

Foundation in Information Technology (FIT)

Programme Structure and Syllabi

Conducted by

e-Learning Centre

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FIT (Foundation in Information Technology)

The FIT programme consists of three main courses: ICT Applications, English for ICT, and Mathematics for ICT. The ICT Applications course includes eight modules/mini-courses. The programme intends to support the students who have decided to take the academic/career path in Information Technology fields after completing their G.C.E. Ordinary Level (O/L) examination. There are no entry requirements for the programme. The FIT programme has been placed at SLQF level 2 (NVQ level 4) with 45 credits. Therefore, this programme is considered an entry requirement for an Information Technology degree. The students can get a certificate after successfully completing all three courses of this programme.

Course Materials, Activities, and Schedules

The FIT programme is delivered via the FIT Virtual Learning Environment (VLE) online at <https://fitvle.bit.lk>. The FIT VLE offers a range of resources for each course, including syllabi, teacher's notes, interactive activities, and practice quizzes. Discussion forums are available to enable collaborative learning among the students. The examination schedules are published on the FIT VLE. The students are advised to check the site announcements and course announcements on the FIT VLE regularly. The students will be given access to FIT VLE when the registration is completed.

The FIT website which is available online at <https://fit.bit.lk> provides detailed information about the FIT programme. It contains the programme structure and syllabi, details about registration, examinations, Frequently Asked Questions (FAQ), and contact information. The FIT applicants are expected to create an account on FIT website and register online. The students are advised to check the announcements on the FIT website regularly.

Online Learning and Support

There are online facilitators to support the students studying online. However, the students of this programme are expected to be self-directed and self-regulated to successfully complete all the courses within a year from the date of registration. Registration period is explained in the FIT Registration Policy published in the website.

Examination

The final examination of the programme consists of two components: theoretical component and practical component. The two components are assessed by an e-test and a practical test respectively.

The final examination of the FIT 103 - ICT Applications course includes both an e-test and a practical test covering the eight modules of the course. The FIT 203 – English for ICT course also has a final examination including the two components: an e-test and a practical test. The final examination of the FIT 303 – Mathematics for ICT includes only an e-test.

All examinations are conducted under supervision. The duration of a test is two hours.

The examination details are published on the FIT website and the FIT VLE. The students are advised to visit the FIT website and the FIT VLE regularly to be updated about the examinations.

Learning Outcomes

By the end of the programme, the students will be able to,

- Describe the emerging technology trends in computing and their usage for societal needs.
- Identify components of a computer system.
- Use Microsoft Office applications to prepare reports, letters, presentations, and spreadsheets and create databases.
- Apply basic concepts of software programming using C programming language to solve a problem.
- Use mathematical language, operations, and techniques to formulate problems.
- Solve basic mathematical problems more efficiently.
- Write effective reports, essays, and technical documents in English for various purposes.
- Communicate in English using online communication facilities more confidently and effectively.
- Develop self-directed and self-regulated learning skills.

FIT Programme Structure

The Foundation in Information Technology is a 45-credit study programme. It consists of three main courses: FIT 103 - ICT Applications, FIT 203 – English for ICT, and FIT 303 – Mathematics for ICT. The structure of the programme with credit allocation and time allocation is given in the following tables (Table 1 and Table 2).

Table 1: Courses and credits

| Course Code/Module Code | Course/Module | Total Credits | Theory Credits | Practical Credits |
|-------------------------|--|---------------|----------------|-------------------|
| FIT 103-1 | Computing for the Society | 3 | 2 | 1 |
| FIT 103-2 | Introduction to Computers | 4 | 3 | 1 |
| FIT 103-3 | Word Processing for Electronic Documents | 4 | 2 | 2 |
| FIT 103-4 | Spreadsheets for Calculation | 3 | 2 | 1 |
| FIT 103-5 | Multimedia and Electronic Presentation | 3 | 2 | 1 |
| FIT 103-6 | Data and Databases | 4 | 2 | 2 |
| FIT 103-7 | The Internet and Web Applications | 4 | 2 | 2 |
| FIT 103-8 | Fundamentals of Programming | 4 | 2 | 2 |
| FIT 203 | English for ICT | 8 | 4 | 4 |
| FIT 303 | Mathematics for ICT | 8 | 4 | 4 |
| Total | | 45 | 25 | 20 |

Table 2: Time allocation

| Course Code/Module Code | Course/Module | Theory Hours | Practical Hours | Self-Learning Hours |
|---------------------------|--|--------------|-----------------|---------------------|
| FIT 103-1 | Computing for the Society | 30 | 30 | 90 |
| FIT 103-2 | Introduction to Computers | 45 | 30 | 125 |
| FIT 103-3 | Word Processing for Electronic Documents | 30 | 60 | 110 |
| FIT 103-4 | Spreadsheets for Calculation | 30 | 30 | 90 |
| FIT 103-5 | Multimedia and Electronic Presentation | 30 | 30 | 90 |
| FIT 103-6 | Data and Databases | 30 | 60 | 110 |
| FIT 103-7 | The Internet and Web Applications | 30 | 60 | 110 |
| FIT 103-8 | Fundamentals of Programming | 30 | 60 | 110 |
| FIT 203 | English for ICT | 60 | 120 | 220 |
| FIT 303 | Mathematics for ICT | 60 | 120 | 220 |
| Total (2250 Hours) | | 375 | 600 | 1275 |

Foundation in Information Technology (FIT)

FIT 103: ICT Applications

Module 1: Computing for the Society

Program Content

| | | | |
|--|---------------------------|------------------|----------------------|
| Course Code: | FIT 103-1 (Module 1) | | |
| Course Name: | Computing for the Society | | |
| Credit Value: | 3 | | |
| Core/Optional | Core | | |
| Hourly Breakdown | Theory | Practical | Independent Learning |
| | 30 | 30 | 90 |
| Course Aim/Intended Learning Outcomes: | | | |
| After successful completion of this module the students will be able to, | | | |
| <ul style="list-style-type: none">• Describe the uses and impacts of new technologies in ICT.• Explain health problems due to computing.• Use computing devices safely, legally and ethically.• Identify potential computer risks.• Explain how to protect computers, software and data. | | | |
| Course Content: | | | |
| Topic | Teaching (Hrs) | Practical (Hrs.) | |
| 1. ICT in Different Sectors | 7 | 5 | |
| 2. Computing Streams and Job Opportunities | 4 | 2 | |
| 3. Electronic Wastes, Misuses and Mistakes | 4 | 5 | |
| 4. Legal and Ethical Issues Associated with Computing | 6 | 6 | |
| 5. Health Issues and Ergonomics | 3 | 6 | |
| 6. Safeguarding Hardware, Software and Data | 6 | 6 | |
| Total | 30 | 30 | |
| 1. ICT in Different Sectors | | | |
| 1.1. Government | | | |
| 1.1.1. Government to Citizen Applications | | | |

- 1.1.2. Government to Business Applications
 - 1.1.3. Government to Government Applications
 - 1.1.4. GIS Applications
 - 1.1.5. Right to Information
- 1.2. Education
 - 1.2.1. Technology for Classroom
 - 1.2.2. e-Learning
 - 1.2.3. m-Learning
 - 1.2.4. Learning Management Systems
- 1.3. Industries
 - 1.3.1. ICT in Manufacturing Industry (robotics and drones)
 - 1.3.2. e-Tourism
 - 1.3.3. ICT for Fishing Industry
 - 1.3.4. ICT for Agriculture
- 1.4. Business
 - 1.4.1. e-Business
 - 1.4.2. e-Commerce
 - 1.4.3. m-Commerce
- 1.5. Transport
 - 1.5.1. e-Travel
 - 1.5.2. Transportation Technologies
 - 1.5.3. Intelligent Transportation Systems
- 1.6. Medicine and Health Care
 - 1.6.1. Use of ICT in diagnosis
 - 1.6.2. Telemedicine
 - 1.6.3. Prosthetic Implants
- 1.7. Entertainment
 - 1.7.1. 3D images and animations and virtual reality
 - 1.7.2. Holographic image processing technology
 - 1.7.3. Cartoon films
 - 1.7.4. Digital audio materials
 - 1.7.5. Digital games
 - 1.7.6. Simulation games
- 1.8. Social Security

1.8.1.Criminal Investigation

1.8.2.Threats Detection

1.8.3.Forensics

1.8.4.CCTV

2. Computing Disciplines and Job Positions

2.1. Major Disciplines in Computing

2.1.1.Computer Science

2.1.2.Computer Engineering

2.1.3.Information Technology

2.1.4.Software Engineering

2.1.5.Information Systems

2.2. Job Positions

2.2.1.Software Engineer/Programmer

2.2.2.System/Software Architect

2.2.3.System/Software Designer

2.2.4.Software Quality Assurance Engineer

2.2.5.Database Administrator

2.2.6.Computer Engineer

2.2.7.System Analyst

2.2.8.System Developer

2.2.9.Network Administrator

2.2.10. Cyber/Network Security Analyst

2.2.11. Graphic Designer

2.2.12. Multimedia Developer

2.2.13. IT Consultant

2.3. Threats for Job Seekers

2.3.1.Robots

2.3.2.Software Agents

2.3.3.Smart Devices

2.3.4.IoT Devices

3. Electronic Wastes, Misuses and Mistakes

3.1. Computer Wastes

- 3.1.1. Electronic Waste and Harmful Elements
- 3.1.2. Harmful Effects of Electronic Waste
- 3.1.3. e-Waste Management
- 3.1.4. Minimizing e-waste through the 3R technique
- 3.1.5. Proper disposal of e-waste
- 3.2. Green Computing
 - 3.2.1. Greening of Computing
 - 3.2.2. Computing/IT for Greening
- 3.3. Computer User Mistakes
 - 3.3.1. Common Mistakes that Computer Users Make
 - 3.3.2. Avoiding Computer Mistakes
- 3.4. Misuse and Unauthorized Use of Computers
 - 3.4.1. Misuse of Computers
 - 3.4.2. Misuse ACT

4. Legal and Ethical Issues Associated with Computing

- 4.1. Legal Issues
 - 4.1.1. Data Thefts
 - 4.1.2. Hardware Theft
 - 4.1.3. Crackers
 - 4.1.4. Hackers
 - 4.1.5. Intellectual property rights
 - 4.1.6. Computer Fraud
 - 4.1.7. Impersonation
 - 4.1.8. Software Piracy
 - 4.1.9. Economic/Business Torts
- 4.2. Cyber Crimes
 - 4.2.1. Identity Theft
 - 4.2.2. Cyber Extortion
 - 4.2.3. Cyber Terrorism and Cyber Warfare
 - 4.2.4. Sharing Obscene Graphics
- 4.3. Issues related to values
 - 4.3.1. Plagiarism
 - 4.3.2. Privacy

4.4. Malicious software / Malware

4.4.1.Spams

4.4.2.Virus

4.4.3.Worms

4.4.4.Trojan horses

4.4.5.Ransomware

4.4.6.Spyware

4.4.7.Adware

4.4.8.Scareware

4.5. Social issues related to ICT

4.5.1.Digital divide

4.5.1.1. Definitions of Digital Divide

4.5.1.2. Means of Connectivity

4.5.1.3. Overcoming the Divide and Sustainable Development Goals

4.5.2.Digital Bridge

4.5.3.De-Skilling

5. Health Issues and Ergonomics

5.1. Health Issues

5.1.1.Musculoskeletal Problems

5.1.2.RSI – Repetitive Stress Injury

5.1.3.CTS – Carpel Tunnel Syndrome

5.1.4.CVS - Computer Vision Syndrome

5.1.5.Tired and Stress

5.2. Minimizing Computer Related Health Issues

5.2.1.Ergonomics

5.2.2.Good working positions

5.2.3.Lighting

5.2.4.Glare

5.2.5.Ventilation

5.2.6.Selecting and arranging workstation components

5.2.7.Ergonomics of using mobile devices

6. Safeguarding Hardware, Software and Data

6.1. Laws, Standards and Procedures

6.1.1. Gramm-Leach-Bliley Act

6.1.2. HIPPA Act

6.2. Data Protection and Security

6.2.1. Passwords

6.2.2. Software Firewall

6.2.3. Antivirus Software

6.2.4. Backups

6.2.5. Input Controls

6.2.6. Software Upgrades

6.2.7. Disposal Policies and Procedures

6.2.8. General Data Protection Regulations and Principles

6.3. Intellectual property rights

6.3.1. Copyright

6.3.2. Patents

6.3.3. Confidential Information

6.4. Safeguarding Hardware

6.4.1. Handling Storage Media

6.4.2. Storing Computer Equipment

6.4.3. Access Control Systems

6.4.4. Recovery of Stolen Property

6.4.5. Uninterrupted Power Supply (UPS)

6.4.6. Hardware Firewalls

6.4.7. Controlled access through locked doors

6.4.8. Surge protector

6.4.9. Environmental factors

Teaching /Learning Methods:

Foundation in Information Technology (FIT) has been designed as a self-learning programme. The candidates can learn online using the interactive online learning materials available in the [VLE \(Virtual Learning Environment\)](#) for FIT. The candidates will get information to access the [FIT VLE](#) after their

registration to the FIT Programme. The learners are encouraged to actively engage with learning activities and attempt the practice quizzes in the FIT VLE to complete the course successfully. (Marks will not be given for these activities and practice quizzes).

Final Examination:

FIT 103-1 – Computing for the Society is the module 1 of the FIT103 – ICT Applications course. The FIT103 – ICT Applications course consists of 8 modules. The final examination of **FIT103 - ICT Applications course** covers all eight modules. The examination includes two components: **an e-test and a practical test**. Both e-test and practical test will be conducted under supervision.

The e-test consists of 50 Multiple Choice Questions (MCQs), and it carries questions from each module based on their credit weight. The duration of the e-test is 2 hours.

The practical test will be a two-hour assessment. The students will have to perform the skills gained from the course modules of the ICT Applications course.

References/ Reading Materials:

Ref 1: Stair, R., & Reynolds, G. (2018). Principles of Information Systems, 13th Edition: Cengage Learning. (Available from pdfdrive.com)

Ref 2: Marakas, G. M. & O'Brien, J. A. (2013). Introduction to information systems. 16th Edition: Tata McGraw-Hill Publishing Company Limited. (Available from pdfdrive.com)

Foundation in Information Technology (FIT)

FIT 103: ICT Applications

Module 2: Introduction to Computers

Program Content

| | | | |
|--|---------------------------|-----------|------------------------|
| Course Code: | FIT 103-2 (Module 2) | | |
| Course Name: | Introduction to Computers | | |
| Credit Value: | 4 | | |
| Core/Optional | Core | | |
| Hourly Breakdown | Theory | Practical | Independent Learning |
| | 45 | 30 | 125 |
| Course Aim/Intended Learning Outcomes: | | | |
| After successful completion of this module, the students will be able to; | | | |
| <ul style="list-style-type: none">• Describe the fundamentals of a computer system with its evolution• Identify different categories of computer hardware and software• Explain the needs of data communication and its representation in a computer system• Apply Boolean Algebra concepts to solve simple real-world problems• Describe the uses of computer networks in terms of their types and structure• Analyze different types of information systems | | | |
| Course Content: | | | |
| Topics | Teaching Hours | | Practical Hours |
| 1. Fundamentals of Computer System | 6 | | 3 |
| 2. Hardware Devices | 8 | | 5 |
| 3. Software Products | 4 | | 2 |
| 4. Operating Systems | 10 | | 10 |
| 5. Data Representation and Digital Logic | 8 | | 5 |
| 6. Computer Networks | 6 | | 3 |
| 7. Information Systems | 3 | | 2 |
| Total | 45 | | 30 |

1. Fundamentals of Computer System

- 1.1. Evolution of the Computer
- 1.2. Classification of Computers
- 1.3. The parts of a Computer System
- 1.4. Information Processing Cycle
- 1.5. Performance of a Computer

2. Hardware Devices

- 2.1. Processing Devices
 - 2.1.1. Microcomputer Processors
 - 2.1.2. RISC Processors
 - 2.1.3. Parallel Processing
- 2.2. Memory Devices
- 2.3. Input devices
 - 2.3.1. Keyboard
 - 2.3.2. Mouse
 - 2.3.3. Ergonomics and Input Devices
 - 2.3.4. Hand held Devices
 - 2.3.5. Optical Input Devices
 - 2.3.6. Audio Visual Input Devices
- 2.4. Output devices
 - 2.4.1. Monitors
 - 2.4.2. Data Projectors
 - 2.4.3. Sound Systems
 - 2.4.4. Printers
 - 2.4.5. Plotters
- 2.5. Storage Devices
 - 2.5.1. Magnetic Storage and Optical Storage

- 2.5.2. Solid-State Storage
- 2.5.3. Cloud Storage
- 2.5.4. Optimizing Disk Performance
- 2.5.5. Ports in a computer

3. Software Products

- 3.1. System Software
- 3.2. Application Software
- 3.3. Utility Software
- 3.4. Acquiring Software as a product

4. Operating Systems

- 4.1. Types of Operating Systems
- 4.2. PC Operating Systems
 - 4.2.1. DOS Operating System
 - 4.2.2. Microsoft Windows Operating System
 - 4.2.3. Apple Mac Operating System
 - 4.2.4. UNIX
 - 4.2.5. Ubuntu Operating System
 - 4.2.6. Hanthana Linux
 - 4.2.7. Android Operating System
 - 4.2.8. Network operating System
 - 4.2.9. Embedded Operating System
- 4.3. Customizing Operation System Settings
 - 4.3.1. Change theme
 - 4.3.2. Change the Window Colour
 - 4.3.3. Enlarging text
 - 4.3.4. Setting Desktop Background
 - 4.3.5. Customizing Desktop Icons
 - 4.3.6. Using a Screen Saver

4.3.7. Touch Typing

4.3.8. Changing the volume

4.3.9. Managing the other desktop features

4.4. Services of an Operating Systems

4.4.1. Process Management

4.4.2. Memory Management

4.4.3. Device Management

4.4.4. File Management

4.4.5. Security Management

4.4.6. Network Management

5. Data Representation and Digital Logic

5.1. Data Communication Devices

5.2. Data Representation in a Computer System

5.3. How Computer Process Data

5.4. Character Representation

5.5. Basic Arithmetic and Logic Operations

5.6. Basic Logic Gates

5.7. Combinational and Universal Logic Gates

5.8. Boolean Algebra

5.9. Boolean Expressions

6. Computer Networks

6.1. The uses of a Network

6.2. Types of Computer Network

6.3. Structure of a Network

6.4. Network Topologies and Protocols

6.5. Network Media

6.6. Network Hardware

6.7. Protocols

6.8. OSI Model

7. Information Systems

7.1. Different Types of Information System

7.2. System Development Models and Methods

7.3. System Development Life Cycle

Teaching /Learning Methods:

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Final Examination:

FIT 103-2 Introduction to Computers is the module 2 of the FIT103 – ICT Applications course. The FIT103 – ICT Applications course consists of 8 modules. The final examination of **FIT103 - ICT Applications course** covers all eight modules. The examination includes two components: **an e-test and a practical test**. Both e-test and practical test will be conducted under supervision.

The e-test consists of 50 Multiple Choice Questions (MCQs), and it carries questions from each module based on their credit weight. The duration of the e-test is 2 hours.

The practical test will be a two-hour assessment. The students will have to perform the skills gained from the course modules of the ICT Applications course.

References/ Reading Materials:

Ref1: Introduction to Computers (7th Edition) by Peter Norton, Tata McGraw-Hill Edition,

Ref2: Grade 10 ICT Textbook

Ref3: Grade 11 ICT Textbook

Ref4: Grade 12 Teacher's Guide

Foundation in Information Technology (FIT)

FIT 103: ICT Applications

Module 3: Word Processing for Electronic Documents

Program Content

| | | | |
|---|--|-----------|-------------------------|
| Course Code: | FIT 103-3 (Module 3) | | |
| Course Name: | Word Processing for Electronic Documents | | |
| Credit Value: | 4 | | |
| Core/Optional | Core | | |
| Hourly Breakdown | Theory | Practical | Independent Learning |
| | 30 | 60 | 110 |
| Course Aim/Intended Learning Outcomes: | | | |
| Upon completion of this module, students will be able to; | | | |
| <ul style="list-style-type: none">• Explain the concept of Word processing• List different word processing applications and their features• Use given features of word processing application to complete relevant tasks• Prepare documents using the word processing software for given purpose | | | |
| Course Content: | | | |
| Topic | Teaching (Hrs) | | Practical (Hrs.) |
| 1. Introduction to Word Processing | 4 | | |
| 2. Exploring Office 365 | 6 | | 10 |
| 3. Creating a New Document | 4 | | 15 |
| 4. Working on Pictures and Graphics | 4 | | 13 |
| 5. Working on Tables | 4 | | 12 |
| 6. Mail Merge | 4 | | 5 |
| 7. Proofreading | 4 | | 5 |
| Total | 30 | | 60 |
| 1. Introduction to Word Processing | | | |
| 1.1. Basic introduction | | | |
| 1.2. Different types of word processing software | | | |

2. Exploring Office 365

- 2.1. Introduction to Office 365
- 2.2. Feature identification
- 2.3. Working with the user interface
- 2.4. Getting help with Office 365

3. Creating a New Document

- 3.1. Opening, Saving, Printing and Closing documents
- 3.2. Starting with the new blank document
- 3.3. Working on page setup
- 3.4. Creating a word document
- 3.5. Modify the appearance of text
- 3.6. Simple formatting facilities
- 3.7. Create a table of content

4. Working on Pictures and Graphics

- 4.1. Inserting a picture
- 4.2. Making necessary adjustment for a picture
- 4.3. Cross-reference to characters and pictures
- 4.4. Inserting clip art, smart art, Excel chart
- 4.5. Apply captions to the graphic

5. Working on Tables

- 5.1. Creating a table
- 5.2. Adding, deleting a column and row
- 5.3. Apply table caption

6. Mail Merge

- 6.1. Understand the mail merge process
- 6.2. Start the mail merge process
- 6.3. Choose and refine the data source
- 6.4. Insert merge field

6.5. Preview and complete merge

7. Proofreading

7.1. Applying spell and grammar checking

7.2. Thesaurus

Teaching /Learning Methods:

Foundation in Information Technology (FIT) has been designed as a self-learning programme. The candidates can learn online using the interactive online learning materials available in the [VLE \(Virtual Learning Environment\)](#) for FIT. The candidates will get information to access the [FIT VLE](#) after their registration to the FIT Programme. The learners are encouraged to actively engage with learning activities and attempt the practice quizzes in the FIT VLE to complete the course successfully. (Marks will not be given for these activities and practice quizzes).

Final Examination:

FIT 103-3 – Word Processing for Electronic Documents is the module 3 of the FIT103 – ICT Applications course. The FIT103 – ICT Applications course consists of 8 modules. The final examination of **FIT103 - ICT Applications course** covers all eight modules. The examination includes two components: **an e-test and a practical test**. Both e-test and practical test will be conducted under supervision.

The e-test consists of 50 Multiple Choice Questions (MCQs), and it carries questions from each module based on their credit weight. The duration of the e-test is 2 hours.

The practical test will be a two-hour assessment. The students will have to perform the skills gained from the course modules of the ICT Applications course.

References/ Reading Materials:

Ref 1: New Perspectives Microsoft Office 365 & Office 2019 Introductory (MindTap Course List) 1st Edition by Patrick Carey, Katherine T. Pinard, Ann Shaffer, Mark Shellman, Sasha Vodnik.

Ref 2: Microsoft Resources (<https://support.microsoft.com/en-us/word>)

Foundation in Information Technology (FIT)

FIT 103: ICT Applications

Module 4: Spreadsheet for Calculation

Program Content

| | | | |
|--|-----------------------------|-----------|----------------------|
| Course Code: | FIT 103-4 (Module 4) | | |
| Course Name: | Spreadsheet for Calculation | | |
| Credit Value: | 3 | | |
| Core/Optional | Core | | |
| Hourly Breakdown | Theory | Practical | Independent Learning |
| | 30 | 30 | 90 |
| Course Aim/Intended Learning Outcomes: | | | |
| After successful completion of this module the students will be able to; | | | |
| <ul style="list-style-type: none">• Identify the different components in a worksheet• Carry out basic operations in a given spreadsheet• Construct formulas to manipulate numeric data in a Worksheet• Visualize numeric data in different format using the chart functions• Differentiate between formulas and functions in spreadsheets using Excel. | | | |
| Course Content: | | | |
| Topic | Teaching (Hrs.) | | Practical (Hrs.) |
| 1. Introduction to Electronic Spreadsheet | 2 | 2 | |
| 2. Working with worksheets and workbooks | 4 | 3 | |
| 3. Formula Creation & Math Functions | 6 | 5 | |
| 4. Cell for different requirements | 4 | 5 | |
| 5. Relative & absolute cell reference | 5 | 5 | |
| 6. Charts for display data | 5 | 6 | |
| 7. Setting Up Pages | 4 | 4 | |
| Total | 30 | 30 | |
| 1. Introduction to Electronic Spreadsheet | | | |
| 1.1. Introduction to spreadsheet application software | | | |

- 1.2. Different types of spreadsheet applications
- 1.3. Basic features and facilities of spreadsheet application
- 1.4. Getting help with MS Office 365
- 2. Working with worksheets and workbooks**
 - 2.1. Opening, saving, and renaming worksheets
 - 2.2. Navigating the worksheet
 - 2.3. Cell References
 - 2.4. Entering and editing data
 - 2.5. Simple formatting
- 3. Formula Creation & Math Functions**
 - 3.1. Simple calculations using values and mathematical operators
 - 3.2. Formulas with cell addresses and operators
 - 3.3. Use of functions to do calculations
- 4. Cell for different requirements**
 - 4.1. Working with formatting toolbar (Ribbon)
 - 4.2. Use of Dialog Boxes to format values
 - 4.3. Adjusting row height/column width
 - 4.4. Formatting a range of cells
 - 4.5. Locking cells and hiding formulas
- 5. Relative & absolute cell references**
 - 5.1. Use of fill handle for copying formula
 - 5.2. Understand the difference between relative and absolute references
 - 5.3. Relative cell reference
 - 5.4. Row absolute cell references
 - 5.5. Column absolute cell references
 - 5.6. Row and column absolute cell references
- 6. Charts for display data**
 - 6.1. Creating charts
 - 6.2. Formatting/modifying charts
- 7. Setting up pages**

- 7.1. Adding title rows/columns and headers/footers
- 7.2. Freeze Panes
- 7.3. Page breaks and Page setup
- 7.4. Print preview
- 7.5. Workbook Protection

Teaching /Learning Methods:

Foundation in Information Technology (FIT) has been designed as a self-learning programme. The candidates can learn online using the interactive online learning materials available in the [VLE \(Virtual Learning Environment\)](#) for FIT. The candidates will get information to access the [FIT VLE](#) after their registration to the FIT Programme. The learners are encouraged to actively engage with learning activities and attempt the practice quizzes in the FIT VLE to complete the course successfully. (Marks will not be given for these activities and practice quizzes).

Final Examination:

FIT 103-4 – Spreadsheet for Calculation is the module 4 of the FIT103 – ICT Applications course. The FIT103 – ICT Applications course consists of 8 modules. The final examination of **FIT103 - ICT Applications course** covers all eight modules. The examination includes two components: **an e-test and a practical test**. Both e-test and practical test will be conducted under supervision.

The e-test consists of 50 Multiple Choice Questions (MCQs), and it carries questions from each module based on their credit weight. The duration of the e-test is 2 hours.

The practical test will be a two-hour assessment. The students will have to perform the skills gained from the course modules of the ICT Applications course.

References/ Reading Materials:

Ref 1: Chapter 7: Information and Communication Technology, Grade 10

Ref 2: Advanced Excel by tutorialspoints (<https://www.tutorialspoint.com>)

Ref 3: New Perspectives Microsoft Office 365 & Office 2019 Introductory (MindTap Course List)
1st Edition by Patrick Carey, Katherine T. Pinard, Ann Shaffer, Mark Shellman, Sasha Vodnik

Foundation in Information Technology (FIT)

FIT 103: ICT Applications

Module 5: Multimedia and Electronic Presentation

Program Content

| | | | |
|--|--|-----------|----------------------|
| Course Code: | FIT 103-5 (Module 5) | | |
| Course Name: | Multimedia and Electronic Presentation | | |
| Credit Value: | 3 | | |
| Core/Optional | Core | | |
| Hourly Breakdown | Theory | Practical | Independent Learning |
| | 30 | 30 | 90 |
| Course Aim/Intended Learning Outcomes: | | | |
| After successful completion of this module, the students will be able to; | | | |
| <ul style="list-style-type: none">• Describe multimedia concepts• Define the various factors of images• Edit images using relevant software/tools• Describe the role of audio in creating multimedia content• Use audio editing tools for a given requirement• Develop digital animations• Create electronic presentations | | | |
| Course Content: | | | |
| Topic | Teaching (Hrs.) | | Practical (Hrs.) |
| 1. Introduction to Multimedia | 04 | | 02 |
| 2. Working with Digital Images | 05 | | 06 |
| 3. Introduction to Audio | 04 | | 04 |
| 4. Developing Digital Animations | 05 | | 06 |
| 5. Introduction to Video | 05 | | 06 |
| 6. Electronic Presentations | 07 | | 06 |
| Total | 30 | | 30 |

1. Introduction to Multimedia

- 1.1. What is meant by multimedia?
- 1.2. Evolution of multimedia
- 1.3. Where and when to use multimedia
- 1.4. Future of multimedia

2. Working with Digital Images

- 2.1. Elements of an image
 - 2.1.1. Working with Pixel
 - 2.1.2. Resolution of an Image
 - 2.1.3. Colours and Colour models
 - 2.1.4. Image size and compression
- 2.2. Image Types
 - 2.2.1. Bitmap Images (Raster graphic)
 - 2.2.2. Vector drawings
 - 2.2.3. Difference between raster graphic and vector graphic
- 2.3. Image processing with software
 - 2.3.1. Common features of an image editing software
 - 2.3.2. Image editing using GIMP software
 - 2.3.2.1. GIMP editing tools
 - 2.3.2.2. Creating a graphic with pictures
 - 2.3.2.3. Creating a graphic with text

3. Introduction to Audio

- 3.1. Different audio file formats
- 3.2. Different Software tools to edit audio
- 3.3. Importance and requirement of audio editing
- 3.4. Basic and common features of audio editing
- 3.5. Developing digital audio files using Audacity Software tool

4. Developing Digital Animations

- 4.1. Introduction to animations
- 4.2. Basic of animation
- 4.3. Importance of animation
- 4.4. Difference between 2D and 3D animations

4.5. Animation Techniques

4.5.1. Frames

4.5.1.1. Types of Frames

4.5.1.1.1. Key Frame

4.5.1.1.2. Tween Frame

4.5.1.1.3. Blank Key Frame

4.5.2. Kinematics

4.5.3. Morphing

4.6. Different Animation file formats

4.7. Create an animation

4.7.1. Software used to create animations

4.7.2. Common features of animation software

4.7.3. Developing animations with Pencil2D Animation tool

5. Introduction to Video

5.1. Role of Video in multimedia content

5.2. Factors of Video Content

5.2.1. Frames and frame rates

5.2.2. Resolution of a Video

5.2.3. Analog Display and Digital Video standards

5.2.4. Video file size

5.3. Creating a video clip

5.3.1. Video editing tools

5.3.2. Common features of video editing software

5.3.3. Developing videos with Windows OpenShot Video Editor

6. Electronic presentations

6.1. Introduction to electronic presentations

6.1.1. What is meant by presentation?

6.1.2. Benefits of electronic presentations

6.2. Electronic presentation software

6.2.1. Common features of electronic presentation software

6.2.2. Popular presentation software/tools

6.3. Create an electronic presentation

- 6.3.1. Introduction to Microsoft office 365 PowerPoint software
- 6.3.2. How to use Microsoft office 365 PowerPoint to create a presentation
- 6.4. Effective Features of a good presentation

Teaching /Learning Methods:

Foundation in Information Technology (FIT) has been designed as a self-learning programme. The candidates can learn online using the interactive online learning materials available in the [VLE \(Virtual Learning Environment\)](#) for FIT. The candidates will get information to access the [FIT VLE](#) after their registration to the FIT Programme. The learners are encouraged to actively engage with learning activities and attempt the practice quizzes in the FIT VLE to complete the course successfully. (Marks will not be given for these activities and practice quizzes).

Final Examination:

FIT 103-5 – Multimedia and Electronic Presentation is the module 5 of the FIT103 – ICT Applications course. The FIT103 – ICT Applications course consists of 8 modules. The final examination of **FIT103 - ICT Applications course** covers all eight modules. The examination includes two components: **an e-test and a practical test**. Both e-test and practical test will be conducted under supervision.

The e-test consists of 50 Multiple Choice Questions (MCQs), and it carries questions from each module based on their credit weight. The duration of the e-test is 2 hours.

The practical test will be a two-hour assessment. The students will have to perform the skills gained from the course modules of the ICT Applications course.

References/ Reading Materials:

Ref 1: Multimedia: Making It Work (Eighth Edition):Tay Vaughan

Ref2: Digital Multimedia: Nigel Chapman and Jenny Chapman

Ref3: <https://www.gimp.org/>

Ref4: <https://www.audacityteam.org/>

Ref5: <https://www.pencil2d.org/>

Ref6: <https://www.openshot.org/>

Ref7: Information and Communication technology Grade 10: Educational Publications Department,
Sri Lanka

Ref8: <https://www.office.com/>

Foundation in Information Technology (FIT)

FIT 103: ICT Applications

Module 6: Data and Databases

Program Content

| | | | |
|--|-----------------------|-------------------------|----------------------|
| Course Code: | FIT 103-6 (Module 6) | | |
| Course Name: | Data and Databases | | |
| Credit Value: | 4 | | |
| Core/Optional | Core | | |
| Hourly Breakdown | Theory | Practical | Independent Learning |
| | 30 | 60 | 110 |
| Course Aim/Intended Learning Outcomes: | | | |
| After successful completion of this module, the students will be able to; | | | |
| <ul style="list-style-type: none">• Explain the objectives of data and information management• Describe the fundamental elements of relational database management systems• Explain the basic concepts of relational database design (relational data model, entity-relationship model)• Design ER-models to represent simple database application scenarios• Convert the ER-model to relational tables• Populate relational database and formulate SQL queries on data• Develop Structured Query Language (SQL) queries to create and read relational database data | | | |
| Course Content: | | | |
| Topic | Teaching (Hrs) | Practical (Hrs.) | |
| 1. Introduction to Database Management Systems | 2 | | |
| 2. Database Architecture Basics | 2 | | |
| 3. Designing Databases Using Relational Model | 2 | | |
| 4. Conceptual Data Modelling Using ER Diagrams | 6 | 15 | |
| 5. Mapping ER to Relational Model | 8 | 20 | |
| 6. Introduction to Data Manipulation Using SQL | 10 | 25 | |
| Total | 30 | 60 | |

1. Introduction to Database Management Systems

1.1 The Evolution of Database Technology

- 1.1.1. Data, information, database, database system, database management system
- 1.1.2. Characteristics of the Database Approach
- 1.1.3. File oriented systems: Meeting the need for random access processing
- 1.1.4. Advantages of Using the DBMS Approach: Data redundancy, inadequate data manipulation capabilities, program-data dependency; data independence.
- 1.1.5. Users and practitioners of a Database System

1.2 Users and practitioners of a Database System

1.3 History of Database Applications

2. Database Architecture Basics

2.1 Components of a Database Management System (DBMS)

2.2 Data Models and Schemas

2.3 The Three-Schema Architecture

3. Designing Databases Using Relational Model

3.1. Introduction to Relational Model Concepts: Domains, Attributes, Tuples, and Relations

3.2. Relational Database Schemas

3.3. Keys in the Relational Model

4. Conceptual Data Modelling Using ER Diagram

4.1. Introduction to the database design process

4.2. Entities and Attributes

4.3. Key Attributes

4.4. Relationship Types and Degree

4.4.1. Binary Relationship

4.4.2. Introduction to ER notation and modelling

5. Mapping Entity Relationship (ER) to Relational Model

5.1. Mapping of Regular Entity Type

5.2. Mapping of Weak Entity Types

5.3. Mapping of Binary 1:1 Relationship Types

5.4. Mapping of Binary 1:N Relationship Types

5.5. Mapping of Binary M:M Relationship Types

6. Introduction to Data Manipulation using SQL

6.1. Creating tables in SQL

6.2. Introduction to SQL data types

6.3. Adding primary and foreign keys to tables

6.4. Data manipulation using SQL

6.4.1. Selecting Data

6.4.2. Inserting data into a table

6.4.3. Updating data

6.4.4. Deleting data

Teaching /Learning Methods:

Foundation in Information Technology (FIT) has been designed as a self-learning programme. The candidates can learn online using the interactive online learning materials available in the [VLE \(Virtual Learning Environment\)](#) for FIT. The candidates will get information to access the [FIT VLE](#) after their registration to the FIT Programme. The learners are encouraged to actively engage with learning activities and attempt the practice quizzes in the FIT VLE to complete the course successfully. (Marks will not be given for these activities and practice quizzes).

Final Examination:

FIT 103-6 – Data and Databases is the module 6 of the FIT103 – ICT Applications course. The FIT103 – ICT Applications course consists of 8 modules. The final examination of **FIT103 - ICT Applications course** covers all eight modules. The examination includes two components: **an e-test and a practical test**. Both e-test and practical test will be conducted under supervision.

The e-test consists of 50 Multiple Choice Questions (MCQs), and it carries questions from each module based on their credit weight. The duration of the e-test is 2 hours.

The practical test will be a two-hour assessment. The students will have to perform the skills gained from the course modules of the ICT Applications course.

References/ Reading Materials:

Fundamentals of Database Systems by R. Elmasri and S.B. Navathe, 7th edition, Addison-Wesley, 2015

Foundation in Information Technology (FIT)

FIT 103: ICT Applications

Module 7: The Internet and Web Applications

Program Content

| | | | |
|---|-----------------------------------|-----------|-------------------------|
| Course Code: | FIT 103-7 (Module 7) | | |
| Course Name: | The Internet and Web Applications | | |
| Credit Value: | 4 | | |
| Core/Optional | Core | | |
| Hourly Breakdown | Theory | Practical | Independent Learning |
| | 30 | 60 | 110 |
| Course Aim/Intended Learning Outcomes: | | | |
| After successful completion of this module the students will be able to; | | | |
| <ul style="list-style-type: none">• Describe the evolution of the Internet• Explain the terminologies related to the Internet and the World Wide Web• Explain how the Internet and how web works• Identify what a web application is• Use of Web storage Organization• Use Web authoring tools for web content development• Design a simple website | | | |
| Course Content: | | | |
| Topic | Teaching (Hrs) | | Practical (Hrs.) |
| 1. History of the Internet | 2 | | 4 |
| 2. The Terminology of the Internet | 2 | | 4 |
| 3. Connecting to the Internet | 4 | | 4 |
| 4. New Media and Web Applications | 4 | | 4 |
| 5. Web Storage Organization | 4 | | 4 |
| 6. Web Authoring Tools | 7 | | 20 |
| 7. Web Application Development | 7 | | 20 |
| Total | 30 | | 60 |

1. History of the Internet

- 1.1. Evolution of the World Wide Web (WWW)
- 1.2. Generations of the web/ (How web technology is evolving): Web 1.0, Web 2.0, Web 3.0, Web 4.0, Web 5.0
- 1.3. Internet Protocols and Internet Protocol version IPv4 and IPv6
- 1.4. History of HTML
- 1.5. Internet Web Browsers

2. The Terminology of the Internet

- 2.1. Uniform resource identifier (URI) and Uniform Resource Locator (URL)
- 2.2. Domain name
- 2.3. Domain Name Server
- 2.4. IP addresses
- 2.5. HyperText Transfer Protocol (HTTP)
- 2.6. Standards bodies
- 2.7. The World Wide Web Consortium (W3C)
- 2.8. Search Engine

3. Connecting to the Internet

- 3.1. Describing the different connecting methods (e.g., Tethering)
- 3.2. Internet service provider (ISP)
- 3.3. List the advantages and disadvantages of connecting methods
- 3.4. Client-server model and web architecture
- 3.5. How to access the Web

4. New Media and Web Applications

- 4.1. Social media
- 4.2. Blogs
- 4.3. Video conferencing
- 4.4. Online newspapers
- 4.5. eBusiness
- 4.6. Online games
- 4.7. Products and Features of the Google (Google ecosystem)

5. Web Storage Organization

- 5.1. Local device storage
- 5.2. Serverless Computing/ Cloud Storage
- 5.3. Google Cloud Platform
- 5.4. Microsoft Azure
- 5.5 Oracle Cloud Platform
- 5.6 OpenWhisk

6. Web Development Tools

- 6.1. What is Full-Stack?
- 6.2. Introduction to Web Client Software
- 6.3. Introduction to Web Server Software
- 6.4. Version Controlling (What is GitHub?)

7. Web Application Development

- 7.1. Introduction
- 7.2. Developing a simple website
- 7.3. Creating a web page using HTML 4
 - 7.3.1. The HTML DOM (Document Object Model)
 - 7.3.2. Adding simple styles to the webpage using CSS
 - 7.3.3. Adding interactions to a web page using JavaScript

Teaching /Learning Methods:

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Final Examination:

FIT 103-7 The Internet and Web Applications is the module 7 of the FIT103 – ICT Applications course. The FIT103 – ICT Applications course consists of 8 modules. The final examination of **FIT103 - ICT Applications course** covers all eight modules. The examination includes two components: **an e-test and a practical test**. Both e-test and practical test will be conducted under supervision.

The e-test consists of 50 Multiple Choice Questions (MCQs), and it carries questions from each module based on their credit weight. The duration of the e-test is 2 hours.

The practical test will be a two-hour assessment. The students will have to perform the skills gained from the course modules of the ICT Applications course.

References/ Reading Materials:

Ref 1: https://www.w3schools.com/whatis/whatis_ajax.asp

Ref 2: <http://www.evolutionoftheweb.com/#/evolution/day>

Ref 3: <https://www.google.com/accessibility/products-features/>

Ref 4: <https://dev.to/flippedcoding/what-is-the-difference-between-a-uri-and-a-url-4455>

Ref 5: https://www.w3schools.com/whatis/whatis_github.asp

Foundation in Information Technology (FIT)

FIT 103: ICT Applications

Module 8: Fundamentals of Programming

Program Content

| | | | |
|---|-----------------------------|-------------------------|----------------------|
| Course Code: | FIT 103-8 (Module 8) | | |
| Course Name: | Fundamentals of Programming | | |
| Credit Value: | 4 | | |
| Core/Optional | Core | | |
| Hourly Breakdown | Theory | Practical | Independent Learning |
| | 30 | 60 | 110 |
| Course Aim/Intended Learning Outcomes: | | | |
| After successful completion of this module the students will be able to; | | | |
| <ul style="list-style-type: none">• Draw a flow chart for a given problem to show its solution.• Write the algorithm using a pseudocode for the given problem.• Describe the basic structure of a program using a programming language.• Identify the appropriate data types for variables to represent different data.• Describe the control structure of a program for a given requirement.• Write a structured program to solve a simple problem. | | | |
| Course Content: | | | |
| Topic | Teaching (Hrs.) | Practical (Hrs.) | |
| 1. Solving a problem using a computer program | 01 | 01 | |
| 2. Overview of C Programming Language | 01 | 01 | |
| 3. Data Types | 01 | 02 | |
| 4. Variables and constants | 02 | 04 | |
| 5. Operators | 03 | 06 | |
| 6. Conditional statements | 03 | 07 | |
| 7. Loop control | 03 | 07 | |
| 8. Array | 03 | 07 | |
| 9. Strings | 02 | 04 | |
| 10. Functions | 02 | 04 | |
| 11. Recursion | 02 | 05 | |
| 12. Pointers | 02 | 04 | |
| 13. Structures | 03 | 04 | |
| 14. File Handling | 02 | 04 | |
| Total | 30 | 60 | |

1. Solving a problem using a program

- 1.1. Analyze a simple problem
- 1.2. Identify alternative solutions for a given problem
- 1.3. Write an algorithm using the pseudocode for the selected solution
 - 1.3.1. What is an algorithm
 - 1.3.2. Control structure of an algorithm
 - 1.3.3. Draw a flow chart to present an algorithm
 - 1.3.4. Write a pseudocode to solve a simple problem

2. Overview of C Programming Language

- 2.1. My first program
- 2.2. Basic structure of C program
- 2.3. Identifiers
- 2.4. Keywords
- 2.5. Tokens
- 2.6. Format Specifiers

3. Data Types

- 3.1. About data types
- 3.2. Numeric data types
- 3.3. Character data types

4. Variables and constants

- 4.1. About variable
- 4.2. Variable declaration and initialization
- 4.3. Variable types and Scope
 - 4.3.1. Local variables
 - 4.3.2. Static variable
 - 4.3.3. Global variables
- 4.4. Constants

5. Operators

- 5.1. About operators
- 5.2. Arithmetic operators

- 5.3. Relational operators
- 5.4. Bit-wise Operators
- 5.5. Logical operators
- 5.6. Assignment operators
- 5.7. Conditional operator
- 5.8. Sizeof() operator
- 5.9. Operator precedence

6. Conditional statements

- 6.1. About conditional statements
- 6.2. Different forms of “if” statement
 - 6.2.1. “if-else” statement
 - 6.2.2. Nested if statement
 - 6.2.3. “if-else-if” ladder
- 6.3. Switch statement

7. Loop control

- 7.1. About loops
- 7.2. “while” loop
- 7.3. “do while” loop
- 7.4. “for” loop
- 7.5. “break” and “continue” statements

8. Array

- 8.1. Single dimensional array
- 8.2. Multi-dimensional array

9. String manipulation

- 9.1. About string functions
- 9.2. Commonly used string functions

10. Functions

- 10.1. About functions
 - 10.1.1. The structure of a function
 - 10.1.2. Return type

10.2. Calling a function

10.2.1. Call by value

10.2.2. Call by reference

10.3. Types of functions

10.3.1. User-defined functions

10.3.2. Predefined functions

11. Recursion

11.1. About recursion

11.2. Base case

11.3. Recursive case

12. Pointers

12.1. About pointer

12.2. Types of pointers

12.3. Accessing and retrieving values of variables

12.4. Pointer and array

12.5. Strings as pointers

12.6. Pointer to function

12.7. Call by reference

13. Structures

13.1. About structures

13.2. Defining a structure

13.3. Accessing structure members

14. File Handling

14.1. About files

14.2. Basic file operations in C

14.2.1. Create a new file

14.2.2. Opening and closing a file

14.2.3. Read from a file

14.2.4. Write to a file

14.2.5. Append to a file

Teaching /Learning Methods:

Foundation in Information Technology (FIT) has been designed as a self-learning programme. The candidates can learn online using the interactive online learning materials available in the [VLE \(Virtual Learning Environment\)](#) for FIT. The candidates will get information to access the [FIT VLE](#) after their registration to the FIT Programme. The learners are encouraged to actively engage with learning activities and attempt the practice quizzes in the FIT VLE to complete the course successfully. (Marks will not be given for these activities and practice quizzes).

Final Examination:

FIT 103-8 - Fundamentals of Programming is the module 8 of the FIT103 – ICT Applications course. The FIT103 – ICT Applications course consists of 8 modules. The final examination of the **FIT103 - ICT Applications course** covers all eight modules. The examination includes two components: **an e-test and a practical test**. Both e-test and practical test will be conducted under supervision.

The e-test consists of 50 Multiple Choice Questions (MCQs), and it carries questions from each module based on their credit weight. The duration of the e-test is 2 hours.

The practical test will be a two-hour assessment. The students will have to perform the skills gained from the course modules of the ICT Applications course.

References/ Reading Materials:

C: The Complete Reference Paperback – 1 Jul 2017 by Herbert Schildt (Author)
C programming – <https://www.atnyla.com/>

Programming Environment

https://www.tutorialspoint.com/compile_c_online.php

Foundation in Information Technology (FIT)

FIT 203: English for ICT

Program Content

| | | | |
|-------------------------|-----------------|-----------|----------------------|
| Course Code: | FIT 203 | | |
| Course Name: | English for ICT | | |
| Credit Value: | 8 | | |
| Core/Optional | Core | | |
| Hourly Breakdown | Theory | Practical | Independent Learning |
| | 60 | 120 | 220 |

Course Aim/Intended Learning Outcomes:

After successful completion of this course the students will be able to;

- Exchange information and talk confidently with others
- Pronounce English words accurately
- Engage in active listening and respond appropriately & confidently
- Use English grammar accurately and effectively in communication
- Write effectively and accurately
- Use mechanics of writing effectively
- Use vocabulary meaningfully and accurately to convey meaning
- Retrieve necessary information from IT related texts

Course Content:

| Topic | Teaching (Hrs) | Practical (Hrs.) |
|---|----------------|------------------|
| 1. Getting to know each other-Introducing yourself and others | 02 | 06 |
| 2. Pronunciation-phonetics | 03 | 06 |
| 3. Morphological Awareness | 04 | 08 |
| 4. Recognizing nouns, verbs and articles | 04 | 06 |
| 5. Recognizing adjectives and adverbs | 05 | 06 |
| 6. Listening skill development | 03 | 08 |
| 7. Prepositions and conjunctions | 05 | 10 |
| 8. Developing oral skills | 03 | 08 |
| 9. Introduction to general and academic vocabulary | 04 | 06 |
| 10. Reported speech | 04 | 06 |
| 11. Conditional sentences | 04 | 06 |
| 12. Developing reading skills | 03 | 12 |

| | | |
|--|----|-----|
| 13. Understanding mechanics of writing | 04 | 08 |
| 14. Introduction to the process of writing | 03 | 06 |
| 15. Introduction to technical writing | 04 | 08 |
| 16. General language skills- writing bio data forms, covering letters, applications, memos, abstracts, references etc. | 05 | 10 |
| Total | 60 | 120 |

1. Getting to know each other (6 hrs.)

Intended Learning Outcomes

- Exchanges /collects personal information
- Introduces oneself to others
- Writes a biography

1.1 Getting to know each other (Ref: 04)

- 1.1.1 Greetings in English
- 1.1.2 Inquiring / collecting information
- 1.1.3 Self-introduction

1.2 Writing a biography (Ref: 04)

- 1.2.1 Writing a biography
- 1.2.2 Writing an autobiography

2. Pronunciation-phonetics (6 hrs.)

Intended Learning Outcomes

- Articulates unfamiliar words correctly
- Uses dictionary as a useful resource for language learning
- Listens to texts and retrieve information
- Uses phonetic scripts to pronounce unfamiliar words

2.1 Introduction to English sound system (Ref: 04)

- 2.1.1 Relationship between English alphabet and sound system
- 2.1.2 Introduction to phonetics scripts
- 2.1.3 Consonant sounds in English
- 2.1.4 Vowel sounds in English
- 2.1.5 Diphthongs in English
- 2.1.6 Borrowings from other languages to English

2.2 Use of The dictionary (Ref: 04)

- 2.2.1 Spellings & pronunciation of words
- 2.2.2 Different meanings of words
- 2.2.3 Parts of speech
- 2.2.4 Synonyms and antonyms
- 2.2.5 Other information - Use and Usage / etymology

3. Morphological Awareness and Introduction to Syntax (8 hrs.)

Intended Learning Outcomes

- Identifies the minimal units of meaning in word
- Recognize the differences between free and bound morpheme
- Uses word analysis to find meanings of unknown words
- Recognize and uses the word formation types
- Recognize the word classes

3.1 Introduction to morpheme

- 3.1.1 Minimal unit of meaning
- 3.1.2 Free and bound morpheme
- 3.1.3 Ordering rules
- 3.1.4 Rule breakers

3.2 Types of word formation (Ref: 10 and Ref: 11)

- 3.2.1 Coinage
- 3.2.2 Clipping
- 3.2.3 Blends
- 3.2.4 Back formation
- 3.2.5 Acronym
- 3.2.6 Compounds
- 3.2.7 Borrowing
- 3.2.8 Derivations
- 3.2.9 Conversion

4. Recognizing Nouns, verbs & the use of articles (6 hrs.)

Intended Learning Outcomes

- Uses nouns correctly and appropriately
- Identifies & explains the function of articles in a sentence
- Places articles correctly and appropriately
- Identifies & explains the functions of the verb
- Uses correct verb forms in sentences
- Explains the functions of auxiliary verbs
- Changes an affirmative sentence into negatives
- Changes an affirmative sentence into interrogative

4.1 Introduction to Nouns (Ref: 01, Ref: 04)

- 4.1.1 Function of the noun
- 4.1.2 Countable and uncountable nouns
- 4.1.3 Plurals and irregular plurals
- 4.1.4 Collective nouns

4.2 Introductions to articles and determiners (Ref: 01, Ref: 02, Ref: 03)

- 4.2.1 Definite / indefinite articles
- 4.2.2 Functions of determiners

4.3 Introduction to English verb (Ref: 01, Ref: 02)

- 4.3.1 Function of the verb
- 4.3.2 Classification of the verb
- 4.3.3 Five forms of the verb
- 4.3.4 Irregular Verbs
- 4.3.5 Gerunds

- 4.4 Sentence patterns
 - 4.4.1 Sentence patterns
 - 4.4.2 Simple and compound sentences
 - 4.4.3 Complex sentences
- 4.5 Subject verb agreement
 - 4.5.1 Plural and singular subjects
 - 4.5.2 Separated subjects and verbs
 - 4.5.3 Compound subjects
- 4.6 Tense - Simple present/ past/ future/ perfect
- 4.7 Voice - Active / Passive
- 4.8 Mood - Indicative / Imperative /Subjunctive
- 4.9 Introduction to Auxiliary verbs (Ref: 01, Ref: 04)
 - 4.9.1 Functions of auxiliaries
 - 4.9.2 Primary auxiliaries
 - 4.9.3 Modals
- 4.10 Transformation of sentences (Ref: 01, Ref: 04)
 - 4.10.1 Affirmative sentences
 - 4.10.2 Negative sentences
 - 4.10.3 Positive and negative interrogatives

5. Recognizing adjectives and adverbs (6 hrs.)

Intended Learning Outcomes

- Uses adjectives to describe a noun properly
- Uses the correct order of adjective
- Uses adverbs appropriately to describe an action

- 5.1 Introductions to adverbs (Ref: 01, Ref: 04)
 - 5.1.1 Function of adverbs
 - 5.1.2 Adverb order
- 5.2 Kinds of adverbs (Ref: 01, Ref: 04)
 - 5.2.1 Adverbs of manner
 - 5.2.2 Adverbs of place
 - 5.2.3 Adverbs of time
 - 5.2.4 Adverbs of certainty
 - 5.2.5 Adverbs of degree
 - 5.2.6 Interrogative adverbs
 - 5.2.7 Relative adverbs
 - 5.2.8 Viewpoint and commenting adverbs
- 5.3 Adjectives
 - 5.3.1 Introduction to adjectives
 - 5.3.2 Order of adjectives
 - 5.3.3 Degree of adjectives
 - 5.3.4 Irregular comparatives and superlatives

6. Developing Listening skills. (8 hrs.)

Intended Learning Outcomes

- Responds to an audio text correctly and appropriately
- Retrieves information from and audio texts accurately

- Paraphrases an audio text effectively and accurately

- 6.1 Listening to audio texts and retrieving information
- 6.2 Understanding and responding to native speakers
- 6.3 Paraphrasing audio texts.

7. Recognizing the use of prepositions and Conjunctions (10 hrs.)

Intended Learning Outcomes

- Identifies & explains the functions of a preposition
- Uses prepositions correctly in sentences
- Uses prepositional phrases in sentences
- Writes a summary out of a given text
- Uses conjunctions to connect two simple sentences
- Explains different types of conjunctions

- 7.1 Introduction to prepositions (Ref: 01)
 - 7.1.1 Functions of the prepositions
 - 7.1.2 Preposition of time/place/location/movement/etc.
 - 7.1.3 Prepositions associated with Nouns adjectives and verbs
 - 7.1.4 Idiomatic expressions with prepositions
- 7.2 Introduction to conjunctions
 - 7.2.1 Function of the conjunctions
 - 7.2.2 Coordinating conjunctions
 - 7.2.3 Subordinating conjunctions
 - 7.2.4 Correlative Conjunctions
- 7.3 Conjunctive adverbs
 - 7.3.1 Commonly used conjunctive adverbs

8. Developing oral skills (8 hrs.)

Intended Learning Outcomes

- Makes an effective telephone conversation on a given topic
- Makes an effective public speech on a given topic
- Makes an effective presentation on a given topic

- 8.1 Telephone skills
- 8.2 Public speeches
- 8.3 Interpersonal communications
- 8.4 Making presentations (Power point)

9. Introduction to general and academic Vocabulary (6 hrs.)

Intended Learning Outcomes

- Uses dictionaries to find out word meanings
- Explains the meaning of a new word guessing from context
- Uses prefixes and affixes to derive word meaning
- Creates a glossary on ICT related words

- 9.1 Using dictionaries

- 9.2 Recognizing word roots
- 9.3 Recognizing prefixes and suffixes
- 9.4 Recognizing borrowed words in English
- 9.5 Common synonyms, antonyms and homonyms

10. Reported speech (6 hrs.)

Intended Learning Outcomes

- Form statements in indirect speech
- Recognize the differences between direct and indirect speech
- Ask important information
- Incorporate questioning techniques

- 10.1 Define direct speech and indirect speech (Ref. 12)
- 10.2 Distinguish between direct and indirect speech (Ref. 12)
- 10.3 List the rules for converting direct speech to indirect speech and indirect speech to direct speech (Ref. 12)
- 10.4 Research famous quotes and turn them into reported speech.

11. Conditional sentences (6 hrs.)

Intended Learning Outcomes

- Use the real conditional tense to listen, speak, read, and write in English
- Use the words when, if, will, and would to indicate the conditional tense

- 11.1 Zero conditional, used for present, real/factual situations
- 11.2 First conditional, used for future, real/factual situations
- 11.3 Second conditional, used for present or future unreal, imaginary situations
- 11.4 Third conditional, used for past unreal, imaginary situations

12. Developing reading skills (12 hrs.)

Intended Learning Outcomes

- Retrieves specific information from a given text
- Writes a coherent and smooth summary

- 12.1 Retrieving information from IT related texts
- 12.2 Scanning and Skimming Skills
- 12.3 Reading for specific information
- 12.4 Paraphrasing and summarizing

13. Understanding the mechanics of writing (8 hrs.)

Intended Learning Outcomes

- Uses punctuations appropriately
- Uses abbreviations Numbers in correct format

- 13.1 Using punctuation conventions
- 13.2 Using capitals, italics, hyphens

13.3 Using abbreviations and numbers

14. Introduction to the process of writing (6 hrs.)

Intended Learning Outcomes

- Writes a paragraph effectively on a given topic
- Writes logical, cohesive and coherent paragraphs
- Organizes a paragraph effectively
- Maintains smooth reading

14.1 Introduction to process of writing (Ref: 08)

14.1.1 Brainstorming and drafting

14.1.2 Revising and editing

14.2 Techniques of writing (Ref: 08)

14.2.1 Tense consistency

14.2.2 Topic sentence

14.2.3 Paragraph development

15. Introduction to technical writing (8 hrs.)

Intended Learning Outcomes

- Prepare technical documents correctly
- Use appropriate technical vocabulary for targeted readers
- Use correct format and syntax

15.1 Technical reports: Process and structure (Ref: 05)

15.2 Abstracts introductions and conclusions (Ref: 05)

15.3 Document design (Ref: 05)

15.3.1 Headings and table of content

15.3.2 Lists of figures, graphics and tables

15.3.3 Indexing, adding foot notes

16. General language skills (10 hrs.)

Intended Learning Outcomes

- Writes a memo
 - notice
 - telegram in correct format
- Prepares an abstract and reference list correctly
- Produces an effective and accurate business letter

16.1 Writing memos, Notices, Telegrams (Ref: 04)

16.2 Applications, bio-data, cover letters (Ref: 04)

16.3 Abstracts, reference lists, literature reviews (Ref: 04)

16.4 Business correspondence and resumes (Ref: 04)

Teaching /Learning Methods:

Foundation in Information Technology is a self-learning programme. Candidates can learn online at [VLE for FIT \(Virtual Learning Environment for FIT\)](#) where all course learning materials are available online.

Candidates will be provided with access to the [FIT VLE](#) at the registration for FIT programme. Learners are encouraged for higher and continuous engagement with learning at FIT VLE for successful completion of the course.

Final Examination

The final examination of the FIT 203 **English for ICT course** includes two components: **an e-test and a practical test**. Both e-test and practical test will be conducted in supervised mode. The e-test will consist of 50 Multiple Choice Questions (MCQs) covering all topics of the course. The duration of the e-test is 2 hours. Three practical tests for listening, speaking & writing will be conducted.

References/ Reading Materials:**Main References**

Ref 1: Grammar for Communication by Parvathi Nagasundaram

Ref 2: Living English Structures by Stannard Allen

Ref 3: General English for G.C.E. (A/L)

Ref 4: English for IT – UCSC publication.

Recommended Links:

Ref 5: <https://www.prismnet.com/~hcexres/textbook/>

Ref 6: <http://grammar.ccc.commnet.edu/grammar/index.htm>

Ref 7: <http://grammar.ccc.commnet.edu/grammar/composition/composition.htm>

Ref 8: <http://grammar.ccc.commnet.edu/grammar/adjectives.htm>

Ref 9: <http://www.englishcurrent.com>

Ref 10: <http://vlearn.fed.cuhk.edu.hk>. word formation

Ref 11: <https://linguisticsunimet.wordpress.com/words-and-word-formation-process>

Ref 12: <https://learningpundits.com/module-view/27-direct-&-indirect-speech/1-english-grammar-tips---direct-&-indirect-speech/>

Foundation in Information Technology (FIT)

FIT 303: Mathematics for ICT

Program Content

| | | | |
|---|-----------------------|-------------------------|----------------------|
| Course Code: | FIT 303 | | |
| Course Name: | Mathematics for ICT | | |
| Credit Value: | 8 | | |
| Core/Optional | Core | | |
| Hourly Breakdown | Theory | Practical | Independent Learning |
| | 60 | 120 | 220 |
| Course Aim/Intended Learning Outcomes: | | | |
| After successful completion of this course the students will be able to; | | | |
| <ul style="list-style-type: none"> • Use mathematical operations, Display Numerical competency, Solve problems (Computational skills) • Use mathematical language (oral, written, algebraic and graphical) (Communication skills) • Develop and evaluate mathematical conjectures and conversations (Skills of inductive and deductive reasoning) • Use mathematical knowledge and techniques to formulate and solve problems (Problem solving) • Identify connections between important mathematical ideas and concepts, and use these in Information Technology. | | | |
| Course Content: | | | |
| Topic | Teaching (Hrs) | Practical (Hrs.) | |
| 1. Introduction to Numbers and Arithmetic | 4 | 8 | |
| 2. Indices and logarithms | 4 | 8 | |
| 3. Number systems | 4 | 8 | |
| 4. Ratios and proportions | 4 | 8 | |
| 5. Algebraic expressions | 4 | 8 | |
| 6. Equations | 4 | 8 | |
| 7. Inequalities | 4 | 8 | |
| 8. Measurements | 4 | 8 | |
| 9. Sets | 4 | 8 | |
| 10. Relations | 4 | 8 | |
| 11. Functions | 4 | 8 | |
| 12. Common functions and their graphs | 4 | 8 | |
| 13. Introduction to mathematical reasoning | 4 | 8 | |
| 14. Fundamentals of Statistics | 4 | 8 | |
| 15. Introduction to Probability | 4 | 8 | |
| Total | 60 | 120 | |

1. Introduction to Numbers and Arithmetic [Ref 1: pg 1-33], [Ref 2: pg 1-17, pg 62-69, Pg 87]

Intended Learning Outcomes

- Describe factors, multiples, divisibility of integers and prime numbers
- Determine the above properties for given integers
- Carry out the prime factorization of an integer
- Use the above process to determine factors, greatest common divisor and least common multiple of integers
- Solve problems using these notions
- Identify rational numbers as terminating and recurring decimals
- Perform arithmetic operations on rational numbers
- Solve problems involving fractions
- Simplify expressions containing surds and basic mathematical operations
- Rationalize the denominator of an expression containing surds
- Recognize the existence of irrational numbers and identify surds as examples of such numbers
- Identify rational numbers and irrational numbers
- Identify number systems by the standard symbols \mathbb{N} , \mathbb{Z} , \mathbb{Q} , \mathbb{R} and $\mathbb{R} \setminus \mathbb{Q}$
- Determine the relations $<$, \leq , $>$ and \geq on real numbers
- Perform mathematical operations on real numbers and simplify expressions involving absolute values
- Describe intervals on the number line
- Describe and use rounding off to approximate real numbers

1.1. Natural numbers and Integers

- 1.1.1. Integers and their properties
- 1.1.2. Divisibility, prime numbers and factors
- 1.1.3. Unique factorization of natural numbers (integers)
- 1.1.4. Greatest common divisor and least common multiple

1.2. Rational numbers

- 1.2.1. Arithmetic with fractions

1.3. Real numbers

- 1.3.1. Existence of numbers that are not rational
- 1.3.2. The number line and the ordering of numbers
- 1.3.3. Basic mathematical operations
- 1.3.4. The order of operations
- 1.3.5. Absolute value of a real number
- 1.3.6. Intervals on the number line
- 1.3.7. Rounding off and approximate values of real numbers

2. Indices and Logarithms [Ref 1: pg 45-49, pg 54-69, pg 233-250], [Ref 2: pg 112-118]

Intended Learning Outcomes

- Write numbers of the form $\sqrt[n]{a}$ using indices
- Simplify expressions using rules of indices and logarithms
- Solve equations that involve indices
- Identify the relationship between logarithms and indices

- Solve equations that involve indices and/or logarithms
- Change the base of a logarithms and express numbers as powers of different bases

- 2.1 Indices
- 2.2 Integral and rational indices
- 2.3 Rules of indices
- 2.4 Logarithms
- 2.5 Rules of logarithms
- 2.6 Change of base of a logarithm

3. Number systems [Ref 1: pg 154-164], [Ref 2: pg 368-381]

Intended Learning Outcomes

- Describe the notion of a base and place value to give examples of number systems
- Convert a given number (in any of the bases 2, 8, 10 or 16) to a number in bases 2, 8, 10 and 16
- Describe how conversions between bases 2, 8 and 16 can be carried out easily and use it in computations and problem solving
- Perform mathematical operations on numbers represented in any of the bases 2, 8, 10 or 16
- Give an algorithmic description for addition, subtraction and multiplication in base 2

- 3.1 Place value and representation of numbers in base 10
- 3.2 Representing numbers in different bases
- 3.3 Binary, octa-decimal and hexadecimal numbers
 - 3.3.1 Conversion between these number systems
- 3.4 Mathematical operations in different basses

4. Ratios and Proportions [Ref 1: pg 34-44], [Ref 2: pg 24-34, pg 38-53, pg 199-215]

Intended Learning Outcomes

- Convert ratios into proportions and vice versa
- Determine the proportion and ratio of a quantity
- Manipulate ratios and proportions and solve problems
- Describe a percentage of a quantity and use it in expressing values such as rates, profit, loss and tax
- Perform computations related to percentages of profit and loss
- Perform computations related to tax and discount
- Perform computations involving simple interest and compound interest and compare them
- Perform computations related to velocity, work and time and volume and time
- Solve problems involving rate of change

- 4.1. Ratios
- 4.2. Proportions
- 4.3. Introduction to Percentages and Interest Rates
 - 4.3.1. Percentage of profit and loss
 - 4.3.2. Working with tax and discount
 - 4.3.3. Calculation of simple interest and compound interest
- 4.4. Time Related Problems

- 4.4.1. Distance and time
- 4.4.2. Work and time
- 4.4.3. Volume and time

5. Algebraic Expressions [Ref 1: pg 45-53, pg 70-113], [Ref 2: pg 72-86]

Intended Learning Outcomes

- Identify $\frac{1}{x^a}$ as x^{-a}
- Simplify algebraic expressions, including fractions and indices
- Expand binomial expressions $(x \pm y)^n$
- Recognize expansions of $(x \pm y)^n$ for $n = 2, 3$
- Factorize algebraic expressions
- Manipulate formulas to express one variable in terms of others

- 5.1. Introduction to algebraic expressions
- 5.2. Manipulating algebraic expressions
- 5.3. Expanding and factorizing algebraic expressions
- 5.4. Working with formulas

6. Equations [Ref 1: pg 114-125], [Ref 2: pg 88-111]

Intended Learning Outcomes

- Construct and solve linear equations
- Recognize the need to use the quadratic formula to solve quadratic equations
- Use factorization and completion of squares to solve quadratic equations
- Derive and use the formula $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ to obtain the solutions to the quadratic equation $ax^2 + bx + c = 0$
- Describe the meaning of the solutions to the quadratic equation $ax^2 + bx + c = 0$ graphically
- Construct and solve quadratic equations
- Solve a pair of simultaneous equations in two unknowns by the elimination and substitution methods
- Construct a pair of simultaneous equations based on a given situation and determine the solutions
- Graphically explain the solution to a system of linear equations in two unknowns
- Solve equations of the form $|ax + b| = c$

- 6.1. Solving quadratic equations
- 6.2. Solving simultaneous equations
 - 6.2.1. Elimination method
 - 6.2.2. Substitution method
 - 6.2.3. Graphical interpretation
- 6.3. Equations involving absolute values

7. Inequalities [Ref 2: pg 174-178]

Intended Learning Outcomes

- Describe and use basic rules of inequalities
- Accept and use the inequalities $x^2 \geq 0$, $|x| \geq 0$
- Determine the solution to an inequality of the form $ax + b \gtrless c$ and graphically represent the solution set on the real line
- Solve a system of two linear inequalities and graphically interpret the solution
- Solve inequalities of the form $|ax + b| \gtrless c$ and graphically interpret the solutions
- Construct inequalities based on some information and determine the solution

7.1. Rules of inequalities

7.2. Solutions to an inequality

7.3. Systems of inequalities

7.4. Inequalities involving absolute value

8. Measurements [Ref 1: pg 251-278], [Ref 2: pg 130-150, pg 216-222, pg 289-320]

Intended Learning Outcomes

- Determine the perimeter and area bounded by triangles, quadrilaterals, circles and sectors of a circle
- Determine the perimeter and area of compound objects made of triangles, quadrilateral and sectors
- State the volume and surface area of a cube, cuboid, right pyramid (with triangular faces and square base), right circular cone, right circular cylinder and sphere
- Describe the surface area of the above solids by means of nets
- Perform computations and solve problems related to the surface area and volume of the above solids and compound shapes made of these solids
- Describe trigonometric ratios of a right angled triangle
- Use tables and a calculator to determine the values of the trigonometric ratios of a given angle and to determine the angle with a given trigonometric ratio
- Perform calculations related to trigonometric ratios
- Solve problems using trigonometric ratios, including that involve angles of elevation and depression

8.1. Perimeter, area and volume of objects of different shapes

8.1.1. Problems with compound shapes

8.2. Trigonometric ratios

8.2.1. Problems involving angles of elevation and depression

9. Sets [Ref 1: pg 141-153], [Ref 2: pg 356-367]

Intended Learning Outcomes

- Identify different methods of denoting sets
- Illustrate properties of set algebra using labeled Venn-diagrams
- Identify sets and describe the membership relation and the set operations union, intersection, complement and relative complement

- Identify and describe the notion of a universal set (of a problem)
- Determine the subset and equality relations between sets
- Describe and determine the power set of a set
- Describe and use basic properties of set operations
- Draw Venn diagrams to represent up to three subsets of a universal set and label the regions
- Use Venn diagrams to solve problems
- Describe the notion of ordered pairs and the Cartesian product of two or more sets

9.1. The concept of a set

9.2. Operations on sets

9.2.1. Union, intersection, complement, relative complement and Cartesian product

9.3. Relations between sets

9.3.1. Subset, equality, proper subset

9.4. Power set

9.5. Laws of algebra of sets

9.6. Venn diagrams

9.6.1. Labeled Venn diagrams

9.6.2. Special Venn diagrams

10. Relations [Ref 2: pg 382-389]

Intended Learning Outcomes

- Describe the concept of a relation and describe it schematically
- Give examples of relations from the real world
- Describe the reflexive, symmetric, anti-symmetric and transitive properties of a relation
- Determine whether a given relation has any of the above properties
- Describe order relations and equivalence relations
- Give examples of order relations and equivalence relations

10.1. Introduction to Relations

10.2. Binary relations

10.3. Order relations (partial order and total order)

10.4. Equivalence relations

11. Functions [Ref 1: pg 176-188], [Ref 2: pg 382-389]

Intended Learning Outcomes

- Describe a function as a rule and a function as a relation
- Describe the properties one-to-one, onto and bijective of functions
- Determine whether a given function satisfies the above properties
- Describe recursive ways of specifying functions and ways of computing them
- Describe and determine the composite function
- Describe and determine the invertibility and the inverse of a function

11.1. The notion of a function

11.2. Functions as relations

11.3. Domain (inputs), codomain and range (outputs)

11.4. One-to-one functions and onto functions

- 11.5. Bijections
- 11.6. Algorithmic approach to compute functions
 - 11.6.1. Factorial function
 - 11.6.2. Recursion
- 11.7. Composite function
- 11.8. Inverse function
- 11.9. Graph of a function

12. Common functions and their Graphs [Ref 1: pg 189-250, pg 279-291], [Ref 2: pg 151-167]

Intended Learning Outcomes

- Describe different types of functions and solve problems involving functions
- Sketch graphs of exponential, logarithm, trigonometric and polynomial (up to quadratic) functions
- Sketch curves of rational functions using a suitable graphing tool
- Determine the properties of the graphs of even and odd functions
- Describe properties of the above functions and use them in sketching graphs

- 12.1. Exponential functions
- 12.2. Logarithm functions
- 12.3. Logarithm functions as inverses of exponential functions
- 12.4. Trigonometric functions
- 12.5. Polynomial functions
- 12.6. Rational functions
- 12.7. Even and odd functions

13. Introduction to mathematical reasoning [Ref 1: pg 165-175]

Intended Learning Outcomes

- Describe logical operations and their truth tables
- Describe the notion of a proof and give examples
- Write direct, contrapositive, contradiction or induction (in the case of natural numbers) proofs for simple mathematical statements

- 13.1. Propositions
- 13.2. Mathematical proofs
 - 13.2.1. Direct proofs
 - 13.2.2. Contra positive
 - 13.2.3. Method of contradiction
 - 13.2.4. Induction

14. Fundamentals of Statistics [Ref 1: pg 388-402], [Ref 2: pg 407-421]

Intended Learning Outcomes

- Apply underlying statistical concepts and definitions
- Identify methods of summarization and organization of data numerically and graphically

- Apply different types of frequency distributions in problem solving
- Define the measures of central tendency, measures of dispersion and measures of position
- Identify the normal curve

14.1. Introduction to Statistics

14.2. Descriptive Statistics

14.2.1. Types of data (qualitative, quantitative, continuous, discrete)

14.2.2. Scales of measurement (nominal, ordinal, interval, ratio)

14.3. Organization and summarization of data

14.3.1. Frequency table, cumulative frequency table, histogram, frequency polygon, cumulative frequency polygon

14.3.2. Bar charts, pie-charts, percentiles, 5- number summary, Box plot

14.4. Measures of location

14.4.1. Mean

14.4.2. Median

14.4.3. Mode

14.5. Measures of dispersion

14.5.1. Range

14.5.2. Inter quartile range

14.5.3. Variance

14.5.4. Standard deviation

15. Introduction to Probability [Ref 1: pg 403-411], [Ref 2: pg 422-427]

Intended Learning Outcomes

- Define the sample space and events related to random experiments
- Describe the concept of probability and discuss ways to assigning probabilities to events
- Explain compound (composite) events and ways to find the probabilities of such events
- Discuss relative probabilities with respect to reduced sample spaces
- Describe a convenient graphical tool to compute probabilities in a (finite) sequence of experiments
- Explain methods to find probabilities of events (and related conditional probabilities) for a given partition of the sample space
- Use Binomial distribution and apply it in real life problems

15.1. Introduction to probability

15.2. Sample space and events

15.3. Some basic theorems on the sample space

15.4. Mutually exclusive events

15.5. Conditional probability and tree diagrams

15.6. Independent events

15.7. Total probability law and Bayes' theorem

15.8. The binomial distribution

Teaching /Learning Methods:

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Final Examination

The final examination of the **Mathematics for ICT course** will be an e-test which will be conducted in the supervised mode. The e-test will consist of 50 Multiple Choice Questions (MCQs). The duration of the e-test is 2 hours.

References/ Reading Materials:

Main References

Ref 1: Foundation Maths, Anthony Croft, Robert Davison, Pearson, 2016

Ref 2: New Comprehensive Mathematics for 'O' Level 2nd Edition 2nd Edition, Alex Greer, Oxford University Press (November 1, 2014)

Ref 3: Cambridge IGCSE® and O Level Additional Mathematics Coursebook, Sue Pemberton, Cambridge University Press; 2 edition (March 7, 2018)

Additional Resources

Free books:

1. Fundamentals of Mathematics, Denny Burzynski, OpenStax CNX
2. Intermediate Algebra, Lynn Marecek, OpenStax
3. Spiral Workbook for Discrete Mathematics, Harris Kwong, Open SUNY (2015), ISBN 13: 9781942341161
4. A Gentle Introduction to the Art of Mathematics, Joseph E. Fields, Independent Publishers
5. Discrete Mathematics with Applications (4th Edition), Susanna S. Epp, Cengage Learning (August 4, 2010)

Other references:

1. Discrete Mathematics DeMYSTiFied, Steven G. Krantz, McGraw Hill
2. Cambridge O Level Mathematics Coursebook, Audrey Simpson, Cambridge University Press; 2 edition (November 23, 2016)
3. Intermediate Algebra, 13th Edition, Margaret L. Lial, John Hornsby, Terry McGinnis, Pearson, 2020
4. Basic College Mathematics, Julie Miller and Molly O'Neill and Nancy Hyde, McGraw-Hill Education; 3 edition (January 27, 2014)
5. Basic College Mathematics, 6th Edition, Elayn Martin-Gay, Pearson, 2019
6. New Grade 9-1 GCSE Maths Edexcel Student Book – Foundation, Coordination Group Publications Ltd (CGP) (17 May 2019)
7. New Grade 9-1 GCSE Maths AQA Student Book – Higher, Coordination Group Publications Ltd (CGP) (30 May 2018)