.; Magalhães-Hill, M.; Investigação Operacional - Vol. II, Exercícios de Programação Linear (2ª Edição totalmente Revista), Edições Sílabo, 2009 Magalhães-Hill, M.; Santos, M.M.; Monteiro, A.I.L.; Investigação Operacional - Vol. III, Transportes, Afectação e Optimização em Redes, Edições Sílabo, 2008		
Additional information			

Course title	Algorithms and Data Structures		
Teaching method	Initially it is made a diagnosis of knowledge of each student. There are identified needs for support. To raise the motivation is made awareness of the importance of the course in the professional field. Contents are presented, defined objectives, skills to acquire, the integration on the curriculum and conformity with the professional profile. During the semester, the contents are developed, giving rise to the active, reflective and critical student participation, consolidated with practical exercises, debates, summaries, individual and group work. As a way of monitoring, the activities are the subject of formative and summative assessment, enabling targeting for support. The assessment is individual, continuous and summative, allowing the measurement of the level of knowledge by demonstration of developed applied skills. Along the way it is possible to detect support needs and implement appropriate measures to promote success.		
Person responsible for the course	Carlos Costa	E-mail address:	ccosta@estgl.ipv.pt
Language of instruction	English	ECTS points	6
Semester	Fall	Type of course	compulsory
Hours per week	4	Hours per semester	HT: 162 TP: 30 PL: 30
Objectives of the course	Provide topics on algorithms and data structures via robust solutions to problem solving and a base of knowledge for understanding and using programming techniques, according to the principles of software development. Specifically it is intended: the study of methods and techniques for developing and analyzing algorithms; the study, use and implementation of algorithms and data structures for efficient problem solving. The student should be able to: identify techniques for analyzing and solving problems by computational means, develop/adapt/identify algorithms for problems solving and propose solutions consisting of algorithms and data structures, analyze algorithms as to efficiency and complexity, implement solutions according to the principles of modular programming and code reuse, implement/use abstract data types and sort and search algorithms in the C language.		
Entry requirements	There aren't any.		
Course contents	Preparatory aspects: fundamental concepts; aspects of modular programming in C, structured files in C, handling pointers and dynamic memory allocation, recursion, analysis of algorithms. Data Structures and Data Abstraction: linked lists, stacks and queues, hash tables, trees, graphs. Algorithms: sorting, search.		
Assessment methods	Theoretical-practical test (40%) Individual works (30%) Group work (30%)		
Recommended readings	Rocha, A. (2008). Estruturas de Dados e Algoritmos em C. Editora FCA Loudon, K. (1999). Mastering Algorithms With C. O'Reilly Kernighan, B. e Ritchie, D. (1988). C Programming Language (2/E). Prentice Hall		
Additional information			

Course title	Network Planning and Management		
Teaching method	Initially a diagnosis is made of knowledge of each student. The needs for support are identified. Motivation is set to raise the importance of the course in the professional field. Contents are presented, set goals, acquire skills, curriculum integration and interconnection with the professional profile. During the semester, the contents are developed as project-based learning, with student active, reflective and critical participation, consolidated with exercises, discussions and individual and group work to targeted results. For monitoring, the activities are subject to formative and summative assessment, enabling tracking and targeting for support. The assessment is individual, continuous and summative, allowing the measurement of the level of knowledge by the applied demonstration of skills developed. During the semester is possible to detect support needs and implement appropriate measures to promote success.		
Person responsible for the course	José Lopes (PhD)	E-mail address:	jlopes@estgl.ipv.pt
Language of instruction	English	ECTS points	6
Semester	Fall	Type of course	compulsory
Hours per week	4	Hours per semester	HT: 162 TP: 30 PL: 30
Objectives of the course	Relate the knowledge previously acquired within the curricular units of data communication networks, through practical case on management and network planning. Thus, it is intended to provide the theoretical and practical knowledge in the context of routing and traffic analysis and network security. Specifically it is intended the knowledge and practice on: the application protocols for network control and traffic routing; management and network security; network planning. The student should be able: to configure the application protocols, including DHCP, DNS and SMTP; determine the traffic routing protocol to use; configure traffic routing protocols and equipments; install, configure and use network management tools; define security policies; plan, build and configure a network security system.		
Entry requirements	There aren't any.		
Course contents	Introduction to network management. LAN vs. WAN network Management. Network support protocols: IP, DNS, DHCP, SMTP, SNMP. Routing algorithms in packet switched networks. Definition of security policies on networks. Firewall Systems. Definition of network management system. Products NMS (Network Management Systems). Network Management Tools.		
Assessment methods	Test(s) (70%) Work (30%)		
Recommended readings	Stamper, D. and Case, T. (2003). Business Data Communications, 6ª Ed., PHIPE – Prentice-Hall Monteiro, E., Boavida, F. (2000). Engenharia de Redes Informáticas. Editora FCA Boavida, F. et al. (2009). Administração de Redes Informáticas. Editora FCA Loureiro, P. (2003). TCP/IP em Redes Microsoft para profissionais, 6ª Ed. Editora FCA		
Additional information			

Course title	Database Systems		
Teaching method	Lessons are theoretical-practical activities with development of laboratory work either individually or in groups. During the classes are displayed content using the projection. In the second part of the class, examples are given on the contents and solved exercises in order to put into practice the contents taught. The evolutionary typology of content, requires the application of knowledge from previous classes. They are produced videos on the use of software to support teaching. The evaluation of the course by continuous assessment includes three components: the first in the form of mini-tests, the second by the elaboration of a draft of databases connected with VB.NET/C# and the third assessing the behavioral component. The remaining evaluation periods (final, recourse, special or improvement) are evaluated by two components: a written exam and project.		
Person responsible for the course	José Lousado (PhD)	E-mail address:	jilousado@estgl.ipv.pt
Language of instruction	English	ECTS points	6
Semester	fall Semester	Type of course	Compulsory
Hours per week	4	Hours per semester	HT: 162 TP:30 PL: 30
Objectives of the course	This unit has as main objectives: acquiring knowledge about the management systems of databases, particularly in terms of installation, management and data management; know linking databases with Visual Programming Languages (VB.NET or C#), for developing computer applications; describe queries in databases using relational algebra and SQL; know how to use CASE tools for modeling databases; build databases and tables and their relations based on the SQL-DDL. At the end of the unit students should be able to: designing a database, given a specific problem of data modeling; implement a database to a study of the DBMS; develop computer applications using access to databases, using the language C # or VB.NET; using software to support the development of software (CASE Tools); install, configure and administer a DBMS.		
Entry requirements	There aren't any.		
Course contents	Fundamental Concepts of Databases Data vs. Information Management Systems Files vs. Database Data Model Data Dictionary Management System Database (DBMS) ANSI / SPARC architecture Transaction Concept Fundamental Requirements of DBMS Safety mechanisms and data recovery (Backup / Recovery) Users of Database Systems Models Database Hierarchical Network Models Relational Model The Standardization Process Entity Relationship Model Relational Algebra The SQL Language Data Definition Language (DDL) Data manipulation language (DML) - Basic Structure Operations between sets Operations with multiple tables Transactions between an element and a set Tuple Variables Comparisons with sets Ordering of tuples Calculations on groups of tuples Verification of shallow relationships (exists / not exists) Modification of the database via SQL		
Assessment methods	Written test (s), exercises and / or mini-tests (45%) Work and / or projects (45%) Attendance, class participation (10%)		
Recommended readings	Damas, Luís (2000), SQL, Ed. FCA MYSQL (Manual on-line) - http://dev.mysql.com/doc Pereira, José Luís, (1998), Tecnologia de Bases de Dados, Ed. FCA Carvalho, V.; Azevedo, A.; Abreu, A. (2008), Bases de Dados com MS Access 2007, , Ed. Centro Atlântico PostgreSQL (Manual on-line) - http://www.postgresql.org/docs/8.0/interactive/index.html CEF/0910/27766 — Guião para a auto-avaliação (Poli) - Ciclo de estu... http://www.a3es.pt/si/iportal.php/process_form/print?processId=7ac61...		
Additional information			

Course title	Telecommunication Systems		
Teaching method	Relating to teaching methodologies: theoretical classes are taught mixed with practical classes. In theoretical classes telecommunications systems topics are presented, there is also place to surprise tests as a way to encourage continuous study and class participation though doubts that might arise during class. In practical classes a discrete event simulation software is developed with the objective of simulation of a network in it's activity peak and infer on the possibility of a call being lost. It is intended therefore to conjugate knowledge with practical work increasing student interest.		
Person responsible for the course	Jorge Duarte	E-mail address:	jduarte@estgl.ipv.pt
Language of instruction	English	ECTS points	6
Semester	fall	Type of course	compulsory
Hours per week	4	Hours per semester	HT: 162 TP: 30 PL: 30
Objectives of the course	Understand the inner workings of the Telecommunications Network .Understand the inner workings, media, transport, and information coding strategies and transmission on the Transport Network. Understand the inner workings of call establishment and termination in the local link, as well as the digital modes available to the customer. Understand in which ways the signalling is performed in the local link and in the transport network. Create simulation algorithms of communication systems to test their correct functioning.		
Entry requirements	There aren't any.		
Course contents	Introductory Concepts of Telecommunications Systems Data link Transport network Local Loop Signaling in Circuit Switching Networks Wireless Telecommunication Systems		
Assessment methods	Evaluation Test (s) (60%) Practical Work (40%)		
Recommended readings	Monteiro, E., Boavida, F. (2011). Engenharia de Redes Informáticas – 10ª Edição Atualizada e Aumentada. Editora FCA Tanenbaum Andrew (2010), Computer Networks, Wetherhall Bellamy, John C. (2000), Digital Telephony, 3rd Edition, John Wiley & Sons Outras Fontes: E1 Pocket Guide da Acterna. http://www.scribd.com/doc/6609554/SDH-Pocket-Guide-Acterna1 ATM Pocket Guide da Acterna. http://paginas.fe.up.pt/~mleita/STEL/Tecnico/ATM_ACTERNA.pdf SDSL Anywhere. http://www.ntia.doc.gov/legacy/ntiahome/broadband/comments/dslf/dsl_anywhere.pdf International Telecommunications Union. http://www.itu.int/ Internet Engineering Task Force. http://www.ietf.org/ TechFest. http://www.techfest.com/networking/index.htm Protocols.com. http://www.protocols.com/ DSL Forum. http://www.dslforum.org/ Korbonen Juha (2003), "Introduction to 3G Mobile Communications". Artech House. Oficial Radio Mobile web page http://www.cplus.org/rmw/english1.html		
Additional information			

