FYUGP CURRICULAR FRAMEWORK FOR BACHELORS PROGRAMME WITH INFORMATION TECHNOLOGY AS MAJOR- 2023

SEMESTER	COURSE CODE	TYPE OF COURSE	TITLE OF COURSE	CREDITS	
				THEORY	PRACTICAL / TUTORIAL
I	BIT122J	CT-1	**INFORMATION TECHNOLOGY:** BASIC COMPUTING	4	2
II	BIT223J	CT-1	**INFORMATION TECHNOLOGY:** COMPUTER ARCHITECTURE AND ORGANISATION	4	2
III	BIT323J	CT-1	**INFORMATION TECHNOLOGY:** C - PROGRAMMING	4	2
IV	BIT422J1	CT-1	**INFORMATION TECHNOLOGY:** OOPS USING C++	3	1
	BIT422J2	CT-2	**INFORMATION TECHNOLOGY:** OPERATING SYSTEMS	4	2
	BIT422J3	CT-3	**INFORMATION TECHNOLOGY:** SOFTWARE ENGINEERING	4	2
V	BIT522J1	CT-1	**INFORMATION TECHNOLOGY:** DOT NET	3	1
	BIT522J2	CT-2	**INFORMATION TECHNOLOGY:** DATABASE MANAGEMENT SYSTEM	4	2
	BIT522J3	CT-3	**INFORMATION TECHNOLOGY:** DATA STRUCTURES USING 'C'	4	2
VI	BIT622J1	CT-1	**INFORMATION TECHNOLOGY:** SYSTEM ANALYSIS AND DESIGN	3	1
	BIT622J2	CT-2	**INFORMATION TECHNOLOGY:** CORE JAVA PROGRAMMING	4	2
	BIT622J3	CT-3	**INFORMATION TECHNOLOGY:** CYBER SECURITY	4	2
FOR FYUGP HONOURS					
VII	BIT722J1	CT-1	**INFORMATION TECHNOLOGY:** MOBILE COMPUTING	3	1
	BIT722J2	CT-2	**INFORMATION TECHNOLOGY:** DATA COMMUNICATIONS AND NETWORKS	4	2
	BIT722J3	CT-3	**INFORMATION TECHNOLOGY:** PYTHON PROGRAMMING	4	2
VIII	BIT822J1	CT-1	**INFORMATION TECHNOLOGY:** MACHINE LEARNING	3	1
	BIT822J2	CT-2	**INFORMATION TECHNOLOGY:** COMPUTER GRAPHICS	4	2
	BIT822J3	CT-3	**INFORMATION TECHNOLOGY:** MICROPROCESSOR	4	2
FOR FYUGP HONOURS WITH RESEARCH					
VII	BIT722J1	CT-1	**INFORMATION TECHNOLOGY:** INTRODUCTION TO INNOVATION AND ENTREPRENEURSHIP TECHNOLOGY	3	1
	BIT722J2	CT-2	**INFORMATION TECHNOLOGY:** DATA COMMUNICATIONS AND NETWORKS	4	2
	BIT722J3	CT-3	**INFORMATION TECHNOLOGY:** PYTHON PROGRAMMING	4	2
VIII	BIT822J1	CT-1	**INFORMATION TECHNOLOGY:** MACHINE LEARNING	3	1
	BIT822RP	PROJECT	**INFORMATION TECHNOLOGY:** PROJECT WITH DISSERTATION	-	12

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BACHELORS WITH INFORMATION TECHNOLOGY AS MAJOR

1st SEMESTER

BIT122J: INFORMATION TECHNOLOGY _ BASIC COMPUTING

CREDITS: THEORY: 4; PRACTICAL: 2

UNIT I

Introduction to Computing-Computer Systems, Components of a computer system, Hardware and software, Evolution and generations of computers, and Classification of computers on the basis of capacity, purpose, and generation.

Data representation in digital computer. Number System: Bit, byte, binary, decimal, octal systems and hexadecimal conversion from one system to the other, representation of characters, integers and fractions. Binary Arithmetic: Addition, subtraction and multiplication. Computer Codes-BCD, Gray Code, ASCII and Unicode.

UNIT II

Problem Solving approaches top-down and bottom-up programming. Representation of Algorithm, Flowchart, Pseudo code and Source Code with examples. Transformation of Algorithms into source code.

The Role of Algorithms in Computing, Algorithms as a technology, analyzing algorithms, Designing algorithms, Growth of Functions.

Computer languages - Machine language, assembly language, higher level language, 4GL. Translator Programs - Compiler, Interpreter, Assembler.

UNIT III

Operating Systems-Introduction, Features, Functions- Process Management, Memory Management, File Management, Device Management etc. Introduction to different Operating Systems. Different types and classification of Operating Systems.

Data, Information and Knowledge. Database, database management system, database System, Database Applications. Structured and Unstructured data. Big Data. Different kinds of databases.

UNIT IV

Internet, History of Internet, Features and uses of Internet. Internet Architecture, IP Address, Domain Name. Managing the Internet. Introduction to WWW, Web browsers, Websites, Email, Search Engine etc.

Connecting to the Internet, Internet Connections, Internet Address, Internet Services, Uses of Internet, Introduction to Internet of Things (IoT) and Cloud Computing. Introduction to E-commerce, E-governance, E-government, Smart homes with relevant examples like AMS, admissions systems etc.

TUTORIAL: (2-CREDITS)

Note: ***The Tutorial Component shall be based on the Unit-I to Unit-IV***

REFERENCEBOOKS

1. Introduction to Information Technology, V Rajaraman, PHI
2. Introduction to Computers, Peter Norton, 7thEdition, McGraw Hill Education
3. Fundamentals of Computers, V. Rajaraman, PHI Publications
4. Computer Fundamentals, Anita Goel, Pearson Education India

SEMESTER	COURSE CODE	TYPE OF COURSE	TITLE OF COURSE	CREDITS	
				THEORY	PRACTICAL / TUTORIAL
I	**BIT122N**	**CT-1**	**INFORMATION TECHNOLOGY:** BASIC COMPUTING	**4**	**2**
II	**BIT223N**	**CT-1**	**INFORMATION TECHNOLOGY:** COMPUTER ARCHITECTURE AND ORGANISATION	**4**	**2**
III	**BIT323N**	**CT-1**	**INFORMATION TECHNOLOGY:** C - PROGRAMMING	**4**	**2**
IV	**BIT422N**	**CT-1**	**INFORMATION TECHNOLOGY:** OOPS USING C++	**3**	**1**
V	**BIT522N**	**CT-1**	**INFORMATION TECHNOLOGY:** DOT NET	**3**	**1**
VI	**BIT622N**	**CT-1**	**INFORMATION TECHNOLOGY:** SYSTEM ANALYSIS AND DESIGN	**3**	**1**
VII	**BIT722N**	**CT-1**	**INFORMATION TECHNOLOGY:** MOBILE COMPUTING	**3**	**1**
VIII	**BIT822N**	**CT-1**	**INFORMATION TECHNOLOGY:** MACHINE LEARNING	**3**	**1**

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BACHELORS WITH INFORMATION TECHNOLOGY AS MINOR

1st SEMESTER

BIT122N: INFORMATION TECHNOLOGY _ BASIC COMPUTING

CREDITS: THEORY: 4; PRACTICAL: 2

UNIT I

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TUTORIAL: (2-CREDITS)

Note: ***The Tutorial Component shall be based on the Unit-I to Unit-IV***

REFERENCEBOOKS

1. Introduction to Information Technology, V Rajaraman, PHI
2. IntroductiontoComputers, PeterNorton, 7thEdition, McGrawHillEducation
3. FundamentalsofComputers, V.Rajaraman, PHIPublications
4. Computer Fundamentals, Anita Goel, Pearson Education India

FYUGP CURRICULAR FRAMEWORK FOR BACHELORS PROGRAMME WITH APPLIED INFORMATION TECHNOLOGY AS MINOR

(FOR STUDENTS WITH COMPUTER APPLICATIONS / INFORMATION TECHNOLOGY AS MINOR ONLY)

SEMESTER	COURSE CODE	TYPE OF COURSE	TITLE OF COURSE	CREDITS	
				THEORY	PRACTICAL / TUTORIAL
I	**AIT124N**	**CT-1**	**APPLIED IT:** DIGITAL ELECTRONICS	**4**	**2**
II	**AIT223N**	**CT-1**	**APPLIED IT:** OPEN-SOURCE TOOLS AND TECHNOLOGIES	**4**	**2**
III	**AIT323N**	**CT-1**	**APPLIED IT:** CLOUD COMPUTING	**4**	**2**
IV	**AIT422N**	**CT-1**	**APPLIED IT:** IOT FUNDAMENTALS	**3**	**1**
V	**AIT522N**	**CT-1**	**APPLIED IT:** DESIGN ANALYSIS AND ALGORITHM	**3**	**1**
VI	**AIT622N**	**CT-1**	**APPLIED IT:** DATA MINING	**3**	**1**
VII	**AIT722N**	**CT-1**	**APPLIED IT:** ARTIFICIAL INTELLIGENCE	**3**	**1**
VIII	**AIT822N**	**CT-1**	**APPLIED IT:** LATEX	**3**	**1**

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BACHELORS WITH APPLIED INFORMATION TECHNOLOGY AS MINOR
1st SEMESTER
AIT122N: APPLIED INFORMATION TECHNOLOGY _ DIGITAL ELECTRONICS
CREDITS: THEORY: 4; PRACTICALS: 2

UNIT I:

NUMBER SYSTEMS: Binary, Octal, Decimal, Hexadecimal. Number base conversions,
Binary Arithmetic: Binary Addition, Decimal Subtraction Using 9's and 10's Compliment, Binary Subtraction Using 1's and 2's Compliment, Multiplication and Division.
LOGIC GATES: AND, OR, NOT, NAND, NOR, Exclusive-OR and Exclusive-NOR. Implementations of Logic Functions using gates, NAND-NOR implementations

Unit-II:

BOOLEAN ALGEBRA: Boolean postulates and laws – De-Morgan's Theorem, Principle of Duality, Boolean expression – Boolean function, Minimization of Boolean expressions – Sum of Products (SOP), Product of Sums (POS), Minterm, Maxterm, Canonical forms, Conversion between canonical forms, Karnaugh map Minimization, Don't care conditions, Quine-McCluskey method.

Unit-III:

Combinational Circuits: Half Adder, Full Adder, Parallel Adder, Half Subtractor, Full Subtractor, 4-Bit Binary Adder Subtractor, Multiplexer, Demultiplexer, Decoder, Encoder, Parity Detector. Implementation of combinational logic using MUX, BCD to7 segment decoders.

Unit IV:

SEQUENTIAL CIRCUITS: Flip flops SR, JK, T, D and Master slave, Excitation table, Edge triggering, Level Triggering, Realization of one flip flop using other flip flops. Asynchronous /Ripple counters, Synchronous counters, Modulo-n counter, Ring Counters. Design of Synchronous counters: state diagram, Circuit implementation. Shift registers**.**

PRACTICAL: (2-CREDITS)

Note: ***The Practical Component shall be based on the Unit-I to Unit-IV of Theory Course***

SUGGESTED READING:

1) Navaneeth, Kale and Gokhale, "Digital and Analogue Technique". ISBN-81-225-0153-2
2) Soumitra Mandal, "Digital Electronics", TMH, ISBN 0-07015382-5
3) Modern Digital Electronics by R. P. Jain, Tata McGrawHill.
4). Digital Fundamentals by Thomas Floyd, Prentice Hall.
5). Digital Logic and computer Design by' Morris Mano, PHI pvt. Ltd.
6) Jacob Millman, Christos Halkias, Chetan D Parikhu, Integrated Electronics, Tata Mc Graw

BACHELORS WITH INFORMATION TECHNOLOGY AS MAJOR
3rd SEMESTER
BIT323J: INFORMATION TECHNOLOGY _ C-PROGRAMMING
CREDITS: THEORY: 4; PRACTICAL: 2

UNIT-I
C Fundamentals- Character set, Identifiers and keywords, Data Types, Constants, Variables and Arrays, Declarations, Operators & Expressions, Library functions, Statements, Symbolic Constants.
Operators- Arithmetic operators, Unary operators, Relational operators, Logical operators
Data Input and Output- printf(), scanf(), getc(), getch(), getchar(), putc(), putchar(), gets(), puts().

UNIT-II
Storage Class in C- Automatic, Register, static, external
Control Statements- if statement, if-else statement, nested if statement, got statement, switch-case statement
Loops- while (), do-while (), for (), nested loops, break, continue, exit (), comma operator.

UNIT-III
Arrays- Arrays, one dimensional array, Various Operation on Array (Inserting of Element, Deleting of Element, Sorting and Searching) and two-dimensional arrays (Matrix Addition, Transpose of Matrix, Matrix Multiplication). Arrays and strings – standard string functions
Functions- defining function, accessing function, passing arguments to functions, function prototype, recursion, passing array to a function.
Pointers - pointer declaration, operators and pointers, passing pointer to a function, pointer and one-dimensional arrays, array of pointers, Dynamic memory allocation.

UNIT-IV
Structures and Unions- defining a structure, processing a structure, user defined data type, sorting structures, passing structure to a function. Overview of union.
File Management - introduction, defining and opening a file, closing a file. Input/output operations file. Random access file. Command line arguments.

Practical: (2-Credits)

Note: ***The Practical Component shall be based on the Unit-I to Unit-IV***

SUGGESTED READING:

1. “Programming in C” by Schaum Series
2. “Let Us C” by Yashwant Kanitkar, BPB Publications
3. “Programming in ANSCI C” by E. Balaguruswamy, Tata McGraw Hill
4. “Art and Craft of C” by R.B. Patel.
5. “Programming with C” by Brayan Gottfried, Tata McGraw Hill

BACHELORS WITH INFORMATION TECHNOLOGY AS MINOR
3rd SEMESTER
BIT323N: INFORMATION TECHNOLOGY _ C-PROGRAMMING
CREDITS: THEORY: 4; PRACTICAL: 2

UNIT-I
C Fundamentals- Character set, Identifiers and keywords, Data Types, Constants, Variables and Arrays, Declarations, Operators & Expressions, Library functions, Statements, Symbolic Constants.
Operators- Arithmetic operators, Unary operators, Relational operators, Logical operators
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BACHELORS WITH APPLIED INFORMATION TECHNOLOGY AS MINOR

3rd SEMESTER

AIT323N: APPLIED INFORMATION TECHNOLOGY _ CLOUD COMPUTING

CREDITS: THEORY: 4; TUTORIAL: 2

Unit – I

Introduction to Computing Paradigms: High-Performance Computing, Parallel Computing, Distributed Computing, Cluster Computing, Grid Computing, Cloud Computing, Bio-computing, Mobile Computing, Quantum Computing, Optical Computing, Nano-computing, Network Computing. Cloud Computing Fundamentals: Motivation, Need, Definition of Cloud Computing. Principles of Cloud computing: Five Essential Characteristics, Four Cloud Deployment Models, Three Service Offering Models, Cloud Ecosystem, Requirements for Cloud Services.

Unit – II

Cloud Computing Architecture: cloud Architecture, User/Client Layer, Network Layer, Cloud Management Layer, Hardware Resource Layer, Network Connectivity in Cloud Computing, Public Cloud Access Networking, Private Cloud Access Networking.

UNIT – III

Cloud Computing Management: Cloud Application, Benefits and Drawbacks Applications on the Cloud, Managing the Cloud, Managing the Cloud Infrastructure, Managing the Cloud Application, Migrating Application to Cloud, Cloud Deployment Models: Private Cloud, Outsourced Private Cloud, Community Cloud, On-Premise Community Cloud, Hybrid Cloud. Cloud Service Models: Infrastructure as a Service, Platform as a Service, Software as a Service, Introduction to Open-Source Tools for IaaS, Paas & SaaS: Apache.

UNIT – IV

Technological Drivers for Cloud Computing: SOA and Cloud, SOA and SOC, Benefits of SOA, Multi-core Technology: Multi-core Processors and VM Scalability, Memory and Storage Technologies, Cloud Storage Requirements, Networking Technologies, Web 2.0: Characteristics, Difference from Web 1.0, Applications, Social Media, Marketing, Education.

TUTORIAL: (2-CREDITS)

Note: ***The Tutorial Component shall be based on the Unit-I to Unit-IV***

REFERENCES:

1. Essentials of Cloud Computing, K Chandrasekaran, CRC Press [ISBN: 3: 978--4822-0544-2]
2. Raj Kumar Buyya, James Broberg and rezei M.Goscinski, -Cloud Computing: Principles and Paradigms, -Wiley 2011.
3. Srinivasan, J. Suresh, -Cloud Computing – a Practical Approach for Learning and Implementation, Pearson India, [ISBN 978131776513]
4. Toby Velte, Anthony Velte, Robert Elsenpeter, - Cloud Computing, a Practical Approach - McGraw Hill, 2010 [ISBN: 0071626948]

BACHELORS WITH INFORMATION TECHNOLOGY AS MAJOR
2nd SEMESTER
BIT223J: INFORMATION TECHNOLOGY _ COMPUTER ARCHITECTURE AND ORGANIZATION
CREDITS: THEORY: 4; PRACTICAL: 2

UNIT-I

Basic Structure of computer, and basic operational concepts, registers (general purpose registers, accumulator, status register, program counter, stack pointer, word size and register size).data movement among registers**.**

UNIT-II

Computer Instructions (input/output, instructions, register referenced instructions, direct addressing mode memory referenced instructions), how an instruction is executed? Instructions formats, bus structure and addressing modes.

UNIT-III

ALU & control unit organization: simple ALU organization, floating point ALU, Arithmetic processors, control unit organization: functional requirements of a control unit, structure of a control unit, micro-programmed and hardware control unit.

UNIT-IV

I/O organization: Peripheral devices(input/output devices),synchronous and asynchronous communication, I/O(input/output)interface, (serial and parallel points),data transfer and synchronization, programmed I/O interrupt initiated I/O, DMA, interrupts (software and hardware).
Main Memory (ROM, RAM-static and dynamic RAM), design of main memory (RAM 4x4), virtual memory (paging & page replacement).

TUTORIAL: (2-CREDITS)

Note: ***The Tutorial Component shall be based on the Unit-I to Unit-IV***

REFERENCES:

V.C Hamacher, A.G Vranesic and S.G Zaky," Computer Organization"
J.P Hayes," Computer System Architecture", McGraw Hill
Morris Mano," Computer System Architecture", Prentice Hall of India

BACHELORS WITH INFORMATION TECHNOLOGY AS MINOR
2nd SEMESTER
BIT223N: INFORMATION TECHNOLOGY _ COMPUTER ARCHITECTURE AND ORGANIZATION
CREDITS: THEORY: 4; PRACTICAL: 2

UNIT-I

Basic Structure of computer, and basic operational concepts, registers (general purpose registers, accumulator, status register, program counter, stack pointer, word size and register size).data movement among registers**.**

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Main Memory (ROM, RAM-static and dynamic RAM), design of main memory (RAM 4x4), virtual memory (paging & page replacement).

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J.P Hayes," Computer System Architecture", McGraw Hill
Morris Mano," Computer System Architecture", Prentice Hall of India

BACHELORS WITH APPLIED INFORMATION TECHNOLOGY AS MINOR
2nd SEMESTER
AIT223N: APPLIED INFORMATION TECHNOLOGY _ OPEN-SOURCE TOOLS AND TECHNOLOGIES
CREDITS: THEORY: 4; PRACTICALS: 2

UNIT-I

Introduction: Need of Open Sources – Advantages of Open Sources – Applications – FOSS – FOSS usage - Free Software Movement, Commercial aspects of Open-Source movement -Certification courses issues - global and Indian. Application of Open Sources–Commercial aspects of Open-Source movement- Contrasting and comparing open source vs. traditional development Methodologies

UNIT-II

Introduction to Linux, History of Linux – Features of Linux - Drawbacks of Linux, Components of Linux. Difference Between Linux and Windows., Difference Between Linux and Unix, Linux is Virus proof, Various Linux Distributions, Pros and Cons Understanding Files and Directories in Linux - File Structure and hierarchy, File Permissions, root, shell, Using VI editor and command associated with it.

UNIT III

Linux Commands and Utilities : Basic Commands –mkdir, touch, ls, pwd, cd, chmod, df, du, dd, adduser, passwd, rm, rmdir, date. cat, tail, cmp, diff, wc, sort, rmdir, cp, more, who, whoami, mv, chmod, kill, write, wall, merge, mail, news – pipes, filters and redirection utilities.

UNIT-IV

Shell Scripts: Creating and executing simple shell programs – variables – special characters – comparison of expressions – iteration statements – conditional statements – functions.
Open-source software tools: Browsers – Processors – Compilers.

Practicals: (2-Credits)

Note: ***The Practical Component shall be based on the Unit-I to Unit-IV***

References

1. N. B. Venkateshwarlu (Ed); Introduction to Linux: Installation and Programming, B S Publishers; 2005.
2. Matt Welsh, Matthias KalleDalheimer, Terry Dawson, and Lar Kaufman, Running Linux, Fourth Edition, O'Reilly Publishers, 2002
3. The Linux Kernel Book Rem Card,Eric Dumas and Frank Mevel Wiley Publications sons, 2003
4. Linux - The Complete Reference Richard Peterson, Tata McGraw Hill, New Delhi

Course Title (MULTIDISCIPLINARY COURSE) 1st to 3rd SEMESTER	Course Code	Credits
BIT022I: INFORMATION TECHNOLOGY (BASIC COMPUTING)	BIT122I	03

UNIT I

Definition of Computer, Characteristics of Computer, Components of a Computer System, Hardware and Software, Classification of Computers, Evolution and Generations of Computers, System Software – Operating System and its Functions, Application Software – Office Packages etc., Input and Output Devices.

Data representation in Digital Computer. Number System and their Conversions.

UNIT II

Problem Solving – Algorithm, Flowchart, Pseudocode and Source Code. Representation of Algorithm, Flowchart, Pseudo code with examples.

Computer languages - Machine language, Assembly language, Higher level languages, 4GL. Translator Programs - Compiler, Interpreter, Assembler.

Internet, History of Internet, Features and uses of Internet. Connecting to Internet, Internet Connections, Internet Services. Introduction to WWW, Web browsers, Websites, Email, Search Engine etc. URL, IP Address, Domain Name. Introduction to E-commerce, E-governance, E-government, with relevant examples like AMS, Admissions System etc.

UNIT III

MS office: Introduction to MS office, Components and Features, Using Office in Online and Offline Mode.

MS Word: Creating Letter, Table, Fonts, Page Layout Document, Formatting, Spell Check, Print Preview, Template, Color, Mail Merge, Auto Text, Inserting Picture, Word Art.

MS Excel: Introduction to Excel, Sorting, Formulas, Graphs, Scientific Functions.

PowerPoint: Introduction to PowerPoint, Creation of Slides, Inserting Pictures, Preparing Slide Show with Animation.

Reference Books

1. Introduction to Information Technology, V Rajaraman, PHI
2. Introduction to Computers, Peter Norton, 7th Edition, McGraw Hill Education
3. Fundamentals of Computers, V. Rajaraman, PHI Publications
4. Computer Fundamentals, Anita Goel, Pearson Education India
5. Mastering MS Office, Bittu Kumar, V&S Publishers.