Aror University of Art, Architecture, Design & Heritage Sukkur, Sindh

1. COURSE DETAILS	
Program	BS Artificial Intelligence, Multi Media Gamming and Cyber Security
Course Title:	Application of Information, Communication and Technologies
Course Code:	CSC 102
Credits (Theory + Lab):	3 Credit Hours (2 Hrs Theory and 1 Hr Lab)
Pre-Requisite:	NA

Brief Course Description:

This course provides a foundational understanding of Information and Communication Technology (ICT) and Computer Science, enabling students to develop essential digital literacy and problem-solving skills. It introduces the basic concepts of computer systems, data representation, communication, and networking, along with the study of hardware and software components. Students will explore the fundamentals of cyber security and gain insights into automated and emerging technologies shaping the digital world.

The course emphasizes algorithmic thinking through flowchart design and pseudocode, preparing learners for structured problem solving. Additionally, students will be introduced to web technologies, including HTML, CSS, and JavaScript, to design and develop simple interactive web pages. By the end of the course, learners will have a well-rounded foundation in ICT and computer science concepts, equipping them for further studies and practical applications in the digital domain.

2. INSTURCTOR DETAILS	
Name:	Rashida Naz
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3. Teaching Material		
1	Understanding Computers Today and Tomorrow By Deborah Morley, Charles S. parker, 16th Edition	Course book
2	Peter Norton, Introduction to Computers, 7th Edition Williams Sawyer, Using Information Technology: A Practical Introduction to Computer & Communications, 10th Edition Computers, Communications & information: A user's introduction, Sarah, E. Hutchinson. Stacey, C. Swayer. Fundamentals of Information Technology, Alexis L Mathewsleon Leon Press.	Reference Book

3	*Handouts / slides / assigned readings*	Reference Material
Total Contact Hours		

4. COURSE UNIT WISE MAJOR TOPICS

Unit No.	Topics	
1	Introduction to ICT and Computer Science Basics	Theory
2	Data Representation	
3	Data Communication and Networking	
4	Hardware	
5	Software	
6	Cyber Security	
7	Automated and emerging technologies	
8	Algorithm design and Problem solving: Flowchart and Pseudocode	
9	Web development Technologies: HTML, CSS, Javascript	Lab
10	MS Office and Python for AI	Lab
Total Contact Hours		

5. COURSE LEARNING OUTCOMES (CLOs)

Sr. No	Unit No	CLO Statement	Taxonomy Level	GA
CLO's for Theory				
CLO-1	1-6	**Discuss** the fundamental concepts of Information and Communication Technology	C2	GA (1)
CLO-2	4	**Create** Algorithm and Flow Charts to represent problem Solving process	C3	GA (2)
CLO-3	5,6	**Explain** the emerging topics of application of ICT and their impact on various fields and industries	C2	GA (1)
CLOs for Lab				
CLO-4		**Use** various ICT tools and software applications	C3	GA (2)
CLO-5		**Develop** simple program solutions using appropriate programming languages.	C5	GA (4)

Week	Unit #	Topics Covered in Theory Class
1	1	• Overview of ICT Systems

		• Tools of ICT
		  ○ Computer System
		  ○ Mobile System
		  ○ Satellite System
		  ○ Radio System
		• **Computer System** (detailed overview):
		  ○ Introducing to the world of Computers
		  ▪ Computers in your life (Home, Education, Jobs, on the go)
		  ▪ What is a computer and what does it do?
		  ▪ Data and information
		  ▪ Computer Users and Professionals
		  ▪ Computers to fit every need (Embedded, Mobile, PC, Servers, Mainframe, Supercomputer)
		  ▪ Classification of Computer System

2-3	2	**Number System** • Binary Number System • Decimal Number System • Octal Number System • Hexadecimal Number System • Converting from one number system to another • Binary Addition • Binary Shift • One's and Two's Complement of a binary number

4-5	3	**Networks And Internet**
		• The Internet, The world wide web, internet protocols
		• OSI Model and TCP/IP Model
		• Data transmission its types (Serial and parallel) and Modes (Simplex, Duplex, half Duplex)
		• Network Types
		• Network Topologies
		• Packet and its Structure
		• Methods of Error Detection
		  ○ Parity Check
		  ○ Checksum
		  ○ Check digit
		  ○ Echo check

6	4	**Hardware**
		• Computer Architecture
		  ○ Von Neumann Architecture
		  Instruction set and structure of a CPU, Latest development in computer architectures (Dal Core, Core2Duo, Core I5/I7, Mobile architectures.
		• Input and output devices
		• Data storage
		  ○ Primary Storage
		  ○ Secondary Storage

		• Network Hardware
7	5	**Software** • Application software • System Software • High level languages and low level languages • Types of Translators and IDE

8-9	3	**Cyber Security**
		• Cyber threats
		  o brute force attacks
		  o data interception
		  o distributed denial of service (DDoS) attacks
		  o hacking
		  o malware (viruses, worms, Trojan horse, spyware, adware and ransomware)
		  o phishing
		  o pharming
		  o social engineering.
		• Keeping Data safe from Security threats
		  o Access Levels
		  o Anti-malware, Anti-spyware, anti-virus
		  o Authentication
		  o Two step verification
		  o Biometrics (Finger Print scanner, face recognition, retina scanner, Voice recognition)
		  o Firewall and Proxy
		  o SSL and TLS

10-11	7	**Automated and Emerging Technologies** • AI / Machine learning • Block chain • Robotics • Internet of Things • Cloud Computing • Augmented Reality and Virtual Reality
12-13	4	**Algorithm Design and Problem Solving** • The program development life cycle • Computer System, Sub system and Decomposition • Problem solving using flow chart and Pseudocode • Complete a trace table to document a dry-run of an algorithm using flowchart only
14	4	**Web Development** • HTML • CSS • Javascript

Week #	Unit #	Topics Covered in Lab	CLOS, GA
1-2	10	MS WORD All tabs, Design CV Design FORM and Report Design, Letters, posters etc	C4 , C5, GA2, GA4
3	10	MS Powerpoint Developing a Game in Powerpoint	
4	10	Excel Developing Mark sheet	
5	9	HTML Introduction Editors Basic Elements Attributes Headings Paragraphs Formatting Quotations Comments	
6	9	HTML Colors CSS Links Images Lists	
7	9	HTML Favicon Page Title Tables ID,Class DIV Iframe	
9	9	CSS Inline CSS, Internal CSS	
10	9	CSS External CSS	
11	9	CSS Navigation bar Dropdowns Image Gallery	
12	9	CSS	

		Forms Web Layout	
13	9	Javascript Basic to advanced	
14	9	Introduction to Python Installation Basic Python Basic AI	
15	9	Boostrap / Guest Speaker Session	
16	10	Project Demonstration	

6. CLO ASSESSMENT MECHANISM

Assessment Tool	CLO1	CLO2	CLO3	CLO4	CLO5
Quizzes	✓	✓	✓		
Assignments	✓	✓	✓		
Projects				✓	✓
Lab				✓	✓
Mid Term Exam	✓	✓			
Final Term Exam	✓	✓	✓		

7. POLICY & PROCEDURES

- **Attendance Policy:** Students must attend 75% of this course's lectures and laboratory work. Students who fall short of the required attendance percentage cannot appear in the terminal examination.
- **Course Assessment:**

Assessment Tool	Quiz	Assignment	Lab Task	Project	Mid Term Exam	Final Term Exam	Total
Theory (T)	20%	10%	0	0	30%	40%	100
Lab (L)	0	0	35%	15%	20%	30%	100