

GUJARAT TECHNOLOGICAL UNIVERSITY (GTU)**Competency-focused Outcome-based Green Curriculum-2021 (COGC-2021)**1st Semester**Course Title: Basics of Information and Communication Technology (ICT)**

(Course Code: 4300010)

Diploma programme in which this course is offered	Semester in which offered
Electronics & Communication Engineering, Electrical Engineering, Civil Engineering	First

1. RATIONALE

In this era of the 21st century, information and communication technology (ICT) is used in every walk of life. Today, the potential of ICT is extensively used in scientific, business, industrial and educational areas. This course envisages developing basic skill sets in the use of Information and Communication Technology. It will provide the student hands-on experience on different application software used for office automation and improve day-to-day problem-solving skills using online resources for creating business documents, data analysis, and graphical representations. It will also enable the student to use Internet services for different communication.

2. COMPETENCY

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

- **Develop basic skills in ICT for creating professional documents, analyzing data, preparing multimedia presentations, and using internet services.**

3. COURSE OUTCOMES (COs)

The practical exercises, the underpinning knowledge and the relevant soft skills associated with the identified competency are to be developed in the student for the achievement of the following COs:

- Classify various computer hardware, peripherals, and software for various purposes.
- Prepare professional documents, analyzing data, creating a presentation
- Use computer Networks for data and device sharing.
- Use Internet services for various applications.
- Create a webpage using HTML

4. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P/2)	Examination Scheme				Total Marks
				Theory Marks		Practical Marks		
L	T	P	C	CA	ESE	CA	ESE	
0	-	4	2	0	0	25*	25	

(*): For this practical only course, 25 marks under the practical CA has two components i.e. the assessment of micro-project, which will be done out of 10 marks and the remaining 15 marks are for the assessment of practical. 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, **CA** - Continuous Assessment; **ESE** - End Semester Examination.

5. SUGGESTED PRACTICAL EXERCISES

The following practical outcomes (PrOs) are the sub-components of the COs. These PrOs need to be attained to achieve the COs.

S. No.	Practical Outcomes (PrOs)	Unit No.	Approx. Hrs. Required
1	Identify various parts of computer systems & peripherals.	I	02
2	Install Windows/linux Operating System.	I	04
3	Use various tools / utilities available in accessories of Windows/Linux OS.	I	04
4	Install printer, scanner, web cam, projector with the computer system.	I	02
5	Create a text document incorporating different formatting features, inserting images and tables as per given sample	II	02
6	Create a text document setting page layout features, backgrounds, shapes and smart arts as per given sample.	II	02
7	Use mail merge feature for sending invitation letter for expert lecture to 10 industries.	II	04
8	Create spreadsheet, analyse data using formulas and functions and present it through charts.	II	04
9	Create Pay bills/ Pay slips/ Electricity bills/student mark sheets using spreadsheet and take a print out.	II	04
10	Create a professional presentation incorporating various formatting features, inserting media and action buttons.	II	04
11	Prepare & test Ethernet LAN Cable for connecting computers & peripherals using PING command.	III	04
12	Connect two Computers/laptops and transfer/share data using Bluetooth/Wifi/cable.	III	04
13	Connect a Remote Desktop and share data using any remote login method.	III	02
14	Create an E-Mail account for sending and receiving mail.	IV	02
15	Create an online form for registration of students (for any activity) and download its response.	IV	04
16	Organize an online video meeting inviting 10 students.	IV	02
17	Develop HTML/Web page using various formatting tags as per given sample.	V	06
	Total		56

Note

- i. *More **Practical Exercises** can be designed and offered by the respective course teacher to develop the industry relevant skills/outcomes to match the COs. The above table is only a suggestive list.*
- ii. *Care must be taken in assigning and assessing study report as it is a first year study report. Study report, data collection and analysis report must be assigned in a group. Teacher has to discuss about type of data (which and why) before group start their market survey.*

*The following are some **sample** 'Process' and 'Product' related skills (more may be added/deleted depending on the course) that occur in the above listed **Practical Exercises** of this course required which are embedded in the COs and ultimately the competency.*

S. No.	Sample Performance Indicators for the PrOs	Weightage in %
1	Lab Records	05
2	Question answer or Writing steps exercise	20
3	Executing of exercise	40
4	Printout/ Result	20
5	Viva voice	15
Total		100

6. MAJOR EQUIPMENT/ INSTRUMENTS REQUIRED

These major equipment with broad specifications for the PrOs is a guide to procure them by the administrators, so uniformity for conducting practical can be maintained across the state.

S. No.	Equipment Name with Broad Specifications	PrO. No.
1	Computer with basic configuration and Internet Facility	All
2	Word Processing Software	All
3	Data Analysis Software	All
4	Presentation Software	All
5	Anti Virus Software	All
6	Window/ Linux as operating system	All
7	Gujarati Indic	ALL

7. AFFECTIVE DOMAIN OUTCOMES

The following **sample** Affective Domain Outcomes (ADOs) are embedded in many of the above-mentioned COs and PrOs. More could be added to fulfil the development of this course competency.

- a) Follow safety practices.
- b) Practice good housekeeping.
- c) Demonstrate working as a leader/a team member.

- d) Maintain tools and equipment
- e) Follow ethical practices.

The ADOs are best developed through the laboratory/field-based exercises. Moreover, the level of achievement of the ADOs according to Krathwohl's 'Affective Domain Taxonomy' should gradually increase as planned below:

- i. 'Valuing Level' in 1st year
- ii. 'Organization Level' in 2nd year.
- iii. 'Characterization Level' in 3rd year.

8. UNDERPINNING THEORY

The major underpinning theory is given below based on the higher level UOs of *Revised Bloom's taxonomy* that are formulated for development of the COs and competency. If required, more such UOs could be included by the course teacher to focus on attainment of COs and competency.

Unit	Unit Outcomes (UOs) (4 to 6 UOs at different levels)	Topics and Sub-topics
Unit – I Basics of Computer Systems	1a. Explain functions of CPU, ALU and memory unit of a computer system 1b. Write the steps to install Windows and Linux operating Systems in virtual box	1.1 Computer system block diagram, Concept of Hardware and Software 1.2 CPU, Control Unit, Arithmetic logic Unit(ALU), Memory Unit, Power Unit and Interfacing Ports. 1.3 Input Output unit: Monitor, keyboard, External Hard disk, Mouse Printers, Plotters, Scanner, Projectors, Webcam, Mic, etc. 1.4 Operating system concepts, purpose and functions 1.5 Operations of Windows and Linux 1.5.1 Installation on PC / virtual box 1.5.2 Configuration 1.5.3 Files and Folder Operation 1.5.4 Basic Terminal Commands 1.5.5 Installation of various Application Software
Unit – II Documentations	2a. Write steps for text formatting, page Setup features, checking spelling and grammar, with header and footer for a Word Document 2b. Write steps for inserting graphics/clipart, Shapes and Table in a Word Document 2c. Write steps to mail merge documents for inviting students 2d. Write steps for creating a excel	Using Text Processing 2.1 Basics of Font type, size, colour, Effects and other text formatting features 2.2 Page settings and margins including header and footer in word document. 2.3 Spelling and Grammatical checks 2.4 Table and its options, Inserting rows or columns, merging and splitting cells, Arithmetic Calculations in a Table.

Unit	Unit Outcomes (UOs) (4 to 6 UOs at different levels)	Topics and Sub-topics
	<p>worksheet and representing in the form of chart.</p> <p>2e. Write steps to setup page as per given layout and print an excel sheet</p> <p>2f. Write steps for creating presentation and apply basic formatting features using Spreadsheet.</p> <p>2g. Write steps to insert objects ,clips, video, audio, with special effects and hyperlink in a multimedia presentation.</p> <p>2h. Write steps for installing Indic IME Gujarati for creating a document.</p>	<p>2.5 Working with pictures, Drawings and WordArt</p> <p>2.6 Mail merge</p> <p>Using Spreadsheet</p> <p>2.7 Introduction to data, Cell address, Excel Data Types, formatting, number, text and date Concept of hyperlink in Worksheet</p> <p>2.8 Understanding formulas, Operators and Common spreadsheet functions</p> <p>2.9 Types of graphics : Word art, auto shapes ,Images ,charts</p> <p>2.10 Concept of print area, margins, header, footer and other page setup options</p> <p>2.11 Overview of Spreadsheets and how to create Spreadsheets</p> <p>Using Professional Presentation</p> <p>2.12 Creating new Slides, Working with text boxes, fonts, tables, Layouts, themes, effects, background and Colours</p> <p>2.13 Selecting, deleting, moving, copying, resizing and arranging objects.</p> <p>2.14 Working with drawing tools, Applying shape or picture styles, Applying object borders, object fill, object effects, clip art collection and modifying clip art</p> <p>2.15 Embed a video, Link to a video, Size a video, Video playback options.</p> <p>2.16 Configuring a sound playback, Assigning sound to an object, Adding a digital music sound track, Transition effects and timings</p> <p>Using Gujarati IME</p> <p>2.17 Installation of Gujarati IME Software</p> <p>2.18 How to change language English to Gujarati</p> <p>2.19 Introduction about the Gujarati keyboards</p> <p>2.20 Introduction about the Gujarati</p>

Unit	Unit Outcomes (UOs) (4 to 6 UOs at different levels)	Topics and Sub-topics
		IME and create Documents in Gujarati
Unit– III Computer Networks and Data Sharing	3a. State the advantages of Computer Network in your lab 3b. Create a layout of computer network topology in the lab 3c. Analyse network specifications(Devices,Cables & Connectors) ,IP addressing scheme of Computer Network of your lab 3d. Write steps of various remote login techniques 3e. Write steps of various Data Transfer Techniques	3.1 Basics of Computer Networks 3.1.1 Needs 3.1.2 Types 3.1.3 Topologies 3.1.4 Components 3.2 Network Cables and Connectors 3.3 Overview of Network Devices 3.4 IP Addresses Basics 3.5 Computer and Peripheral sharing in LAN 3.6 Remote Login 3.6.1 Remote Desktop 3.6.2 Telnet 3.6.3 FTP 3.7 Data Transfer or sharing 3.7.1 Using LAN 3.7.2 Bluetooth 3.7.3 Wi-Fi 3.7.3 Modems
Unit– IV Internet Services	4a. Use various internet applications. 4b. Create Online form for data collection. 4c. Write various methods to secure your personal computer	4.1 Internet 4.2 Web Browser and Browsing Websites 4.3 Search engines 4.4 WWW and URL 4.5 E-mail 4.6 Video-Conferencing/online Meet 4.7 Online Games 4.8 E-Commerce 4.9 Forums 4.10 Online Data Management 4.10.1 Online Quiz 4.10.2 Online Forms 4.10.3 Online Assignment. 4.11 Cyber security 4.11.1 Threats in Internet : Virus, Malware 4.11.2 Preventing Tools : Antivirus, Firewall
Unit-V Designing of Web pages, Blogs and Websites	5a. Write structure of a HTML page 5b. Write formatting tags as per the sample given page. 5c. Write tags to insert a table in a HTML page	Working with HTML 5.1 Structure of HTML Page 5.2 Inserting formatting tags for Text 5.3 Font color, size, style, Alignment 5.4 Margin with body tag, background and text colour

Unit	Unit Outcomes (UOs) (4 to 6 UOs at different levels)	Topics and Sub-topics
	5d. Write tags to insert image in a HTML page	5.5 Ordered and unordered lists 5.6 Tables – basic structure, Using TD, TR, TH tags, use of basic elements in table : border, cell padding, cell spacing, width, caption, align, bg color 5.7 Images in web page: inserting and formatting of images using SRC, border, Vspace, Hspace, align, ALT, height, width and background in HTML page

9. SUGGESTED SPECIFICATION TABLE FOR QUESTION PAPER DESIGN

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
			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: Students should perform following activities in group and prepare reports of about 5 pages for each activity. They should also collect/record physical evidences for their (student's) portfolio which may be useful for their placement interviews:

- Undertake micro-projects in team/individually.
- Encourage Students for creating and designing forms related to Departmental work.
- Encourage students to participate in the Microsoft-Office Specialist World Championship.
- Students are encouraged to register themselves in various MOOCs such as: Swayam, edx, Coursera, Udemy etc to further enhance their learning.
- Undertake a market survey of different Version like new and improved desktop apps, as well as mobile apps and a web-based alternative for both Windows and Mac users.

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:

- Guide student(s) in undertaking micro-projects.
- Diagnosing Essential Missed Learning concepts that will help for students to improve their performance.
- Guide Students to do Personalized learning so that students can understand the course material at his or her pace.
- Encourage students to do Group learning by sharing so that learning can be enhanced.

- e) About **20% of the topics/sub-topics** which are relatively simpler or descriptive in nature is to be given to the students for **self-learning**, but to be assessed using different assessment methods.

Guide students on addressing the issues on environment and sustainability using the knowledge of this course

12. SUGGESTED MICRO-PROJECTS

Only one micro-project is planned to be undertaken by a student that needs to be assigned to him/her in the beginning of the semester. In the first four semesters, the micro-project are group-based (group of 3 to 5). However, **in the fifth and sixth semesters**, the number of students in the group should **not exceed three**.

The micro-project could be industry application based, internet-based, workshop-based, laboratory-based or field-based. Each micro-project should encompass two or more COs which are in fact, an integration of PrOs, UOs and ADOs. 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 duration of the microproject should be about **14-16 (fourteen to sixteen) student engagement hours** during the course. The students ought to submit micro-project by the end of the semester to develop the industry-oriented COs.

A suggestive list of micro-projects is given here. This has to match the competency and the COs. Similar micro-projects could be added by the concerned course teacher:

MICRO PROJECT 1: Prepare the following text documents

1. Prepare your Resume as per the given sample
2. Draft a letter addressed to the principal getting permission to avail leave.\
3. Develop a handout for Unit-1 of 10-pages with the table of content (INDEX).

MIICRO PROJECT 2: / Prepare the following spreadsheets.

1. Prepare a Timetable for your current semester.
2. Prepare a Mark sheet with grades for your final examination as per the given sample.

MICRO PROJECT 3: Prepare 15-20 slides presentation having Department and Institute Information.

MICRO PROJECT 4: Develop a webpage for your department as per the given sample.

13. SUGGESTED LEARNING RESOURCES

S. No.	Title of Book	Author	Publication with place, year and ISBN
1	Computer Course	R Taxali	Tata McGraw Hills. New Delhi.
2	World Wide Web design with HTML	Xavier	Tata McGraw Hills. New Delhi.
3	INFORMATION TECHNOLOGY	Dennis P. Curtin, Kim Foley, Kunal Sen, Cathy Morin	Tata McGraw Hills. New Delhi.
4	Fundamentals of	V. Rajaraman	PHI; 5th edition (1 December 2011)

S. No.	Title of Book	Author	Publication with place, year and ISBN
	Computers		
5	Data communication and networking	Behrouz A Forouzan	Tata McGraw Hills. New Delhi.

14. SOFTWARE/LEARNING WEBSITES

- a) www.tutorialspoint.com
- b) www.wix.com
- c) www.blogger.com
- d) www.forms.google.com

15. PO-COMPETENCY-CO MAPPING

Semester-I	Basics of Information and Communication Technology (ICT) (Course Code: 4300010)						
	POs						
Competency & Course Outcomes	PO 1 Basic & Discipline specific knowledge	PO 2 Problem Analysis	PO 3 Design/development of solutions	PO 4 Engineering Tools, Experimentation & Testing	PO 5 Engineering practices for society, sustainability & environment	PO 6 Project Management	PO 7 Life-long learning
Competency <i>Use Fundamentals of Computer in various engineering applications</i>							
Course Outcomes CO a) Classify various computer hardware, peripherals and software for various purposes	3	3	2	3	2	2	2
CO b) Prepare professional documents, analyzing data, creating presentation	2	1	2	1	-	2	1
CO c) Use computer Networks for data and device sharing.	3	2	2	3	1	2	3
CO d) Use Internet	3	2	2	2	1	2	3

Semester-I	Basics of Information and Communication Technology (ICT) (Course Code: 4300010)						
	POs						
Competency & Course Outcomes	PO 1 Basic & Discipline specific knowledge	PO 2 Problem Analysis	PO 3 Design/development of solutions	PO 4 Engineering Tools, Experimentation & Testing	PO 5 Engineering practices for society, sustainability & environment	PO 6 Project Management	PO 7 Life-long learning
services for various applications.							
CO e) Create webpage using HTML.	3	2	2	1	1	2	3

Legend: '3' for high, '2' for medium, '1' for low and '-' for no correlation of each CO with PO.

16. COURSE CURRICULUM DEVELOPMENT COMMITTEE

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