INTRODUCTION TO IT SYSTEMS

with Lab Manual

Prashant Joshi

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प्रो. अनिल डी. सहस्रबुद्धे
अध्यक्ष
Prof. Anil D. Sahasrabudhe
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सत्यमेव जयते

अखिल भारतीय तकनीकी शिक्षा परिषद्
(भारत सरकार का एक सांविधिक निकाय)
(शिक्षा मंत्रालय, भारत सरकार)
नेल्सन मंडेला मार्ग, वसंत कुंज, नई दिल्ली–110070
दूरभाष : 011–26131498
ई–मेल : chairman@aicte-india.org

ALL INDIA COUNCIL FOR TECHNICAL EDUCATION
(A STATUTORY BODY OF THE GOVT. OF INDIA)
(Ministry of Education, Govt. of India)
Nelson Mandela Marg, Vasant Kunj, New Delhi-110070
Phone : 011-26131498
E-mail : chairman@aicte-india.org

FOREWORD

Engineering has played a very significant role in the progress and expansion of mankind and society for centuries. Engineering ideas that originated in the Indian subcontinent have had a thoughtful impact on the world.

All India Council for Technical Education (AICTE) had always been at the forefront of assisting Technical students in every possible manner since its inception in 1987. The goal of AICTE has been to promote quality Technical Education and thereby take the industry to a greater heights and ultimately turn our dear motherland India into a Modern Developed Nation. It will not be inept to mention here that Engineers are the backbone of the modern society - better the engineers, better the industry, and better the industry, better the country.

NEP 2020 envisages education in regional languages to all, thereby ensuring that each and every student becomes capable and competent enough and is in a position to contribute towards the national growth and development.

One of the spheres where AICTE had been relentlessly working from last few years was to provide high-quality moderately priced books of International standard prepared in various regional languages to all it's Engineering students. These books are not only prepared keeping in mind it's easy language, real life examples, rich contents and but also the industry needs in this everyday changing world. These books are as per AICTE Model Curriculum of Engineering & Technology – 2018.

Eminent Professors from all over India with great knowledge and experience have written these books for the benefit of academic fraternity. AICTE is confident that these books with their rich contents will help technical students master the subjects with greater ease and quality.

AICTE appreciates the hard work of the original authors, coordinators and the translators for their endeavour in making these Engineering subjects more lucid.

(**Anil D. Sahasrabudhe**)

ACKNOWLEDGEMENT

The author is grateful to AICTE for their meticulous planning and execution to publish the technical book for Diploma students.

I sincerely acknowledge the valuable contributions of the reviewer of the book Prof. Kotak Paresh, for making it students' friendly and giving a better shape in an artistic manner.

This book is an outcome of various suggestions of AICTE members, experts and authors who shared their opinion and thoughts to further develop the engineering education in our country.

It is also with great honour that I state that this book is aligned to the AICTE Model Curriculum and in line with the guidelines of National Education Policy (NEP) -2020. Towards promoting education in regional languages, this book is being translated in scheduled Indian regional languages.

Acknowledgements are due to the contributors and different workers in this field whose published books, review articles, papers, photographs, footnotes, references and other valuable information enriched us at the time of writing the book.

Finally, I like to express my sincere thanks to the publishing house, M/s. Khanna Book Publishing Company Private Limited, New Delhi, whose entire team was always ready to cooperate on all the aspects of publishing to make it a wonderful experience.

Prashant Joshi

PREFACE

There is no exaggeration if the development of information technology is considered a great achievement of the 20th century. The impact of technology on human life can be easily seen. In information technology, computer systems are used to create, store, collect, or share electronic data or information. The basic knowledge of hardware, software required in these processes is essential for the users of this technology so that they can make proper use of this technology. Keeping this objective in mind, the subject "Introduction to Information Technology Systems" has been kept in the AICTE's Model Curriculum for first year diploma course.

The first unit describes the various hardware components used in computer systems such as CPU, memory types, displays and peripheral devices. The internet technology is useful in exchanging information or services between remote computers. Overview of internet technology has been included in the first unit. Further, the web browser which is an application software required to use the popular WWW service of the Internet is described in detail. In this unit readers will also be aware of the extensive list of Digital India portals classified under Digital India Mission.

The second unit covers the most important system software of the computer system i.e., operating system. In this unit learner will understand the step-by-step process of installing operating systems. Learners will be versed to install Microsoft Windows 10 Operating System and Linux OS variant UBUNTU 20.04. In this unit, the structure of Linux OS, as well as the features, types, and various important commands of Linux shells, have been explained with examples. At the end of the unit, vi editor, the most popular text editor of unix system, its modes and commands are presented.

In the third unit, the computer languages used in the creation and development of WWW i.e., HTML and CSS has been included. In this unit, various tags and attributes of HTML have been explained. The unit also elaborates how to use CSS to present the content of webpages in an attractive and stylish way.

The fourth Unit deals with the study of Apache Open Office, a tool capable of performing office suite tasks i.e., word processing, calculations, and presentation tasks. In this, the processing and presentation of information has been taught through three important components of Apache Open Office i.e., writer, calc and impress.

In this digital era our information is kept in digital form. To keep these information assets safe, security is required at various levels. What precautions and rules should we adopt in our daily digital life so that we can provide information security, are discussed in the last unit. Two activities are also included for the perpetual learning of the titled unit.

Practical work is always necessary to deeply understand the theoretical knowledge and to make it permanent. The experiments described in the AICTE Model Curriculum have been included at the end of every unit. In addition to objective and subjective exercises, the exercise section is also enriched with online quizzes and crosswords.

The author believes that although full care has been taken in the writing of the content, some errors are possible in it and the content can be improved further. Due to limited knowledge and time of the author, this creation is only an attempt, which can be improved further with your suggestions. If you have any suggestion or notice any error in the book that is not included in the errata list displayed on **https://www.epragya.in/aict-book-itsystems/errata_itsystems** then you should write the same to email address: *joshi.prashant@gov.in* or to publisher, so that the next version can be refined.

Prashant Joshi

OUTCOME BASED EDUCATION

The outcome-based curriculum has been developed for the implementation of an outcome-based education for diploma engineering students. It incorporates the outcome-based assessment also through which educators and evaluators will be able to assess and evaluate the achievement of students in the form of standard, specific and measurable program outcomes. Outcome-based education emphasizes achieving program-specific skills systematically and gradually which diploma engineering students must acquire. Through outcome-based education, learners will be able to commit to achieving a minimum standard without quitting the program at any level. Upon completion of the specific program with an outcome-based education strategy, diploma engineering students will be able to arrive at the following program outcomes:

1. **Basic and Discipline specific knowledge**: Apply knowledge of basic mathematics, science and engineering fundamentals and engineering specialization to solve the engineering problems.
2. **Problem analysis**: Identify and analyse well-defined engineering problems using codified standard methods.
3. **Design/ development of solutions**: Design solutions for well-defined technical problems and assist with the design of systems components or processes to meet specified needs.
4. **Engineering Tools, Experimentation and Testing**: Apply modern engineering tools and appropriate technique to conduct standard tests and measurements.
5. **Engineering practices for society, sustainability and environment**: Apply appropriate technology in context of society, sustainability, environment and ethical practices.
6. **Project Management**: Use engineering management principles individually, as a team member or a leader to manage projects and effectively communicate about well-defined engineering activities.
7. **Life-long learning**: Ability to analyse individual needs and engage in updating in the context of technological changes.

COURSE OUTCOMES

After Completing the course, learner will be able to:
CO1: use computer system, browse government portals and use search engines efficiently.
CO2: connect other external hardware devices to personal computer and install driver software.
CO3: install different operating systems in the personal computer (Linux and MS Windows)
CO4: execute shell commands in Unix systems.
CO5: create stylish webpages with HTML4 and CSS.
CO6: work on basic office suit programs e.g., word processing, spreadsheets & presentations.
CO7: to protect their information on personal computer systems & web.

Mapping of Course Outcomes with Programme Outcomes

Course Outcome	Expected Mapping with Programme Outcomes (1- Weak Correlation; 2- Medium correlation; 3- Strong Correlation)						
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7
CO-1	2	1	1	2	2	1	3
CO-2	3	2	3	2	1	1	3
CO-3	2	1	2	1	1	1	3
CO-4	2	2	1	2	1	1	2
CO-5	3	2	2	2	2	1	3
CO-6	3	3	3	3	1	2	3
CO-7	3	3	2	2	3	1	2

LIST OF ABBREVIATIONS

Abbreviation	Full Form	Abbreviation	Full Form
3G/4G	Third Generation/Fourth Generation	MODEM	Modulator/Demodulator
AI	Artificial Intelligence	MOOCS	Massive Open Online Courses
ALU	Arithmetic and Logic Unit	MPLS	Multiprotocol Label Switching
ATM	Automated Teller Machine	NFC	Near Field Communications
CD	Compact Disc	NVM	Nonvolatile Memory
CRT	Cathode Ray Tube	OLED	Organic Light Emitting Diode
DHCP	Dynamic Host Configuration Protocol	OS	Operating System
DLP	Digital Light Processing	PIN	Personal Identification Number
DNS	Domain Name System	POTS	Plain Old Telephone System
DRAM	Dynamic Randon Access Memory	QR Code	Quick Response Code
DVD	Digital Versatile Disc	RAM	Random Access Memory
ESD	Electrostatic Discharge	ROM	Read Only Memory
FOSS	Free and Open Source Software	SERP	Search Engine Result Pages
FTP	File Transfer Protocol	SMS	Short Message Service
GIS	Geospatial Information Systems	SMTP	Simple Mail Transfer Protocol
GOI	Government of India	SRAM	Static Random Access Memory
GPRS	General Packet Radio Service	SSL	Secure Socket Layer
GPS	Global Positioning System	TFT	Thin-Film Transistor
GUI	Graphical User Interface	UPI	Unified Payments Interface
HTTP	Hypertext Transfer Protocol	URI	Uniform Resource Indicator
HTTPS	Hypertext Transfer Protocol Secure	URL	Uniform Resource Locator
ICT	Information Communication Technology	USB	Universal Serial Bus
IOT	Internet of Things	VoIP	Voice over the Internet Protocol
ISP	Internet Service Provider	VPN	Virtual Private Network
LAN	Local Area Network	WYSIWYG	What You See Is What You Get
LCD	Liquid Crystal Display	WWW	World Wide Web
LED	Light Emitting Diode	XML	Extensible Markup Language
LTS	Long Term Support		
MAC	Media Access Control		
MFA	Multi Factor Authentication		
MIS	Management Information System		
ML	Machine Learning		

LIST OF FIGURES

UNIT 1: INTERNET SKILLS AND COMPUTER BASICS

UNIT 2: OPERATING SYSTEMS

UNIT 3: HTML AND CSS

UNIT 4: OPEN OFFICE TOOLS

UNIT 5: INFORMATION SECURITY BEST PRACTICES

LIST OF TABLES

UNIT 1: INTERNET SKILLS AND COMPUTER BASICS

UNIT 2: OPERATING SYSTEMS

UNIT 3: HTML AND CSS

UNIT 4: OPEN OFFICE TOOLS

UNIT 5: INFORMATION SECURITY BEST PRACTICES

GUIDELINES FOR TEACHERS

To implement Outcome Based Education (OBE) knowledge level and skill set of the students should be enhanced. Teachers should take a major responsibility for the proper implementation of OBE. Some of the responsibilities (not limited to) for the teachers in OBE system may be as follows:

- Within reasonable constraint, they should manoeuvre time to the best advantage of all students.
- They should assess the students only upon certain defined criterion without considering any other potential ineligibility to discriminate them.
- They should try to grow the learning abilities of the students to a certain level before they leave the institute.
- They should try to ensure that all the students are equipped with the quality knowledge as well as competence after they finish their education.
- They should always encourage the students to develop their ultimate performance capabilities.
- They should facilitate and encourage team work to consolidate newer approach.
- They should follow Blooms taxonomy in every part of the assessment.

Bloom's Taxonomy

Level	Teacher should check	Student should be able to	Possible mode of assessment
Creating	Students ability to create	Design or Create	Mini project
Evaluating	Students ability to justify	Argue or Defend	Assignment
Analysing	Students ability to distinguish	Differentiate or Distinguish	Project/Lab Methodology
Applying	Students ability to use information	Operate or Demonstrate	Technical Presentation/ Demonstration
Understanding	Students ability to explain the ideas	Explain or Classify	Presentation/Seminar
Remembering	Students ability to recall (or remember)	Define or Recall	Quiz

GUIDELINES FOR STUDENTS

Students should take equal responsibility for implementing the OBE. Some of the responsibilities (not limited to) for the students in OBE system are as follows:

- Students should be well aware of each Unit Outcome (UO) before the start of a unit in each and every course.
- Students should be well aware of each Course Outcome (CO) before the start of the course.
- Students should be well aware of each Programme Outcome (PO) before the start of the programme.
- Students should think critically and reasonably with proper reflection and action.
- Learning should be connected and integrated with practical and real-life consequences.
- Students should be well aware of their competency at every level of OBE.
- The content included in the chapters has been kept as concise as possible. For detailed study, use QR code resources or references and suggested readings given at the end of the units.
- Unit wise solutions can be obtained from URL: *https://www.epragya.in/aicte-book-it-systems*

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