

VICTORIAN INSTITUTE OF TECHNOLOGY

Bachelor of Information Technology & Systems

Unit Descriptors

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1) ITSU1001 - Introduction to Computer Systems and Networking

Unit Description:

This unit introduces the underlying theories and mechanisms of modern computer systems and networks. It provides the fundamental knowledge of the hardware, software and network technologies of computer systems and the skills required for the operation of computer systems and networked environments. Students of this unit will gain a critical knowledge and application of how various components of computer systems and networks work together in different operating system environments and secure network implementations.

Students will be prepared to adapt their knowledge and understanding over time to ensure sound theoretical understanding of the issues relevant to computer systems and networking. Resolution of such issues is critical in a changing environment, as exemplified by the impact the on networking resulting from the rise of mobile device usage.

Subject weighting

6 out of 144 points

2) ITAP1001 - Software Development Fundamentals

Unit Description:

The unit introduces modern programming concepts and techniques required to implement software programs in a variety of application areas. The unit covers the basic theory of creating algorithms and program design in object-oriented programming paradigm. Students will gain practical skills to develop general software programs, as well as web, desktop, and database applications.

Students will be prepared to adapt their knowledge and understanding over time to ensure sound theoretical understanding of the issues and changing demands relevant to software development. Fundamentals will be presented in a form that will enable students to keep pace with the speed of programming methodology/language changes experienced by professionals.

Subject weighting

6 out of 144 points

3) ITDA1001 - Database Fundamentals

Unit Description:

The unit covers the underlying theory and basic concepts of relational data modelling, query languages and database design. Students will develop the knowledge and skills necessary for the effective design and implementation of database systems that satisfy the data management requirements of an enterprise. The unit will also address the various issues and techniques of data management, including retrieval, update, integrity, privacy and security aspects associated with data access, manipulation and administration.

Students will be prepared to adapt their knowledge and understanding over time to ensure sound theoretical understanding of the issues relevant to database fundamentals. Unification of multiple data sources is central to the 'big data' paradigm likely to dominate database design over the coming decades. Our students will be prepared to critically evaluate and understand database issues as they arise in practice over the coming years. This unit provides the foundation for such understanding.

Subject weighting

6 out of 144 points

4) ITNE1001 - Network Architecture

Unit Description

The unit covers the fundamental concepts of network architecture and network technologies. It includes internetworking protocols, operational tools and techniques for network management. Students will gain the knowledge and skills required to implement defined network architecture with basic network security.

Students will be prepared to adapt their knowledge and understanding over time to ensure sound theoretical understanding of the issues relevant to network architecture. Implementation of appropriate network architectures is now crucial for full exploitation of IT infrastructure within competitive environments. This unit is designed to ensure students have the fundamental knowledge to adapt and innovate within this context.

Subject weighting

6 out of 144 points

5) ITAP1004 – Website development

Unit Descriptor:

This unit introduces the basic concepts, tools and techniques of website authoring, from design to implementation. Students will develop knowledge and skills in creating digital content which is authored to deal with the particular design and implementation issues of web publishing. The unit examines the use of markup and scripting programming languages and models as website authoring suite, including incorporating images, audio and video into websites. In addition, the unit introduces World Wide Web standards for creating dynamic database driven content, web usability and web design specification.

Students will be prepared to adapt their knowledge and understanding over time to ensure sound practical understanding of the issues relevant to website development. Full understanding and appreciation of international standards and software tools will be supplemented with fundamental understanding of principles to ensure student adaptability and flexibility into the future.

Subject weighting

6 out of 144 points

6) ITSA1001 - Server Administration Fundamentals

Unit Description:

The unit covers fundamentals and theoretical foundations of server administration. It provides knowledge and skills required to perform server administration with emphasis on key principles related to server hardware, software and storage, disaster recovery and trouble shooting. In addition, students will acquire practical skills needed to plan, install, configure and manage servers through laboratory work and practical activities.

Students will be prepared to adapt their knowledge and understanding over time to ensure sound theoretical and practical understanding of the issues relevant to server administration. Although server administration is an inherently applied subject, due consideration of fundamental issues will ensure students are well placed to adapt to future developments.

Subject weighting

6 out of 144 points

7) ITSU1003 - IT Professional Practice

Unit Description

The unit provides a theoretical introduction to the professional and ethical practices in a typical IT workplace of today. In particular, the unit emphasises on organisational and professional communication and teamwork, ensuring that the personal information of stakeholders is handled in a confidential and professional manner when dealing with stakeholders in an IT environment. It also covers a range of issues related to health and safety requirements in the IT workplace, maintaining professionalism as well as software copyright requirements and licencing.

Students will be prepared to adapt their knowledge and understanding over time to ensure sound understanding of the issues relevant to IT professional practice. As IT becomes more and more central to organisational operations, the need to maintain ethical and professional practice becomes increasingly paramount. This unit ensures a fundamental understanding of the issues and theories that drive ethical and professional practice.

Subject weighting

6 out of 144 points

8) ITSU1005 - Design and Create Organizational Documentation

Unit Description

This unit provides the essential guide to technical communication for IT professionals. It covers the principles, tools and techniques for preparing software project proposals, user documentation, technical documentation and feasibility reports. Standard workplace communications such as memos, emails, and business letters are also covered. Students will acquire the knowledge and skills to become a competent technical communication professional in an IT work place environment.

Students will be prepared to adapt their knowledge and understanding over time to ensure sound ability to ensure effective design and creation of organizational documentation.

Subject weighting

6 out of 144 points

9) ITSU2006 - Project Management

Unit Description

The units presents a systems approach for managing projects within various industry sectors. It covers project life cycle, problem definition, project evaluation, project planning, risk management and project issues. Students will also be able to apply conceptual methodologies using techniques such as networking, resource planning and control, team coordination, including a range of management strategies.

Students will be prepared to adapt their knowledge and understanding over time to ensure sound theoretical understanding of the issues relevant to project management. Due reference will be made to the PMBOK (Project Management Body of Knowledge) to facilitate student's fundamental understanding of project management principles and theory.

Subject weighting

6 out of 144 points

10) ITSU2004 - Systems Analysis and Design

Unit Description

This unit focuses on providing students with systems modelling and design principles and methodologies to formalise all aspects of systems development processes. It will develop student's abilities to apply contemporary tools and techniques that are effectively used at various stages of systems development life cycle.

Students will be prepared to adapt their knowledge and understanding over time to ensure sound theoretical understanding of the issues relevant to systems analysis and design. Being a second year level course, an increased emphasis is placed on critical analysis and interpretation skills. In the context of systems analysis and design, this includes consideration of the pros and cons of the various considered techniques, with due reference to the latest research through journal articles.

Subject weighting

6 out of 144 points

11) ITSU2010 - Technical Documentation for Software Engineers

Unit Description

This unit covers the principles of technical documentation used in software engineering. It includes methods of writing systems specification documents, including graphical aids for depicting systems processes (analysis, planning, implementation, testing, and maintenance of systems). In addition, the role of hypertext, hypermedia and markup languages in technical documentation and systems development are covered.

Students will be prepared to adapt their knowledge and understanding over time to ensure sound theoretical understanding of the issues relevant to software engineering technical documentation. Being a second year level course, an increased emphasis is placed on critical analysis and interpretation skills. In the context of technical documentation for software engineers, this includes critical evaluation of different writing styles and documentation methods, with due reference to the latest research through journal articles.

Subject weighting

6 out of 144 points

12) ITNE2002 - Network and Information Security

Unit Description

The unit covers the basic theoretical principles of network and information security. It provides students the knowledge and skills to analyse various security risks and issues associated with network and information including cryptography, network threats, application security and wireless security. Industry standard security and privacy measures such as encryption methods, firewall defence, policies and procedures will also be covered.

Students will be prepared to adapt their knowledge and understanding over time to ensure sound theoretical understanding of the issues relevant to network and information security. Being a second year level course, an increased emphasis is placed on critical analysis and interpretation skills. Network and information security is a particularly theory rich discipline within Information Technology and Systems. A core component of this unit is therefore an ability to interpret and understand the latest relevant theories and practices. This will draw upon the latest published research.

Subject weighting

6 out of 144 points

13) ITSA2003 - Network Operating System and Configuration

Unit Description

The unit covers the principles of network operating system and configuration techniques. It provides the knowledge of hardware and software mechanisms used to carry out various functions of network operating system, including management of process, memory, resources and network terminals. Students will also gain the skills required to install, upgrade and configure different operating systems and their performance tuning.

Students will be prepared to adapt their knowledge and understanding over time to ensure sound theoretical understanding of the issues relevant to network operating systems and configuration. Being a second year level course, an increased emphasis is placed on critical analysis and interpretation skills. In the context of network operating system and configuration, this includes deep understanding of the practice and associated theories with optimal network performance.

Subject weighting

6 out of 144 points

14) ITNE2003 - Install, configure, operate, and troubleshoot medium-size networks

Unit Description

The units provides the theoretical constructs underpinning small to medium size networks. The fundamental concepts covered include network types; network media; routing and switching; the TCP/IP and OSI models; IP addressing; WAN technologies; connecting to a WAN; implementing network security; operating and configuring IOS devices; extending switched networks with VLANs; determining IP routes; managing IP traffic with access lists; establishing point-to-point connections; and establishing Frame Relay connections. Students will also acquire the skills required to install, operate, and troubleshoot a small to medium size enterprise branch network.

Students will be prepared to adapt their knowledge and understanding over time to ensure sound theoretical understanding of the issues relevant to this unit. Whilst this is an inherently practical unit, it is concerned with issues of fundamentally higher complexity than year one units.

Subject weighting

6 out of 144 points

15) ITSA2005 - Planning and Implementing Server

Unit Description

This unit provides the fundamental concepts of planning and implementing server required for setting up a typical IT infrastructure in an organisation. It covers a range of server administration topics including planning server roles; maintaining server security; planning data storage, network load balancing, and server backups; managing software deployment and versioning; monitoring IPv6, server performance and capacity, and backup; scheduling server deployments; and designing a rollback contingency plan. Students will gain the necessary knowledge and skills to plan and implement a server based on enterprise requirement and administer appropriately resolving the issues that may arise in practical situations.

Students will be prepared to adapt their knowledge and understanding over time to ensure sound theoretical understanding of the issues relevant to planning and implementing server. Whilst this is an inherently practical unit, it is concerned with issues of fundamentally higher complexity than year one units.

Subject weighting

6 out of 144 points

16) ITSA2006 - Server Virtualization

Unit Description

This unit provides the principles of server virtualization and the skills required to implement and manage virtual server in a network. Students will acquire the knowledge and skills to analyse the server virtualization requirements to install, configure and optimise virtual servers. The unit also covers management and performance issues related to integrating a virtual server in a network.

Students will be prepared to adapt their knowledge and understanding over time to ensure sound theoretical understanding of the issues relevant to planning and implementing server virtualization. Whilst this is an inherently practical unit, it is concerned with issues of fundamentally higher complexity than year one units.

Subject weighting

6 out of 144 points

17) ITNE2005 - Develop a security infrastructure for a medium-size networks

Unit Description

The unit covers the theoretical and applied background for securing standard routers and switches and their associated networks. It provides the basic skills for installation, troubleshooting and monitoring of network devices to maintain integrity, confidentiality and availability of data and devices and ensures that students can undertake tasks compliant to industry standards and practices.

Students will be prepared to adapt their knowledge and understanding over time to ensure sound theoretical understanding of the issues relevant to developing a security infrastructure for medium-size networks. Being a second year level course, an increased emphasis is placed on critical analysis and interpretation skills. In the context of this unit, this includes a sound understanding of security threats and the theory of their development and prevention.

Subject weighting

6 out of 144 points

18) ITAP2002 – Introduction to Windows application development

Unit Description

This unit focuses on the theoretical foundations of Windows application development. It covers the principles of Windows programming to develop various types of applications that run on Windows. It emphasises on developing good graphical user interface (GUI) and the effective use of Windows services to program and host Windows-based applications.

Students will be prepared to adapt their knowledge and understanding over time to ensure sound theoretical understanding of the issues relevant to windows application development. Being a second year level course, an increased emphasis is placed on critical analysis and interpretation skills. In the context of this unit, Windows application development expertise will be explored in the context of general application good practice and principles. The theory of sound application development will be leveraged to ensure students have the flexibility to develop applications in rapidly changing environments.

Subject weighting

6 out of 144 points

19) ITAP2003 – Introduction to Web application development

Unit Description

This unit provides the theoretical constructs underpinning Web design and development. It covers the principles of Web programming to develop dynamic Web applications. Students will gain key knowledge and skills for building Web applications rapidly and efficiently. The unit also covers standard markup language features; database controls and objects; fundamentals of client-side and server-side scripting; debugging and error handling; and configuring and deploying Web applications.

Students will be prepared to adapt their knowledge and understanding over time to ensure sound theoretical understanding of the issues relevant to webapplication development. Being a second year level course, an increased emphasis is placed on critical analysis and interpretation skills. In the context of this unit, Analogous to ITAP 2002, application development expertise will be explored in the context of general application good practice and principles. The theory of sound application development will be leveraged to ensure students have the flexibility to develop applications in rapidly changing environments.

Subject weighting

6 out of 144 points

20) ITAP2013 - Software Engineering

Description

The unit provides the fundamental principles of software engineering. It covers software development lifecycle models; software project planning, quality and control; software functional specifications and design specifications; integration and testing strategies; software maintenance and reuse. Students will acquire the knowledge and skills required to perform the role of an effective Software Engineer in an enterprise project.

Students will be prepared to adapt their knowledge and understanding over time to ensure sound theoretical understanding of the issues relevant to software engineering. Being a second year level course, an increased emphasis is placed on critical analysis and interpretation skills. Within this degree program, software engineering is particularly research rich. This is fully utilised within this unit, with students required to understand software engineering principles in the context of the latest published research.

Subject weighting

6 out of 144 points

21) ITAP2008 - Software Testing

Unit Description

This unit provides the fundamental principles of software testing and quality assurance. It covers practical software testing goals and approaches to test software through all phases of the software testing lifecycle. Topics include different testing terminologies, standards and metrics, types of testing (black-box and white-box), test planning, analysis, test case generation, test resources, test scheduling, test execution, assessing and managing risk, test prioritisation, automation strategy, defect management, test execution and software quality assurance activities. Students will acquire the necessary knowledge and skills of a professional software tester.

Students will be prepared to adapt their knowledge and understanding over time to ensure sound theoretical understanding of the issues relevant to software testing. Being a second year level course, an increased emphasis is placed on critical analysis and interpretation skills. In the context of software testing we place the techniques within the context of the latest research regarding software reliability assurance.

Subject weighting

6 out of 144 points

22) ITAP2005 - Java Programming Fundamentals

Unit Description

This unit introduces the principles and concepts of Java programming language. It provides an overview of object-oriented design principles required to create robust Java programs. It covers salient topics of object-oriented programming methods using Java, including encapsulation, inheritance and polymorphism and the standard software development practices in IT industry.

Students will be prepared to adapt their knowledge and understanding over time to ensure sound theoretical understanding of the issues relevant to Java programming. Being a second year level course, an increased emphasis is placed on critical analysis and interpretation skills. In the context of this unit, analogous to ITAP 2002, java programming expertise will be explored in the context of general programming good practice. Java programming is discussed and learned in the context of general programming language theory – identifying the key elements of Java that determine whether it is an appropriate programming tool.

Subject weighting

6 out of 144 points

23) ITNE3006 - Design network infrastructure

Unit Description

The unit provides the design principles of routed and switched network infrastructures and services involving LAN, WAN, and broadband access for organizations. It covers network design processes and models, switching, IP routing, quality of service (QoS), security, wireless LANs (WLANs), voice transport, content networking, network management, internet protocols, IP multicasts, increasing network availability, and storage networking. In addition, internetworking standards, networking architecture, technology and operation in different distributed networked environments are covered.

Students will be prepared to adapt their knowledge and understanding over time to ensure sound theoretical understanding of the issues relevant to network infrastructure. Being a final year level course, the unit is designed to ensure students undertake independent evaluation of unit principles in the context of the latest published research.

Subject weighting

6 out of 144 points

24) ITNE3007 - Advanced Routing

Unit Description

The unit provides the principles of advanced routing in enterprise networks. It covers topics on how to plan, configure and verify the implementation of secure enterprise LAN and WAN routing solutions using a range of routing protocols and configuration of solutions to support branch offices and mobile workers. In addition, students will also gain the knowledge and skills necessary to use advanced IP addressing and routing in implementing scalable and secure standards-based routers connected to LANs and WANs.

Students will be prepared to adapt their knowledge and understanding over time to ensure sound theoretical understanding of the issues relevant to network routing. Being a final year level course, the unit is designed to ensure students undertake independent evaluation of unit principles in the context of the latest published research.

Subject weighting

6 out of 144 points

25) ITNE3004 – Wireless communication and Networks

Unit Description

The unit provides the basic theory of wireless networks and communication. It covers planning, architecture, protocols and design of small to medium-size WLANs, including installing, configuring, operating, and troubleshooting operations. In addition, WLAN security issues and policies are covered.

Students will be prepared to adapt their knowledge and understanding over time to ensure sound theoretical understanding of the issues relevant to wireless communications and networks. Being a final year level course, the unit is designed to ensure students undertake independent evaluation of unit principles in the context of the latest published research.

Subject weighting

6 out of 144 points

26) ITNE3008 - Advanced Switching

Unit Description

The unit provides the principles of advanced switching in enterprise networks. It covers topics on how to plan, configure and verify the implementation of complex enterprise switching solutions, secure integration of VLANs, WLANs, voice and video traffic into enterprise networks are covered. In addition, enhanced switching technologies, verifying advanced switching functions and troubleshooting common switched network issues are covered.

Students will be prepared to adapt their knowledge and understanding over time to ensure sound theoretical understanding of the issues relevant to advanced switching. Being a final year level course, the unit is designed to ensure students undertake independent evaluation of unit principles in the context of the latest published research. Evaluation of switching configurations will be undertaken with due consideration of the latest research.

Subject weighting

6 out of 144 points

27) ITAP3010 - Developing Data Access Solutions

Unit Description

This unit provides advanced concepts in database design and data management for application integration. It focuses on optimizing the database design and performance fine-tuning of data access and transactions for real-time application solutions deployed in different enterprise environments.

Students will be prepared to adapt their knowledge and understanding over time to ensure sound theoretical understanding of the issues relevant to developing data access solutions. Being a final year level course, the unit is designed to ensure students undertake independent evaluation of unit principles in the context of the latest published research. Pivotal for this unit is an understanding of the impact of big data trends, bringing massive amounts of disparate data to bear in large and small organisations.

Subject weighting

6 out of 144 points

28) ITAP3011 - Developing Windows Applications

Unit Description

This unit provides advanced Windows based application design and development. It covers advanced Windows based programming models, enhancing client-side programming, user interfaces and controls, and advanced testing and debugging techniques. Students will gain the necessary knowledge and skills to apply advanced Windows programming features for creating rich and user-friendly Windows applications in an enterprise development environment

Students will be prepared to adapt their knowledge and understanding over time to ensure sound theoretical understanding of the issues relevant in advanced windows applications development. Being a final year level course, the unit is designed to ensure students undertake independent evaluation of unit principles in the context of the latest published research, including aspects of usability and reusability.

Subject weighting

6 out of 144 points

29) ITAP3012 - Developing Web Applications

Unit Description

This unit provides advanced Web based application design and development. The focus is on coding activities that enhance the performance and scalability of the Web site application. It covers advanced architectural styles for client-server Web applications, and the rapid prototyping and Web deployment principles. Students will gain the necessary knowledge and skills to apply advanced Web programming features for creating highly accessible and reliable Web applications in an enterprise development environment

Students will be prepared to adapt their knowledge and understanding over time to ensure sound theoretical understanding of the issues relevant to developing advanced web applications. Being a final year level course, the unit is designed to ensure students undertake independent evaluation of unit principles in the context of the latest published research.

Subject weighting

6 out of 144 points

30) ITAP3006 - Advanced Java Programming

Unit Description

This unit provides the principles of advanced Java programming. It covers advanced capabilities of the Java programming language such as JDBC, Servlets, JSP and Web Services. In addition, efficient programming for multithreading, event handling, database connectivity, and secure transactions for application development in an enterprise environment are covered.

Students will be prepared to adapt their knowledge and understanding over time to ensure sound theoretical understanding of the issues relevant to advanced Java programming. Being a final year level course, the unit is designed to ensure students undertake independent evaluation of unit principles in the context of the latest published research. Trends in programming language research will be understood to ensure student's skills and knowledge remain relevant.

Subject weighting

6 out of 144 points

31) ITAP3009 - Software analysis, design and architecture

Unit Description

The unit covers object-oriented systems modelling and design principles. Component-based design, use of UML, design patterns and software architecture are also examined in this unit. Students will acquire the necessary knowledge and skills to adopt appropriate systems modelling and software architecture methodologies for the analysis and design requirements of software development in an enterprise.

Students will be prepared to adapt their knowledge and understanding over time to ensure sound theoretical understanding of the issues relevant to object oriented software analysis, design and architecture. Being a final year level course, the unit is designed to ensure students undertake independent evaluation of unit principles in the context of the latest published research. Students will be able to justify architectural decisions in the context of the latest research.

Subject weighting

6 out of 144 points

32) ITSU3007 – Manage IT Projects

Unit Description

The unit covers the theory and practice of managing IT projects in various industry sectors. It includes topics on initiating, planning, executing, controlling and closing of IT projects. It also covers defining the cost, resources, quality, risks and security policies for project planning and management of a complete project lifecycle.

Students will be prepared to adapt their knowledge and understanding over time to ensure sound theoretical understanding of the issues relevant to managing IT projects. Being a final year level course, the unit is designed to ensure students undertake independent evaluation of unit principles in the context of the latest published research.

Subject weighting

6 out of 144 points

33) ITSU3008 - Project 1

Unit Description

This unit is designed to give final year students the opportunity to apply the skills which they have learnt from the Project Management and Managing IT Projects units. Students will work in a group to produce individual quality outputs and prepare a report comprising the project planning for the proposed project that they intend to undertake for a relevant simulated real-world project in the Project 2 unit.

Subject weighting

6 out of 144 points

34) ITSU3009 - Project 2

Unit Description

The unit is designed to give final year students the opportunity to apply the skills which they have learned so far in the course on the development of real world systems. Students will undertake a relevant simulated real-world project and work in a group on a software or systems and networking project for a client. The client may be internal or external. Groups are responsible for their own project management, with guidance from an allocated supervisor. Students will learn to work in a group environment and produce individual quality outputs meeting target dates for the deliverables during their project development stages.

Subject weighting

6 out of 144 points

35) ITNE3013 - Advanced Network and Infrastructure Security

Unit Description

This unit provides advanced theory and practice of systems and network security. Students will be exposed to an in-depth coverage of a range of security problems in information systems, namely physical security, network security and software security. Within these areas, topics covered include risk analysis, authentication, access control, and a range of cryptographic techniques. It looks at various management issues, including use and abuse of encryption, distributed systems authentication, contingency planning, auditing, logging and integrity management.

Students will be prepared to adapt their knowledge and understanding over time to ensure sound theoretical understanding of the issues relevant to advanced network and information security. Being a final year level course, the unit is designed to ensure students undertake independent evaluation of unit principles in the context of the latest published research.

Subject weighting

6 out of 144 points