

Program Name : All Branches of Diploma in Engineering and Technology.

Program Code : CE/CR/CS/CH/PS/CM/CO/FC/W/DE/EJ/EN/EQ/ET/EX/IE/MU/EE/EP/EL/IS/IC/AE/FG/ME/PG/PT/DC/TX/TC/BC

Semester : First

Course Title : Fundamentals of ICT

Course Code : 22001

1. RATIONALE

In any typical business setup in order to carry out routine tasks related to create business documents, perform data analysis and its graphical representations and making electronic slide show presentations, the student need to learn various software are office automation tools like word processing applications, spreadsheets and presentations. They also need to use these tools for making their project reports and presentations. The objective of this course is to develop the basic competency in students for using these office automation tools to accomplish the job.

2. COMPETENCY

The aim of this course is to help the student to attain the following industry identified competency through various teaching learning experiences:

- Use computers for internet services, electronic documentation, data analysis and slide presentation.

3. COURSE OUTCOMES (COs)

The theory, practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following *industry oriented* COs associated with the above mentioned competency:

- Use computer system and its peripherals.
- Prepare business document using word processing tool.
- Interpret data and represent it graphically using spreadsheet.
- Prepare professional presentations.
- Use different types of web browsers.

4. TEACHING AND EXAMINATION SCHEME

Teaching Scheme	Credit (L+T+P)	Examination Scheme									
		Theory					Practical				
		Paper		Total		ESE		PA		Total	
L	T	P	ESE	PA	Total	Max	Min	Max	Min	Max	Min
2	4	--	--	--	--	25	10	25	10	50	20

(-/-): For the courses having ONLY practical examination, the PA has two components under practical marks i.e. the assessment of practicals (seen in section 6) has a weightage of 60% (i.e.15 marks) and micro-project assessment (seen in section 12) has a weightage of 40% (i.e.10 marks). This is designed to facilitate attainment of COs holistically, as there is no theory ESE.

Legends: L-Lecture; T – Tutorial/Teacher Guided Theory Practice; P - Practical; C – Credit, ESE - End Semester Examination; PA - Progressive Assessment; # No theory exam.

5. COURSE MAP (with sample COs, PrOs, UOs, ADOs and topics)
 This course map illustrates an overview of the flow and linkages of the topics at various levels of outcomes (details in subsequent sections) to be attained by the student by the end of the course, in all domains of learning in terms of the industry/employer identified competency depicted at the centre of this map.

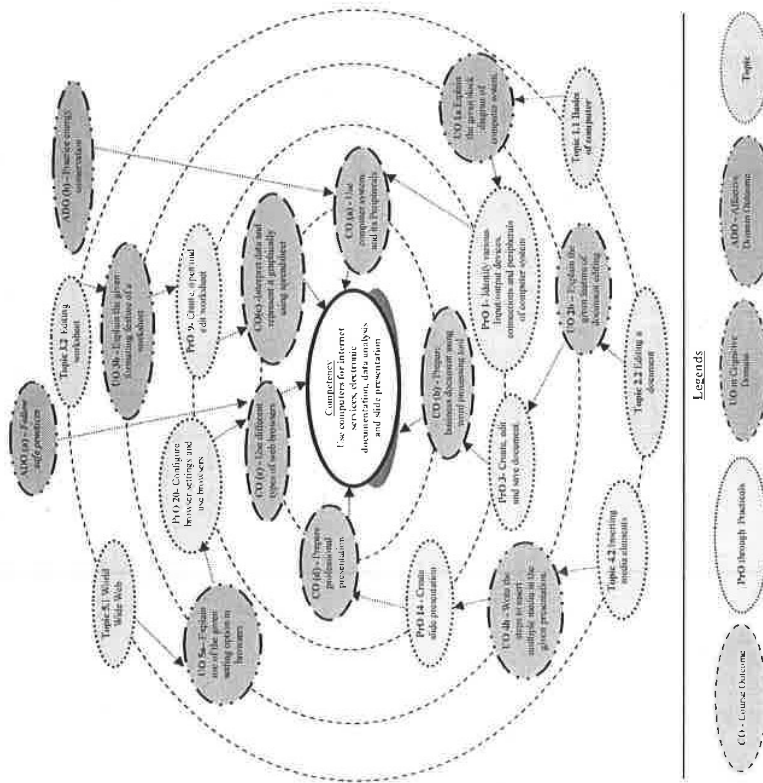


Figure 1 - Course Map

6. SUGGESTED PRACTICALS/ EXERCISES
 The practicals in this section are PrOs (i.e. sub-components of the COs) to be developed and assessed in the student for the attainment of the competency.

S. No.	Practical Outcomes (PrOs)	Unit No.	Approx. Hrs. required
1	Computer system and Operating system: Identify various input/output devices, connections and peripherals of computer system	1	1*



S. No.	Practical Outcomes (PrOs)	Unit No.	Approx. Hrs. required
2	Manage files and folders : Create, copy, rename, delete, move files and folder	I	1
3	Word Processing Create, edit and save document : apply formatting features on the text - line, paragraph	II	2*
4	Use bullets, numbering, page formatting	II	2
5	Insert and edit images and shapes, sizing, cropping, colour, background, group/ungroup	II	2
6	Insert and apply various table formatting features on it.	II	2
7	Apply page layout features i. Themes, page background, paragraph, page setup ii. Create multicolumn page iii. Use different options to print the documents	II	2*
8	Use mail merge with options.	II	1
	Spreadsheets		
9	Create, open and edit worksheet i. Enter data and format it, adjust row height and column width ii. Insert and delete cells, rows and columns iii. Apply wrap text, orientation feature on cell.	III	2*
10	Insert formulas, "IF" conditions, functions and named ranges in worksheet.	III	2
11	Apply data Sort, Filter and Data Validation features.	III	2*
12	Create charts to apply various chart options.	III	2
13	Apply Page setup and print options for worksheet to print the worksheet.	III	1
	Presentation Tool		
14	Create slide presentation i. Apply design themes to the given presentation ii. Add new slides and insert pictures/images, shapes	IV	2*
15	i. Add tables and charts in the slides. ii. Run slide presentation in different modes iii. Print slide presentation as handouts	IV	2
16	Apply animation effects to the text and slides.	IV	1
17	Add audio and video files in the given presentation	IV	1
	Internet Basics		
18	Configure Internet connection	V	1
19	Use internet for different web services.	V	2*
20	Configure browser settings and use browsers.	V	1*
	Total		32

*: compulsory practicals to be performed.

Note

i. A suggestive list of practical UOs is given in the above table, more such PrOs can be added to attain the COs and competency.

ii. Hence, the 'Process' and 'Product' related skills associated with each PrOs of the laboratory/workshop/field work are to be assessed according to a suggested sample given below:

S. No.	Performance Indicators	Weightage in %
a.	Use of Appropriate tool to solve the problem (Process)	40
b.	Quality of output achieved (Product)	30
c.	Complete the practical in stipulated time	10
d.	Answer to sample questions	10
e.	Submit report in time	10
	Total	100

The above PrOs also comprise of the following social skills/attitudes which are Affective Domain Outcomes (ADOs) that are best developed through the laboratory/field based experiences:

- Follow safety practices.
- Practice good housekeeping.
- Demonstrate working as a leader/a team member.
- Maintain tools and equipment.
- Follow ethical practices.

The ADOs are not specific to any one PrO, but are embedded in many PrOs. Hence, the acquisition of the ADOs takes place gradually in the student when s/he undertakes a series of practical experiences over a period of time. Moreover, the level of achievement of the ADOs according to Krathwohl's Affective Domain Taxonomy should gradually increase as planned below:

- 'Valuing Level' in 1st year
- 'Organising Level' in 2nd year
- 'Characterising Level' in 3rd year.

7. MAJOR EQUIPMENT/ INSTRUMENTS REQUIRED

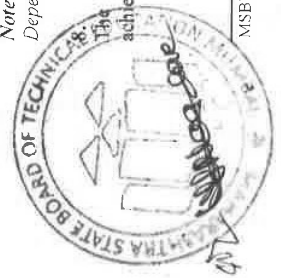
The major equipment with broad specification mentioned here will usher in uniformity in conduct of PrOs, as well as aid to procure equipment by authorities concerned.

S. No.	Equipment Name with Broad Specifications	Exp. S.No.
1	Computer system with all necessary components like: motherboard, random access memory (RAM), read-only memory (ROM), Graphics cards, sound cards, internal hard disk drives, DVD drive, network interface card.	1
2	Double side printing laser printer.	1,6,12,13
3	Hubs, Switches, Modems.	1, 16,17
4	Any operating system.	2 to18
5	Any Office Software.	2 to 15
6	Any browser.	16,17, 18

Note: There are no specifications fixed for the above listed systems, devices and instruments. Depending on the availability in the institute they can be utilized for the purpose.

UNDERPINNING THEORY COMPONENTS

The following topics/subtopics are to be taught and assessed in order to develop UOs for achieving the COs to attain the identified competency.



Unit	Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
Unit – I Introduction to Computer System	<p>1a. Explain the given block diagram of computer system.</p> <p>1b. Classify the given type of software</p> <p>1c. Explain characteristics of the specified type of network.</p> <p>1d. Describe procedure to manage a file /folder in the given way.</p> <p>1e. Describe application of the specified type of network connecting device</p>	<p>1.1 Basics of Computer System: Overview of Hardware and Software: block diagram of Computer System, Input/Output unit CPU, Control Unit, Arithmetic logic Unit (ALU), Memory Unit</p> <p>1.2 Internal components: processor, motherboards, random access memory (RAM), read-only memory (ROM), video cards, sound cards and internal hard disk drives)</p> <p>1.3 External Devices: Types of input/output devices, types of monitors, keyboards, mouse, printers: Dot matrix, Inkjet and Laserjet, plotter and scanner, external storage devices CD/DVD, Hard disk and pen drive</p> <p>1.4 Application Software: word processing, spreadsheet, database management systems, control software, measuring software, photo-editing software, video-editing software, graphics manipulation software</p> <p>System Software compilers, linkers, device drivers, operating systems and utilities</p> <p>1.5 Network environments: network interface cards, hubs, switches, routers and modems, concept of LAN, MAN, WAN, WLAN, Wi-Fi and Bluetooth</p> <p>1.6 Working with Operating Systems: Create and manage file and folders, Copy a file, renaming and deleting of files and folders, Searching files and folders, application installation, creating shortcut of application on the desktop.</p>
Unit – II Word Processing	<p>2a. Write steps to create the given text document.</p> <p>2b. Explain the specified feature for document editing.</p> <p>2c. Explain the given page setup features of a document.</p> <p>2d. Write the specified table formatting feature.</p>	<p>2.1. Word Processing: Overview of Word processor Basics of Font type, size, colour, Effects like Bold, italic, underline, Subscript and superscript, Case changing options, Previewing a document, Saving a document, Closing a document and exiting application.</p> <p>2.2. Editing a Document: Navigate through a document, Scroll through text, Insert and delete text, Select text, Undo and redo commands, Use drag and drop to move text, Copy, cut and paste, Use the clipboard, Clear formatting, Format and align text, Formatting Paragraphs, Line and paragraph spacing using FIND and REPLACE, Setting link</p>

Unit	Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
		<p>spacing, add bullet and numbers in lists, add borders and shading, document views, Page settings and margins, Spelling and Grammatical checks</p> <p>2.3. Changing the Layout of a Document: Adjust page margins, Change page orientation, Create headers and footers, Set and change indentations, Insert and clear tabs.</p> <p>2.4. Inserting Elements to Word Documents: Insert and delete a page break, Insert page numbers, Insert the date and time, Insert special characters (symbols), Insert a picture from a file, Resize and reposition a picture</p> <p>2.5. Working with Tables: Insert a table, Convert a table to text, Navigate and select text in a table, Resize table cells, Align text in a table, Format a table, Insert and delete columns and rows, Borders and shading, Repeat table headings on subsequent pages, Merge and split cells.</p> <p>2.6. Working with Columned Layouts and Section Breaks: a Columns, Section breaks, Creating columns, Newsletter style columns, Changing part of a document layout or formatting, Remove section break, Add columns to remainder of a document, Column widths, Adjust column spacing, Insert manual column breaks.</p>
Unit – III Spreadsheets	<p>3a. Write steps to create the given spreadsheet.</p> <p>3b. Explain the specified formatting feature of a worksheet.</p> <p>3c. Write steps to insert formula and functions in the given worksheet.</p> <p>3d. Write steps to create charts for the specified data set.</p> <p>3e. Explain steps to perform advance operation on the given data set.</p>	<p>3.1. Working with Spreadsheets: Overview of workbook and worksheet, Create Worksheet Entering sample data, Save, Copy Worksheet, Delete Worksheet, Close and open Workbook</p> <p>3.2. Editing Worksheet: Insert and select data, adjust row height and column width, delete, move data, insert rows and columns, Copy and Paste, Find and Replace, Spell Check, Zoom In-Out, Special Symbols, Insert Comments, Add Text Box Undo Changes, - Freeze Panes, hiding/unhiding rows and columns.</p> <p>3.3. Formatting Cells and sheet: Setting Cell Type, Setting Font, Text options, Rotate Cells, Setting Colors, Text Alignments, Merge and Wrap, apply Borders and Shades, Sheet Options, Adjust Margins, Page</p>



Unit	Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
Unit- IV Presentation Tool	<p>4a. Write the steps to create the specified slide presentation.</p> <p>4b. Write the steps to insert multiple media in the given presentation.</p> <p>4c. Write steps to apply table features in the given presentation</p> <p>4d. Write steps to manage charts in the given presentation</p>	<p>Orientation, Header and Footer, Insert Page Breaks, Set Background.</p> <p>3.4. Working with Formula: Creating Formulas, Copying Formulas, Common spreadsheet Functions such as sum, average, min, max, date, In, And, or, mathematical functions such as sqrt, power, applying conditions using IF.</p> <p>3.5. Working with Charts: Introduction to charts, overview of different types of charts, Bar, Pie, Line charts, creating and editing charts. Using chart options: chart title, axis title, legend, data labels, Axes, grid lines, moving chart in a separate sheet.</p> <p>3.6. Advanced Operations: Conditional Formatting, Data Filtering, Data Sorting, Using Ranges, Data Validation, Adding Graphics, Printing Worksheets, print area, margins, header, footer and other page setup options.</p> <p>4.1 Creating a Presentation: Outline of an effective presentation, Identify the elements of the User Interface, Starting a New Presentation Files, Creating a Basic Presentation, Working with textboxes, Apply Character Formats, Format Paragraphs, View a Presentation, Saving work, creating new Slides, Changing a slide Layout, Applying a theme, Changing Colours, fonts and effects, apply custom Colour and font theme, changing the background, Arrange Slide sequence.</p> <p>4.2 Inserting Media elements: Adding and Modifying Graphical Objects to a Presentation - Insert Images into a Presentation, insert audio clips, video/animation, Add Shapes, Add Visual Styles to Text in a Presentation, Edit Graphical Objects on a Slide, Format Graphical Objects on a Slide, Group Graphical Objects on a Slide, Apply an Animation Effect to a Graphical Object, Add Transitions, Add Speaker Notes, Print a Presentation.</p> <p>4.3 Working with Tables: Insert a Table in a Slide, Format Tables, and Import Tables from Other Office Applications.</p>

Unit	Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
Unit- V Basics of Internet	<p>5a. Explain use of the given setting option in browsers.</p> <p>5b. Explain features of the specified web service.</p> <p>5c. Describe the given characteristic of cloud.</p> <p>5d. Explain the specified option used for effective searching in search engine.</p>	<p>4.4 Working with Charts: Insert Charts in a Slide, Modify a Chart, Import Charts from Other Office Applications.</p> <p>5.1 World Wide Web: Introduction, Internet, Intranet, Cloud, Web Sites, web pages, URL, web servers, basic settings of web browsers-history, extension, default page, default search engine, creating and retrieving bookmarks, use search engines effectively for searching the content.</p> <p>5.2 Web Services: e-Mail, Chat, Video Conferencing, e-learning, e-shopping, e-Reservation, e-Groups, Social Networking.</p>

Note: To attain the COs and competency, above listed UOs need to be undertaken to achieve the 'Application Level' and above of Bloom's 'Cognitive Domain Taxonomy'.

9. **SUGGESTED SPECIFICATION TABLE FOR QUESTION PAPER DESIGN**
- Not Applicable -

10. **SUGGESTED STUDENT ACTIVITIES**

Other than the classroom and laboratory learning, following are the suggested student-related *co-curricular* activities which can be undertaken to accelerate the attainment of the various outcomes in this course:

- Prepare journal of practicals.
- Prepare a sample document with all word processing features.(Course teacher shall allot appropriate document type to each student)
- Undertake micro projects

11. **SUGGESTED SPECIAL INSTRUCTIONAL STRATEGIES (if any)**

These are sample strategies, which the teacher can use to accelerate the attainment of the various outcomes in this course:

- Massive open online courses (*MOOCs*) may be used to teach various topics/sub topics.
- 'L' in item No. 4 does not mean only the traditional lecture method, but different types of teaching methods and media that are to be employed to develop the outcomes.
- About 15-20% of the topics/sub-topics which is relatively simpler or descriptive in nature is to be given to the students for *self-directed learning* and assess the development of the COs through classroom presentations (see implementation guideline for details).
- With respect to item No.10, teachers need to ensure to create opportunities and provisions for *co-curricular activities*.
- Guide student(s) in undertaking micro-projects.
- Guide student(s) in undertaking various activities in the lab/workshop.
- Demonstrate students thoroughly before they start doing the practice.
- Show video/animation films for handling/functioning of instruments.
- Observe continuously and monitor the performance of students in Lab.



12. SUGGESTED MICRO-PROJECTS

Only one micro-project is planned to be undertaken by a student assigned to him/her in the beginning of the semester. S/he ought to submit it by the end of the semester to develop the industry oriented COs. Each micro-project should encompass two or more COs which are in fact, an integration of POs, UOs and ADOs. The micro-project could be industry application based, internet-based, workshop-based, laboratory-based or field-based. Each student will have to maintain dated work diary consisting of individual contribution in the project work and give a seminar presentation of it before submission. The total duration of the micro-project should not be less than **16 (sixteen) student engagement hours** during the course.

In the first four semesters, the micro-project could be group-based. However, in higher semesters, it should be individually undertaken to build up the skill and confidence in every student to become problem solver so that s/he contributes to the projects of the industry. A suggestive list is given here. Similar micro-projects could be added by the concerned faculty:

- Word documents:** Prepare Time Table, Application, Notes, Reports. (Subject teacher shall assign a document to be prepared by the each students)
- Slide Presentations:** Prepare slides with all Presentation features such as: classroom presentation, presentation about department, presentation of report. (Subject teacher shall assign a presentation to be prepared by the each student).
- Spreadsheets:** Prepare Pay bills, tax statement, student's assessment record using spreadsheet. (Teacher shall assign a spreadsheet to be prepared by each student).

13. SUGGESTED LEARNING RESOURCES

S. No.	Title of Book	Author	Publication
1	Computer Fundamentals	Goel, Anita	Pearson Education, New Delhi, 2014, ISBN: 978-8131733097
2	Computer Basics Absolute Beginner's Guide, Windows 10	Miller, Michael	QUE Publishing, 8th edition August 2015, ISBN: 978-0789754516
3	Linux: Easy Linux for Beginners	Alvaro, Felix	CreatevSpace Independent Publishing Platform- 2016, ISBN: 978-1533683731
4	Microsoft Office 2010: On Demand	Johnson, Steve	Pearson Education, New Delhi India, 2010; ISBN: 9788131770641
5	Microsoft Office 2010 for Windows: Visual Quick Start	Schwartz, Steve	Pearson Education, New Delhi India, 2012, ISBN: 9788131766613
6	OpenOffice.org for Dummies	Leete, Gurdy, Finkelstein Ellen, Mary Leete	Wiley Publishing, New Delhi, 2003 ISBN: 978-0764542220

14. SOFTWARE/LEARNING WEBSITES

- <https://www.microsoft.com/en-in/learning/office-training.aspx>
- <http://www.tutorialsforopenoffice.org/>
- https://s3-ap-southeast-1.amazonaws.com/r4tue295xy0d/Special_Edition_Using_StarOffice_6_0.pdf

