DOWNLOAD PDF COMPUTER NETWORKS (CRUCIAL STUDY TEXTS FOR COMPUTING DEGREE COURSES)

Chapter 1 : Computer Science â€“ Applied Computing (CSCI)

*Computer Networks (Crucial Study Texts for Computing Degree Courses) [Philip Irving] on calendrierdelascience.com *FREE* shipping on qualifying offers. This book is written to help students succeed in British university level assessments.*

Required Courses in Information Technology All courses, Concepts may be introduced with a visual tool. Topics are demonstrated and implemented in a higher-level contemporary language such as Java or C. Emphasis will be placed on the scope of computer architecture and troubleshooting, basic network concepts, TCPIP, Windows and Linux operating systems, network security fundamentals, routing and switching concepts, and virtualization. Database as a Service DBaaS ; entity relationships as foundations of relational database design; ensuring data integrity; the use of standard SQL as a means of developing complex queries; and the use of comparison operators to customize data presentation for reporting. Topics include the function and purpose of hardware and software, system board components and memory management, working with floppy and hard drives, supporting input and output devices, multimedia technology, supporting operating systems, printers, and notebook computers, troubleshooting fundamentals, applying disaster-recovery techniques and developing maintenance plans, and working with networks and the Internet. Topics include planning and installing a Linux system, using and managing desktop interfaces, working with Linux shells and text files, performing system administration and management tasks such as file system management, application, process, and module management, network services installation and configuration, system security evaluation and enhancement, performance tuning, and troubleshooting techniques. It will instruct the student in the latest security industry recommendations and how to properly protect leading OS servers in a variety of settings as well as how to conduct security audits. Topics include exploring router components and their function, configuring routers according to the industry standard operating system OS , routing fundamentals in a subnetted network infrastructure, and LAN design technologies. Routing protocol basics, such as static and dynamic routing techniques, are covered, with extensive labs and hands-on exercises. Topics include advanced Linux system administration, using Linux as an e-mail server, FTP server, database server, web server, and news server. It also includes an introduction to object-oriented programming and GUI programming concepts and topics. Students will learn data storage principles, architectures, and implementations. It prepares students to manage complex information technology projects. Students are introduced to all five major process groups in project management, namely initiating, planning, executing, monitoring, controlling, and closing. Topics include project life cycles, cost benefit analysis, work breakdown structure, staffing, roles, responsibilities, accountability, finance, estimation, budgeting, planning, risk management, scheduling, and tracking. The course also introduces students to computer software for project management. Students will work in teams to design a project plan for a real-world IT project that demonstrates an ability to follow standard project management methodology. Students will learn cloud computing principles, architectures, and implementations. Topics include cloud computing history, principles, architectures, and implementations, cloud services and solutions, virtualization, network infrastructure and access, data storage, security, end-user access, and standards and compliance. Topics include installing the client and server operating systems, planning, installing, managing, and troubleshooting server roles, features, and network services, implementing and conducting administration of resources, implementing, managing, and troubleshooting hardware devices and drivers, monitoring and optimizing performance, reliability and availability, managing, configuring, and troubleshooting storage use, configuring and troubleshooting the desktop environment and network connections, implementing, managing, and troubleshooting network protocols, and implementing, monitoring, and troubleshooting security. Topics include business and performance benefits of virtualization, local and network storage management, creating and managing stand-alone virtual machines, cloning virtual machines, virtualization in the network operations center,

software and network testing using virtualization, virtualization as a disaster recovery tool, and managing and tuning virtual machine and virtual infrastructure performance. Emphasis is placed on learning several virtualization environments and approaches, both proprietary and open-source. Concepts will be illustrated and enforced with a variety of actual installations and practical projects. Topics include wireless theory, including radio frequency and infrared transmissions. It also covers wireless topologies, access points, wireless bridges, antenna theory, wireless security, site surveys, and troubleshooting techniques. Students will design and implement scripts of moderate complexity that automate administrative tasks such as the creation of user accounts, the administration of disk drive and printer, and the management of system services and event logs. Topics include tools and utilities, interactive command line programs, shell programming using constructs, variables, commands, functions, and debugging processes. Topics include the architecture and communication abilities of mail servers, installation of mail servers, backward integration and compatibility, client support and configuration, real-time collaboration, foreign mail system connectors, SMTP and Internet-based client access, security techniques, performance monitoring, maintenance procedures, and troubleshooting issues. The lab-intensive environment gives each student in-depth knowledge and practical experience with the current essential security systems. Students will begin by understanding how perimeter defenses work and then be led into scanning and attacking their own networks; no real network is harmed. Students then learn how intruders escalate privileges and what steps can be taken to secure a system. Students will also learn about intrusion detection, policy creation, social engineering, open-source intelligence, incident handling, and log interpretation. This course teaches the student how to install and configure the voice-over IP telephony technology. Topics include installing and configuring voice and data network routers, configuring voice-over frame relay, ATM and IP, configuring voice ports and dial peers, voice traffic analysis, and QoS. Focus will be on basic principles of good writing-which scientific and technical writing shares with other forms of writing-and on types of documents common in scientific and technical fields and organizations. While the emphasis will be on writing, oral communication of scientific and technical information will form an important component of the course, as well. The processes and techniques used to produce manuals and other supporting documents to communicate complex and technical information more easily will be explored. Elective Courses in Information Technology A minimum of The course introduces students to advanced concepts in router and switch design and configurations. The course concentrates on the systems development process-the analysis. The analysis process provides a strong basis for understanding and modeling the user needs in an information system solution with a business-driven conception. The course does not include any programming of the system or actual layout of the network. Emphasis is placed on the tools and analytical skills required of the systems analyst. Topics include PC hardware, computer networking, OSI model, client and server operating systems, basic virtualization, programming and logic, databases, and basic web authoring. The various types of learning artifacts that are commonly used in portfolios, including presentations, diagrams, papers and project summaries will be reviewed. Upon successful completion of the course, students will have built an ePortfolio which they may continue to build upon. This course also includes the preparation and completion of the Microsoft exams , , and This course also includes the preparation and completion of the CCNA exam Topics include access control lists, intrusion prevention systems, IPSec, and virtual private networks. Students will learn Information Assurance and Security principles; legal and ethical considerations; incident handling and reporting; risk identification and mitigation; security and operations management; security policies; security audits; and information security standards. The goal of the ethical hacker is to help organizations take pre-emptive measures against malicious attacks by attacking the system themselves while staying within legal limits. This course will explore the various means that an intruder has available to gain access to the security of a network and various resources. Students will be introduced to penetration testing with the ethics and responsibilities of testing in mind as well as various security attacks to the advanced level. The course will have an intense laboratory component which will be limited to student networks. Foundations in security policy, perimeter defenses, intrusion detection, security monitoring, liability

issues, and ethics will be covered. Topics to be covered include, but are not limited to, penetration testing, enumerating, footprinting, scanning, hacking techniques, firewall, IDS, procedural documentation, host reconnaissance Trojans, backdoors, and system attacks such as WLAN, database servers, web servers, and e-mail servers. It must be noted that hacking is a felony in the United States and most other countries. When it is done by request and under a contract between an Ethical Hacker and an organization, it is legal. Topics include implementation of IPSec in several different scenarios including a detailed and extensive lesson on securing Linux and Windows network infrastructures. Students will also be introduced to securing routers and switches in an infrastructure design as well as professional documentation of network infrastructures. Students will work in teams on a project to demonstrate concepts of hardening a network infrastructure. There is an in-depth treatment of several significant topics such as user authentication, browser security, business logic, data handling, and distributed threats. The course also covers motivating attacks, defense mechanisms, and security tools and techniques. Emphasis is placed on the skills and abilities for analyzing and documenting web security as a security specialist in order to protect web-related services. Topics include client security, cookies and web beacons, phishing, transaction security-certificates and secure connections, spyware and viruses, man-in-the-middle attacks, server security, denial-of-service attacks, attacks via clients e. Topics include detailed discussions of corporate security culture, the reasons for building and components of a trusted network, and an in-depth look into cryptography, computer forensics law, and legislation, looking at the legalities surrounding networks and network security. Additional topics include a detailed look at biometrics and its applications, strong authentication, and a discussion of two of the cornerstones of trusted networks: Topics include network security principles, security threats, routers and switches security configuration, monitoring, management, authentication, authorization, and accounting implementation, access control list configuration, and intrusion prevention operation. Topics include securing the local area network LAN , including endpoint, Layer 2, wireless, VoIP, and network storage devices, defining and using cryptographic systems, implementing and configuring virtual private networks VPNs , managing a secure network, listing network security policy elements, and describing a Cisco Adaptive Security Appliance ASA. Students will learn advanced network infrastructure principles and architectures to deploy, manage, and maintain a network server operating system infrastructure. Topics include advanced network infrastructure architectures, solutions, and implementations, high availability, file and storage solutions, business continuity and disaster recovery, advanced active directory infrastructure, and identity and access solutions. Topics include analyzing security requirements and designing network security solutions for access between networks and communication channels. Topics include web server technology, selecting a web server platform, establishing server services such as HTTP, FTP, SMTP, and NNTP, supporting server-side technologies CGI, servlets, server-side includes, ASP, and JSP ,supporting web client technologies Java applets, ActiveX, and plug-ins , client configuration and browser support, indexing and index servers, virtual directories and content, web server security and host access, SSL and certificate authorities, supporting intranets with web servers, web server performance and troubleshooting, integrating proxy and web servers, handling of different protocols by proxies, proxy caching, filtering, monitoring, access control, and proxy security, performance, capacity planning, and load balancing. Topics include switching roles, configuration and troubleshooting of switches, VLAN technology, spanning tree protocol, multilayer switching, multicasting, IP telephony, layer 2 and 3 configuration, and SANs. Other topics may include route redistribution, path selection, policy based routing, layer 3 path control and securing communications hardware in an enterprise network. It is focused on providing real-world application, skill enhancement, and troubleshooting methodologies. Required Capstone or Internship 3. Interim reports to the sponsor or to the class, a final project report, and a final presentation will be required. The career internship course is designed for students interested in pursuing a career in the computer science and information technology fields. The outcome of the internship is an informed student fully apprised of the opportunities their program offers for professional growth. During the internship, the student will experience various aspects of working in the actual field in which the student has been educated.

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The internship is designed to provide the student with the opportunity to experience and participate in duties typical of a contemporary workplace setting. Student learning centers on observing experienced personnel as well as participating in actual hands-on procedures under close supervision of trained professionals. Refer to the General Education section of the catalog for specific information about courses within each discipline. Topics include but are not limited to Blackboard support, student support services, e-books, university policies, resumes, self-reflection, time management, goal setting, and strategies for anxiety reduction. Topics include research, job searching, developing career documents, refining interview and communication skills, and creating a personal budget.

Chapter 2 : Computer Networking

About the Computer Networks and Cybersecurity Bachelor's Degree. The bachelor's degree program in computer networks and cybersecurity begins with courses designed to build your foundational IT skills.

Charles Babbage sometimes referred to as the "father of computing". Machines for calculating fixed numerical tasks such as the abacus have existed since antiquity, aiding in computations such as multiplication and division. Further, algorithms for performing computations have existed since antiquity, even before the development of sophisticated computing equipment. Wilhelm Schickard designed and constructed the first working mechanical calculator in In , Thomas de Colmar launched the mechanical calculator industry [note 1] when he released his simplified arithmometer , which was the first calculating machine strong enough and reliable enough to be used daily in an office environment. Charles Babbage started the design of the first automatic mechanical calculator, his Difference Engine , in , which eventually gave him the idea of the first programmable mechanical calculator, his Analytical Engine. Computer science began to be established as a distinct academic discipline in the s and early s. The first computer science degree program in the United States was formed at Purdue University in Although many initially believed it was impossible that computers themselves could actually be a scientific field of study, in the late fifties it gradually became accepted among the greater academic population. Initially, computers were quite costly, and some degree of humanitarian aid was needed for efficient useâ€”in part from professional computer operators. As computer adoption became more widespread and affordable, less human assistance was needed for common usage. Contributions[edit] The German military used the Enigma machine shown here during World War II for communications they wanted kept secret. The start of the " Digital Revolution ", which includes the current Information Age and the Internet. It also enabled advanced study of the mind, and mapping of the human genome became possible with the Human Genome Project. Algorithmic trading has increased the efficiency and liquidity of financial markets by using artificial intelligence , machine learning , and other statistical and numerical techniques on a large scale. Even films that feature no explicit CGI are usually "filmed" now on digital cameras , or edited or post-processed using a digital video editor. Modern computers enable optimization of such designs as complete aircraft. Notable in electrical and electronic circuit design are SPICE, as well as software for physical realization of new or modified designs. The latter includes essential design software for integrated circuits. There are many applications of AI, some of which can be seen at home, such as robotic vacuum cleaners. It is also present in video games and on the modern battlefield in drones, anti-missile systems, and squad support robots. Humanâ€”computer interaction combines novel algorithms with design strategies that enable rapid human performance, low error rates, ease in learning, and high satisfaction. Researchers use ethnographic observation and automated data collection to understand user needs, then conduct usability tests to refine designs. Key innovations include the direct manipulation , selectable web links, touchscreen designs, mobile applications, and virtual reality. Because of this, several alternative names have been proposed. Danish scientist Peter Naur suggested the term datalogy, [32] to reflect the fact that the scientific discipline revolves around data and data treatment, while not necessarily involving computers. The first scientific institution to use the term was the Department of Datalogy at the University of Copenhagen, founded in , with Peter Naur being the first professor in datalogy. The term is used mainly in the Scandinavian countries. An alternative term, also proposed by Naur, is data science ; this is now used for a distinct field of data analysis, including statistics and databases. Also, in the early days of computing, a number of terms for the practitioners of the field of computing were suggested in the Communications of the ACMâ€”turingineer, turologist, flow-charts-man, applied meta-mathematician, and applied epistemologist. For example, the study of computer hardware is usually considered part of computer engineering , while the study of commercial computer systems and their deployment is often called information technology or information systems. However, there has been much cross-fertilization of ideas between the various computer-related disciplines.

Computer science research also often intersects other disciplines, such as philosophy, cognitive science , linguistics , mathematics , physics , biology , statistics , and logic. Computer science is considered by some to have a much closer relationship with mathematics than many scientific disciplines, with some observers saying that computing is a mathematical science. Computer science departments with a mathematics emphasis and with a numerical orientation consider alignment with computational science. Both types of departments tend to make efforts to bridge the field educationally if not across all research. Philosophy of computer science A number of computer scientists have argued for the distinction of three separate paradigms in computer science. Peter Wegner argued that those paradigms are science, technology, and mathematics. Eden described them as the "rationalist paradigm" which treats computer science as a branch of mathematics, which is prevalent in theoretical computer science, and mainly employs deductive reasoning , the "technocratic paradigm" which might be found in engineering approaches, most prominently in software engineering , and the "scientific paradigm" which approaches computer-related artifacts from the empirical perspective of natural sciences , identifiable in some branches of artificial intelligence. Outline of computer science As a discipline, computer science spans a range of topics from theoretical studies of algorithms and the limits of computation to the practical issues of implementing computing systems in hardware and software. In addition to these four areas, CSAB also identifies fields such as software engineering, artificial intelligence, computer networking and communication, database systems, parallel computation, distributed computation, humanâ€”computer interaction, computer graphics, operating systems, and numerical and symbolic computation as being important areas of computer science. Theoretical computer science Theoretical Computer Science is mathematical and abstract in spirit, but it derives its motivation from practical and everyday computation. Its aim is to understand the nature of computation and, as a consequence of this understanding, provide more efficient methodologies. All studies related to mathematical, logic and formal concepts and methods could be considered as theoretical computer science, provided that the motivation is clearly drawn from the field of computing. Data structures and algorithms[edit] Data structures and algorithms are the study of commonly used computational methods and their computational efficiency.

Chapter 3 : Online Master of Computer Science in Data Science | Illinois Computer Science

Computer Networks Crucial Study Computing Degree Computer networks and cybersecurity bachelor's degree, in university of maryland university college's award winning bachelor of science in computer networks and.

Fields of Study Algorithms and computational complexity, artificial intelligence, data networking, databases, graphics, machine learning, programming languages, robotics, scientific computing, security and privacy, and systems. Research Facilities The department operates a high-bandwidth, local-area computer network based mainly on distributed workstations and servers, with connections to worldwide networks. Laboratory contains specialized equipment for graphics, vision, and robotics research. Various printers, including color printers, as well as image scanners, are also available. The primary educational facility consists of thirty-seven PC workstations supported by a large Intel PC server. This facility is used for courses and unsponsored research by Computer Science majors and first-year graduate students. Access to computing, through both the workstations and remote login facilities, is available to everyone in the department. Special Admissions Requirements Applicants for admission should have strong preparation in mathematics, engineering, or science. They should be competent in programming but need no computer science beyond that basic level. Special Requirements for the Ph. Degree There is no foreign language requirement. To satisfy the distribution requirement requirement 2 above , the student must take one course in programming languages or systems, one programming-intensive course, two theory courses, and two in application areas. In order to gain teaching experience, all graduate students are required to serve as teaching assistants for two terms during their first three years of study. All requirements for admission to candidacy must be completed prior to the end of the third year. This requirement must be met prior to registering for a second year of study. See Degree Requirements under Policies and Regulations. To qualify for the M. An average grade of at least High Pass is required, with at least one grade of Honors. The requirements are the same as for the M. This program is normally completed in one year, but a part-time program may be spread over as many as four years. A brochure providing additional information about the department, faculty, courses, and facilities is available from the Graduate Coordinator, Department of Computer Science, Yale University, PO Box , New Haven CT ; e-mail, cs-admissions cs. Topics include synchronization, deadlocks, process management, storage management, file systems, security, protection, and networking. Topics include process management, memory management, storage management, protection and security, distributed systems, and virtual machines. Emphasis on fundamental concepts rather than implementation. Aspects of processor and machine architecture. Techniques such as multithreading, message passing, and data parallel computing using graphics processing units. Performance measurement, tuning, and debugging of parallel programs. Algorithmic and Heuristic Composition Scott Petersen Study of the theoretical and practical fundamentals of computer-generated music. Music and sound representations, acoustics and sound synthesis, scales and tuning systems, algorithmic and heuristic composition, and programming languages for computer music. Theoretical concepts are supplemented with pragmatic issues expressed in a high-level programming language. Sound Representation and Synthesis Scott Petersen Study of the theoretical and practical fundamentals of computer-generated music, with a focus on low-level sound representation, acoustics and sound synthesis, scales and tuning systems, and programming languages for computer music generation. Topics include layered network architectures, applications, transport, congestion, routing, data link protocols, local area networks, performance analysis, multimedia networking, network security, and network management. Emphasis on protocols used in the Internet. Topics include the design principles, implementation, and practical evaluation of such systems in new settings, including cloud computing, software-defined networking, 5G, Internet of things, and vehicular networking. The relational model and the SQL query language. Relational database design, integrity constraints, functional dependencies, and natural forms. Learning how to collect requirements and write a specification. Project planning and system design. Introduction to type systems, static analysis, and

model checking. This course provides an introduction to the concepts needed to build new visualization systems, rather than to use existing visualization software. Major topics are abstracting visualization tasks, using visual channels, spatial arrangements of data, navigation in visualization systems, using multiple views, and filtering and aggregating data. Case studies to be considered include a wide range of visualization types and applications in humanities, engineering, science, and social science. The UI in the context of the windows-menus-mouse desktop, as developed by Alan Kay and Xerox in the s and refined by Apple in the early s. Students develop a detailed design and simple implementation for a UI. We cover applications of machine-learning methods in the analysis of high-throughput biological data, especially focusing on genomic and proteomic data, including denoising data; nonlinear dimensionality reduction for visualization and progression analysis; unsupervised clustering; and information theoretic analysis of gene regulatory and signaling networks. State-of-the-art tools used for program verification; detailed insights into algorithms and paradigms on which those tools are based, including model checking, abstract interpretation, decision procedures, and SMT solvers. Emphasis on the interplay between concepts and their implementation in real systems. Fundamental concepts of concurrency and synchronization, communication, reliability, topological and geometric constraints, time and space complexity, and distributed algorithms. Focus on technology, with consideration of such societal issues as balancing individual privacy concerns against the needs of law enforcement, vulnerability of societal institutions to electronic attack, export regulations and international competitiveness, and development of secure information systems. Basic complexity classes, including polynomial time, nondeterministic polynomial time, probabilistic polynomial time, polynomial space, logarithmic space, and nondeterministic logarithmic space. The roles of reductions, completeness, randomness, and interaction in the formal study of computation. Topics include knowledge representation, predicate calculus, temporal reasoning, vision, robotics, planning, and learning. Project topics may include human-robot interaction, adaptive intelligent behavior, active perception, humanoid robotics, and socially assistive robotics. Suitable as an introduction to biological perception for computer science and engineering students, as well as an introduction to computational vision for mathematics, psychology, and physiology students. Emphasis on differential geometry, machine learning, visual psychophysics, and advanced neurophysiology. Topics include perceptual organization, shading, color, and texture. Topics include part of speech tagging, Hidden Markov models, syntax and parsing, lexical semantics, compositional semantics, machine translation, text classification, discourse, and dialogue processing. Additional topics such as sentiment analysis, text generation, and deep learning for NLP. Topics include affine and projective transformations, clipping and windowing, visual perception, scene modeling and animation, algorithms for visible surface determination, reflection models, illumination algorithms, and color theory. Topics vary and may include reflectance modeling, global illumination, subdivision surfaces, NURBS, physically based fluids systems, and character animation. The goal is to give students exposure to building hardware and low-level software support for emerging high-performance server systems used in data centers. Key topics include the virtual memory abstraction, cache coherence, and memory consistency, particularly in the context of performance and energy efficiency. We study the impact of hardware heterogeneity on these trends; and the emergence of hardware accelerators i. The course prepares students to understand these challenges and provides the background to architecture systems that embrace extreme heterogeneity. Students who do not fit this profile may be allowed to enroll with permission of the instructor. The course is addressed to Computer Science graduate students who do not necessarily specialize in numerical computation; it assumes the understanding of calculus and linear algebra and familiarity with or willingness to learn either C or FORTRAN. Its purpose is to prepare students for using elementary numerical techniques when and if the need arises. Part of the course examines approaches for perception with a variety of devices and algorithms; the other part focuses on methods for decision-making. The course is a combination of lectures, reviews of state-of-the-art papers, discussions, coding homework, and a final team project. The combinatorial meaning of the eigenvalues and eigenvectors of matrices associated with graphs. Applications to optimization, numerical

linear algebra, error-correcting codes, computational biology, and the discovery of graph structure. This course provides a principled and hands-on approach to deep learning with neural networks. Students master the principles and practices underlying neural networks, including modern methods of deep learning, and apply deep learning methods to real-world problems including image recognition, natural language processing, and biomedical applications. Course work includes homework and a final projectâ€”either group or individual, depending on the total number enrolledâ€”with both a written and oral i. Topics include secure multiparty computation, verifiable computation, cryptographic obfuscation, functional encryption, and more. We study the motivation for, applications of, and security requirements for each of these primitives. We then focus on a few different constructions that instantiate each primitive and the formal proofs of security for them. Another point of consideration is the efficiency properties for the constructions, both asymptotically and in concrete practical terms when implementations are available. In this readings-and-projects-based course, we explore how to use tools such as probabilistic models, probabilistic programs, and neural networks to generate content, explore design spaces, and support creativity for 2D and 3D graphics and vision applications. Each week, we read recent papers from the visual computing and AI literatures and discuss their contributions, connections, and limitations. Students also complete a collaborative, open-ended final project. Throughout, the course emphasizes key academic skills such as critical paper-reading and how to give clear and compelling presentations. Topics include arranging objects, controlling procedural models, generating 3D geometry, writing and drawing, assigning materials and colors, generative adversarial models, learning representations of shape, learning from RGB-D panoramas, deep reinforcement learning, and exploring manifolds. Students are not expected to be familiar with all of these areas; this is a multidisciplinary area, and we welcome students of diverse backgrounds to share their expertise and interests. Students who lack this background may be allowed to enroll with permission of the instructor. Requires a faculty supervisor and the permission of the director of graduate studies. This year, the focus is on a broad scope of biomedical data-analysis tasks, such as single-cell RNA sequencing, single-cell signaling and proteomic analysis, health care assessment, and medical diagnosis and treatment recommendations. The seminar is based on student presentations and discussions of recent prominent publications from leading journals and conferences in the field. Mining and Modeling Mark Gerstein Biomedical data science encompasses the analysis of gene sequences, macromolecular structures, and functional genomics data on a large scale. It represents a major practical application for modern techniques in data mining and simulation. Specific topics to be covered include sequence alignment, large-scale processing, next-generation sequencing data, comparative genomics, phylogenetics, biological database design, geometric analysis of protein structure, molecular-dynamics simulation, biological networks, normalization of microarray data, mining of functional genomics data sets, and machine-learning approaches to data integration.

Chapter 4 : Computer Networks and Security BSc (Hons) - Computing - University of Derby

You'll study algorithms and programming, as well as computer systems, networks, and network and software security. The emphasis is on the principles, practice and management of computer networks and the security technologies organisations rely on.

The aim is to apply principles and concepts from a variety of social science disciplines e. Topics include how technology changes relationships, the cumulative advantages and disadvantages associated with technology, digital natives versus digital immigrants, the pace of technological change, changes to the nature of how people learn and think, and the meaning of technology in society. An introduction to the structure and function of living organisms. The objective is to use knowledge about biological principles and scientific reasoning to make informed decisions about the natural world. Topics include the chemical foundations of life, cell biology, genetics, evolution, ecosystems, and the interdependence of living organisms. Discussion also covers the importance of the scientific method to biological inquiry and the impact of biological knowledge and technology on human societies. Students may receive credit for only one of the following courses: Fulfills the laboratory science requirement only with previous or concurrent credit for BIOL A hands-on study of the structure and function of living organisms. The goal is to apply the scientific method and to use scientific and quantitative reasoning to make informed decisions about experimental results in the biological sciences. Laboratory exercises emphasize the scientific method and explore topics such as the chemical foundations of living organisms, cell structure and function, and the classification of organisms. An overview of the criminal justice system and the application of digital forensic evidence in criminal justice cases. The objective is to apply Constitutional and case law to the search and seizure of digital evidence, determine the most effective and appropriate forensic response strategies to digital evidence, and provide effective courtroom testimony in a case involving digital evidence. Topics include crime scene procedures and the collection of digital evidence, procedures performed in a digital forensics lab, and the preparation of courtroom testimony by the digital forensic investigator. Social Networking and Cybersecurity Best Practices CMIS 3 Credits A hands-on study of current social networking applications and approaches to protect against cyber attacks and enhance personal cybersecurity. The goal is to collaborate and interact through personal and professional social networking while developing and using computer security best practices. Discussion covers issues associated with the impact of social computing on individuals and society. Projects include creating and maintaining accounts on selected social networking sites. The first in a sequence of courses in Java. CMIS or prior programming experience. A study of structured and object-oriented programming using the Java language. The goal is to design, implement, test, debug, and document Java programs, using appropriate development tools. Projects require the use of algorithms, simple data structures, and object-oriented concepts. Further study of the Java programming language. The objective is to design, implement, test, debug, and document Java programs, using appropriate development tools. Topics include object-oriented design, event-driven programming, exceptions, recursion, arrays, and data structures. A thorough review of computer hardware and software, with emphasis on the application of current and appropriate computing safety and environmental practices. The goal is to evaluate, install, configure, maintain, and troubleshoot computer hardware components and operating systems. An introduction to networking technologies for local area networks, wide area networks, and wireless networks. The aim is to recognize the type of network design appropriate for a given scenario. Topics include the OSI open system interconnection model, security, and networking protocols. A study of the fundamental concepts of computer security and its implementation. The aim is to assess and mitigate risk, evaluate and select appropriate technologies, and apply proper security safeguards. Development of the structured knowledge base needed to discover vulnerabilities and recommend solutions for tightening network security and protecting data from potential attackers. Focus is on penetration-testing tools and techniques to protect computer networks. A hands-on introduction to Cisco internetworking devices.

The goal is to configure and manage Cisco switches within multiprotocol internetworks. Topics include VoIP voice over Internet protocol , wireless network protocols, and routing protocols. An overview of the installation and configuration of Windows Server operating systems. The objective is to install, configure, and troubleshoot Windows Server operating systems, including domain and network services. An overview of the management and administration of Windows Server operating systems. An advanced review of the configuration and management of Windows Server infrastructure. The aim is to configure, manage, and troubleshoot Windows Server services, including Network Load Balancing, clustering, Dynamic Access Control, advanced network services, and advanced Active Directory roles. A comprehensive study of the knowledge and skills necessary to plan, design, and deploy the physical and logical Windows Server infrastructure. A comprehensive study of the knowledge and skills necessary to plan and implement the advanced features of a Windows Server infrastructure. The goal is to plan and implement highly available enterprise and server virtualization infrastructures and identity and access solutions. A study of the Linux operating system. A project-driven study of the digital forensic evaluation process. The objective is to build forensic workstations, collect evidence, extract artifacts, identify unknown files, and reassemble evidence from network packet captures. A comprehensive study of information systems security to enhance organizational security. The goal is to manage risks by identifying and mitigating them. A project-driven study of mobile devices from a forensic perspective. The aim is to implement various techniques to collect and analyze information from mobile devices used in forensic investigations. A comprehensive study of the implementation of a routed network using Cisco Systems Technologies. Topics include configuration of secure routing solutions, configuration and troubleshooting of various routed environments access, distributed, and core , and management of access and control. A comprehensive study of switched IP networks using Cisco Systems technologies. Topics include secure integration of VLANs virtual local area networks , WLANs wireless local area networks , and voice and video into campus networks. A comprehensive study of methods for troubleshooting and managing switched IP networks using Cisco Systems technologies. The objective is to plan and perform regular network maintenance and diagnose and resolve complex network problems quickly and effectively. Discussion covers technology-based practices and a systematic ITIL information technology infrastructure library - compliant approach to perform network troubleshooting and maintenance. A comprehensive study of methods for securing Cisco Systems technologies. The objective is to create a security infrastructure and to monitor networks, identify and address threats, and detect and remove vulnerabilities. Focus is on developing the skills required to secure and defend computer networks that use Cisco technologies. A project-driven study of networks from a forensics perspective. The goal is to implement various techniques that are used in forensic investigations in response to network intrusions to collect and analyze information from computer networks. A comprehensive project-driven study of network design and security, with an emphasis on the integration of knowledge, practical applications, and critical thinking. The objective is to implement a secure and scalable network to meet organizational needs. Topics include advanced concepts in network and security design. Economics in the Information Age ECON 3 Credits A survey of basic concepts and principles in micro- and macroeconomics and how the economy has been affected by technology. The aim is to define and explain the key terms and concepts in economics and determine how technology has affected consumers, producers, and markets, as well as economic growth and policy. Topics include how innovation affects labor markets, the value of information, and the role of technological change in the economy. Physical Geology GEOL 3 Credits An introductory study of geology, encompassing the Earth, the materials that constitute its makeup, the structure of those materials, and the processes acting on them. The goal is to understand geological principles and how humans affect geological processes. Topics include the rocks and minerals composing Earth, the movement within Earth, and its surface features and the agents that form them and our environment. Discussion also covers energy and mineral resources. Technological Transformations HIST 3 Credits A focused survey of the intersection of technology and history and the evolutionary process that marks what we call progress. The objective is to apply historical

precedent to everyday responsibilities and relationships in order to advance the goals and ideals of contemporary society; compare and contrast historical eras; and describe how events influence our sense of time, space, and technology. An introduction to data and the range of technologies including hardware, software, databases, and networking and information systems that provide the foundation for the data-centric focus of modern organizations. Discussion covers issues related to technology as a vehicle for collecting, storing, and sharing data and information, including privacy, ethics, security, and social impact. Applied exercises focus on the manipulation, analysis, and visualization of data and effective data communication strategies. An overview of information technology management and governance. Topics include strategic alignment, portfolio management, risk management, business continuity, compliance, and organizational relationships. Introduction to Humanities HUMN 3 Credits An introduction to the humanities through a review of some of the major developments in human culture. The goal is to analyze how societies express their ideas through art, literature, music, religion, and philosophy and to consider some of the underlying assumptions about the way societies are formed and run. Focus is on developing the conceptual tools to understand cultural phenomena critically. Introduction to Research LIBS 1 Credit An introduction to the research process and methods for retrieving information in a library or through online sources. The aim is to identify an information need and locate, evaluate, and use appropriate resources in keeping with academic integrity and ethical standards. Students may not earn credit for LIBS through challenge exam or portfolio credit and may receive credit for only one of the following courses: MATH or an appropriate result on the placement test. A study of mathematical models in finite mathematics, including linear models, systems of linear equations, linear programming, sets and counting, probability, descriptive statistics, and the mathematics of finance. The aim is to demonstrate fluency in the language of finite mathematics; find, solve, and graph linear equations and inequalities; describe sample spaces and event; assign probabilities to events and apply probability rules; and apply the mathematics of finance to formulate and solve problems. An introduction to calculus. The goal is to demonstrate fluency in the language of calculus; discuss mathematical ideas appropriately; and solve problems by identifying, representing, and modeling functional relationships. Topics include functions, the sketching of graphs of functions, limits, continuity, derivatives and applications of the derivative, definite and indefinite integrals, and calculation of area. An introduction to the basic principles of physics and chemistry, with applications to geology, oceanography, meteorology, and astronomy. The objective is to use scientific and quantitative reasoning to make informed decisions about topics related to physical science. Discussion covers the development of scientific thinking, the scientific method, the relationships among the various physical sciences, the role of the physical sciences in interpreting the natural world, and the integrated use of technology. An overview of the skills needed for academic and professional success. Focus is on enhancing communication and critical thinking skills.

Chapter 5 : Computer Science < Yale University

Therefore, students who've completed the right online courses may find a wide variety of jobs available, including occupations such as computer programmer, network engineer, network analyst, network technician, database administrator, and computer repair specialist.

An elective course for graduate students in the Applied Computing program. The student enrolled in this course will engage in work related to computer science for an industry, business, or government entity for at least 10 hours per week for a semester. May be repeated for credit with a change in internship responsibilities. This course will address a focused topic, particularly recent development, in the field of applied computing. Topics will vary from semester to semester. This course may be repeated for credit with the prior approval of the graduate advisor. Topics include Linux operating environment and architecture, command line Linux utilities, application development under Linux, virtualization, building and using libraries, POSIX threads programming, synchronization and semaphores, shared memory programming, advanced file handling, regular expressions, shells and shell scripting in various languages. It introduces topics ranging from cryptographic techniques to trusted systems to multilevel security to network security to ethics in the computing profession. Students will learn fundamental concepts of security that can be applied to many traditional aspects of computer programming and computer system design. CSCI Algorithms or consent of instructor. Topics covered include principles of parallel hardware, principles of concurrent system design, communication topologies, the development, measurement, and tuning of concurrent programs, design of concurrent algorithms, performance metrics for concurrent systems, and special problems with distributed concurrent systems. Topics include abstract basis of machines and programming, automata, context free grammars and Turing machines. Chomsky hierarchy, computability, and computational complexity. Topics will include multimedia information capture, digitization, compression, network communication, and practical applications. This course covers the development of applications for network-enabled mobile devices. The course will introduce interactive client-server web applications that can be built using various types of Internet technologies. The demonstration of database-driven web sites is performed with the software architecture involved in each tier explored in detail. Common-Gateway-Interfaces are implemented for processing both client and server output data. Security issues and strategies pertaining to an enterprise-wide web-based application are examined and implemented. CSCI Algorithms or equivalent. Specific applications in financial data and Bioinformatics are included. Topics include advanced client-server techniques using Java networking features, website deployment using the Java Server Programming Interface, and Android mobile application development consisting of custom user interfaces, 2-D animations, and multimedia integration. This course is intended to meet the thesis requirement for the degree. Topics are chosen in consultation with an advisor. Up to six credit hours maybe applied toward the degree. Topics include data mining tools, cost-sensitive learning, active learning, semi-supervised learning, ensemble techniques, multi-instance learning, multi-label learning, noise handling, and multiple noisy label learning in advanced data mining. CSCI Networking or equivalent. Systems include parallel, distributed, and client-server databases; applications include data mining and on-line analytical processing. Topics include data analytics, data science and problems solutions, neighbors and clusters, predictive models and fitting a model to data, and business strategies. The application of data mining in different domain areas, such as Bioinformatics and Business Informatics, will also be emphasized. CSCI or ; or consent of instructor. Students learn object-oriented principles from practical experience through the development group projects of large systems. Includes development of processes, their instantiation in actual product development, and techniques ensuring quality of developed products. Students who request to take the course should provide a written statement of the content of the course and a tentative reading list. A literature review, project report, or other written product is normally required. This course is offered only in areas of importance but insufficient demand to justify a regular course. May be repeated for credit with instructor

permission.

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Chapter 6 : Computer science - Wikipedia

Crucial Conversations Books, Find the lowest price on new, used books, textbooks Compare Book Prices at Stores! Help Bookmark Tell a Friend Out-of-Print Wish List Home.

What will I get from the Master of Science in cloud computing architecture? The program focuses on cloud technologies, applications, and design of cloud platforms. It will require that you become adept with computer, network, and cloud technologies at a high level. Will there be hands-on labs in this program? To complete the labs, you will need a minimum Internet connection speed of KB per second and an up-to-date Chrome or Firefox web browser. It is recommended that you have a desktop computer running the Windows, Mac, or Linux operating system. The minimum supported resolution is by pixels and the maximum supported resolution is by pixels. Learn about ways to meet, manage, and lower your education costs. The discount for Federal employees and their spouses and eligible dependents will be applied to out-of-state tuition and specialty graduate programs. It does not apply to doctoral programs. This discount cannot be combined with the Completion Scholarship for Maryland community college students or the Pennsylvania Completion Scholarship. Undergraduate and standard graduate program tuition for students who meet the criteria for Maryland residency will be the applicable in-state rate. Public Health Service and National Oceanic and Atmospheric Administration; and the spouses and dependents of these student groups will be the applicable military or specialty rate. View important information about the education debt, earnings, and completion rates of students enrolled in certificate programs. All students are required to pay tuition for all courses in which they are enrolled. They may be changed, or other charges may be included, as a result of the Board of Regents decisions. Notwithstanding any other provision of this or any other university publication, the university reserves the right to make changes in tuition, fees and other charges at any time such changes are deemed necessary by the university and the USM Board of Regents. Requests for services for example, transcripts, diplomas, registration will be denied until all debts are paid. Please see the USM residency policy for specific details about residency requirements. Financial aid and tuition remission for University System of Maryland employees cannot be applied to noncredit courses. Golden ID benefits may not be applied to fees, noncredit courses, specialty graduate programs, or doctoral programs. GI Bill is a registered trademark of the U. Department of Veterans Affairs. More information about education benefits offered by VA is available on the U. The UCSP requirement may be waived if you previously earned a graduate degree from a regionally accredited institution. For more information, contact your academic advisor. Request Info Please leave the following field blank Complete this form to have an admissions advisor contact you. First Name Please provide your First Name. Last Name Please provide your Last Name. Phone Please provide a valid Phone. Degree of Interest Please choose a Degree of Interest. Military Affiliation if applicable Please choose a U. For more details, including how to opt out, read our privacy policy or contact an admissions advisor.

Chapter 7 : Online Computer Networks and Cybersecurity Bachelor's Degree | UMUC

You can get a wide range of skills, for example, diplomas, bachelor degrees, foundation degrees and post-graduate degrees. Computer Networking combines both an expertise in computer science with an understanding of current and future technologies in computer networking.

Chapter 8 : Online Cloud Computing Architecture Master's Degree | UMUC

Courses in computer networking have the benefit of covering all the basic computer science material while you develop an expertise in the way they connect to one another. This specialty has many different applications, from analysis to support positions, so there is a lot you can do with a degree in this area.

Chapter 9 : IT vs. Computer Science: Which Degree is Right for You? [Infographic] | Rasmussen College

The comprehensive training you receive through this degree equips you with wide-ranging skills which are relevant to a broad spectrum of careers in the computing field such as security, networks and computer systems management.