Welcome to The Estonian Information Technology College!

Fall semester, 29 August – 29 January, 2017;
Examination Session - 02 January – 29 January, 2017;
Arrival and Orientation Days for International exchange Students, 24 August – 28 August, 2016;

Spring Semester courses in english for academic year 2016/17 :

Code: I307	Digital Communication
Credit points:	3 ECTS
Lecturer:	Ivo Müürsepp
Description:	The course introduces the general principles and methods of analysis of the building of digital communication systems. The random processes, the possible noise occurring in the communication channels as well as the characteristics of wireless multi-path channels are also discussed. Various methods of digital modulation and demodulation are compared. The matched-filter systems and their characteristics are observed. The base band transfer of digital signals as well as the behaviour of the band pass signal in the presence of noise is examined. The systems using spread spectrum and their advantages are observed. The line and channel codes for fault detection and repair are also considered.

Code: I238	Intellectual Capital Theory
Credit points:	4 ECTS
Lecturer:	Linnar Viik
Description:	A student who has successfully completed the course should have acquired an understanding of knowledge-based economy, different methods and practices for innovation management,

the subject, scope and methods of calculation of the Intellectual Capital and its application in the creation and observation of product models and the economic models of an enterprise. Special focus will be put on product development, product life cycle analysis and product positioning.

Code: I378	Data Security and Cryptology
Credit points:	5 ECTS
Lecturer:	Valdo Praust
Description:	The course gives a systematic overview of contemporary data security and cryptology, both theoretically and practically. First general concepts of data security are dealt with and an overview of dangers, weaknesses, risks and safety measures as well as connections between them is given. Then two main methods of guaranteeing security are discussed - risk analysis and the method of baseline security. A thorough overview of cryptography follows, including all most often used algorithms and protocols. The main emphasis is placed on symmetric and asymmetric crypto-algorithms and their properties, but primarily on their applicability in practice. Algorithms DES, IDEA, AES and RSA are studied in more detail. A thorough introduction of digital signature and the related infrastructure follows. The last parts of the course focus on network security, database security and security management of an organisation. Information hiding problems and the discipline, which studies this - steganography, are touched upon.

Code: I214	Functional and Logic Programming
Credit points:	4 ECTS
Lecturer:	Tarmo Uustalu; MSc Tõnu Tamme

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Description:	The main emphasis of the course is on principles and techniques of declarative programming. The course gives an overview of the basic constructions of logic programs as facts, rules and queries; Presentation of knowledge bases and puzzles in Prolog; Recursive structures: arithmetic expressions and lists as well as prolog's meta facilities, second order predicates and non-logical commands. The basic properties of functional languages - functions, referential transparency, recursion, types, polymorphism, higher order functions, lazy and strict evaluation will be introduced. In addition, an overview of lazy functional language Haskell and its programming techniques will be given.
	A student who has successfully completed the course knows the programming language Prolog, can apply Prolog to problem solving, has general understanding of the functional programming paradigm and has practical experience of Haskell programming and of using Haskell for simple problem solving

Code: I231	Algorithms and Data Structures
Credit points:	5 ECTS
Lecturer:	Jaanus Pöial
Description:	The main focus of the course is to provide conceptual understanding of algorithms and data structures needed for programming. The course topics also include algorithms and methods to express and analyse the complexity of algorithms.
	The course gives a systematic overview of different data types, data structures and algorithms needed for effective programming. The course covers searching and sorting algorithms, text algorithms, classical data structures: stack, queue, dequeue, hashtable, tree, BST, B-tree, graph. Implementation of graphs and trees is used as a programming exercise.

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A student who has successfully completed the course is familiar to the basic data structures and should be capable to analyse and implement the basic algorithms.

Code: I237	Hardware Programming
Credit points:	4 ECTS
Lecturer:	Andres Mulin
Description:	The course gives the general knowledge about working principles of microcontrollers, explains how to make a program for a microcontroller and presents basic principles of using controllers. The course introduces computer architecture from programmer's point of view. An overview of central processing unit, memory organisation, peripherals and input/output ports will be given. In addition, the instruction set architecture as arithmetical, logical, data transfer and control instructions as well as interrupts system will be given. The course focuses also assembler language fundamentals: instructions; operators; expressions and directives will be introduced as well. A student who has successfully completed the course is able to solve simple programming problems by designing the program for microcontrollers, make programs based on the design of microcontroller and is capable to make the peripheral -systems control-programs. Additionally, the student should have acquired the basic principles of Assembler language, should have understood the influence of microcontroller's architecture to programming process and should be capable to use microcontroller's programming tools.

Code: I384	CISCO: Configuring Switches and Understanding VLANs
Credit points:	4 ECTS

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Lecturer:	Truls T. Ringkjob
Description:	The primary focus of this course is on LAN switching and wireless LANs. The goal is to develop an understanding of how a switch communicates with other switches and routers in a small- or medium-sized business network to implement VLAN segmentation. This course focuses on Layer 2 switching protocols and concepts used to improve redundancy, propagate VLAN information, and secure the portion of the network where most users access network services.

Code: I319	Oracle: Programming Languages SQL and PL/SQL
Credit points:	3 ECTS
Lecturer:	Toomas Lepikult, PhD
Description:	The course introduces development programming languages SQL and PL/SQL, used in developing Oracle databases. SQL query language and PL/SQL programming language and their practical usage on database administration are studied. In addition of theoretical background of SQL and PL/SQL languages the course objective is to give first hands on experience to the students for building up practical programming capabilities. This course provides the database administrators and developers practical experience on the implementation of SQL queries on large size databases. Additionally, the practice for creating, administering and managing the databases and developing database applications using PL/SQL will be provided. The main topics include: using SQL*Plus, classification of SQL sentences, data filtering and sorting, table joins, building the queries from joined tables, using the group and single row functions, building subqueries, manipulating data, creating and managing tables, views and other database objects, controlling user access, PL/SQL scalar and complex data types, control statements, procedures, functions, packets and triggers.

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Having completed the course, the student should possess the theoretical knowledge and practical programming skills using SQL and PL/SQL. He/she understands the main constructs of the SQL and PL/SQL languages. Also, he/she is able to use these languages in creating and managing databases and in developing of database applications. A student who has completed the course is capable of passing the corresponding Oracle qualification examinations and creating applications in the Oracle database management system

Code: I340	Basics of GIS
Credit points:	3 ECTS
Lecturer:	Peep Krusberg
Description:	The course gives a broad overview how information and computer technologies are used in the field of geoinformatics: Geographic Information Systems, photogrammetry, Remote Sensing and Global Navigation Satellite Systems. Spatial data capture, modelling, storage, processing, output and dissemination are covered. Also institutional arrangements like standardisation, organisations and Spatial Data Infrastructures are discussed. At the end of the course the students will have ideas where these technologies can be implemented and which methods and tools are appropriate for certain GIS purpose.

Code: I348	Digital Audio and Video Processing
Credit points:	4 ECTS
Lecturer:	Indrek Rokk, Janno Äniline, Margus Ernits
Description:	The course introduces the principles of image and audio digitization. Audio information, its processing, coding and

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compression are explained. Concepts of excess information and information loss will be introduced. Principles of the processing of speech information and detection and synthesis of speech signals are thought. Image information, video signals, visualization of image information, processing of static and moving image, image information compression are explained. As well as the principles of recording, assessment of quality and standardization are explained.

Students should be familiar with previously listed concepts and should possess relevant skills for entry level audio and video processing.

Code: I219	Software Engineering
Credit points:	3 ECTS
Lecturer:	Paul Leis
Description:	The main emphasize of this course is on the analysis of software development process from traditional Waterfall, Spiral Development, Incremental Development including agile methodologies and Unified Process. In the recent years the importance of agile software development methodologies is growing. In this course the different agile approaches: Scrum, Extreme programming, Feature Driven Development etc are analyzed. Also flow based, non-iterative modern methodologies as Lean software development and Kanban software development are discussed in detail. In addition, this course gives knowledge of software project management, how to organize the project personnel and how to identify and mitigate the risks involved in software development process. Among others, the techniques for provided software development quality and different testing methods as Integration testing, System testing, User Acceptance Testing are discussed during this study. New in the course: Kanban software engineering.

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> The participants would gain the theoretical background and the skills needed for the successful software development project management and implementation.

Code: I353	IT Strategy
Credit points:	4 ECTS
Lecturer:	Paul Leis
Description:	This course gives an overview of the IT tactical planning needed for any organization using and /or developing the information technology. The course examines importance and mutual relationships of an organization vision, mission, business goals and business strategy and their impact on the development of IT goals, strategy and IT tactical Plan. The main focus is given to the linking the business and IT strategies for meeting the most effective way the organization goals. The planning process on conceptual and detailed level and the content of the plan and cyclic improvement of the plan are considered. Additionally, how to determine the Gap between Current and Future Status of IT and how to determine the High-Level Direction of IT as Strategic Objectives, Information Systems Architecture, Information Architecture, Policies, IT Service Architecture is studied as well.
	The student should have gained the understanding of the importance of IT strategic planning, connection with the organization overall planning mechanisms and should possess the first level skills needed for IT tactical planning.

Code: I386	Windowsi Server Administration
Credit points:	3 ECTS
Lecturer:	Hannes Siitas/ Toomas Lekik

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Description:	The course introduces Microsoft Windows Server as one of the infrastructure platforms.The main emphasise is put on developing the administration skills and knowledge of MS Windows Server based systems. Detailed information of Windows Server Services related to Windows Deployment Services, Network Infrastructure and Active Directory will be given.
	A student who has successfully completed the course should know how to deploy, manage and secure Windows Server and should be able to use Windows Server as platform of network infrastructure. Additionally, the student should have gained the understanding of roles and features of Microsoft Windows Server, should be able to install and configure the AD DS, DHCP, DNS roles on Windows Server, manage the user accounts, account groups and recover the data using the backups.

Code: I370	Maintenance of Windows Workstations
Credit points:	3 ECTS
Lecturer:	Hannes Siitas
Description:	The goal of this course is to give a solid introduction to the client version of Microsoft Windows. The focus of this course is given to gradually develop the student competence in Microsoft Windows client maintenance: installation, upgrading and migration Windows based systems; configuration the applications and hardware.
	After the successful course completion the attendant will be able to configure Windows clients, should know how to deploy, manage and use Windows operating system and should be able to give a support for Windows users.

Code: I008	Ethical, Social and Professional Aspects of Information Technology

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Credit points:	4 ECTS
Lecturer:	Kaido Kikkas, PhD
Description:	The goals of the course are to give an overview of the broader social background of IT and the interaction between IT and other spheres of social life; to direct the students not to think only in technological and economic terms but to broaden their understanding of the social aspects of their activities; to teach students to understand the main development directions of the field (including IT history, information society and network culture, legal matters, IT risks, online communities etc) and make future predictions through the observation of development processes of IT; to recognize the Internet as not only technical but a social phenomenon; to teach the fundamentals of professional self-expression and information exchange through seminars, presentations and written assignments.
	The graduate has acquired knowledge about the history and development of IT, legal regulations covering software and online content (copyright, licenses etc), is aware of ethical problems concerning IT and is familiar with various aspects of the professional culture in IT. The graduate has acquired basic knowledge and some experience in technical writing, presenting and reviewing, as well as using Web 2.0 technologies to achieve this. Additionally, the graduate is aware of the social dimension and ethical questions in IT and is able to place him/herself into the context of the professional culture.

Code: I249	**Basics of Telecommunication**
Credit points:	4 ECTS
Lecturer:	Truls T. Ringkjob, Avo Ots
Description:	The goal of this course is to introduce you to fundamental networking concepts and technologies. These online course materials will assist you in developing the skills necessary to plan and implement small networks across a range of applications.
	You will be introduced to the two major models used to plan and implement networks: OSI and TCP/IP. You will gain an understanding of the "layered" approach to networks and examine

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the OSI and TCP/IP layers in detail to understand their functions and services. You will become familiar with the various network devices, network addressing schemes and, finally, the types of media used to carry data across the network. As well you will get detailed understand of deploying Ipv4 subnets. And how the data flows through the models above from source to the destination devices.

Students will be able to design install and maintain a small network. Design meaning both the physical wiring and logical IP number structure, Install the cables and attache the pc to the network. Give PC ip numbers. Gain access to and configure the basics information in a router and switch. Host names, Ip numbers, passwords to secure router and switch from unauthorized access.

Code: I232	Network Administration, Routers
Credit points:	4 ECTS
Lectures:	Truls T. Ringkjob
Description:	The course is part of the Cisco network academy cycle. It deals with the main activities connected with the administration of routers - initial router configuration and reconfiguration of the router, router settings, and use of routing protocols. All topics are covered with interactive lecture materials in English, which deal with the necessary concepts and give instructions for administration activities on Cisco routers. The activities are undertaken practically in a laboratory equipped with Cisco network technology.

Code: I359	CCNP1 Advanced Routing
Credit points:	4 ECTS
Lecturer:	Truls T. Ringkjob
Description:	Advanced Routing is the first of four courses leading to the Cisco Certified Network Professional certification. CCNP 1 teaches students how to design, configure, maintain, and scale routed networks. Students learn to sue VLSMs, private addressing, and NAT to enable more efficient use of IP addresses. This course teaches students how to implement routing protocols such as RIP v2, EIGRP, OSPF, IS-IS, and BGP, In addition, the course details

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	the important techniques used for route filtering and route redistribution.

Code:	**Oral and Written Communication Skills**
Credit points:	4 ECTS
Lecturer:	Kärt Rummel
Description:	Oral and Written Communication aims to develop students' academic and professional literacy skills and competences required to operate in field-realted authentic contexts. It also focuses on team-building and individual skills of effective communication. By the end of the course, students will have developed individual and team building skills and competences to communicate meaning in English-speaking contexts in both oral and written modes more effectively and fluently.

Code:	**Introduction to Informatics and Computers**
Credit points:	6 ECTS
Lecturer:	Lauri Võsandi
Description:	Course objective is to provide introduction to informatics and computers, covering wide range of computing topics such as hardware, software, electronics, logic, history, standards and to prepare students to continue their studies in depth. The course builds problem-solving mental set that is necessary for successful IT career. By the end of the course, students have basic understanding of high-level computer components motherboard, CPU architectures, RAM, ROM, harddisks, solid-state disks, various buses (I²C, UART, SPI, PCI Express, AMBA/AXI), Students can identify various ports, buses and their uses..

Code:	**Logic and Descrete Mathematics**
Credit points:	4 ECTS
Lecturer:	Jaan Penjam
Description:	This course is designed to introduce students to the techniques, algorithms, and reasoning processes involved in the study of discrete mathematical structures. Students will be introduced to set theory, deductive and inductive reasoning, elementary counting techniques, ordering, functional and equivalence relations, graphs, and trees. The

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aim is to give them knowledge and skills that would enable to use the basic methods of discrete mathematics in subsequent courses, in the design and analysis of algorithms, computability theory, software engineering, and computer systems.

Code:	Basic Networking
Credit points:	6 ECTS
Lecturer:	Roman Kuchin
Description:	Course objective is to provide the basic knowledge and skills for installing, operating and troubleshooting a small enterprise branch network, including basic network security. The cource covers networking fundamentals, WAN technologies, basic security and wireless concepts, routing and switching fundamentals, and configuring simple networks. After finishing this cource students are able to get CCENT certification. By the end of the course, students will have developed skills and competences to design a small network, choose architecture, apropriate equipment, addressing schemes, etc.

Code:	Basic Programming
Credit points:	6 ECTS
Lecturer:	Mikk Mangus
Description:	The aims of this course are: introduce general terms of programming; teach the basics of algorithms and programming; improve algorithmic thinking; train to program in basic level in Java; introduce tools used for programming. Inexhaustive list of subjects: algorithm, expression, variable, branch, loop, array, multi-dimensional array, subroutine, string, class, object, subclass, interface, exception, revision control.

For more information please see The Study Information System.
https://itcollege.ois.ee/en/curriculum.

For application please send:

- Application and Learning Agreement Form
- Transcripts of Records
- 1 photo (3x4 cm) in electronic format (.jpg/.tif)
- Copy of ID card or passport

For application please use the application Form and Learning Agreement available on our web page:
http://www.itcollege.ee/en/exchange-studies/incoming/.

Documents should be sent by post:
Martina Tsänkmann
Raja 4c,
12616 Tallinn, Estonia

Deadline for application: 15, June, 2016.

For ESTILC - Estonian Intensive Language Courses please look for here
http://erasmuspluss.ee/en/haridus/estilc/.

You are welcome to contact for any additional information!

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