

COURSE SYNOPSIS

FACULTY OF COMPUTING AND INFORMATICS

BACHELOR OF SCIENCE WITH HONOURS

BPKP	PROGRAMME CODE
HC12	Multimedia Technology

BACHELOR OF INFORMATION TECHNOLOGY WITH HONOURS

BPKP	PROGRAMME CODE
HC13	Business Computing

BACHELOR OF COMPUTER SCIENCE WITH HONOURS

BPKP	PROGRAMME CODE
HC00	Software Engineering
HC05	Network Engineering

FACULTY CORE (CENTRE FOR INFORMATION TECHNOLOGY STUDIES)

IT12103 INTRODUCTION TO COMPUTER PROGRAMMING

This course provides an introductory to computer programming. Students will learn basic programming concepts such as structure, decision making, looping, arrays, and methods and will learn good style and logical thinking. Debugging techniques will be covered throughout.

References

- P.J. Deitel, H.M. Deitel. C++ How to Program, 10th Edition. Prentice Hall. 2017.
D.S.Malik. Introduction to C++ Programming: Brief Edition. Course Technology, Cengage Learning. 2009
B. Stroustrup. Programming: Principles and Practice Using C++.Addison-Wesley Professional. 2008.
D.S.Malik. C++ Programming: From Problem Analysis to Program Design Fifth Edition. Course Technology, Cengage Learning. 2011
Zak, Diane. An Introduction to Programming with C++, Sixth Edition. Cengage Learning. 2010.

IT12203 BASIC MATHEMATICS

This course provides students with introduction to basic mathematics in calculus, which of function, Limit & Continuous, Algebra Vectors, Differentiation, Integration and their applications. The purpose is to develop the students' mathematical knowledge and to provide the students analytical techniques as well as problem solving methods needed in computing.

References

- James Stewart. 2015. Stewart Calculus: Early Transcendental. 8th Ed. Brooks Cole.
George B. Thomas, Joel R. Hass, Maurice D. Weir. 2014. Thomas' Calculus. 13th Ed. Pearson/Addison Wesley.
Anton H., Bivens I. Davis S. 2012. Calculus Early Transcendental. 10th Ed. John Wiley & sons.
Ron Larson. 2014. Algebra & Trigonometry. 9th Ed. Brooks Cole.

IT12403 INTERNET TECHNOLOGY

This course provides an introduction of fundamental concepts and architecture of internet in addition to the World Wide Web (WWW) and its associated technologies. Course covers topics in Internet and WWW technology such as communication tools, security and privacy, multimedia, e-commerce and information services on the internet. The basic Web page creation with HyperText Markup Language (HTML) and Cascading Style Sheets (CSS) are also introduced.

References

- Jennifer T. Campbell. 2014. Discovering the Internet Complete, 5th Edition, Publisher: Course Technology
Gary P. Schneider & Jessica Evans. 2013. New Perspectives on the Internet: Comprehensive, 9th Edition, Publisher: Course Technology
Gary B. Shelly, Denise M. Woods & William J.Dorin. 2013. HTML5 and CSS Comprehensive, 7th Edition, Publisher: Course Technology
Jason Beaird & James Michael George. 2014. The Principles of Beautiful Web Design, 3rd Edition, Publisher: SitePoint

IT12603 OPERATING SYSTEM

This course introduces students to the importance of the concept of Operating System (OS) as primarily providing users with interface to manage a complex system. A computer consists of processors, memories, timers, disks, mouse, keyboard, network interfaces, and wide variety of other devices. In short, OS is to provide for an orderly and controlled allocation of the processors, memories and input / output devices.

References

- Silberschatz, A., et al., 2012 Operating System Concepts, 9th Edition. Wiley
Flynn, I.M McHoes, A., 2013 Understanding Operating Systems, 7th Edition. Cengage Learning
Palmer, M.J., 2011 Guide to Operating Systems. Prentice Hall, (Enhanced Edition)
Tanenbaum, A. S., 2014 Modern Operating Systems. Prentice Hall, 4th Edition
Stallings, W. 2014 Operating Systems: Internals and Design Principles. Prentice Hall, 8th Edition
Ida M. Flynn (Author)
Sobell M.G 2012 A Practical Guide to Linux Commands, Editors and Shell Programming 3rd Edition. Prentice Hall
Muster, J. 2002 Introduction to Unix and Linux. McGraw Hill

3 SYNOPSIS | FACULTY OF COMPUTING AND INFORMATICS

IT22103 OBJECT ORIENTED PROGRAMMING

Object-Oriented Programming with Java takes a full-immersion approach to object-oriented programming. Proper object-oriented design practices are emphasized throughout the course. Students learn how to use the standard classes first, then learn to design their own classes. In this course will introduce and uses a gentler approach to teaching students on how to design their own classes, separating the coverage into two sections. GUI coverage is also located independently in the middle of semester will be covered as desired by industry. This course provides a language-independent presentation of object-oriented principles, such as objects, methods, inheritance (including multiple inheritance) and polymorphism.

References

Wu Thomas C., 2013, An Introduction to Object-Oriented Programming with Java, 10th Edition, McGraw Hill, US.
Malhotra S. & Choundhary S., 2014, Programming in java, 2nd Edition, Oxford University Press, UK.
Barnes D.J & Kolling M., 2012, Objects First With Java, 5th Edition Pearson Prentice Hall.
Savitch W. & Carrano F., 2011, Java: An Introduction to Problem Solving & Programming, 7/E, Prentice Hall, US.
Morelli R. & Walde R., 2012, Java, Java, Java, Object-Oriented Problem Solving, 6th Edition, Prentice Hall, US.

IT22303 STATISTIC

This course provides students with statistic theories in probability theory, discrete probability distributions, continuous probability distributions, estimation methods, and hypothesis tests.

References

McClave, James T. & Sincich, Terry, 2011, A First Course in Statistics, 11th Ed, Pearson/Prentice Hall: New Jersey.
Hishamuddin, Som, 2005, Panduan Mudah Analisis Data Menggunakan SPSS Windows, UTM:Malaysia.
Larson, Ron and Farber. Besty, 2003, Elementary Statistics-Picturing the World, 2nd Ed, Prentice Hall: New Jersey.
Mann, Prem S., 2006, Introductory Statistics, 6th Ed, John Wiley & Sons.
Yahaya, A.S. et.al., 2008, Problem and solutions in Statistics for Engineers & Scientist, Prentice Hall.

IT22403 DATABASE MANAGEMENT SYSTEM

The course introduces the field of database management and its advantages as compared to file based system as the precursor to database system. It examines the database environment and the three level ANSI SPARC architecture. The course covers relational model and languages, namely relational algebra, SQL and a brief introduction to Data Definition Language (DDL). The course discusses the main techniques for database analysis and design such as ER Diagram and Normalization. The course also considers on the issue of DBMS security. The course finally concentrates on three functions that should be provided by the Database Management System, namely transaction management, concurrency control and recovery.

References

Thomas Connolly, Carolyn Begg. 2005, Database Systems : A Practical approach to design, implementation and management), Addison Wesley.
Jeffrey A. Hoffer et al. 2014, Modern Database Management. Pearson Education Inc.
CJ Date. 2004. An Introduction to Database Systems. Pearson Education Inc.
David M. Kroenke et al. 2008. Database Concepts. Pearson Education Inc
Kendall & Kendall, 2006, Systems Analysis and Design, Seventh Ed, Pearson International Edition

IT22603 DATA STRUCTURE

This course will introduce to student on the concept of Data Structure which enclose Foundational Data Structure and Object Oriented Design (OOD), Pointer and Array-Based List, Linear structure; Linked Lists, Queues and Stack, Dynamic Structure: Binary Trees and B-Tree. Algorithmic; Searching and Hashing Algorithms, and Sorting Algorithms, Recursion and Standard Template Library.

References

Malik, D. S. (2013) Data Structure Using C++, 3rd Edition. Course Technology.
Deitel & Deitel (2014) C++ How to Program 2014, International Edition, Pearson International Edition, Pearson Education.
Carrano Frank M. (2012) Data Abstraction and Problem Solving with C++ Walls and Mirrors, Sixth Edition, Addison Wesley
Collins, William J. (2003) Data Structures and The Standard Template Library, International Edition. McGraw-Hill.

IT32203 DISCRETE MATHEMATICS

The purpose of this course is to provide an overview of many of the Discrete Mathematical concepts which are important to computing. Students are exposed to Logic, Sets, Simple Proof Techniques, Integers, Mathematical Inductions, Diophantine Equation, Counting Principles, Functions, Relations, Posets, Graph, Tree and Boolean Algebra.

4 SYNOPSIS | FACULTY OF COMPUTING AND INFORMATICS

References

- Malik D.S. and Sen M.K. 2010. Discrete Mathematics: Theory and Application. Revised edition, Thomson Learning.
- Epp S.S., 2011. Discrete Mathematics with Applications. (Fourth edition). Brooks/Cole.
- Johnsonbaugh R. 2009. Discrete Mathematics. International edition, 7th edition. Pearson education.
- Rosen K.H., 2012. Discrete Mathematics & its Application, (7th edition). McGraw-Hill.

IT32103 HUMAN COMPUTER INTERACTION

This course provides introduction and overview of the field of HCI. HCI is an interdisciplinary field that integrates theories and methodologies from computer science, cognitive psychology, design and many other areas. Topics are divided into three main components – Foundations, Design Process, and Models and Theories. Subtopics include introduction to human, computer and interaction, interaction design basics, design rules, evaluation techniques, universal design, task analysis, modelling rich interaction and groupware.

References

- David Benyon. 2014. Designing Interactive Systems: A Comprehensive Guide to HCI and Interaction Design. 3rd ed. Pearson Education Limited.
- Ben Shneiderman, Catherine Plaisant, Maxine Cohen, Steven Jacobs. Designing the User Interface: Strategies for Effective Human-Computer Interaction. 2016. 6th ed. Prentice Hall.
- Yvonne Rogers, Helen Sharp, Jenny Preece. 2015. Interaction Design: Beyond Human - Computer Interaction. 4th ed. Wiley.
- Alan Dix, Janet Finlay, Gregory D. Abowd, Russel Beale. 2003. Human Computer Interaction. 3rd ed. Prentice Hall.

IT32403 MANAGEMENT INFORMATION SYSTEM

This course teaches students how organisations use ICT and Information Systems to achieve their objectives. In the early part of this course, the discussions focus on how organisations use Information Systems to achieve their objectives. It is then followed by a discussion on how to secure information system. The latter parts discuss how IS can help managers to enhance decision making processes.

References

- Kenneth C. Laudon. (2014). Management Information System: Managing the Digital Firm. 13th Edition. Pearson International Edition
- James O'Brien & George Marakas (2011). Management Information Systems. 10th Edition. McGraw-Hill/Irwin
- Farah Walledd Jalaluddin, et al. (2014). Information Systems: An Introduction. Oxford Fajar Sdn Bhd.
- Haag, Cummings & Phillips. (2007). Management Information System for Information Age. 6th Edition. McGraw-Hill (International Edition).

CORE PROGRAM TECHNOLOGY MULTIMEDIA (HC12)

IM12103 FUNDAMENTALS OF MULTIMEDIA

This course covers an introduction of multimedia building block such as text, graphic, sound, animation, and video. Appropriate multimedia authoring software and hardware will be used and discusses. Processes involved in multimedia development such as planning, costs, design, production, talent acquisition, testing, and delivery are also covered.

References

- Tay Vaughan. 2014. Multimedia Making It Work. 9th ed. Mc Graw Hill.
- Vic Costello. 2016. Multimedia Foundations: Core Concepts for Digital Design, 2nd ed. Focal Press.
- Nigel Chapman and Jenny Chapman. 2009. Digital Multimedia. 3rd ed. John Wiley.
- T. M. Savage and K. E. Vogel. 2013. An Introduction to Digital Multimedia. 2nd ed. Burlington, MA : Jones & Bartlett Learning.

IM12203 MULTIMEDIA DESIGN

This course exposes students with multimedia design processes, particularly interactive multimedia. It focuses on the design aspects of digital media as well as on the theory and practice of the tools and techniques required for creating interactive multimedia application through the development of design and technology knowledge, understanding and skills.

5 SYNOPSIS | FACULTY OF COMPUTING AND INFORMATICS

References

- Vic Costello, Susan Youngblood, Norman E. Youngblood. 2016. Multimedia Foundations: Core Concepts for Digital Design. 2nd ed. Focal Press.
- David Benyon. 2014. Designing Interactive Systems: A Comprehensive Guide to HCI and Interaction Design. 3rd ed. Pearson Education Limited.
- Ben Shneiderman, Catherine Plaisant, Maxine Cohen, Steven Jacobs. 2016. Designing the User Interface: Strategies for Effective Human-Computer Interaction. 6th ed. Prentice Hall.
- Carolyn Handler Miller. 2014. Digital Storytelling: A Creator's Guide to Interactive Entertainment, 3rd ed. Focal Press.
- Alan Cooper, Robert Reimann, and David Cronin. 2014. About Face 3: The Essential of Interaction Design. 4th ed. Wiley Publishing.

IM22103 VIDEO PRODUCTION

The course describes the latest industry trends in video production. It will introduce the students to the video technologies and techniques that are relevant in ensuring successful video production project. By developing practical skills, it aids the student's own development, and provides a coherent overview of the issues that affect all in the converging industries of communications and media. The course will also provide practical advice and tips to help students deliver a high quality project on time and within budget.

References

- Vasuki Belavadi. 2013. Video Production. 2nd ed. Oxford University Press.
- Gerard Millersoon and Jim Owens. 2011. Video Production Handbook. 5th ed. Focal Press.
- Bruce Mamer. 2013. Film Production Technique, Creating the Accomplished Image. 6th ed. Wadsworth Cengage Learning.
- Leonard C. Shyles. 2007. The Art of Video Production". Sage Publications.
- Lynne S. Gross and James C. Foust. 2012. Video Production: Disciplines and Techniques. 11th ed. Videomaker and John Burkhart. 2012. The Videomaker Guide to Video Production. 5th ed. Focal Press.

IM22203 ANIMATION

This course covers the history, concepts, principles and techniques of animation. The students will be exposed to three dimensional (3D) digital creative content development processes such as storyboarding, modelling, rendering, animating, visual effects and compositing. Upon completion of the course, students are able to produce one digital creative 3D animation project.

References

- Sham Tickoo. 2017. Autodesk Maya 2017: A Comprehensive Guide, 9th Edition. Purdue Univ.
- Liz Blazer. 2016. Animated Storytelling: Simple Steps For Creating Animation and Motion Graphics. Peachpit Press.
- Molly Bang. 2016. Picture This: How Pictures Work. Chronicle Books.
- Tina O'Hailey. 2013. Rig it Right! Maya Animation Rigging Concepts (Computers and People). Focal Press.
- Paul Wells. 2011. Understanding Animation. Routledge. London.
- Neil Landau. 2010. 101 Things I Learned @ in Film School. Grand Central Publishing.

IM22403 TECHNOPRENEURSHIP

This course provides exposure to entrepreneurial areas applying and using technology expertise in the production of products, services, business management and decision-making regarding business profits. This course is divided into entrepreneur development phase starting from 'Idea Generation' and 'Proof Of Idea' (POI) through competency, generic, entrepreneurial and academic development approaches. Next, the Phase of Strategic Technological Improvement (PPTS) will start with "Proof Of Concept" (POC) and R & D through enhancement and enhancement of existing products / services. To be relevant to the existing industry, this course will provide exposure to the preparation of business plans using the MDeC format.

References

- Brikman, Yevgeniy, (2016) Hello, Startup, O'Reilly
- Gruber, Frank (2014) Startup Mixology: Building, Growing, Celebrating Startup Success, Wiley
- Dorf, C., R., Byers, T., H., (2005), Technology Ventures: From Idea to Enterprise, McGraw Hill
- Friedman, T., L., (2006), The World is Flat: The globalized world in the twenty-first century, Penguin Books
- Tapscot, D., Williams, A., D., Wikinomics: How Mass Collaboration Changes Everything, Atlantic Books
- E-Business Technologies, Napier, Judd, Rivers, and Adams

IM32103 WEB PROGRAMMING

This course will provide students with a fundamental understanding as to how an HTML-compliant web site was developed, implemented, and maintained by using the Internet programming language. Students also learn two types of web programming language; client-side scripting (HTML5, CSS3, Canvas and JavaScript) and server-side scripting (PHP) with a simple connection to the SQL database (MySQL) using Apache Web Server.

6 SYNOPSIS | FACULTY OF COMPUTING AND INFORMATICS

References

Meloni, Julie C. 2015. Sams Teach Yourself PHP, MySQL and Apache. 5th ed. Sams Publishing.
Deitel and Deitels. 2015. Internet & World Wide Web How to program. 6th ed. Prentice Hall.
Welling, Luke & Thomson, Laura. 2009. PHP and MySQL Web Development. 4th ed. Pearson Education, Inc

IM32303 COMPUTER GRAPHIC

This subject is an introduction to computer graphic, students will learn the concepts on how to create graphic either in two dimensional (2D) or three dimensional (3D). Geometric elements such as line, polygon, circle and curve are among the topics will be discussed. Besides learning the concept of computer graphic, the student will also be learning on how image is generated onto our computer screen. This course also covered 2D and 3D transformation (translate, rotate, shear, etc) to create an animation. Students will be exposed with graphic programming language. At the end of this course students are required to develop a graphic application with user interaction.

References

Angel E. 2012. Interactive Computer Graphics: A Top-Down Approach Using OpenGL. 6th ed. New York: Addison Wesley.
Hill, F. S. Jr. 2007. Computer Graphics Using OpenGL. 3rd ed. New Jersey: Prentice Hall.
Hearn, D. & Baker, M.P. 2011. Computer Graphics with OpenGL. New Jersey: Prentice-Hall.
Dave Shreiner, Mason Woo, Jackie Neider and Tom Davis. 2008. OpenGL Programming Guide. 6th ed. Pearson.
James D. Foley, Andries van Dam, Steven K. Feiner, John F. Hughes. 1995. Computer Graphics: Principles and Practice in C. 2nd ed. Addison-Wesley Professional.

IM32503 SYSTEM ANALYSIS & DESIGN

This course introduces students to the concepts and skills of systems analysis and design (SAD). Approaches to SAD includes traditional structural approach and modern object-oriented approach. Through the course students will learn how to translate business requirement into information systems that support a company's objectives.

References

Kenneth E. Kendall and Julie E. Kendall. 2014. System Analysis and Design. Ninth edition. Pearson.
Jeffrey L. Whitten, Lonnie D. Bentley. 2008. Introduction to Systems Analysis and Design. McGraw-Hill, New York.
Joseph Valacich, Joey George, Jeffrey A. Hoffer. 2011. Essentials of Systems Analysis and Design (5th Edition). Prentice Hall.
Alan Dennis, Barbara Haley Wixom, and Roberta M. Roth. 2008. Systems Analysis and Design. 4th edition. Wiley.
Gary B. Shelly, Thomas J. Cashman, Harry J. Rosenblatt. 2007. Systems Analysis and Design. Seventh edition. Course Technology

IM32603 ADVANCED MULTIMEDIA

The course is designed to give students a detailed grounding in issues related to multimedia technology such as concepts and representation of sound, pictures, video, data compression and transmission. It will also cover aspects of multimedia communication networks including broadband ATM, wireless and mobile networks. The students will also learn on how to develop a two dimensional (2D) animation for broadcasting during tutorial sessions.

References

Parag Havaldar and Gerard Medioni (2011). Modern Multimedia Systems, 1st Edition. Cengage. ISBN-10: 9814352608 | ISBN-13: 9789814352604
Ze-Nian Li and Mark S. Drew (2004). Fundamentals of Multimedia. Pearson Prentice Hall, New Jersey. ISBN-10: 0130618721
David A. Forsyth and Jean Ponce (2003). Computer Vision: A Modern Approach. Prentice Hall. ISBN-10: 0130851981
Tay Vaughan (2006). Multimedia: Making it Work, Seventh Edition. McGraw-Hill Osborne Media. ISBN-10: 0072264519
David Salomon (2000). Data Compression: The Complete Reference (2nd edition). Springer. ISBN: 0-387-95045-1

IM32803 MULTIMEDIA PROJECT MANAGEMENT

Multimedia project management is crucial for every student to learn how to plan and execute their project on time. The course will teach the student how to manage the project base on the pre-production, production and post-production development phases. The student will be equipped with variety of skills that is useful in the management of multimedia project. The students are expected to demonstrate their knowledge of multimedia project management in the individual and group assignments as well as the final project.

7 SYNOPSIS | FACULTY OF COMPUTING AND INFORMATICS

References

- Greg Horine. 2017. Project Management Absolute Beginner's Guide (4th Edition). Pearson Education Inc.
- Donald J. Scott. 2016. Project Management: A Quick Start Beginner's Guide for the Serious Project Manager to Managing Any Project Easily.
- Joseph Heagney, 2016. Fundamentals of Project Management. 5th Edition. American Management Association.
- Nancy Lyons & Meghan Wilker. 2012. Interactive Project Management: Pixels, People, and Process (Voices That Matter).
- Russ Unger & Carolyn Chandler. 2012. A Project Guide to UX Design: For user experience designers in the field or in the making. 2nd ed. Peachpit Press.
- Scott Berkun. 2008. Making Things Happen: Mastering Project Management (Theory in Practice). O'Reilly Media.

IM33002 PROJECT 1

This course is designed to let students to generate a creative project idea and teach them on how to manage and handle an ICT application project in a proper way by going through a complete and correct development process. It will focus on the planning, analysis and design part in producing an ICT product that can be adapt into business.

References

- Gaya Penulisan UMS
Online Journal.

IM42103 ETHICS IN INFORMATION TECHNOLOGY INDUSTRIES

This course addresses the legal, ethical and social issues relevant to Information Technology, and the roles and responsibilities of computer professionals. Students are exposed to a wide variety of issues related to information technology that covers intellectual property, privacy, computer and network security and professional ethics. In addition, the quality of issues, workplaces and ICT literacy are also covered in this course.

References

- Mike Quinn (2014), Ethics for the Information Age, International Edition, Pearson.
- George W.Reynolds (2012), Ethics in Information Technology, 4th Edition, International Edition, Cengage Learning.
- Raymond R. Panko. (2012). Corporate Computer and Network Security. 3rd Edition, Pearson.
- Randall J.Boyle and Raymond R. Panko (2013). Corporate Computer Security (Third Edition).Pearson

IM42303 NETWORK AND SECURITY

In this course, students will learn such concepts as protocols, topologies, hardware, and network operating systems. This course will also cover various types of security issues on web, email, file transfer, wireless, instant messaging, and how to protect physical access. Students will learn about intrusion detection, computer virus prevention, and various encryption technologies to secure access to network resources.

References

- William Stallings. 2014. Network Security Essentials – Application and Standards. 5th ed. Pearson.
- Raymond R. Panko. 2013. Corporate Computer and Network Security. 3rd edition. Pearson.
- Dieter Gollmann. 2011. Computer Security. 3rd ed. Wiley (Australia).
- William Stallings. 2014. Cryptography and Network Security – Principles and Practices. 6th ed. Pearson.

IM42504 PROJECT 2

This course is designed to let students to generate a creative project idea and teach them on how to manage and handle an ICT application project in a proper way by going through a complete and correct development process. It also designed to let students apply all the ICT knowledge to turn into an ICT application product. It will focus on the development and implementation and handle project testing in producing an ICT product that can be adapt into business.

References

- Gaya Penulisan UMS
Online Journal
- Charles S. Wasson, "System Analysis, Design and Development: Concepts, Principal and Practices", Wiley Publishing, 2016.

IM42612 INDUSTRIAL TRAINING

Industrial Training aims to expose students with real working environment before they graduate and find employment. The duration of industrial training is 24 weeks. Throughout the industrial training period, students are placed in IT-related companies under the supervision of industrial supervisor where the students undergo their industrial training, and an academic supervisor from the faculty.

CORE PROGRAM E-COMMERCE (HC13)

IE12103 E-COMMERCE

This module focuses on marketing & promotion plans, strategic planning, consumer habits, legal and trade-related issues on the Internet or more commonly known as Electronic Commerce. It covers the sale and purchase of digital network products and services. The module also provides a framework and technical analysis to understand electronic commerce. It is divided into three main domains:

- Economics (Includes digital banking systems, advertising and marketing, business model and e-cash)
- Social and Transaction Models (Including intellectual property and legal matters).
- Technology (Including internet infrastructure and server management)

References

- Chaffey, D. (2007). E-business and E-commerce Management: Strategy, Implementation and Practice. Pearson Education.
- Efrain Turban et. Al..2012. Electronic Commerce: A Managerial and Social Networks Perspective, 7th Edition, Global Edition. Person International.
- Farhoomand, A. F., & Lovelock, P. (2001). Global e-commerce: Text and Cases. Prentice Hall.
- Laudon K.C. & Traver C. G. 2014. E-Commerce 2015 Business Technology Society, Ninth Edition. Pearson International.
- Schneider Gary P. 2015. Electronic Commerce, Eleventh Edition. Course Technology: Cengage Learning.

IE12203 BUSINESS MANAGEMENT

This module is outlined as an introduction to management principles in the context of business and management for e-commerce students. It is meant to introduce the students with theories and practical approach used whilst tries to comprehend latest management principles. The topics discussed will include four main functions in managements which are planning, organising, leading and controlling. The importance of management in global environment and organisational culture and how to manage changes are also being discussed in this module.

References

- Khalidah, Satirenjit, Lai F.W., Rohani, Sofiah, Rahayu, Ilmiah (2015). Business Management A Malaysian Perspective. Oxford
- Andrew DuBrin (2012). Management Essentials. Cengage Learning
- Robbins, Stephen P. & Coulter, Mary (2010). Management. Pearson
- Burnes (2010). Managing Change. Pearson

IE22103 MARKETING

This course is designed to ensure students are knowledgeable in marketing to provide them with the real world of business through current industry-based course exposure. Traditional business disciplines begin to appreciate the fundamental challenges presented by the application of technology to their knowledge base. In marketing, the most obvious agent of change is Internet and online transactions that have revolutionized several sectors of the world economy. This subject takes marketing and traditional marketing exhibits, and exposes it to critical analysis through peripheral technological changes. It explores how a business can capitalize on how to understand, create, communicate and communicate customer value in the marketplace.

References:

- Philip Kotler and Gary Armstrong (2014) 'Principles of Marketing', London : Prentice Hall, 15th ed.
- Philip Kotler and Gary Armstrong (2013) 'Marketing – An Introduction', London : Prentice Hall, 11th ed.
- Chaffey D., Ellis-Chadwick F., Mayer R. Johnston K. (2009) 'Internet Marketing' Prentice Hall
- Dave Chaffey and P. R. Smith. (2008) 'eMarketing eXcellence: Planning and optimising your digital marketing', Amsterdam London : Butterworth-Heinemann, 3rd ed.

IE22203 E-COMMERCE BUSINESS MODEL

This course will discuss about the process of establishing an online business model through E-Commerce commercial applications and Internet technology. This course focuses more on applying the E-Commerce concept in the supply chain by looking at retail, manufacturing and distribution services. Some business development methodologies such as the Business Model Canvas will be used. This course will also discuss online economies that are closely related to the Internet as well as analyzing business management paradoxs from a social economic perspective and audit issues.

References:

- Gassman, O., Frankenberger, K & Csik, M (2014) The Business Model Navigator, Pearson Education
- Laudon, K. C. & Traver, C. G. (2010) E-Commerce 2010: Business, Technology, Society, 6/e, Pearson Education
- Afuah, A. & Tucci, C. L. (2003) 'Internet Business Models and Strategies', McGraw Hill, 2nd Edition
- Eisenmann, T. R. (2002) Internet Business Models (Text and Cases). Mc Graw Hill.
- Timmers, P. (1998) 'Business Models for Electronic Markets', Electronic Markets 8(2)

9 SYNOPSIS | FACULTY OF COMPUTING AND INFORMATICS

IE22403 WEB PROGRAMMING

This course will provide students with a fundamental understanding as to how an HTML-compliant web site was developed, implemented, and maintained by using the Internet programming language. Students also learn two types of web programming language; client-side scripting (HTML5, CSS3, Canvas and JavaScript) and server-side scripting (PHP) with a simple connection to the SQL database (MySQL) using Apache Web Server.

References

Meloni, Julie C. (2011) Sams Teach Yourself PHP, MYSQL and Apache 5th Edition, Sams Publishing
Deitel and Deitels (2011) Internet & World Wide Web How to program 5th Edition, Prentice Hall.
Welling, Luke & Thomson, Laura (2009) PHP and MySQL Web Development 4th Edition, Pearson Education, Inc.

IE32103 TECHNOPRENEURSHIP

This course provides exposure to entrepreneurial areas applying and using technology expertise in the production of products, services, business management and decision-making regarding business profits. This course is divided into entrepreneur development phase starting from 'Idea Generation' and 'Proof Of Idea' (POI) through competency, generic, entrepreneurial and academic development approaches. Next, the Phase of Strategic Technological Improvement (PPTS) will start with "Proof Of Concept" (POC) and R & D through enhancement and enhancement of existing products / services. To be relevant to the existing industry, this course will provide exposure to the preparation of business plans using the MDeC format.

References

Brikman, Yevgenivy, (2016) Hello, Startup, O`Reilly
Gruber, Frank (2014) Startup Mixology: Building, Growing, Celebrating Startup Success, Wiley
Dorf, C., R., Byers., T., H., (2005), Technology Ventures: From Idea to Enterprise, McGraw Hill
Friedman, T., L., (2006), The World is Flat: The globalized world in the twenty-first century, Penguin Books
Tapscoot, D., Williams., A., D., Wikinomics: How Mass Collaboration Changes Everything, Atlantic Books
E-Business Technologies, Napier, Judd, Rivers, and Adams
Halsall, 2010, Computer Network & the Internet: Pearson.

IE32303 INFORMATION TECHNOLOGY PROJECT MANAGEMENT

Project Management is designed to ensure that the students have the knowledge of project management in order to prepare them to conduct a project based on the key principles and concepts. Managing Information Technology Projects required ideas and information in order to go beyond standard project management. This course will assist students in generate ideas and dealing with project management issues.

References

K. Schwalbe (2014). Information Technology Project Management. Course Technology, Seventh Edition, Thomson Learnin
H. Kerzner (2009). Project Management: A Systems Approach to Planning, Scheduling, and Controlling, Tenth Edition, Wiley
J. R. Meredith & S. J. Mantel (2009). Project Management – A Managerial Approach, Seventh Edition, Wiley
C. A. Campbell (2007). The One Page Project Manager, John Wiley & sons, Inc
C. Gray & E. Larson (2006). Project Management, Fourth Edition, McGraw-Hill

IE32503 ANALYSIS & DESIGN FOR E-COMMERCE

Systems analysis and design concentrate on current practice of system development and principles consists of planning phase, analysis phase and design phase. This course is to understand organizational style of business and its impact on IS as well as the techniques and deliverables of the profession. Students will be exposed on methods and principles of system development cycle which emphasize the role of people, management and quality issues, and consider practical and business realities.

References

Jeffrey A. Hoffer, Joey F. George & Joseph S. Valacich, 2014, Modern System Analysis & Design Seventh Ed, Pearson Education Limited.
Kendall & Kendall, 2014, Systems Analysis and Design, Ninth Ed, Pearson International Edition.
Marakas M. George, 2006, Systems Analysis and Design, Second Ed, McGraw-Hill International Edition

IE32603 ETHNICS IN INFORMATION TECHNOLOGY

This course addresses the legal, ethical and social issues relevant to information technology, and the roles and responsibilities of computer professionals. Students are exposed to a wide variety of issues related to information technology that covers intellectual property, privacy, computer, social network, network security and professional ethics in order for the students to have comprehensive knowledge for them to carry out responsibilities in the digital world.

10 SYNOPSIS | FACULTY OF COMPUTING AND INFORMATICS

References

Mike Quinn (2014), Ethics for the Information Age, International Edition, Pearson.
George W.Reynolds (2012), Ethics in Information Technology, 4th Edition, International Edition, Cengage Learning.
Raymond R. Panko. (2012). Corporate Computer and Network Security. 3rd Edition, Pearson.
Randall J.Boyle and Raymond R. Panko (2013). Corporate Computer Security (Third Edition).Pearson

IE32803 NETWORK AND SECURITY

In this course, students will learn such concepts as protocols, topologies, hardware, and network operating systems. This course will also examine various types of security issues on web, email, file transfer, wireless, instant messaging, and how to protect physical access. Students will learn about intrusion detection, computer virus prevention, and various encryption technologies to secure access to network resources.

References

Data Communication and Networking, Behrouz A. Forouzan, Mc Graw Hill, 5rd Edition. 2013.
Computer Networks; Tanenbaum AS. (Prentice Hall), 5th Edition, 2011.
Raymond R. Panko. (2010). Corporate Computer and Network Security. Pearson.
J. Richard Burke (2004). Network Management: Concepts and Practices – A Hands-on Approach.

IE33002 PROJECT 1

This course is designed to let students to generate a creative project idea and teach them on how to manage and handle an ICT application project in a proper way by going through a complete and correct development process. It will focus on the planning, analysis and design part in producing an ICT product that can be adapt into business.

References

Gaya Penulisan UMS
Online Journal.

IE42103 SECURITY & E-COMMERCE PAYMENT SYSTEM

Electronic Payment is essential to online transactions. The emergence of e-commerce or e-business which is encouraged by advancement of Internet technology has forced the industry players to look for other new alternatives to fulfill the needs of electronic payment. In this course, a few electronic payment methods would be discussed including credit card based online payment, digital check, and digital cash, e-payment based on debit cards, smart cards, prepaid cards, pay-by-phone service and micropayments. Security is one of the major emphases in this course. The security requirements for e-payment or e-commerce such as message privacy, message integrity, authentication, authorization and non-repudiation will be discussed. The course is also attempts to give students the broad and comprehensive understanding in determining the risks for consumers and businesses that involved in electronic payment.

References

Donal O'Mahony, Michael Peirce and Hitesh Tewari. (2001). Electronic Payment for E-Commerce. Artech House, London.
Raymond R. Panko. (2013). Corporate Computer and Network Security. 3rd Edition, Pearson.
Randall J.Boyle and Raymond R. Panko (2014). Corporate Computer Security (Fourth Edition).Pearson

IE42303 DATA MINING

This module is designed for undergraduate students studying on Bachelor in Information Technology course. The module explores the basic concepts of knowledge discovery & data mining. It aims to cover the knowledge discovery and data mining (KDD) process and to understand on how several data mining techniques build models to solve problems and decision making purpose. Through this module, students should gain knowledge of using data mining software and applying correct application of KDD methodology.

References

Hongbo Du (2010), Data Mining Techniques and Applications: An Introduction, CENGAGE Learning
R. Roiger and M. Geatz (2003), Data Mining: A Tutorial Based Primer, Addison Wesley
Witten,Ian,H.,& Frank. E.(2005), Data Mining Practical machine Learning Tools and Techniques, 3rd Edition, morgan Kaufmanm
P.Tan, M.Steinbach and V.Kumar(2006), Introduction to Data Mining, Addison Wesley.
Han,J. and Kamber,M.(2006), Data Mining:Concept and Techniques, 2nd Edition, Morgan Kaufman
Shi,Yong., Olson,David (2007), Introduction to Business Data Mining, Mc Graw Hill

11 SYNOPSIS | FACULTY OF COMPUTING AND INFORMATICS

IE42504 PROJECT 2

This course is designed to let students to generate a creative project idea and teach them on how to manage and handle an ICT application project in a proper way by going through a complete and correct development process. It also designed to let students apply all the ICT knowledge to turn into an ICT application product. It will focus on the development and implementation and handle project testing in producing an ICT product that can be adapt into business.

References

Gaya Penulisan UMS
Online Journal

Charles S. Wasson, "System Analysis, Design and Development: Concepts, Principal and Practices", Wiley Publishing, 2016.

IE42612 INDUSTRIAL TRAINING

Industrial Training aims to expose students with real working environment before they graduate and find employment. The duration of the industrial training is 24 weeks. Throughout the industrial training period, students are placed in IT-related companies under the supervision of industrial supervisor where the students undergo their industrial training, and an academic supervisor from the faculty.

ELECTIVES

IP00103 CREATIVE WRITING

This is an introducing course on creative writing with particular relevance to pre, production and post-production of live action, documentaries, short film, animated short and other media. Students will be given written and practical training in translating idea into scripts for various digital multimedia application. This course will be conducted in workshop format and all activities will be conducted indoor and outdoor. The course objectives are as follows:-

- To expose students to creative writing concepts
- To apply the principles of narration in building story
- To teach the cinematic processes of creative writing into multimedia and feature films format

References

Michael Hauge. 2017. Storytelling Made Easy: Persuade and Transform Your Audiences, Buyers, and Clients — Simply, Quickly, and Profitably. Indie Books International LLC.

Noah & Mica Scalin. 2017. Creative Sprint: Six 30-Day Challenges to Jumpstart Your Creativity Flexi bound. Quarto Publishing Group.

Jill Chamberlain. 2016. The Nutshell Technique: Crack the Secret of Successful Screenwriting. University of Texas Press.

Karen Sullivan, Kate Alexander, Aubry Mintz & Ellen Besen (2013). Ideas for the Animated Short, Finding and Building Stories, 2nd Edition, Focal Press, New York.

Simon Basher. 2013. Basher Basics: Creative Writing- The Plot Thickens! King Fisher.

Nancy Beiman. (2013). Prepare to Board! Creating Story and Characters for Animated Features and Shorts. 2nd Edition. Focal Press, New York.

IP00803 CYBER LAW

Before 1990, few people had heard of the Internet. By the mid-1990s it was hard to drive down the street without seeing a billboard advertising a Web site. In only a few years the Internet significantly changed the way we live and work. It also presented people with tough and interesting legal questions. This course is designed to introduce you to the new and challenging problems of Internet law. We will look at relatively simple questions, such as whether clicking on an "I Agree" button is the same as signing a document, as well as more complicated questions, such as where in the world you are (legally speaking) when you are on the Internet. Issues pertaining intellectual properties (copyright, patent, trademark and etc.) are also discussed. This course also debate issues pertaining to privacy, personal data and internet crime and their association with e-business and national security.

12 SYNOPSIS | FACULTY OF COMPUTING AND INFORMATICS

References

- George W. Reynolds. (2012). Ethics in Information Technology. 4th Edition, Thomson Course Technology
- Gerald R. Ferrera, Margo E.K. REder, Robert C. Bird, Jonathan J. Darrow, Jeffrey M. Aresty, Jacqueline Klosek and Stephen D. Lichtenstein. (2012). Cyberlaw : Text and Cases. 3rd Edition, South-Western

IP00903 PRINCIPLE OF ACCOUNTING

This module is outlined as an introduction to accounting. It is meant to introduce the students with the accounting basics such as book keeping and they will also learn on how to manage a business using all the accounting information. The topics discussed will include introduction to accounting and business, analysing transactions, adjusting process and also preparing financial statements for the business.

References

- Fung, Suriya, Cheong, Fadhlina & Tan (2009). Accounting An Asian Edition. (Cengage Learning)
- Romney & Steinbart (2015). Accounting Information Systems 13th Edition. (Pearson)
- Reeves, Warren & Duchac (2012). Principles of Accounting 24th edition. (Cengage Learning)
- Simkin, Rose & Norman (2015). Core Concepts of Accounting Information Systems 13th Edition. (Wiley)
- Hongren, Harrison & Oliver (2012) Accounting, 9th Edition. (Pearson)

IP01103 RESEARCH METHODOLOGY

This course prepares students to conduct research in Computing Research field. This includes the issues, concepts, methods and techniques associated with computing research field in general. It also introduces students to professional practice and research ethics, the principles of research design, literature review, research methods and techniques of data collection and analysis appropriate to Computing. It covers oral and written communication skills.

References

- Briony J. Oates (2006). Researching Information Systems and Computing. SAGE Publications Ltd.
- Pamela L. Alreck and Robert B. Settle (2004). The Survey Research Handbook. 3rd Ed. Mc-Graw Hill.
- Sekaran, U. (2006). Research Methods for Business : A Skill Building Approach. 4th ed., Wiley Student Edition.
- Salkind, N.J. (2006). Exploring Research. 6th ed., Prentice Hall.
- Sekaran, U., & Bougie, R. (2010). Research Methods for Business : A Skill-Building Approach. New York: John Wiley & Sons.
- Gary B. Shelly and Harry J. Rosenblatt (2011). System Analysis and Design. 9th ed., Shelly Cashman Series.
- Jerry A. Hoffer, Joey F. George, Joseph S. Valacich (2010). Systems Analysis and Design. 5th ed., Prentice Hall.
- Pearsall, Thomas E. (2010). The Elements of Technical Writing. 3rd ed., Longman.

IP01803 CURRENT TOPICS AND ISSUES

There is no set syllabus for this course. Students are required to attend the lecture and talks on the current topics and issues related to the IT industry and the work environment. The talks will be conducted within 6 - 8 weeks of lectures. There are 6 - 8 guest speakers which represent the IT industry and deliver the talk on current topics and issues from e-commerce and multimedia point of views.

References

- <http://www.mscomalaysia.my>
- <https://www.mdec.my/>
- Jebar, H., H. Gheysari, and P. Roghanian, 2012. E-Commerce Reality and Controversial Issue. International Journal of Fundamental Psychology & Social Sciences, 2(4): pp. 74-79

IP00703 PRINCIPLES OF MARKETING

This course is designed to ensure students are knowledgeable in marketing to provide them with the real world of business through current industry-based course exposure. Traditional business disciplines begin to appreciate the fundamental challenges presented by the application of technology to their knowledge base. In marketing, the most obvious agent of change is Internet and online transactions that have revolutionized several sectors of the world economy. This subject takes marketing and traditional marketing exhibits, and exposes it to critical analysis through peripheral technological changes. It explores how a business can capitalize on how to understand, create, communicate and communicate customer value in the marketplace.

References

- Philip Kotler and Gary Armstrong (2015) 'Principles of Marketing', London : Prentice Hall, 16th ed.
Dave Chaffey and P. R. Smith. (2008) 'eMarketing eXcellence: Planning and optimising your digital marketing (E-marketing Essentials)', Amsterdam London : Butterworth-Heinemann, 3rd ed.
Strauss,J.,El-Ansary,A.,Frost, Raymond., 2006.E-Marketing.4th International Edition.Ney Jersey:Pearson Prentice Hall
Friedman, T.,L.,(2006), The World is Flat: The globalized world in the twenty-first century, Penguin Books
Tapscot,D.,Williams.,A.,D., Wikinomics:How Mass Collaboration Changes Everything, Atlantic Books
Anderson, C.,(2006), The Long Tail: How Endless Choice is Creating an Unlimited Demand. Random House Business Books

IP01503 CREATIVE THINKING SKILL (for HC12 students only)

Creative thinking skill is crucial for every student to learn how to apply the unique thinking skill to generate new idea. The course will teach the student how to apply the six thinking hats techniques and the mind mapping techniques for idea visualisation. The student will be equipped with variety of creative thinking skills that is useful for creative problem solving. The students are expected to apply their creative thinking skill using the six thinking hats and demonstrate their knowledge on generating the new idea through the mind mapping techniques during individual and group assignment.

References

- Ace McCloud. 2017. Creativity: Discover How To Unlock Your Creative Genius And Release The Power Within. Pro Mastery Publishing.
Tina Seelig. 2017. Creativity Rules: Get Ideas Out of Your Head and into the World. HarperOne Publishing.
Christine Kohlert & Scott Cooper. 2017. Space for Creative Thinking: Design Principles for Work and Learning Environments. Callwey Verlag Publisher.
Enzo George. 2017. Mental Maps and Mapping the Mind (Mapping in the Modern World).
Edward de Bono (1999). Six Thinking Hats. Penguin Books. London
Edward de Bono (1976). Mechanism of Mind. Penguin Books.

IP01603 E-COMMERCE (for HC12 students only)

This course focuses on the strategic planning, marketing, consumer behavior, issues related to legal policies and laws concerning commerce on the Internet or more known as Electronic Commerce. Covers goods exchanges and services via digital network interactions. It provides the technical framework and analysis for the understanding of electronic commerce. It is divided into three major domains:

- Technology (Including cryptography, internet Infrastructure and server management)
- Economics (Including digital banking system, advertising and marketing, business models and e-cash)
- Social and Transaction Models (Including intellectual rights and legal initiatives).

14 SYNOPSIS | FACULTY OF COMPUTING AND INFORMATICS

References

- Schneider Gary P. 2015. Electronic Commerce. 11th ed. Course Technology: Cengage Learning.
- Laudon K.C. & Traver C. G. 2014. E-Commerce. 2014. Business Technology Society. 9th ed. Pearson International.
- Efrain Turban et. Al..2012. Electronic Commerce: A Managerial and Social Networks Perspective. 7th ed. Global Edition. Person International.
- Greenstein M. & Vasarhelyi M. 2002. Electronic Commerce: Security, Risk Management, and Control. 2nd ed. McGraw-Hill Irwin.

IP01203 ENGINEERING SYSTEM (for HC13 students only)

System engineering has to do with the application of engineering principles in the development of systems that include computers – hardware and software and system’s interaction with users and its environment. To this, system definition, specification, system design, system development and implementation, validating, deploying and maintaining socio-technical systems will be discussed further.

References

- Blanchard B.S. & Facrycky W.J (2014) System Engineering and Analysis. 5th Edition. Prentice Hall Sommerville. (2007). Software Engineering 8 Edition. Pearson Education Ltd
- Kappel, G. et al. (2006). Web Engineering. John Wiley & Sons, Ltd.
- Pfleeger S.L. & Atlee J. M (2012). Software Engineering: Theory and Practice. 4 Editions. Prentice Hall

IP01303 MULTIMEDIA (for HC13 students only)

This course covers an introduction of multimedia building block such as text, graphic, sound, animation, and video. Appropriate multimedia authoring software and hardware will be used and discusses. Processes involved in multimedia development such as planning, costs, design, production, talent acquisition, testing, and delivery are also covered.

References

- Tay Vaughan. 2014. Multimedia Making It Work. 9th ed. Mc Graw Hill.
- Vic Costello. 2016. Multimedia Foundations: Core Concepts for Digital Design, 2nd ed. Focal Press.
- Nigel Chapman and Jenny Chapman. 2009. Digital Multimedia. 3rd ed. John Wiley.
- T. M. Savage and K. E. Vogel. 2013. An Introduction to Digital Multimedia. 2nd ed. Burlington, MA: Jones & Bartlett Learning.

FACULTY CORE

(CENTRE FOR COMPUTER SCIENCE STUDIES)

KT14303 PROGRAMMING PRINCIPLES

This course is an introduction to programming using C++ language. The course will introduce to students how to design and develop programs in C++. The topics covered include introduction to computer science and constructs in C++ including variable, assignment statements, selection structures, repetition and loops, modular programming, simple data types, arrays, strings, abstract data types, text and binary file and dynamic data structures.

References

- Cay Horstmann. “C++ for everyone”. 2nd Edition. John Wiley & Sons, Inc. 2012.
- Bjarne Stroustrup. “The C++ Programming Language”. 4th Edition. Addison-Wesley Professiona. 2013.
- Alex Allain. “Jumping into C++”. Cprogramming.com. 2013
- Sam Key. “C++ Programming Professional Made Easy: Expert C++ Programming Language Success in a Day”. CreateSpace Independent Publishing Platform. 2015.
- Beryl Hoffman. “C++ Programming for Beginners”. Beryl Hoffman. 2013.

KT14503 MATHEMATICS FOR COMPUTING

This course has two main parts: basic calculus and basic linear algebra. Basic calculus involves derivative, and integral calculus studies the integral. The derivative and integral are linked in that they are both defined via the concept of the limit: they are inverse operations of each other (a fact sometimes known as the fundamental theorem of calculus): and they are both fundamental to much of modern science as we know it. Basic linear algebra aim is to present the fundamentals of linear algebra in the clearest possible way to enable student to learn the concepts, algorithms, theory, and applications of Linear Algebra.

References

- Maurice D. Weir and Joel Hass. 2016. Thomas' Calculus. 13th Edition. Pearson. (Main References)
- W. Keith Nicholson. 2013. Linear Algebra with Applications. 7th Edition. McGraw Hill.
- Jim DeFranza and Daniel Gagliardi. 2015. Introduction to Linear Algebra with applications. McGraw Hill.
- Ron Larson and Bruce H. Edwards. 2011. Calculus. 9th Edition. Brooks Cole.
- Waner and Costenoble. 2011. Applied Calculus. 5th Edition. Brooks Cole.
- Kuldeep Singh. 2013. Linear Algebra: Step by Step. Oxford University Press.
- David C. Lay and Steven R. Lay. Linear Algebra and Its Applications. 5th Edition. Pearson.

KT14203 COMPUTER ARCHITECTURE & ORGANIZATION

This course will provide the students an in-depth knowledge about the architecture of computer systems and the technology behind the computer system design. This is done through the learning of computer Evolution and Performance, System Buses, Internal and External memory, Input/Output, Memory Management, Computer Arithmetic, Instruction Sets, CPU Structure, RISCs Technology and Superscalar Processors and Parallel Processing.

References

- Stallings W., Computer Organization and Architecture: Designing for Performance, Tenth Edition, 2016, Pearson Prentice Hall.
- David A. Patterson and John L. Hennessy, Computer Organization and Design, Revised 4th Edition, 4th Edition: The Hardware/Software Interface (The Morgan Kaufmann Series in Computer Architecture and Design), Morgan Kaufmann, 4th Edition, ISBN-10: 0123747503, ISBN-13: 978-0123747501, 2011.
- John L. Hennessy and David A. Patterson, Computer Architecture, Fifth Edition: A Quantitative Approach (The Morgan Kaufmann Series in Computer Architecture and Design), Morgan Kaufmann, 5th Edition, ISBN-10: 012383872X, ISBN-13: 978-0123838728, 2011.
- Linda Null and Julia Lobur, Essentials of Computer Organization and Architecture, Jones & Bartlett Publishers, 3rd Int Edition, ISBN-10: 1449620639, ISBN-13: 978-1449620639, 2011.

KT14403 DISCRETE STRUCTURE

This course introduces discrete mathematics principles including sets, functions, and sequences, relations, induction and recursion, counting, and probability.

References

- Malik D.S. and Sen M.K. 2010, Discrete Mathematics
- Epp. S, 2011, Discrete Matematics with Applications
- Richard Johnsonbaugh. Discrete Mathematics, 7th Edition, 2008. Prentice Hall.
- James L. Hein. Discrete Structures, Logic, and Computability, 2009. Jones & Bartlett Publishers.
- Bernard Kolman, Robert Busby, and Sharon C. Ross. Discrete Mathematical Structures (6th Edition), 2008. Prentice Hall.
- Kenneth Rosen. Discrete Mathematics and Its Applications, 2006. McGraw-Hill.

KT24103 DATA STRUCTURES AND ALGORITHMS

Pre-Requisite: KT14403, KP14603 (HC05), KK14203 (HC00)

This course introduces data structures and elementary algorithms using C++. In the first part of the course, students will learn common data structures such as linked lists, stacks, queues, trees, and graphs. The second part of the course is on algorithms such as searching, sorting, and hashing.

References

- D. .S. Malik, Data Structures Using C++, second edition, Course Technology, 2010.
- Frank. M. Carrano, Data Abstraction & Problem Solving with C++: walls & mirrors (6th ed), Pearson Education 2012.
- Michael Main & Walter Savitch, Data Structures & Other Objects Using C++, 4th Edition, Pearson Education, 2010.
- Mark Allen Weiss, Data Structure and Algorithm Analysis in C++, 4th Edition, Pearson Education, 2013.
- Michael T. Goodrich, Roberto Tamassia, David M. Mount, Data Structures and Algorithms in C++, 2nd Edition, Wiley, 2011.

KT24203 PROBABILITY AND STATISTICS

This course is designed to develop a basic understanding of descriptive and inferential statistics. This course provides the quantitative tools for decision-making and develops the ability to interpret statistical results.

References

- Bluman. G. Allan. 9th Edition, Elementary Statistics: A Step by Step Approach. Mc Graw Hill. 2014. (Main textbook)
- Navidi, W. & Monk, B. (2013). Elementary Statistics. Mc Graw Hill.
- Liptser, R., & Shiryaev, A. N. (2013). Statistics of Random Processes: I. General Theory (Vol. 5). Springer Science & Business Media.
- Devore, J. (2015). Probability and Statistics for Engineering and the Sciences. Cengage Learning.
- Hayter, A. (2013) Probability and Statistics for Engineers and Scientists. 4th Edition. Brooks/Cole Cengage Learning.

KT24503 DATABASE

This course introduces the fundamentals of database architecture, database management systems, and database systems. Principles and methodologies of database design, and techniques for database application development.

References

- Abraham Silberschatz, Henry F. Korth, S. Sudarshan, Database System Concepts, Sixth Edition, Mc Graw Hill, 2011.
- Carlos Coronel, Steven Morris and Peter Rob, Database Systems: Design, Implementation, and Management, Course Technology, Tenth Edition, ISBN-10: 1111969604, ISBN-13: 978-1111969608, 2012.
- Ramez Elmasri and Shamkant Navathe, Fundamentals of Database Systems, Addison Wesley, 6th edition, ISBN-10: 0136086209, ISBN-13: 978-0136086208, 2010.
- Toby J. Teorey, Sam S. Lightstone, Tom Nadeau and H.V. Jagadish, Database Modeling and Design, Morgan Kaufmann, Fifth Edition, ISBN-10: 0123820200, ISBN-13: 978-0123820204, 2011.
- Kevin Loney, Oracle Database 11g The Complete References, McGraw-Hill Osborne Media, First Edition, ISBN-10: 0071598758, ISBN-13: 978-0071598750, 2008.

KT24403 OPERATING SYSTEMS

The operating system provides a well-known, convenient, and efficient interface between user programs and the bare hardware of the computer on which they run. The operating system is responsible for allowing resources to be shared, providing common services needed by many different programs. Particular emphasis will be given to three major OS subsystems: process management (processes, threads, CPU scheduling, synchronization, and deadlock), memory management (segmentation, paging, swapping), file systems, and operating system support for distributed systems.

References

- Silberschatz A., Galvin P. B., and Gagne G., Operating System Concepts, Ninth Edition, Wiley, 2013.
- Tanenbaum A. S., Modern Operating Systems, 4th Edition, Prentice Hall, 2014.
- Stallings W., *Operating Systems: Internal and Design Principles*, 8th Edition by, Prentice Hall, 2014.
- McHoes A. & Flynn I. M., Understanding Operating Systems, 7th Edition, Course Technology, 2014

KT34103 ARTIFICIAL INTELLIGENCE

This is a general introductory course to AI. This course aims to introduce the principles and fundamental techniques of artificial intelligence, and in particular, machine learning. Students will learn the fundamentals and state-of-the-art techniques and acquire practical insights into the current development of this field.

References

- Artificial Intelligence: A Modern Approach, Stuart Russell, Peter Norvig, Third Edition, Prentice Hall. 2010, ISBN: 0-13-207148-7
- Artificial Intelligence: Structures and Strategies for Complex Problem Solving *by George F. Luger*, ISBN-13: 9780321545893, 2008
- Wolfgang Ertel and Nathanael T. Black, Introduction to Artificial Intelligence (Undergraduate Topics in Computer Science), Springer, 1st Edition. ISBN-10: 0857292986, ISBN-13: 978-0857292988, 2011
- Kevin Warwick, Artificial Intelligence: The Basics, Routledge, 1st Edition, ISBN-10: 0415564832, ISBN-13: 978-0415564830, 2011.
- Stephen Lucci and Danny Kopec, Artificial Intelligence in the 21st Century, Mercury Learning and Information, ISBN-10: 1936420236, ISBN-13: 978-1936420230, 2012

KT34303 COMPUTER GRAPHICS

Pre-Requisite: KT14303, KT14503

Computer Graphics concepts and algorithms are found in a significant and increasing number of modern applications and this is a trend that is likely to continue. Today's computing graduates need a firm grasp of graphics fundamentals such as vectors, coordinates systems, modelling, cameras and rendering. This course aims to provide a firm foundation for such topics and is intended to be both immediately useful and the basis for further study.

References

- Francis F. Hill Jr. Computer Graphics using OpenGL (Fifth Edition). 2015, Prentice-Hall.
- Richard S. Wright, Benjamin Lipchak, and Nicholas Haemel. OpenGL SuperBible: Comprehensive Tutorial and References (6th Edition), 2013. Addison-Wesley Professional.
- Frank Klawonn. Introduction to Computer Graphics: Using Java 2D and 3D, 2014. Springer.
- Leen Ammeraal and Kang Zhang. Computer Graphics for Java Programmers, 2014. Wiley.
- Harry Smith. Computer Graphics Fundamentals, 2013. Cambridge.

KT44103 ICT LAWS AND ETHICS

Introducing on how computers can affect the society and how they could further affect it in the future. Various ethical issues surrounding computers will be examined such as piracy, hacking, viruses, responsibility and liability for the use of software, cyberporn, computerized invasion of privacy, computers in the workplace, and the use of artificial intelligence and expert systems. Other than that, the student will also be introduced to ICT Laws practised in Malaysia.

References

- George W. Reynolds, Ethics in Information Technology, 4th Edition, International Edition, 2012.
- Michael J. Quinn, Ethics for the Information Age, Sixth Edition, Global Edition, Pearson. 2015.
- D. G. Johnson, Computer Ethics, 4th edition; Prentice Hall, 2012.
- Robert N. Barger, Computer Ethics: A Case-based Approach, Cambridge University Press, 2015.
- Giannis Stamatellos, Computer Ethics: A Global Perspective, Jones & Bartlett Publishers, 2012.
- Malaysian Information Technology and Multimedia Laws from various Malaysian Ministries Official Websites. 2016.

KT44302 ENTREPRENEURSHIP IN TECHNOLOGY

Students will learn the process of new venture creation through actually working through the process themselves. Students will:

- Understand the nature of technology entrepreneurship
- Work on a technology concept
- Acquire the ability to identify or create an opportunity
- Develop an idea for a new business
- Create a professional-level business plan
- Present the business plan

By the end of the course, each student team should have produced a business plan that could be presented to an angel investor or a venture capitalist.

References

- Allen, K. R., *New Ventures, An Entrepreneurial Approach*, 6th Edition, South-Western Cengage Learning, Canada, 2012.
- Timmons, J. A., Adams, R. and Spinelli, S., *New Venture Creation: Entrepreneurship for the 21st Century*, McGraw-Hill, 9th Edition, 2011.
- Kamariah, K. et al., *Technology Entrepreneurship*, Prentice Hall, 2012.
- Scarborough, N. M., *Techno-Innovative Entrepreneurship Leader (TiEL)*, Global Edition, Pearson, 2014.
- Barringer B. R., *Entrepreneurship: Successfully Launching New Ventures*, Prentice Hall, 4th Edition, 2012.
- Laudon K.C., and Traver C.G., *E-Commerce*, Prentice Hall, 8th Edition, 2012.
- Straus J., and Frost R., *E-Marketing*, Prentice Hall, 6th Edition, 2012.

CORE PROGRAM SOFTWARE ENGINEERING (HC00)

KK14203 OBJECT ORIENTED PROGRAMMING

Prerequisites: KT14303 PROGRAMMING PRINCIPLES

This course is an introduction to object-oriented programming using Java. Students will learn how to develop object-oriented programs by exposing them to the concept of class, class libraries, how to define their own classes, inheritance and polymorphism. The foundations of effective object-oriented design are also covered. Apart from that, the some important features of Java will be discussed. These include control structures, data structures, event-driven programming and file I/O.

References

- Herbert Schildt and Dale Skrien. *Java Programming: A Comprehensive Introduction*, McGraw-Hill, 2013.
- Tony Gaddis and Godfrey Muganda. *Stating Out with Java: From Control Structures through Data Structures*. 2nd Edition, Pearson, 2014.
- Y. Daniel Liang. *Introduction to Java Programming: Comprehensive Version*. 9th Edition, Pearson, 2013.
- D.S. Malik. *Java Programming: From Problem Analysis to Program Design*. 5th Edition. Course Technology, Cengage Learning. 2012.
- Bart Baesens, Aimee Backiel, and Seppe vanden Broucke, *Java Programming: The Object-Oriented Approach*, Wrox, 2015.

KK24103 SYSTEMS ANALYSIS

The course provides an excellent foundation for systems development that includes the development of business case, analysis, design, implementation and maintenance. This course includes expanded coverage of data flow diagrams, data dictionaries, and process specifications, as it introduces examples of new software used by analysts and designers to manage projects, analyze and document systems, design new systems, and implement their plans.

19 SYNOPSIS | FACULTY OF COMPUTING AND INFORMATICS

References

- Roth, R.M., Dennis, A., & Wixom, B.H, *System Analysis and Design 5th Edition*, John Wiley & Sons, Inc., New York, 2013
- Satzinger, John W., Jackson, R.L., and Burd, S.D. 2008. *Systems Analysis and Design in a Changing World*, 5th ed, Cengage Learning.
- Jeffrey A. Hoffer, Joey F. George, and Joseph S. Valacich. *Modern Systems Analysis and Design*, Fifth Edition, Addison Wesley Longman, 2007.
- Pilone, D. & Pitman, N. *UML 2.0 in a Nutshell*. Sebastopol, CA: O'Reilly Media, Inc. 2005.
- Kendall, Kenneth and Kendall, Julie. *Systems Analysis and Design*, Sixth Edition, Prentice Hall, 2005.
- Marakas, G.M., *Systems Analysis and Design: An Active Approach*, Second Edition, McGraw Hill/Irwin, 2006

KK24303 DATA COMMUNICATION

This course is prepared for the students by exposing the knowledge of how to well manage and plan especially in Networking projects. *Networking Project Management in Practice* offers an invaluable guide for managing real networking projects. This course can benefit student seeking to improve the ways one manages networking project.

References

- Dye, Reid. 2014, *Introduction to Networks*, Cisco Press.
- Reid & Lorenz, 2008. *Networking for Home and Small Businesses*, CCNA Discovery Learning Guide, Cisco Press. 2. Panko, 2006, *Business Data Networks and Telecommunications*, Prentice Hall. 3. Forouzan, 2004, *Introduction to Data Communication and Networking*, McGraw Hill 4. FitzGerald, Dennis, 2009, *Business Data Communication and Networking*, 10th Edition, John Wiley & Sons Inc, USA.

KK24203 OBJECT ORIENTED MODELING AND DESIGN

KK14203, KT24103, KK24103

This course is designed for students to analyze and design a problem domain in terms of objects by introducing and clarifying the fundamental ideas and basic concepts associated with object orientation. Object Oriented Analysis and Design (OOAD) method creates a set of models of a software system using UML to implement the identified requirements. This course strongly focus on helping the learner master OOAD through case studies that demonstrate key OO principles and patterns, while also applying the UML.

References

- David Tegarden, Alan Dennis & Barbara Haley Wixom. *System Analysis & Design with David Tegarden, Alan Dennis & Barbara Haley Wixom. System Analysis & Design with UML*. 4th Edition. Wiley. 2013.
- B. S. Ainapure. *Object-oriented Modeling and Design*. Technical Publications Pune. 2010.
- Hassan Gomaa, *Software Modeling and Design: UML, Use Cases, Patterns, and Software Architectures*, Cambridge University Press, 1st Edition, 2011.
- David C. Hay, *UML and Data Modeling: A Reconciliation*, Technics Publications, LLC, 1st Edition, 2011.
- Michael R. Blaha and James R Rumbaugh. *Object-oriented Modeling and Design with UML*. Second Edition. Pearson Prentice Hall. 2005

KK24603 WEB ENGINEERING

Prerequisite: KT14303 PROGRAMMING PRINCIPLES

Students will understand how the internet functions in tandem with the various latest World Wide Web technologies. This course will expose students to the numerous and diverse collection of current web site design and application development technologies. Students will learn the basic principles, protocols & current practices that power the internet and World Wide Web, how to design and implement a basic web site, how to program scripts that serve the client's browser, how to program scripts that access information from the web server and how to integrate databases into the design of dynamic, data-driven web sites.

References

- Internet and World Wide Web: How To Program, 5/E, H. Deitel, P. Deitel & A. Deitel, 2013, Prentice-Hall.
- Programming the World Wide Web, 8/E, R. Sebesta, 2014, Pearson.
- Learning PHP, MySQL, JavaScript, and CSS: A Step-by-Step Guide to Creating Dynamic Websites, 3/E, R. Nixon, 2014, O'Reilly Media.
- Web Programming And Internet Technologies, P. Scobey, 2016, Jones & Bartlett.
- PHP for the Web, L. Ullman, 2016, Peachpit Press.

KK34103 SOFTWARE PROJECT MANAGEMENT

This course is prepared for the students by exposing the knowledge of how to well manage and plan especially in Software projects. Software Project Management in Practice offers an invaluable guide to using lightweight software processes in real projects. This course can benefit student seeking to improve the ways one manages software.

References

- CompTIA Project+ Study Guide, Kim Heldman, William Heldman, 2010, ISBN: 978-0-470-58592-4.
- Information Technology Project Management, Jack T. Marchewka, 2010, ISBN 978-0-470-40948-0
- Frank F. Tsui, Managing software projects, Jones & Bartlett Learning, 2004, ISBN 0763725463, 9780763725464.
- Bob Hughes and Mike Cotterell, Software Project Management, Fourth Edition, McGraw-Hill Companies, 2006.
- Wysocki, Robert K., Effective Project Management: Traditional, Adaptive, Extreme, Fourth Edition, John Wiley & Sons, 2007.
- Harold Kerzner, Project Management: A Systems Approach to Planning, Scheduling, and Controlling, Tenth Edition, John Wiley & Sons, 2009

KK34503 SOFTWARE QUALITY AND TESTING

The objective of this course is to train future software engineers the fundamental concepts on which state-of-the-art software testing techniques are based. In addition, other important aspects related to software quality are addressed, though in a more superficial manner: quality assurance, safety, fault tolerance, reliability assessment. An in-depth study of verification and validation strategies and techniques as they apply to the development of quality software. Topics include test planning and management, testing tools, technical reviews, formal methods and the economics of software testing. The relationship of testing to other quality assurance activities as well as the integration of verification and validation into the overall software development process are also discussed.

References

- Black, R, Veenendaal, E.V and Graham, D. 2012. Foundations of Software Testing. 3rd Edition. Cengage Learning.
- Galín, D. 2004. Software Quality Assurance: From Theory to Implementation. Pearson Addison Wesley.
- Marcus S. Fisher, Software Verification and Validation: An Engineering and Scientific Approach, Springer, 2006.
- Aristides Dasso, Verification, Validation and Testing in Software Engineering, IGI Global, 2006.
- William E. Lewis, Software Testing and Continuous Quality Improvement, Third Edition, AUERBACH, 2008.
- Paul Ammann & Jeff Offutt, Introduction to Software Testing, Cambridge University Press, 2008

KK34203 PROJECT I

Final year projects give students the opportunity to put into practice the knowledge and skills that they have acquired throughout the Software Engineering programme. In the course of their projects, students develop their ability to analyze user requirements, find information for literature review, methods and design a system. Students also further develop their communication skills through their regular meetings with project supervisors, project presentations and the writing of project reports. In addition, students gain experience managing a substantial project.

References

- Follow Gaya Penulisan UMS and FYP handbook.

KK34403 HUMAN COMPUTER INTERACTION

Prerequisites: **KT14403, KP14603 (HC05), KK14203 (HC00)**

This course provides an introduction and overview of the field of human computer interaction (HCI). HCI is an interdisciplinary field that integrates theories and methodologies from computer science, cognitive psychology, design, and many other areas. Issues include: command languages, menus, forms, and direct manipulation, graphical user interfaces, computer supported cooperative work, information search and visualization, World Wide Web design, input/output devices, and display design. Students will learn the fundamental concepts of human-computer interaction and user-centered design thinking. Students will work on both individual and team projects to design, implement and evaluate computer interfaces.

References

Designing Interactive Systems. A Comprehensive Guide to HCI, UX and Interaction Design. David Benyon. 2014.
Human-Computer Interaction. Serengul Smith-Atakan. Course Technology. 2011.
Interaction Design: Beyond Human-Computer Interaction, 3rd Edition, Helen Sharp et al, Wiley. 2011.
Designing the User Interface: Strategies for Effective Human-Computer Interaction, Fifth Edition by Shneiderman, B., and Plaisant, C., Pearson. 2010.

KK34603 COMPUTER SECURITY

Prerequisites: **KT24403**

This course covers aspects of computer and network security. It looks at aspects in computer and network security from the perspective of plan-protect-respond cycle of security. The plan element deals with planning and policy to anticipate security threats, the protect element introduces technologies and measures to enforce security, and the respond element deals with the aftermath of security breaches.

References

Randall J. Boyle and Raymond R. Panko, Corporate Computer Security (3rd ed), Pearson, 2013.
Marian Quigley, ICT Ethics and Security in the 21st Century: New Developments and Applications, IGI Global, 2011.
Pfleeger, C.P. 2012. Analyzing Computer Security: A Threat/Vulnerability/Countermeasure Approach. Prentice Hall.
William Stallings, and Lawrie Brown, Computer Security: Principles and Practice, 2nd edition, Pearson, 2012.
George Curtis, The Law of Cybercrimes and Their Investigations, CRC Press, 2011.

KK34803 PARALLEL PROGRAMMING AND DISTRIBUTED SYSTEMS

Prerequisite: **KT14403, KP14603 (HC05), KK14203 (HC00)**

This course will show students how to exploit different parallel architectures to improve your code's performance, scalability, and resilience. Students will learn about seven concurrency models: threads and locks, functional programming, separating identity and state, actors, sequential processes, data parallelism, and the lambda architecture.

References

Roger Pressman and David Lowe, Web Engineering: A Practitioner's Approach 1st Edition, McGraw-Hill Education; 1 edition (January 22, 2008), ISBN-10: 9780073523293, ISBN-13: 978-0073523293 ASIN: 0073523291.
Jessica Miller, Victoria Kirst, Marty Stepp, Web Programming Step by Step, Step by Step Publishing; 2nd edition (2012), ISBN-10: 110557878X, ISBN-13: 978-1105578786
Semmy Purewal, Learning Web App Development 1st Edition, O'Reilly Media; 1 edition (March 3, 2014), ISBN-10: 1449370195, ISBN-13: 978-1449370190
Robin Nixon, Learning PHP, MySQL & JavaScript: With jQuery, CSS & HTML5 (Learning Php, Mysql, Javascript, Css & Html5) 4th Edition, O'Reilly Media; 4 edition (December 14, 2014), ISBN-10: 1491918667, ISBN-13: 978-1491918661
Leon Shklar and Rich Rosen, Web Application Architecture: Principles, Protocols and Practices 2nd Edition, Wiley; 2 edition (April 27, 2009), ISBN-10: 047051860X, ISBN-13: 978-0470518601

KK44703 PROJEK II

Final year projects give students the opportunity to put into practice the knowledge and skills that they have acquired throughout the Software Engineering programme. In the course of their projects, students develop their ability to analyze user requirements, find information for literature review, methods, design and develop a system. Students also further develop their communication skills through their regular meetings with project supervisors, project presentations and the writing of project reports. In addition, students gain experience managing a substantial project.

References

Gaya Penulisan UMS dan FYP handbook.

KK44903 SOFTWARE MAINTENANCE & EVOLUTION

The first part of this course provides the basic concepts and the framework of maintenance process. The second part will go through the activities that take place during maintenance starting with understanding the system to be changed, through the specific of making the change and testing the modified system. The third part looks at means of measurement and assessment, both of the overall process and the components of software and software maintenance, showing how to keep track and provide objective assessment as well as the maintenance tools that can be used.

References

Penny G., Armstrong. 2003. Software Maintenance: Concept and Practices, World Scientific Publishing Company, 2nd Edition. (this is the major References for most of software maintenance courses, no latest edition)

Ian Sommerville, Software Engineering 9th ed., 2011, Pearson

Tom Mens and Serge Demeyer. Software Evolution, Springer, 2010.

Lowell Jay Arthur. Software Evolution: A Software Maintenance Challenge, John Wiley and Sons, 2008.

Stanislaw Jarzabek. Effective Software Maintenance and Evolution: A Reuse-Based Approach. Auerbach Publications; 1 edition, 2007.

Alain April, and Alain Abran. 2008. Software Maintenance Management: Evaluation and Continuous Improvement. Wiley- IEEE Computer Society Press.

ELECTIVES COURSES

KK04103 HEURISTICS ALGORITHMS

Prerequisite: KT34103

This course will provide students with a basic understanding of modern heuristic algorithms as applied to optimization problems. Theoretical and practical topics include optimization basics, solution representation, objective functions, selection evaluation, search landscapes, local optimums, discrete problems, hill-climbing, global and local search, simulated annealing, tabu search and swarm intelligence.

References

Essentials of Metaheuristics, 2nd Edition, S. Luke, 2015, Lulu.

Handbook of Heuristics, R. Marti, 2017, Springer.

Search and Optimization by Metaheuristics, K. Du, 2016, Birkhauser.

Metaheuristics, P. Siarry, 2016, Springer.

Hybrid Metaheuristics, C. Blum, 2016, Springer.

KK04203 INTELLIGENT AGENTS

The concept of Operating System (OS) as primarily providing users with interface to manage a complex system. A computer consists of processors, memories, timers, disks, mouse, keyboard, network interfaces, and wide variety of other devices. In short OS is to provide for an orderly and controlled allocation of the processors, memories and input / output devices.

References

- Maria Fasli . "Agent Technology for e-Commerce". John Wiley & Sons, Ltd. 2007.
- Michael Wooldridge. "An Introduction to MultiAgent System". 2nd Edition. Wiley. 2009.
- Fabio Luigi Bellifemine, Giovanni Caire, and Dominic Greenwood. "Developing Multi-Agent Systems with JADE (Wiley Series in Agent Technology)". Wiley. 2007.
- Stuart Russell and Peter Norvig. "Artificial Intelligence: A Modern Approach (The Intelligent Agent Book)". Prentice Hall. 2008.

KK04303 ARTIFICIAL IMMUNE SYSTEMS

This course introduces students to basic immunology, immune processes, different immunological models, as well as computational algorithms inspired by those models and processes for problem solving. Topics include an overview of basic immunology, immune models and theories, computational immune-inspired algorithms, and real-world applications of these algorithms..

References

- De Castro and Timmis, Artificial Immune Systems: A New Computational Intelligence Approach, Springer-Verlag, 2002. (no new edition)
- Richard Rimiru, Exploring Immune System's Concepts for the Design of Novel AIS Models: Integrated Innate and Adaptive Artificial Immune Systems Applied to Network Intrusion Detection, LAP LAMBERT Academic Publishing (June 1, 2012), ISBN-13: 978-3659129964, 2012.
- Proceedings on the International Conference on Artificial Immune Systems (2007 – 2011)
- Hongwei Mo, Handbook of Research on Artificial Immune Systems and Natural Computing: Applying Complex Adaptive Technologies (Volume 1), Medical Information Science References; 1 edition (December 16, 2008), ISBN-13: 978-1605663104, 2008.
- Dipankar Dasgupta and Fernando Nino, Immunological Computation: Theory and Practice, CRC Press, 2008.
- <http://www.artificial-immune-systems.org/index.shtml>

KK04403 ARTIFICIAL NEURAL NETWORKS

A general introduction to the challenging topic of Artificial Neural Networks is given in this course. Important biological and mathematical fundamentals are presented first and an understanding of machine learning is established. Various types of neural networks are presented, from basic perceptrons to self-organising maps. Finally, the student's knowledge is applied to real-world problems which include classification and regression. This course is given using Matlab.

References

- Simon Haykin, Neural Networks -- a Comprehensive Foundation, Prentice Hall, 4th ed., 2012.
- Mehryar Mohri, Afshin Rostamizadeh, Ameet Talwalkar. Foundations of Machine Learning, The MIT Press. 2012
- Sergios Theodoridis, Konstantinos Koutroumbas "Pattern Recognition", 4th Edition, Academic Press, 2010
- Gurney, K. An Introduction to Neural Networks London: Routledge, 2011

KK04503 EVOLUTIONARY COMPUTING

Prerequisite: KT34103

This course will provide students with a basic understanding of evolutionary computation. Topics include an overview of how biology inspired computational algorithms, the basic processes of an evolutionary algorithm, genetic algorithms, evolution strategies, evolutionary programming, genetic programming and how to practically apply evolutionary computation.

References

- Evolutionary Optimization Algorithms, D. Simon, 2013, Wiley.
- Introduction to Evolutionary Computing, A.E. Eiben and J. Smith, 2nd edition, 2016, Springer.
- Evolutionary Computation: A Unified Approach, K. De Jong, 2016, Springer.
- Genetic and Evolutionary Computing, T.T. Zin and J. Lin, 2015, Springer.
- Natural Computing Algorithms, A. Brabazon and M. O'Neill, 2015, Springer.

KK04603 SEMANTIC WEB

Prerequisite: **KT14403, KP14603 (HC05), KK14203 (HC00)**

The "Semantic Web" is a work-in-progress, consisting of various initiatives to make web documents more "understandable" by computer programs such as search engines and e-commerce agents. As such, this course will give an overall outline of the Semantic Web "vision" and will concentrate on the Semantic Web technologies that have reached a level of maturity and acceptance in the web-authoring community, particularly XML, RDF and OWL.

References

- Toby Segaran, Colin Evans and Jamie Taylor. "Programming the Semantic Web". O'Reilly. 2016.
- Grigoris Antoniou and Frank van Harmelen. "A Semantic Web Primer". 2nd edition, MIT Press. 2015.
- John Hebel, Matthew Fisher, Ryan Blace, Andrew Perez-Lopez, Mike Dean. "Semantic Web Programming". Wiley. 2014.
- Dean Allemang and James Hendler. "Semantic Web for the Working Ontologist: Effective Modeling in RDFS and OWL". Morgan Kaufmann. 2015.
- John Davies, Rudi Studer, and Paul Warren. "Semantic Web Technologies: Trends and Research in Ontology-based Systems". Wiley. 2016.

KK04703 DATA MINING

Prerequisite: **KT24503**

This course introduces the process and main techniques in data mining, including association rule learning; classification approaches such as inductive inference of decision trees and neural network learning, clustering techniques, and association rules.

References

- Data Mining and Analysis: Fundamental Concepts and Algorithms, Mohammed J. Zaki, Wagner Meira Jr, Cambridge University Press; 1 edition (May 12, 2014), ISBN-10: 0521766338, ISBN-13: 978-0521766333, 2014.
- Data Mining and Predictive Analytics, Daniel T. Larose and Chantal D. Larose, Wiley; 2 edition (March 16, 2015), ISBN-10: 1118116194, ISBN-13: 978-1118116197, 2015.*
- Data Mining: Practical Machine Learning Tools and Techniques, Ian H. Witten, Eibe Frank, Mark A. Hall, Morgan Kaufmann; 3 edition (January 20, 2011), ISBN-10: 0123748569, ISBN-13: 978-0123748560, 2011.
- Data Mining: Concepts and Techniques, Jiawei Han, Micheline Kamber, Jian Pei, Morgan Kaufmann; 3 edition (July 6, 2011), ISBN-10: 0123814790, ISBN-13: 978-0123814791, 2011.
- Data Mining: The Textbook, Charu Aggarwal, Springer; 2015 edition (April 14, 2015), ISBN-10: 3319141414, 2015.

KK04803 INFORMATION RETRIEVAL

Prerequisite: **KT24503**

This course introduces the process and main techniques in data mining, including association rule learning; classification approaches such as inductive inference of decision trees and neural network learning, clustering techniques, and association rules.

References

- Modern Information Retrieval: The Concepts and Technology Behind Search (2nd Edition) Ricardo Baeza-Yates and Berthier Ribeiro-Neto, Addison Wesley, 2011, ISBN978-0-321-41691-9
- Information Retrieval: Implementing and Evaluating Search Engines, Stefan Büttcher, Charles L. A. Clarke and Gordon V. Cormack, 2010, The MIT Press, ISBN-10: 0262026511, ISBN-13: 978-0262026512.
- Introduction to Information Retrieval, Christopher D. Manning, Prabhakar Raghavan and Hinrich Schütze, Cambridge University Press. 2008.
- Information Retrieval in Practice. B. Croft, D. Metzler, T. Strohman. Pearson Education, 2009, Pearson, ISBN-10: 0136072240, ISBN-13: 978-0136072249
- Text Information Retrieval Systems. C.T. Meadow, B.R. Boyce, D.H. Kraft, C.L. Barry. Academic Press, 2007

KK05103 MOBILE COMPUTING

Prerequisite: KT14303

This course provides useful guidelines, standards, techniques, and best practices for building mobile product from start to finish. This course covers basic design and development principles that govern all mobile devices and platforms. Students will be explored with the more advanced capabilities of the mobile web, including markup, advanced styling techniques, and mobile Ajax.

References

Thomas J. Duffy. Programming with Mobile Applications. Cengage Learning. 2014.
Frank Zammetti. Learn Corona SDK Development 2011. Apress. 2013.
Michele M. Fernandez. Corona SDK Mobile Game Development – Beginner's Guide. PACKT. 2012.
Silvia Domenech. Create Mobile Games with Corona. The Pragmatic Bookshelf. 2013.
Mike McGrath. Building Android Apps in Easy Steps. In Easy Steps Ltd. 2013.

KK05203 SPECIAL TOPICS IN COMPUTER SCIENCE

This course introduces special topics and latest issues in the computer science cognitive. It's to expose the students for latest/current trend of researches and info regarding computer science. The content and syllabus of the course is not fix every year. Hence, other info are not available at all.

KT24403 MODELS OF COMPUTATION

Prerequisite: KT14403

The theory of computation comprises the mathematical underpinnings of computer science. It introduces three major topics: formal languages and automata theory, computability theory, and complexity theory. This course focuses on the first two, and provides an introduction to the third. Complexity theory classifies problems with respect to their intrinsic degree of hardness, or the amount of computational resources (in terms of space and time) required to solve them. Computability theory addresses a more fundamental issue: is a given problem solvable (by a computer) in the first place? The theory of formal languages and automata investigates mathematical models of computation, and classifies them with respect to their computational power. These models are used to answer questions and prove results in both computability and complexity theory. In addition to its foundational role, the theory of computation had vast applications in various areas of computing. These include the specification of the syntax of programming languages, compiler construction, string processing, and cryptography.

References

Sipser, Michael (2015). *Introduction to the Theory of Computation (3rd edition)*, Thomson Course Technology, ISBN-10: 0534950973.

Introduction to automata theory, languages, and computation, John E. Hopcroft, Rajeev Motwani, Jeffrey D. Ullman, Pearson/Addison Wesley, ISBN0321455363, 9780321455369, 2013.
Martin, John, **Introduction to Languages and the Theory of Computation**, McGraw 2013.

KK05403 FORMAL METHOD IN SOFTWARE ENGINEERING

This course will introduce students to the use of formal techniques for the specification, design, analysis and verification in the software engineering process. It emphasizes the use of mathematical notation in writing system specification in order to increase its accuracy. Formal methods are essential to develop a critical and large system which dependability is the most important attribute.

References

Shaoying Liu. Formal Engineering for Industrial Software Development. Using SOFL Method. Springer, 2004
Using Z: Specification, Refinement and Proof Jim Woodcock and Jim Davies, 1996, Prentice Hall.
Articles from journals and proceeding related with formal method for software engineering

CORE PROGRAM NETWORK ENGINEERING (HC05)

KP14603 OBJECT ORIENTED CONCEPTS

Prerequisites: KT14303

This course is an introduction to object-oriented programming using Java. Students will learn how to develop object-oriented programs by exposing them to the concept of class, class libraries, how to define their own classes, inheritance and polymorphism. The foundations of effective object-oriented design are also covered. Apart from that, the some important features of Java will be discussed. These include control structures, data structures, event-driven programming and file I/O.

References

- Herbert Schildt and Dale Skrien. Java Programming: A Comprehensive Introduction, McGraw-Hill, 2013.
- Tony Gaddis and Godfrey Muganda. Stating Out with Java: From Control Structures through Data Structures. 2nd Edition, Pearson, 2014.
- Y. Daniel Liang. Introduction to Java Programming: Comprehensive Version. 9th Edition, Pearson, 2013.
- D.S. Malik. Java Programming: From Problem Analysis to Program Design. 5th Edition. Course Technology, Cengage Learning. 2012.
- Bart Baesens, Aimee Backiel, and Seppe vanden Broucke, Java Programming: The Object-Oriented Approach, Wrox, 2015.

KP24103 SYSTEM ANALYSIS & DESIGN

The course presents an overview of information systems and the system development life cycle for the systems analyst, focusing on methods, tools and techniques that the programmer or analyst can use to document information systems.

References

- Shelly, Cashman, Rosenblatt. System Analysis and Design, 10th Edition, Shelly Cashman Series, 2014
- Dennis, A., Wixom, B.H & Roth, R.M., *System Analysis and Design Third Edition*, John Wiley & Sons, Inc., New York, 2006
- Satzinger, J.W., Jackson, R.B. & Burd, S.D., *System Analysis and Design in a Change World Third Edition*, Thomson, Boston, 2004.

KP24303 NETWORK FUNDAMENTALS

This course is prepared for the students by exposing the knowledge of how to well manage and plan especially in Networking projects. Networking Project Management in Practice offers an invaluable guide for managing real networking projects. This course can benefit student seeking to improve the ways one manages networking project.

References

- CompTIA Project+ Study Guide, Kim Heldman, William Heldman, 2010, ISBN: 978-0-470-58592-4
- Information Technology Project Management, Jack T. Marchewka, 2010, ISBN 978-0-470-40948-0
- Bob Hughes and Mike Cotterell, Software Project Management, Fourth Edition, McGraw-Hill Companies, 2006.
- Wysocki, Robert K., Effective Project Management: Traditional, Adaptive, Extreme, Fourth Edition, John Wiley & Sons, 2007.
- Harold Kerzner, Project Management: A Systems Approach to Planning, Scheduling, and Controlling, Tenth Edition, John Wiley & Sons, 2009.

KP24203 ROUTING PROTOCOLS AND CONCEPTS

Prerequisite: KT24203

This course describes the architecture, components and operations of routers and switches in a computer network. Students will learn how to configure the basic functions of a router and a switch. At the end of this course students will be able to configure and troubleshoot issues regarding routing protocols such as RIPv1, RIPv2, *single-area* and *multi-area* OSPF, *virtual LANs*, and *inter-VLAN routing* in IPv4 and IPv6 networks.

References

- Cisco Networking Academy, Routing and Switching Essentials Companion Guide, 1st Edition**, Cisco Press, ISBN-10: 1587133180, ISBN-13: 9781587133183, 2014.
- Rick Graziani and Allan Johnson, Routing Protocols and Concepts: CCNA Exploration Companion Guide (Cisco Systems Networking Academy Program), Cisco Press, 1st Edition, ISBN-10: 1587132729, ISBN-13: 978-1587132728, 2012.
- Ying-Dar Lin, Ren-Hung Hwang, and Fred Baker, Computer Networks: An Open Source Approach (Connect, Learn, Succeed), McGraw-Hill, ISBN-10: 0073376248, ISBN-13: 978-0073376240, 2011.
- Wendell Odom**, CCENT/CCNA ICND1 100-101 Official Cert Guide Cisco Press, ISBN ISBN-10: 1-58714-385-2, 2013.

KP24403 WEB TECHNOLOGY

Students begin this course by understanding how the internet functions in tandem with the various latest World Wide Web technologies. This course then embarks on its main objective of exposing students to the numerous and diverse collection of current web site design and application development technologies. Students will learn the basic principles, protocols & current practices that power the internet and World Wide Web, how to design and implement a basic web site, how to program scripts that serve the client's browser, how to program scripts that access information from the web server and how to integrate databases into the design of dynamic, data-driven web sites.

References

- Internet and World Wide Web: How To Program, 5/E, H. Deitel, P. Deitel & A. Deitel, 2013, Prentice-Hall
- Programming the World Wide Web, 8/E, R. Sebesta, 2014, Pearson
- Learning PHP, MySQL, JavaScript, and CSS: A Step-by-Step Guide to Creating Dynamic Websites, 3/E, R. Nixon, 2014, O'Reilly Media
- PHP and MySQL for Dynamic Web Sites: Visual QuickPro Guide, 4/E, L. Ullman, 2012, Peachpit Press
- Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics, J.N. Robbins, 2012, O'Reilly Media

KP34503 SOFTWARE ENGINEERING

Prerequisite: KP24103

This is an introductory course in software engineering, described in the ACM/IEEE-CS Joint Task Force on Computing Curricula's Computer Science Curricula 2013 as "the discipline concerned with the application of theory, knowledge, and practice to effectively and efficiently build reliable software systems that satisfy the requirements of customers and users." Course topics will include software engineering principles, development methodologies, requirements analysis, project planning, software design, software construction, software process metrics, project management, software testing, quality assurance, and team processes.

References

- Sommerville, I. 2015. Software Engineering. 10th Edition. Addison Wesley.
- Pfleeger, S. L. and Atlee J.M. 2010. Software Engineering: Theory and Practice. 4th Edition. Prentice Hall.
- Weisfeld, M. 2013. Object-oriented Thought Process. 4th Edition. Addison Wesley.
- Pressman, R. S and Maxim, B.R. 2015. Software Engineering: A Practitioner's Approach. 8th Edition. McGraw Hill.

KP34703 HUMAN-COMPUTER INTERACTION

Prerequisite: KT14403, KP14603 (HC05), KK14203 (HC00)

This course provides an introduction and overview of the field of human computer interaction (HCI). HCI is an interdisciplinary field that integrates theories and methodologies from computer science, cognitive psychology, design, and many other areas. Issues include: command languages, menus, forms, and direct manipulation, graphical user interfaces, computer supported cooperative work, information search and visualization, World Wide Web design, input/output devices, and display design. Students will learn the fundamental concepts of human-computer interaction and user-centered design thinking. Students will work on both individual and team projects to design, implement and evaluate computer interfaces.

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Human-Computer Interaction. Serengul Smith-Atakan. Course Technology. 2011.
Interaction Design: Beyond Human-Computer Interaction, 3rd Edition, Helen Sharp et al, Wiley. 2011.
Designing the User Interface: Strategies for Effective Human-Computer Interaction, Fifth Edition by Shneiderman, B., and Plaisant, C., Pearson. 2010.

KP34203 PROJECT I

Final year projects give students the opportunity to put into practice the knowledge and skills that they have acquired throughout the Software Engineering programme. In the course of their projects, students develop their ability to analyze user requirements, find information for literature review, methods and design a system. Students also further develop their communication skills through their regular meetings with project supervisors, project presentations and the writing of project reports. In addition, students gain experience managing a substantial project.

References

Gaya Penulisan UMS and FYP handbook.

KP34403 PARALLEL AND DISTRIBUTED COMPUTING

This course will show students how to exploit different parallel architectures to improve your code's performance, scalability, and resilience. Students will learn about seven concurrency models: threads and locks, functional programming, separating identity and state, actors, sequential processes, data parallelism, and the lambda architecture.

References

George Coulouris et al., Distributed Systems: Concepts and Design (5th Ed.), Addison-Wesley, 2012.
Additional References supporting the course
Ajay D. Kshemkalyani, Mukesh Singhal, Distributed Computing: Principles, Algorithms, and Systems, Cambridge University Press, 2011.
Valentin Cristea, Ciprian Dobre, Corina Stratan, Florin Pop, Large-Scale Distributed Computing and Applications: Models and Trends, IGI Global, 2010.
Andrew S Tanenbaum, Maarten van Steen, Distributed Systems: Principles and Paradigm (2nd Ed.), Pearson International, 2008.
Amjad Umar, Object-Oriented Client/Server Internet Environments, Prentice Hall, 1997.

KP34603 ENTERPRISE NETWORKS

Prerequisite : KT24203

The focus of this course is on the architecture, components, and operations of routers and switches in a larger and more complex network. Students will learn how to configure routers and switches for advanced functionality.

References

Scaling Networks Companion Guide, Cisco Press, 2014.
P. Oppenheimer, Top-Down Network Design, 2nd Edition, 2004.
R. Seifert, The Switch Book: The Complete Guide to LAN Switching Technology. 2000.
J. Martin, J. Leben, K. K. Chapman, Enterprise Networking, 1996
W. Lewis: LAN Switching and Wireless, CCNA Exploration Companion Guide, Cisco Press, 2008.
This course is embedded with the syllabus from Cisco Networking Academy Program (CCNA R&S) <https://www.netacad.com/>

KP34803 NETWORK SECURITY

Prerequisite : KT24303, KT24403

This course covers aspects in information and computer security. It looks at aspects in information and computer security by from the perspective of plan-protect-respond cycle of security. The plan element deals with planning and policy to anticipate security threats, the protect element introduces technologies and measures to enforce security, and the respond element deals with the aftermath of security breaches.

References

- Randall J. Boyle and Raymond R. Panko, Corporate Computer Security (3rd ed), Pearson, 2013.
Additional References supporting the course
Marian Quigley, ICT Ethics and Security in the 21st Century: New Developments and Applications, IGI Global, 2011.
Pfleeger, C.P. 2012. Analyzing Computer Security: A Threat/ Vulnerability/ Countermeasure Approach. Prentice Hall.
William Stallings, and Lawrie Brown, Computer Security: Principles and Practice, 2nd edition, Pearson, 2012.
George Curtis, The Law of Cybercrimes and Their Investigations, CRC Press, 2011.

KP44703 PROJECT II

Prerequisite : KK34203

Final year projects give students the opportunity to put into practice the knowledge and skills that they have acquired throughout the Software Engineering programme. In the course of their projects, students develop their ability to analyze user requirements, find information for literature review, methods, design and develop a system. Students also further develop their communication skills through their regular meetings with project supervisors, project presentations and the writing of project reports. In addition, students gain experience managing a substantial project.

References

Gaya Penulisan UMS and FYP handbook.

KP44903 WAN TECHNOLOGY

Prerequisite : KT24303

The focus of this course is on the WAN technologies and network services required by converged applications in a complex network. In this course, students will learn the selection criteria of network devices and WAN technologies to meet network requirements.

References

- Cisco Networking Academy, Connecting Networks Companion Guide, ISBN-10: 1-58713-332-6, ISBN-13: 978-1-58713-332-9, 2014.
Jeffrey S. Beasley and Piyasat Nilkaew, Practical Guide to Advanced Networking, 3rd Edition, Pearson IT Certification, ISBN-10: 0789749041, ISBN-13: 9780789749048, 2013.
James F. Kurose, Keith W. Ross, Computer Networking: A Top-Down Approach, Addison-Wesley, 6th Edition. ISBN-10: 0132856204 • ISBN-13: 9780132856201, 2013.
Bob Vachon and Rick Graziani, Accessing the WAN: CCNA Exploration Companion Guide, Cisco Press, 1st Edition, ISBN-10: 1587133490, ISBN-13: 978-1587133497, 2012.
Matthew N. O. Sadiku and Sarhan M. Musa, Computer Communication for Metropolitan and Wide Area Networks (Computer Science, Technologies and Applications), Nova Science Pub Inc, ISBN-10: 1616680245, ISBN-13: 978-1616680244, 2011.

ELECTIVES

KP00103 AD HOC AND SENSOR NETWORKS

This is a basic course in networking protocols for multi hop wireless ad hoc networks. The objectives of the course are to introduce and study established and emerging areas of wireless networking. Physical layer properties will be briefly discussed. The focus will be on network protocols above the physical layer, such as the media access control and the network layer.

References

- Ad hoc & sensor networks: theory and applications 2nd Edition, Carlos De Moraes Cordeiro, Dharma Prakash Agrawal, World Scientific Publishing, 2011.
The Handbook of Ad Hoc Wireless Networks, Mohamad Ilyas, CRS Press. 2003
Mobile ad hoc networks: from wireless LANs to 4G networks, George Aggelou, , Mc-Graw Hill. 2005
Mobile ad hoc networking, Stefano Basagni, Marco Conti, Silvia Giordano, Ivan Stojmenović, Wiley-IEEE Press, 2004
Principles of Ad hoc Networking, [Michel Barbeau](#), [Evangelos Kranakis](#), Wiley, 2007

KP00303 NETWORK SIMULATION

This course introduces theoretical and practical aspects of simulation of telecommunications networks and systems for network performance evaluation, optimization and control. The course is divided into two parts. In the first part the knowledge of probability, statistics and stochastic processes required to understand the content of the course is given. In the second part we consider basic principles of discrete event simulation and put a major attention on setup of simulations, collection and analysis of output results. Well-known network simulation packages, including ns2 and OPNET, are also considered. The attention is also paid to simulation of Markov chains that is of major importance in analysis of computer networks and systems.

References

Network simulation, **Richard M. Fujimoto, Kalyan S. Perumalla, George F. Riley, Morgan & Claypool. 2006**
Introduction to Network Simulator NS-2, Teerawat Issariyakul, Ekram Hossain, Springer. 2008
Network Simulation Experiment Manual for Peterson/Davie, 2nd Edition, Emad Aboelela, Morgan Kauffman, 2007
Network Modelling, Simulation and Analysis, Garzia, CRC Press, 1990

KP00403 NETWORK PROGRAMMING

PREREQUISITE : KT14303

This course will provide students with a fundamental understanding of how networks function in terms of software protocols, sockets, services and security. Four major topics will be covered, which are basic networking software (protocol stacks, TCP/IP, HTTP), socket interface (writing clients and servers), web services (XML, JSP, SOAP), and introduction to network security.

References

TCP/IP in 24 Hours, J. Casad, 2017, Sams
Internetworking with TCP/IP, D.E. Comer, 2013, Pearson
Network Programmability and Automation, J. Edelman, S.S. Lowe, M. Oswalt, 2017, O'Reilly
Programming and Automating Cisco Networks, R. Tischer and J. Gooley, 2016, Cisco
Routing TCP/IP, J. Doyle, 2016, Cisco

KP00603 MOBILE APPLICATION

Prerequisite: KT14403, KP14603 (HC05), KK14203 (HC00)

This course provides useful guidelines, standards, techniques, and best practices for building mobile product from start to finish. This course covers basic design and development principles that govern all mobile devices and platforms. Students will be explored with the more advanced capabilities of the mobile web, including markup, advanced styling techniques, and mobile Ajax.

References

Thomas J. Duffy. Programming with Mobile Applications. Cengage Learning. 2014.
Frank Zammetti. Learn Corona SDK Development 2011. Apress. 2013.
Michele M. Fernandez. Corona SDK Mobile Game Development – Beginner's Guide. PACKT. 2012.
Silvia Domenech. Create Mobile Games with Corona. The Pragmatic Bookshelf. 2013.
Mike McGrath. Building Android Apps in Easy Steps. In Easy Steps Ltd. 2013.

KP00703 DATA ENCRYPTIONS AND CRYPTOGRAPHY

Prerequisite: KT14303

The course introduces the principles of number theory and the practice of data encryption and cryptographic algorithms.

References

- William Stallings, *Cryptography and Network Security: Principle and Practice*, Pearson, 2014.
- Keith Martin, *Everyday Cryptography: Fundamental Principles & Application*, Oxford University Press, 2012.
- Jonathan Katz and Yehuda Lindell, *Introduction to Modern Cryptography*, 2nd Edition, Chapman and Hall/CRC, 2014
- Bruce Schneier, *Applied Cryptography: Protocols, Algorithms, and Source Code in C*, 20th Anniversary Edition, Wiley, 2015
- Niels Ferguson, Bruce Schneier, and Tadayoshi Kohno, *Cryptography Engineering: Design Principles and Practical Applications*, Wiley, 2010.

KP00803 SPECIAL TOPICS ON NETWORKS

This course introduces principles and practices of computer forensic, which is most often associated with the investigation of a wide variety of computer crimes. Emphasis is given on the fundamental knowledge as well as hands on practice on computer forensic. Examples from real case studies also will be discussed to assist student learning. Topics covered include types of crimes and evidence, basic steps in computer investigation, network forensic toolkit, legal and ethical issues. Features of computer systems and networks are also reviewed from a point of view of computer forensics.

References

- Guide to Computer Forensics and Investigations Fourth Edition, Bill Nelson Amelia Phillips
Christopher Steuart , COURSE TECHNOLOGY, 2010.
- Computer Forensic: Principle and Practices, Linda Volonino, Prentice Hall, 2008.
- FBI Handbook of Forensics Services, 2013, <https://www.fbi.gov/file-repository/handbook-of-forensic-services-pdf.pdf/view>.

KP00903 WIRELESS AND MOBILE COMPUTING

The course is to teach one of the newest and fastest developing fields in the discipline, mobile and wireless computing. The course is an introduction to mobile and wireless computing. It discusses the basic principles and technologies in mobile and wireless computing. The course assumes a general knowledge of computer communications, and the assignments will need programming skills.

References:

- Kwok, Lau. 2007. *Wireless Internet and Mobile Computing: Interoperability and Performance* (Information and Communication Technology Series). Wiley-IEEE Press
- Makki et.al (eds.). 2007. *Mobile and Wireless Network Security and Privacy*. Springer;
- Umar, A. 2004. *Mobile and Wireless Communications*. NGE Solutions
- Elliott, G. and Phillips, N. 2004. Mobile Commerce and Wireless Computing Systems. Pearson/Addison Wesley*
- Stojmenović, I. 2003. Handbook of Wireless Networks and Mobile Computing. John Wiley & Sons*
- Principles of Wireless Networks, 2002. Pahlavan and Krishnamurthy, Prentice Hall*

Other additional information

- <http://www.cs.sunysb.edu/~jgao/CSE370-spring06/>
- <http://webcampus.stevens.edu/uploadedFiles/020 Degree Programs/ pdf/EE583 Syllabus.pdf>

KP01003 NETWORK MANAGEMENT AND MONITORING

This course discusses the concepts of network management. It includes the planning, testing and performance measurement techniques. The operational aspect, utilization of diagnostic tools and the network management system are also discussed. The current standards in relation to network management also be examined.

References

- Subramanian, M. 2012. *Network Management: Principles and Practice*, 2e. Prentice Hall.
- Bukke, J.R. 2004. *Network Management Concept and Practice: A Hand-On Approach*. New York: Prentice Hall
- Claise, B. and Wolter, R., 2007, *Network Management: Accounting and Performance Strategies*. New York: Cisco Press
- Morris, B.M., 2003, *Network Management, MIBs and MPLS: Principle, Design and Implementation*. New York: Prentice Hall
- Zeltserman, D. 1999. *A Practical Guide to SNMPv3 and Network Management*, New York: Prentice Hall
- IETF Internet Engineering Task Force; <http://www.ietf.org/> Flynn, I.M McHoes, A., 2013 *Understanding Operating Systems*, 7th Edition. Cengage Learning
- Palmer, M.J., 2011 *Guide to Operating Systems*. Prentice Hall, (Enhanced Edition)
- Tanenbaum, A. S., 2014 *Modern Operating Systems*. Prentice Hall, 4th Edition
- Stallings, W. 2014 *Operating Systems: Internals and Design Principles*. Prentice Hall, 8th Edition
- Ida M. Flynn (Author)

KP01103 COMMUNICATION TECHNOLOGIES

This course educates students about communication technologies principles and practices. Emphasis is given on the fundamental knowledge as well as hands on practice on communication. Students will use some communication technology devices and will focus on the development of the communication applications that make these devices useful. Communication Technology provides students with the knowledge and skills to be professional, with particular skills in a chosen area. Examples from real case studies also will be discussed to assist student learning. Topics covered include types of Voice over Internet Protocol (VoIP), Real-time Transport Protocol (RTP), Wireless Local Area Network (WLAN), broadband and security of communication. Communication Technologies has observed rapid growth in the world of telecommunications. VoIP offers high-rate voice services at low cost with good flexibility, typically in a WLAN. In a voice conversation, each client works either as a sender or a receiver depending on the direction of traffic flow over the network.

References

- The Telecommunications Handbook: Engineering Guidelines for Fixed, Mobile and Satellite Systems
Kindle Edition by T J. Penttinen (Author), Wiley 2015
- Window Forensic and Incident Recovery, Carvey Harlan, Addison Wesley, 2004
- Voice over IP Fundamentals, Second Edition, Cisco System 2007 (Author, Jonathan Davidson et.al)
- Broadband Telecommunications Handbook, McGraw Hill Professional, 25 May 2002 (Author, Bates)

KP01203 Next Generation Network

This course has a flexible structure, where students can signify to study a range of Next-Generation Technologies (NGNs). This course consists of introductory level in Local Area Network (LAN) technologies, Routing and Switching Technologies and Internet Protocol version 6 (IPv6) technologies. This course provides a detailed examination of wired and Wireless LAN (WLAN) technologies, protocols and the methods used for implementing LAN based enterprise intranets. In routing and switching technologies will explain various aspects of internetworking behaviors by critically re-discussed on topics of Open Systems Interconnect (OSI) References model, bridges, switches, hubs, Virtual Local Area Networks (VLANs), connection-based and connectionless networks. It will emphasize on the internetworking protocols, including packet format, addressing, routing and security. Meanwhile for IPv6 Technologies, an explanations and illustrates all commonly used network communication protocols, including Transmission Control Protocol/Internet Protocol (TCP/IP), Wide Area Network (WAN), LAN technologies covering the latest and emerging technologies such as Software-Defined Network, Voice over Internet Protocol (VOIP), Storage Area Network (SAN), Metropolitan Area Network (MAN), Virtual Private Network (VPN)/Security, WLAN, Virtual LAN, Optical Network and more Addresses vendor specific technologies: Cisco, IBM, Novell, Sun, HP, Microsoft, Apple, etc. It also provides a succinct, in-depth tour of all the new features and functions in IPv6.

References

- Jingming Li Salina, Pascal Salina (2008), Network Next Generation Networks Perspectives and Potentials, John Wile & Sons, Ltd Press
- Robert Wood , (2005), Next-Generation Network Services, Cisco Press
- Benny Bing, (2007), Emerging Technologies in Wireless LANs: Theory, Design, and Deployment, Cambridge University Press
- Network Protocols Handbook, 2nd Edition by Javvin Technologies
- Peter Loshin, 2004. IPv6: Theory, Protocol, and Practice, 2nd. Edition