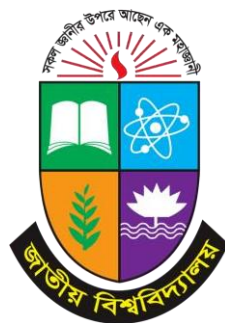


NATIONAL UNIVERSITY BANGLADESH



Syllabus **Applied Information & Communication Technology (ICT)**

A Compulsory Course
for the Students of B.A./B.Sc./B.S.S. and B.B.A.(Honours): 2nd Year
Effective from the Session: 2024–2025 and onwards

Course Code		Marks: 75	Credits: 3
Course Title:	Applied ICT		

Course Aim:

This course aims to develop students' understanding and practical skills in applying ICT tools and emerging digital technologies for solving real-world problems and enhancing academic and professional productivity. It focuses on emerging technologies, digital productivity tools, data analytics applications, Artificial Intelligence tools for content creation and communication, cyber security practices for safe and ethical internet use, and digital marketing skills alongside knowledge of gig economy for future employability.

Course Learning Outcomes: The student will be able to-

CLO 1	Explain emerging technologies and use digital productivity and collaborative tools for communication, teamwork, presentations, and project management.
CLO 2	Apply spreadsheet, data analytics, and Artificial Intelligence (AI) tools for data processing, content creation, communication, academic support.
CLO 3	Apply cyber security practices for safe internet usage, online privacy protection, and ethical digital behavior.
CLO 4	Create digital marketing content and demonstrate introductory knowledge of freelancing, gig economy platforms, and professional online communication.

Course Contents:

Unit 1: Emerging Technologies and Its Implications

Specific Objectives:

The students will be able to:

1. Explain the basic concepts of emerging technologies including Artificial Intelligence (AI), Generative AI, Internet of Things (IoT), Big Data, Cloud Computing, Blockchain, Automation, and Robotics.
2. Describe real-world applications and digital transformation of emerging technologies in sectors such as agriculture, healthcare, education, banking, manufacturing, and other professional fields.
3. Analyze the impact of emerging technologies on society, industries, workplaces, and future career opportunities.
4. Identify digital career pathways, freelancing concepts, remote work environments, and digital entrepreneurship practices.
5. Demonstrate awareness of ethical, social, and security issues related to the use of emerging technologies and digital systems.

Content:

Class 1: Fundamental concepts of emerging technologies, Artificial Intelligence (AI), Generative AI, Agentic AI.

Class 2: Internet of Things (IoT), Big Data, Cloud Computing. Class 3: Applications of AI and IoT in Agriculture, Healthcare, Education, Banking, and Manufacturing.

Class 4: 3D Printing, Automation and Robotics, Blockchain concepts and real-life applications.

Class 5: Technology transformation in education, business, science, and social sectors, Digital career pathways for multidisciplinary students.

Class 6: Digital entrepreneurship, freelancing concepts, remote work environments, ethical and social impacts of technology.

Teaching-Learning Approaches: Interactive lecture, Multimedia presentation, Demonstration and guided practice, Group discussion

Unit 2: Digital Productivity and Collaborative Workspace

Specific Objectives:

The students will be able to:

1. Use collaborative digital tools for communication and teamwork.
2. Apply spreadsheet tools to organize and analyze data.
3. Create professional infographic and visual content.
4. Develop social media and digital communication materials.
5. Create a digital portfolio and professional online identity.
6. Apply basic project management concepts using digital tools.

Content:

Class 1: Collaborative Workspace and Tools: Introduction to Collaborative Workspace, Google Docs, Sheets, Slides, Forms, Classroom, Calendar.

Class 2: Spreadsheet productivity features, simple data analysis tools- pivot table, pivot chart, macros, advanced formulas & functions.

Class 3: AI-assisted spreadsheet features- Copilot, AI agent mode, OCR, forecasting.

Class 4: Professional info graphic creation, and visual storytelling techniques.

Class 5: Designing posters, banners, and social media templates using online design tools.

Class 6: Digital portfolio development, online resume preparation, and professional networking.

Class 7: Introduction to project management concepts and workflow organization.

Class 8: Using digital collaboration and project management tools for teamwork and task tracking.

Teaching-Learning Approaches: Interactive lecture, Hands-on practice, Demonstration, Collaborative learning, Project-based learning, Portfolio development activities

Unit 3: Data Analytics

Specific Objectives:

The students will be able to:

1. Explain concepts of data, datasets and table structures.
2. Understand user-generated dataset and organize data using spreadsheet tools.
3. Prepare and clean datasets for analysis.
4. Apply basic data analysis and visualization techniques.
5. Create simple charts and dashboards.
6. Apply data-driven thinking in academic and practical contexts.
7. Explain responsible data handling and privacy concepts.

Content:

Class 1: Introduction to Data Analytics, Applications of Data analytics, data and datasets, tables and unique identifiers.

Class 2: Data entry, viewing, retrieval, and spreadsheet-based data manipulation.

Class 3: Data collection methods, user-generated data, primary and secondary data sources, CSV and Excel formats.

Class 4: Data cleaning techniques: removing duplicates, blanks, errors, sorting, and validation.

Class 5: Introduction to Power BI, importing data, basic filters, and simple report creation.

Class 6: Data analysis using Power BI: Real-life examples and case studies.

Class 7: Data visualization concepts, charts and graphs, dashboard basics, selecting appropriate charts.

Class 8: Data privacy, responsible data management, data backup, and data security awareness.

Teaching-Learning Approaches: Interactive lecture, Demonstration, Hands-on practice, Case study analysis, Collaborative learning, Project-based activities.

Unit 4: Applications of Generative AI in Real Life

Specific Objectives:

1. Explain the basic concepts of Generative AI and Large Language Models (LLMs).
2. Apply effective prompt writing techniques for academic and professional tasks.
3. Generate and improve professional written content using AI tools.
4. Create AI-generated images, posters, logos, and visual content.
5. Prepare basic AI-assisted video ideas, scripts, storyboards, and captions.
6. Express the concept of Vibe Coding, AI tools for vibe coding.
7. Evaluate AI-generated outputs through human judgment, editing, and fact-checking.
8. Demonstrate ethical and responsible AI usage, including awareness of misinformation, plagiarism, privacy, bias, copyright, and citation.

Content:

Class 1: Introduction to Generative AI, AI tools, Large Language Models (LLMs), How LLMs Work, Tokens, Context Window

Class 2: Prompt Engineering, elements of good prompts, weak vs improved prompts, Bangla and English prompt comparison, prompt writing techniques, iterative prompting, and prompt templates for academic and professional tasks.

Class 3: Using AI for professional writing, email writing, report preparation, summaries, notices, proposals, grammar correction, translation, rewriting, and academic support with human editing and fact-checking.

Class 4: Using AI tools for image generation, posters, logos, thumbnails, banners, social media graphics, video ideas, scripts, storyboards, captions, and basic visual content creation with ethical awareness. AI-assisted video creation for educational and promotional purposes.

Class 5: Introduction to vibe coding, Vibe Coding vs Traditional Coding, AI coding tools and development environments, prompt-driven development, Hands-on Vibe Coding (e.g. Developing a Portfolio Website)

Class 6: Ethical, responsible, and practical AI usage; AI limitations, hallucinations, misinformation, plagiarism, citation, academic honesty, privacy, bias, copyright, ownership concerns.

Teaching-Learning Approaches: Interactive Lecture, Guided practice, Case study analysis, Problem-solving activities

Unit 5: Cyber Security and Ethical Practice

Specific Objectives:

The students will be able to:

1. Apply basic cyber security measures for devices and online accounts.
2. Demonstrate safe internet browsing and online privacy practices.
3. Understand software updates and patch management
4. Implement firewall and network security
5. Identify deep fake video and audio contents.
6. Practice safe social media and online transaction behavior.
7. Identify crypto currency and digital-wallet fraud
8. Develop awareness of cyber bullying, online harassment, and digital ethics.

Content:

Class 1: Introduction to Access Control, Authentication and Authorization, Strong passwords, two-factor authentication, biometric authentication, antivirus tools, and device security.

Class 2: Safe internet browsing, browser privacy settings, VPN concepts, firewall and network security

Class 3: Software updates and patch management, social media privacy settings and fake profile identification.

Class 4: Safe online transactions, secure websites, online banking safety, and financial scam awareness.

Class 5: Deepfake concept, types, common signs, risks & impacts, tools for detecting deepfakes

Class 6: Cyberbullying, online harassment, digital consent, online safety, and cybercrime awareness.

Teaching-Learning Approaches: Interactive lecture, Demonstration, Case study analysis, Awareness-based discussion, Practical activities

Unit 6: Digital Marketing and Gig Economy

Specific Objectives:

The students will be able to:

1. Explain concepts and importance of digital marketing and gig economy.
2. Identify major digital marketing platforms and tools.
3. Create basic digital marketing content and campaigns.
4. Apply introductory email marketing techniques.
5. Develop professional freelancing communication skills.
6. Demonstrate awareness of freelancing ethics and online professional practices.

Content:

Class 1: Introduction to digital marketing, Gig economy, online business ecosystems, and career opportunities.

Class 2: Search Engine Optimization (SEO) concepts, keywords, hashtags, and social media marketing strategies.

Class 3: Overview of Facebook, YouTube, Instagram, LinkedIn and content publishing platforms.

Class 4: Digital marketing tools, analytics basics, and content management platforms.

Class 5: Content marketing, branding, affiliate marketing, influencer marketing, and audience engagement.

Class 6: Digital marketing campaign workflow, audience analysis, campaign planning

Class 7: Professional communication, proposal writing, client interaction.

Class 8: Freelancing ethics, and career development.

Teaching-Learning Approaches: Interactive lecture, Demonstration, Case study analysis, Problem-solving activities, Individual and group work

Course Code		Marks: 25	Credit: 1
Course Title:	Lab: Applied ICT		

Course Aim:

This course aims to develop students' practical skills in applying ICT tools and emerging digital technologies for solving real-world problems and enhancing academic and professional productivity. It focuses on emerging technologies, digital productivity tools, data analytics applications, Artificial Intelligence tools for content creation and communication, cyber security practices for safe and ethical internet use, and digital marketing skills alongside gig economy participation for future employability.

Course Learning Outcomes:

The student will be able to:

CLO 1	Use emerging technology, AI, cloud, and digital productivity tools for problem-solving, communication, teamwork, and professional development.
CLO 2	Use data analytics and AI tools for data processing, visualization, communication, content creation, academic support, and multimedia production.
CLO 3	Apply cyber security practices for secure browsing, online privacy protection, account security, and safe social media usage.
CLO 4	Create digital marketing content, manage basic online campaigns, and develop introductory freelancing and professional communication skills.

Unit 1: Emerging Technologies and Its implications

Lab 1: Emerging Technologies, AI and Digital Career Development

Activities

1. Generate a simple AI-based explanation of Cloud Computing using AI tools.
2. Create a basic smart system diagram (smart home/smart agriculture).
3. Upload, organize, and share files using cloud storage platforms.
4. Prepare a personal digital career development plan.

Outcome: Students will be able to use basic AI and cloud tools, explain simple technology applications, and identify digital career opportunities and professional development pathways.

Tools: ChatGPT, Gemini, Canva, Google Drive,/Dropbox/ Google Drawings/ Google Docs, Browser.

Device: Smartphone/Laptop/Desktop

Teaching-Learning Approaches: Interactive lecture, Multimedia presentation, Demonstration and guided practice, Group discussion, Case study analysis, Project-based learning.

Unit 2: Digital Productivity and Collaborative Workspace

Lab 1: Collaborative Productivity, Communication and Data Visualization

Activities

1. Create and share documents using Google Docs and collaborate with team members.
2. Create and manage Google forms, and online meetings using Google Calendar, and Google Meet.
3. Apply basic spreadsheet formulas and functions for data processing.
4. Sort, filter, and visualize data using charts and graphs in spreadsheet tools.

Outcome: Students will be able to use collaborative platforms for communication and teamwork, and apply spreadsheet tools to organize, analyze, and visualize data effectively.

Tools: Google Docs, Google Forms, Google Calendar, Google Meet, Microsoft Excel, Google Sheets.

Device: Laptop/Desktop/Smartphone.

Lab 2: Digital Content Creation and Portfolio Development

Activities

1. Design presentation slides with infographic elements
2. Create posters, banners, and social media post templates using Canva.
3. Apply storytelling techniques to develop professional and engaging presentations.
4. Create a digital portfolio or online resume using digital tools.

Outcome: Students will be able to create professional visual communication materials and develop digital portfolios using digital tools.

Tools: Canva, Google Slides, Microsoft PowerPoint, LinkedIn, Trello.

Device: Smartphone/Laptop.

Teaching-Learning Approaches: Interactive lecture, Demonstration and guided practice, Hands-on practice, Collaborative learning, Peer learning, Project-based activities.

Unit 3: Data Analytics

Lab 1: Data Collection, Organization and Data Cleaning

Activities

1. Collect primary and secondary data and organize datasets in spreadsheet format.
2. Structure data using rows, columns, and tables in Excel or Google Sheets.
3. Remove blanks, duplicates, and correct inconsistent data entries.
4. Apply sorting, filtering, and basic data validation techniques.

Outcome: Students will be able to collect, organize, clean, and structure datasets effectively for further analysis using spreadsheet tools.

Tools: Microsoft Excel, Google Sheets.

Device: Laptop/Desktop.

Lab 2: Data Analysis and Visualization using Excel and Power BI

Activities

1. Import sample datasets into Excel or Power BI for basic analysis.
2. Use basic filtering, sorting, and simple data exploration techniques.
3. Create charts and graphs to represent data visually.
4. Develop a simple dashboard to present key insights from data.

Outcome: Students will be able to analyze basic datasets and present meaningful insights using spreadsheet tools and introductory data visualization techniques.

Tools: Microsoft Excel, Power BI.

Device: Laptop/Desktop.

Teaching-Learning Approaches: Interactive lecture, Demonstration and guided practice, Hands-on data analysis, Problem-solving activities, Case study analysis, Project-based learning.

Unit 4: AI for Real-World Applications

Lab 1: AI Prompt Writing and Professional Content Creation

Activities

1. Write prompts for different AI tools.
2. Generate professional emails and letters.
3. Create reports and summaries.
4. Edit and improve AI-generated content.

Outcome: Students will be able to use AI tools for academic and professional communication.

Tools: ChatGPT, Gemini, Claude, Canva, etc..

Device: Smartphone/Laptop.

Lab 2: AI-Based Visual Design and Multimedia Content Creation

Activities

1. Generate AI-based images from text prompts for educational and creative purposes.
2. Design posters, logos, and educational graphics using AI-assisted tools.
3. Create short educational or promotional videos using AI tools.
4. Produce social media-friendly video content with basic editing and effects.

Outcome: Students will be able to create AI-generated visual and multimedia content for educational, promotional, and communication purposes.

Tools: Canva, ChatGPT, Gemini, CapCut, Google Veo, Google Flow, etc.

Device: Smartphone/Laptop.

Lab 3: AI Productivity and Academic Applications

Activities

1. Use AI tools for academic research assistance.
2. Generate presentation outlines.
3. Create study notes and learning materials.
4. Practice responsible AI usage and citation.

Outcome: Students will be able to apply AI tools responsibly for academic and productivity purposes.

Tools: ChatGPT, Gemini, Google Docs, etc..

Device: Smartphone/Laptop.

Teaching-Learning Approaches: Interactive lecture, Multimedia presentation, Demonstration and guided practice, Hands-on AI tool practice, Collaborative learning, Project-based activities.

Unit 5: Cyber Security and Ethical Practice

Lab 1: Cyber Security, Online Privacy and Account Protection

Activities

1. Check website security (HTTPS) and apply safe browsing practices.
2. Configure browser and social media privacy settings to protect personal data.
3. Create strong passwords and enable Two-Factor Authentication (2FA) for accounts.
4. Identify phishing emails/messages and use authenticator apps for secure login.

Outcome: Students will be able to apply cyber security practices for safe browsing, protect personal identity online, and secure digital accounts using modern security tools.

Tools: Internet Browser, Facebook, Google Account, Instagram, Google Authenticator, Authy.

Device: Smartphone/Laptop.

Teaching-Learning Approaches: Interactive lecture, Multimedia presentation, Demonstration and guided practice, Simulation-based learning, Group discussion, Case study analysis.

Unit 6: Digital Marketing & Gig Economy

Lab 1: Social Media Content Creation and Analytics

Activities

1. Create promotional social media content.
2. Design posters or captions using AI tools.
3. Publish or simulate social media posting.
4. Analyze engagement metrics.

Outcome: Students will be able to create digital marketing content and interpret basic engagement reports.

Tools: Canva, ChatGPT, Meta Business Suite, etc.

Device: Smartphone/Laptop.

Lab 2: Digital Marketing Campaign Design

Activities

1. Create a Facebook business page.
2. Design banners and promotional content.
3. Prepare a simple digital marketing campaign plan.
4. Present campaign objectives and target audience.

Outcome: Students will be able to design a simple digital marketing campaign for online platforms.

Tools: Facebook Page, Canva, etc.

Device: Smartphone/Laptop.

Lab 3: Freelancing Profile and Proposal Writing

Activities

1. Create an account on a freelancing platform.
2. Select a professional niche.
3. Create a basic freelancing profile.
4. Write a professional cover letter or proposal.

Outcome: Students will be able to develop introductory freelancing communication and professional profile skills.

Freelancing platform: Upwork, Fiverr, Freelancer, etc.

Device: Laptop/Desktop.

Teaching-Learning Approaches: Interactive lecture, Demonstration and guided practice, Hands-on content creation, Collaborative learning, Case study analysis, Project-based learning.

Marks distribution:

Component	Marks
Experiment (2x8)	: 16
Report Writing	: 05
Viva Voce	: 04
Total	: 25