National Education Policy-2020 Proposed Syllabus for SUBJECT: INFORMATION TECHNOLOGY

Year	Sem.	Paper Title	Theory/Practical	Credits
1	I	IT Fundamentals and Problem Solving using	Theory	4
		computer		
1	I	Programming Lab using Python	Practical	2
1	П	Operating System	Theory	4
1	Ш	Operating System Lab	Practical	2
2	III	Object Oriented Programming with Java	Theory	4
2	III	Java Lab	Practical	2
2	IV	Database Management System	Theory	4
2	IV	Database Management System Lab	Practical	2
3	V	Web Technology	Theory	4
3	V	Information Security & Cyber Laws	Theory	4
3	V	Web Technology Lab	Practical	2
3	V	Research Project-I	Project	3
3	VI	E-Commerce	Theory	4
3	VI	Introduction to AI and Data Science	Theory	4
3	VI	Lab on developing AI models using Python	Practical	2
3	VI	Research Project-II	Project	3

Year wise Structure of B.Sc. (Information Technology)

Year wise Structure of B.Sc. for subject Information Technology											
e of ard	Subject: Information Technology									Total Credits of the	
Typ Awa	Year	Sem.	Paper 1 Theory	credit	Paper 2 Theory	Credit	Paper 3 Practical	Credi t	Research Project	credit	subject
rtificate in II	1	Ι	IT Fundamentals and Problem Solving using computer	4			Programm ing Lab using Python	2	Nil	Nil	6
Cei		II	Operating System	4			Operating System Lab	2	Nil	Nil	6
oloma in II	2	III	Object Oriented Programming with Java	4			Java Lab	2	Nil	Nil	6
DiJ		IV	Database Management System	4			Database Management System Lab	2	Nil	Nil	6
е	3	V	Web Technology	4	Information Security & CyberLaws	4	Web Technolo gy Lab	2	Research Project-I	3	13
Bachelor of Scienc		VI	E-Commerce	4	Introd ction to AI and Data Scienc e	4	Lab on developin g AI models using Python	2	Research Project- II	3	13
									Total (Credits:	50

Practical Evaluation & Assessment						
Internal Assessment	Marks	External Assessment	Marks			
Class Interaction	05	Viva Voce	25			
Quiz 1	10	Execution/Demonstration	20			
Quiz 2	10	Write up/theory work	20			
		Practical Record File	10			
	25		75			

Programme	Class: Certificate	Year:	First	Seme	ster: First		
	Subject: Information Technology						
Course Code:	Course Code: Course Title: Fundamental of IT and Problem Solving using Computer						
Course outc	comes:						
 CO1: Understand hardware components of computer system such as memory system organization, input/output devices, aware of software components of computer system, and windows operating system concepts. CO 2: Develops basic understanding of computers, the concept of algorithm and algorithmic thinking. CO3: Develops the ability to analyze a problem, develop an algorithm to solve it. CO4: Develops the use of the Python programming language to implement various algorithms, and develops the basic concepts and terminology of programming in general. 							
	Credits: 4			Core Compu	llsory		
	Max. Marks: 25+75			Min. Passing I	Marks:		
Unit		Торіс					
I	Computer Fundar Characteristics of C and generationsofC	mentals: Introc Computers, Use Computers.	duction to C s of comput	Computers: ers, Types			
II	Basic Computer of ALU, memory hie Computer Progra definition, Program In programming, D	Organization - erarchy, register am: Concept of design, Debug ocumentation.	• Units of a rs, I/Odevice of problem gging, Types	e computer, CPU, es. Planning the solving, Problem s of errors			
III Techniques of Problem Solving: Flowcharting, decision table, algorithms, Structured programming concepts, Programming methodologies viz. top-down and bottom-up programming. IAN WAN MAN Topology OSI and TCP/IP model							
IV Introduction to Python: Python Interpreter, Using Python as calculator, Python shell, Indentation. Atoms, Identifiers and keywords, Literals, Strings, Operators (Arithmetic operator, Relational operator, Logical or Boolean operator, Assignment, Operator, Ternary operator, Bit wise operator, Increment or Decrement operator).							
V	Increment or Decrement operator, Det while operator, Increment or Decrement operator, Det while operator, Creating Python Programs: Input and Output Statements, Control statements (Looping- while Loop, for Loop, Loop Control, Conditional Statement-ifelse, Difference between break, continue andpass), Structures: Numbers, strings, lists, tuples, dictionary, date and time, modules, defining functions, exit function.						

Syllabus for B.Sc.: Subject: Information Technology

	default arguments
Sug	gested Continuous Evaluation Methods: Max. Marks: 25
1. /	ssessment Type: Class Tests (Max. Marks 14)
	Suggested Usage:
	Include all types of questions-essay, short answer, objective; Design to test all levels of domain; Exam Blue Print be prepared to ensure inclusion of all types & levels of questions and proper sampling of content; Marking Criteria made known to students; Teacher should provide written feedback selectively and discuss answers in the class; Only Role/Code numbers, not names be written to avoid bias in marking; Display of model answer copies.
	After Completion of Unit I and Unit II, a first class test of max. marks of 7 shall be conducted.
	After Completion of Unit III and IV, a second class test of max. marks of 7 shall be conducted.
	If any student does not appear in any one or both class test, a makeup test shall be conducted of max. marks of 5 instead of total 14 marks.
1.	Assessment Type: Quizzes/ Objective Tests / Recognition Type (such as MCQs; True or False: Matching: Classifying) / Recall Type - Filling Blanks: One word / Phrase Answers

(Max Marks: 5)

Suggested Usage: Teachers be trained in construction, advantages, disadvantages and precautions while preparing different types of objective items; Go beyond factual information to High Order Thinking (HOT) Skills. It shall be "End of the class quiz".

2. Assessment Type: Assignments (Max Marks: 4)

Suggested Usage: Some class assignments shall be given to students at the end of each Unit. Note making techniques be taught to students; Not just direct questions from notes, but application analysis and synthesis of that knowledge.

3. Assessment Type: Class Interaction (Max. marks: 2)

Programme/Class: Certificate	Year: First	Semester: First						
Subject: Information Technology								
Course Code:	Course Code: Course Title: Programming Lab using Python							
Course outcomes:	Course outcomes:							
 To learn and understand Python programming basics. To learn and understand python looping, control statements and string manipulations. Students should be made familiar with the concepts of GUI controls and designing GUI applications. 								
Credits: 2	Max. Marks: 25+75	Min. Passing Marks:						

Programme/	Class: Certificate	Year: First		Semester: Second			
	Subject: Information Technology						
	Course Title: Operating System						
Course outco After the com 1. Under 2. Analy 3. Apply proble 4. Illustra 5. Evalua	 After the completion of the course the students will be able: 1. Understand role, responsibilities, features, and design of operating system. 2. Analyze memory management schemes and process scheduling algorithms. 3. Apply process synchronization techniques to formulate solution for critical section problems. 4. Illustrate concept of disk scheduling. 5. Evaluate process deadlock handling techniques 						
	Credits: 4			Core Compulsory			
	Max. Marks: 2	5+75		Min. Passing Marks:			
Unit		Торі	с				
I	Introduction Operating system and functions, Classification of Operating systems: Batch, Interactive, Time sharing, Real Time System, Multiprocessor Systems, Multiuser Systems, Multithreaded Systems, Operating System Structure, System Components, Operating System Services, Kernels, Monolithic and						
II	III Process Management II Process Concept, Process States, Process Synchronization, Critical Section, Mutual Exclusion, Classical Synchronization Problems, Process Scheduling, Process States, Process Transitions, Scheduling Algorithms Interprocess Communication, Threads and their management, Security						
CPU SchedulingIIIScheduling Concepts, Techniques of Scheduling, Preemptive and Non- Preemptive Scheduling: First-Come-First-Serve, Shortest Request Next, Highest Response Ration Next, Round Robin, Least Complete Next, Shortest Time to Go, Long, Medium, Short Scheduling, Priority Scheduling. Deadlock: System model, Deadlock characterization, Prevention, Avoidance and detection, Recovery from deadlock.							
IV	IV Memory Management and File System Memory Allocation, Paging,Segmentation, Virtual Memory, Demand Paging, Page Replacement Algorithms File concept, File organization and access mechanism, Filedirectories, and File sharing, File system protection and security						

Suggested Readings:

- 1. Andrew S. Tanenbaum and Herbert Bos, "Modern Operating Systems," Fourth Edition, Pearson, 2014.
- 2. Abraham Silberschatz, Greg Gagne, and Peter B. Galvin, "Operating System Concepts," Tenth Edition, Wiley, 2018.
- 3. William Stallings, "Operating Systems: Internals and Design Principles," Seventh Edition, Prentice Hall, 2011.
- 4. DhanjayDhamdhere, "Operating Systems," First Edition, McGraw-Hill, 2008 5.

4

Suggested Continuous Evaluation Methods:

1. Assessment Type: Class Tests (Max. Marks 14)

Suggested Usage:

Include all types of questions-essay, short answer, objective; Design to test all levels of domain; Exam Blue Print be prepared to ensure inclusion of all types & levels of questions and proper sampling of content; Marking Criteria made known to students; Teacher should provide written feedback selectively and discuss answers in the class; Only Role/Code numbers, not names be written to avoid bias in marking; Display of model answer copies.

After Completion of Unit I and Unit II, a first class test of max. marks of 7 shall be conducted.

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If any student does not appear in any one or both class test, a makeup test shall be conducted of max. marks of 5 instead of total 14 marks.

2. Assessment Type: Quizzes/ Objective Tests / Recognition Type (such as MCQs; True or False; Matching; Classifying) /Recall Type -Filling Blanks; One word / PhraseAnswers (Max Marks: 5)

Suggested Usage:Teachers be trained in construction, advantages, disadvantages and precautions while preparing different types of objective items; Go beyond factual information to High Order Thinking (HOT) Skills. It shall be "End of the class quiz".

3. Assessment Type: Assignments (Max Marks: 4) Suggested Usage: Some class assignments shall be given to students at the end of each Unit. Note making techniques be taught to students; Not just direct questions from notes, but application analysis and synthesis of that knowledge.

4. Assessment Type: Class Interaction (Max. marks: 2)

Course prerequisites: To s	tudy this course, a student m	ust have had the subject						
Mathematics in class 12 th an	Mathematics in class 12 th and Problem solving using computers in first semester							
in clubb 12 un	tranomation in class 12 and 11001011 solving using compaters in first sollester.							
Programme/Class: Certificate	Year: First	Semester: Second						
	Subject: Information Tech	nology						
Course Code:	Course Title: Operating Syster	ns Lab						
Course Coue.	1 5 7							
Course outcomes:								
Ability to:								
1 Une of University	· · · · · · · · · · · · · · · · · · ·							
1. Use of Unix operatin	g system and able to write shell p	orograms.						
2. Simulate and demons	strate the concepts of operating sy	vstems.						
Credits: 2	Max. Marks: 25+75	Min. Passing Marks:						
Suggested Readings:								
1. Sumitabh Das, "Your U	1. Sumitabh Das, "Your Unix/Linux: The Ultimate Guide," McGraw Hill, 2012.							
2. Richard Blum and Chri	2. Richard Blum and Christine Bresnahan, "Linux Command Line and Shell Scripting Bible."							
Wiley 2015	Wiley 2015							

- 3. Stroustrup, Bjarne, Programming: Principles and Practice Using C++, Addison Wesley, USA, 2014, 2nded.
- 4. E Balagurusamy, Object Oriented Programming with C++, McGraw Hill Education (India) Pvt. Ltd., India, 2013, 6th ed.

Lab on Operating Systems

Note: Following exercises can be performed using Linux or Unix

- 1. Usage of following commands: ls, pwd, tty, cat, who, who am I, rm, mkdir, rmdir, touch, cd.
- 2. Usage of followingcommands: cal, cat(append), cat(concatenate), mv, cp, man, date.
- 3. Usage of following commands: chmod, grep, tput (clear, highlight),bc.
- 4. Write a shell script to check if the number entered at the command line is prime ornot.
- 5. Write a shell script to modify "cal" command to display calendars of the specified months.
- 6. Write a shell script to modify "cal" command to display calendars of the specified range ofmonths.
- 7. Write a shell script to accept a login name. If not a valid login name display message "Entered login name isinvalid".
- 8. Write a shell script to display date in the mm/dd/yyformat.
- 9. Write a shell script to display on the screen sorted output of "who" command along with the total number of users.
- 10. Write a shell script to display the multiplication table anynumber,

- 11. Write a shell script to compare two files and if found equal asks the user to delete the duplicate file.
- 12. Write a shell script to check whether the file have all the permissions or not.

Programme/C	Class: Diploma	Y	ear: Second	Semester: Third			
	Subject: Information Technology						
Course Title: Ob	ject Oriented Programn	ning with Jav	a				
Course outc 1: Understa divide and searching and 2: Employ a 3: Design an abstraction a 4: Effectivel and debugge	 Course outcomes: 1: Understand that various problem solving categories exist such as; iterative technique, divide and conquer, dynamic programming, greedy algorithms, and understand various searching and sorting algorithms 2: Employ a deep knowledge of various data structures when constructing a program 3: Design and construct simple object-oriented software with an appreciation for data abstraction and information hiding. 4: Effectively use software development tools including libraries, compilers, editors, linkers and debuggers to write and troubleshoot programs. 						
	Credits: 4			Core Compulsory			
	Max. Marks: 25+75			Min. Passing Marks:			
Unit			Topic				
I	Intro to Java: java evolution; java history, java features, how java differs from C/C++, java and internet, overview of java: intro, simple java program, more of java statements, implementing a java program, JVM, CLA, programming style, constants, variable and data type Intro to operators: types of operators, arithmetic expressions, evaluation of expression, presidence of arithmetic operators, type conversion and associativity, mathematical functions and decision making and branching						
Π	Classes, arrays, string and vectors: classes, objects, methods: intro, defining a class, adding variables, adding methods, creating objects, accessing class members, constructors, method overloading, static members, nesting of methods, inheritance and its concepts, methods, final variables and methods, finalizer method, abstract method and classes.						
III	and classes.IIIInterfaces, packages, multithreading programming: interfaces: multiple inheritance: introduction, defining interfaces, extending interfaces, implementing interfaces, Accessing interface variables. Packages: putting classes together: introduction, java API packages, using system packages, naming convention. Creating Packages, Using Packages, Accessing Packages, Adding a Class to a Package and Hiding the Classes. Multi Threaded Programming :Introduction, Creating Threads, Extending the Thread Class, Stopping and Blocking the Thread, Life Cycle of the Thread, Using Thread Methods, Thread Exceptions, Priority, Synchronization, Implementing the 'Runnable' Interface.						

	Suggested Readings:
	Text Books:
	1. Java: A Beginner's Guide (Sixth Edition): Herbert Schildt
	1 Schildt "The Complete Reference" (Ninth Edition)
	 Patrick Naughton & Herbert Schildt, JAVA 2: The Complete Reference, TMH
A. Balag	urusamy, "Programming with JAVA", A Primer, TMH, 1999
Sugges	ted Continuous Evaluation Methods:
1. As	sessment Type: Class Tests (Max. Marks 14)
Su	ggested Usage:
Inc dor and pro nu	clude all types of questions-essay, short answer, objective; Design to test all levels of main; Exam Blue Print be prepared to ensure inclusion of all types & levels of questions d proper sampling of content; Marking Criteria made known to students; Teacher should ovide written feedback selectively and discuss answers in the class; Only Role/Code mbers, not names be written to avoid bias in marking; Display of model answer copies.
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Af cor	ter Completion of Unit III and IV, a second class test of max. marks of 7 shall be nducted.
If a con	any student does not appear in any one or both class test, a makeup test shall be nducted of max. marks of 5 instead of total 14 marks.
2. As or Ph	sessment Type: Quizzes/ Objective Tests / Recognition Type (such as MCQs; True False; Matching; Classifying) /Recall Type -Filling Blanks; One word / rase Answers (Max Marks: 5)
Su	ggested Usage: Teachers be trained in construction, advantages, disadvantages and
pre	ecautions while preparing different types of objective items; Go beyond factual
inf	ormation to High Order Thinking (HOT) Skills. It shall be "End of the class quiz".
3. As	sessment Type: Assignments (Max Marks: 4)
Su	ggested Usage: Some class assignments shall be given to students at the end of each
Un apj	it. Note making techniques be taught to students; Not just direct questions from notes, but plication analysis and synthesis of that knowledge.
Assess	sment Type: Class Interaction (Max. marks: 2)

Programme/C lass: Diploma		Semester: Third					
		Subject: Information Technolo	ogy				
Course Code:		Course Title: Ja	va Lab				
Course outc	comes:						
1. Ability to 2. Ability to manipulation	learn and und learn and und s.	erstand Java programming basi lerstand Java looping, control s	cs. tatements and string				
Cree	dits: 3	Max. Marks: 25+75	Min. Passing Marks:				
		Practical List on JAV	A				
Write a program	n to calculate t	a area of rectangle					
Write a program	n to swan two i	numbers					
Write a program	n to print all pr	ime numbers between 1 to 100					
Write a program	n to print the av	verage of n numbers					
Write a program	n to swap two i	numbers without using the third v	ariable				
Write a program	n to copy all th	e elements of one array into anoth	ner arrav				
Write a program	n to find the fre	equency of each element of an arra	av				
Write a program	n to print the el	ements of an array	5				
Write a program	n to implement	threading in JAVA					
Write a program	n to implement	multilevel inheritance					
Write a program	n to implement	multiple inheritance using interfa	ice.				
	·	-					

Programme/Class: Diploma	Year: Second	Semester: Fourth		
Subject: Information Technology				
Course Code: Course Title: Database Management System				

Course outcomes:

After the completion of the course the students will be able to:

- 1. Understands the basic concepts of data base management systems.
- 2. Design E-R diagrams for real world applications.
- 3. Formulate relational algebraic expressions using relational data models and languages.
- 4. Apply normalization transaction properties and concurrency control to design database.
- 5. Analyze the security algorithms for database protection.

Credits: 4		Core Compulsory		
Max. Marks: 25+75 Min. Passing		Min. Passing Marks:		
Unit	Торіс			
I	Introduction: Database System Concepts, File system vs. database system, Database system architecture, Data models and their types, Data base scheme and instances, Data independence, Database Languages and Interfaces.ER model concepts: Notations for ER diagram, Extended E-R diagram, Extended E-R model, E-R model design issues, constraints, and keys:			
п	Introduction to SQL: Basic Structure of SQL Query, Set operators, SELECT, UNION,INTERSECT, and EXCEPT, Nested queries, Aggregate function, Null values, Derived Relations, Modification of the Database, Joined relations and up-dates in SQL			
III	Database Design Functional dependencies, Normal forms, First, second, and third normal forms, BCNF, Multi-valued dependencies and Fourth Normal form, Join Dependencies and Fifth Normal form.			
IV	IV Inormal form, Join Dependencies and Fifth Normal form. IV Transaction, Query Processing Transaction and system concepts: transaction states, ACID properties of transactions, Transaction Management concurrent execution schedules and Recoverability, Serializability. Concurrency Control: Concurrency Control Techniques: Two phase Locking Techniques for Concurrency Control; Time stamping in			

Suggested Readings:

- 1. Henry F. Korth and Abraham Silberschatz, "Database System Concepts," Second Edition, McGraw Hill, 1991.
- 2. AtulKahate, "Introduction to Database Management Systems," Pearson India, 2004.
- 3. Raghu Ramakrishnan and Johannes Gehrike, "Database Management Systems," Third McGraw Hill, Edition, 2003.
- 4. R.Elmasri,S.B.NavatheDatabaseSystemsModels,Languages,Designandapplication Programming, 6 Edition, Pearson Education,2013.
- 5. A. Silberschatz, H.F. Korth, S. Sudarshan, Database System Concepts 6thEdition, McGraw Hill, 2010.

Suggested Continuous Evaluation Methods:

1. Assessment Type: Class Tests (Max. Marks 14)

Suggested Usage:

Include all types of questions-essay, short answer, objective; Design to test all levels of domain; Exam Blue Print be prepared to ensure inclusion of all types & levels of questions and proper sampling of content; Marking Criteria made known to students; Teacher should provide written feedback selectively and discuss answers in the class; Only Role/Code numbers, not names be written to avoid bias in marking; Display of model answer copies.

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Assessment Type: Quizzes/ Objective Tests / Recognition Type (such as MCQs; True or False; Matching; Classifying) /Recall Type -Filling Blanks; One word / PhraseAnswers (Max Marks: 5)

Suggested Usage: Teachers be trained in construction, advantages, disadvantages and precautions while preparing different types of objective items; Go beyond factual information to High Order Thinking (HOT) Skills. It shall be "End of the class quiz".

3. Assessment Type: Assignments (Max Marks: 4)

Suggested Usage: Some class assignments shall be given to students at the end of each Unit. Note making techniques be taught to students; Not just direct questions from notes, but application analysis and synthesis of that knowledge.

4. Assessment Type: Class Interaction (Max. marks: 2)

Programme/Class: Diploma	Year: Second	Semester: Fourth			
	Subject: Information Tech	nology			
Course Code:	Course Title: Database Management Systems Lab using MySQL				
Course outcomes:					
 Ability to: Understand, analyze and apply common SQL statements including DDL, DML and DCL statements to perform different operations. Design and implement a database schema for a given problem. Do connectivity of PHP and MySQL to develop applications 					
Credits: 2	Max. Marks: 25+75	Min. Passing Marks:			
 Suggested Readings: 1. Paul DuBois, "MySQL Cookbook: Solutions for Database Developers and Administrators," Third Edition, O'Reilly Media, 2014. 2. Frank M. Kromann, "Beginning PHP and MySQL: From Novice to Professional," Fifth Edition, Apress, 2018. 3. Joel Murach and Ray Harris, "Murach's PHP and MySQL," First Edition, Mike Murach& Associates, 2010. 4. Luke Welling Laura Thomson "PHP and MySQL Web Development" Fourth Edition. 					
4. Luke weining, Laura Addison-Wesley 2008	4. Luke weining, Laura Thomson, PHP and MySQL web Development, Fourth Edition, Addison-Wesley 2008				

Software Lab based on Database Management Systems

Note: <u>MvSOL</u> may be used

List of Experiments

- 1. Creation of databases and execution of SQL queries.
- 2. Creation of Tables using MySQL: Data types, Creating Tables (along with Primary and Foreign keys), Altering Tables and Dropping Tables.
- 3. Practicing DML commands- Insert, Select, Update, Delete.
- 4. Practicing Queries using ANY, ALL, IN, EXISTS, NOT, EXISTS, UNION, INTERSECT, and CONSTRAINTS, etc.
- 5. Practice Queries using COUNT, SUM, AVG, MAX, MIN, GROUP BY, HAVING, VIEWS Creation and Dropping.
- 6. Use of COMMIT, ROLLBACK and SAVEPOINT.
- 7. Practicing on Triggers creation of trigger, Insertion using trigger, Deletion using trigger, Updating using trigger.
- 8. To remove the redundancies and anomalies in the above relational tables, Normalize up to Third Normal Form.



Relational Database Schema - COMPANY

Questions to be performed on above schema

- 1. Create tables with relevant foreign key constraints
- 2. Populate the tables with data
- 3. Perform the following queries on the database:
 - 1. Display all the details of all employees working in the company.
 - 2. Display ssn, lname, fname, address of employees who work in department no7.
 - 3. Retrieve the birthdate and address of the employee whose name is 'Franklin T. Wong'
 - 4. Retrieve the name and salary of every employee
 - 5. Retrieve all distinct salary values
 - 6. Retrieve all employee names whose address is in 'Bellaire'

- 7. Retrieve all employees who were born during the1950s
- Retrieve all employees in department 5 whose salary is between 50,000and 60,000(inclusive)
- 9. Retrieve the names of all employees who do not have supervisors
- 10. Retrieve SSN and department name for allemployees
- 11. Retrieve the name and address of all employees who work for the 'Research' department
- 12. For every project located in 'Stafford', list the project number, the controlling department number, and the department manager's last name, address, andbirthdate.
- 13. For each employee, retrieve the employee's name, and the name of his or her immediatesupervisor.
- 14. Retrieve all combinations of Employee Name and DepartmentName
- 15. Make a list of all project numbers for projects that involve an employee whose last name is 'Narayan' either as a worker or as a manager of the department that controls theproject.
- 16. Increase the salary of all employees working on the 'ProductX' project by 15%. Retrieve employee name and increased salary of these employees.
- 17. Retrieve a list of employees and the project name each works in, ordered by the employee's department, and within each department ordered alphabetically by employee firstname.
- 18. Select the names of employees whose salary does not match with salary of any employee in department10.
- 19. Retrieve the name of each employee who has a dependent with the same first name and same sex as the employee.
- 20. Retrieve the employee numbers of all employees who work on project located in Bellaire, Houston, or Stafford.

Note: The instructors should design detailed experiments based on above suggested experiments.

Programme of Science	e/Class: Bachelor	Year: Th	ird	Semester: Fifth	
Subject: Information Technology					
Course	Course Code: Course Title: Web Technology				
Course ou CO1 Impl CO2 Desi CO3 Buil CO4 Desc	Course outcomes: CO1 Implement interactive web page(s) using HTML, CSS and JavaScript. CO2 Design a responsive web site using HTML5 and CSS CO3 Build Dynamic web site using server side PHP Programming and Database connectivity. CO4 Describe and differentiate different Web Extensions and Web Services.				
	Credits: 4			Core Compu	lsory
	Max. Marks: 2	5+75		Min. Passing N	Marks:
Unit		Торіс			
I	Introduction to WWW: Protocols and programs, secure connections, application and development tools, the web browser, What is server.Web Design: Web site design principles, planning the site and navigation				
Π	Introduction to HTML: The development process, HTML tags and simple HTML forms, web site structure, Introduction to XHTML : XML, Move to XHTML, Meta tags, Character entities, frames and frame sets, inside, Browser				
III	Style sheets: Need for CSS, introduction to CSS, basic syntax and structure, using CSS, background images, colors and properties, manipulating texts, using fonts, borders and boxes, margins, padding lists, positioning using CSS, CSS2.				
IV	Javascript: Client side scripting, What is Javascript, How to develop Javascript, simple Javascript, variables, functions, conditions, loops and repetition, Advance script, Javascript and objects, Javascript own objects, the DOM and web browser environments, forms and Validations,				
V	DHTML: Combuttons, contradvantages & diapplication, alter	bining HTML, CS colling your b sadvantages ,Purpernatives of ajax, In-	S and Javas rowser, A ose of it ,aja troduction a	script, events and Ajax:Introduction, ax based web nd Uses of XML	

VI	Databases: Connection to server creating database selecting a	
V I	Databases. Connection to server, creating database, selecting a	
	database, listing database, listing table names creating a table,	
	inserting data, altering	
	tables, queries, deleting database, deleting data and tables, PHP	
	myadmin and database bugs.	

Suggested Readings:

- 1. Jon Duckett "Beginning Web Programming" WROX.
- 2. Marty Hall and Larry Brown "Core Servlets and Java Server pages Vol. 1: Core Technologies", Pearson.
- 3. DanWoods and GautamGuliani,"Open Source for the Enterprise: Managing Risks, Reaping Rewards", O'Reilly, Shroff Publishers and Distributors, 2005.
- 4. Sebesta,"Programming world wide web" Pearson.
- 5. Dietel and Nieto, "Internet and World Wide Web How to program", PHI/Pearson Education Asia.
- 6. Murach, "Murach's beginning JAVA JDK 5", SPD
- 7. Wang, "An Introduction to web Design and Programming", Thomson

Suggested Continuous Evaluation Methods:

3. Assessment Type: Class Tests (Max. Marks 14)

Suggested Usage:

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4. Assessment Type: Assignments (Max Marks: 4)

Suggested Usage: Some class assignments shall be given to students at the end of each Unit. Note making techniques be taught to students; Not just direct questions from notes, but application analysis and synthesis of that knowledge.

5. Assessment Type: Class Interaction (Max. marks: 2)

P: of	Programme/Class: Bachelor of Science		Year: Third		Sem	ester: Fifth
	Subject: Information Technology					
	Course Code: Course Title: Information Security & Cyber Laws					s
Coui 1	Course outcomes: After the completion of the course the students will be able to:1. Understand types of information Systems, cyber threats, and national/international cybe					to: nternational cyber
	2. Do mathema system.	atical mode	eling and developm	nent of secur	rity techniques and	d information
	1. Apply ethica	al principle	s/responsibilities i	n cyber prac	tices.	
		Credits: 4			Core Compu	lsory
	Max. Marks: 25+75 Min. Passing M			Aarks:		
	Unit		Торіс			
	Ι	Introduction: Introduction to Information System, Type of information system, Development of information system, CIA model of Information Characteristics, Introduction to Information Security, Need of Information Security, Cyber Security, Business need, Ethical and Professional issues of				
	п	Information Security Model, Component of an Information security, Aspect of information security, Security attacks (Active and Passive Attacks), Security mechanism and Security Services (X.800).				
	III	Information Security Techniques, Introduction algorithms, Substitution Cipher and Transposition Cipher,Single XOR , One-way Pad,				
	IV	Security	Policies, Why Pol	licies should	be developed,	

	WWW f	policies, Email Security polici	ies, Policy Review	<i>r</i>		
	Process-Corporate policies- Sample Security Policies.					
Programme/Class:	Year: Third		Semester: Fifth			
Bachlor of Science						
		Subject: Information Tech	nology			
Course Code:	Course Code: Course Title: Web Technology Lab					
Course outcomes						
CO 1: Understand CO 2: A poly the k	and evalu	ate web application architectu	ire, technologies a	nd frameworks		
CO 2. Apply the K	fferent sol	utions in field of web applicat	tion development	JIIS		
CO 4: implement	small to la	rge scale project to provide li	ve solution in web	application		
development field	s			11		
Credits: 3	3	Max. Marks: 25+75	Min. P	assing Marks:		
]	Practical List on Web To	echnology			
Practical Se	et -1 HTM	L				
I Design we	b pages to	r your college containing a de	escription of the co	ourses, departments,		
faculties, lib	rary etc, us	se href, list tags.				
2 Create you	ır class tim	etable using table tag.				
3 Create use	er Student	feedback form (use textbox	, text area , chec	kbox, radio button,		
select box et	c.)					
4 Create a w	eb page us	sing frame. Divide the page in	to two parts with	Navigation links on		
80% On cli	e of page ((width=20%) and content pag	ge on right hand si	de of page (width = $\frac{1}{2}$ shown on the right		
hand side.	icking the	navigation Links correspond	ing content must be	5 shown on the right		
5 Write htm	l code to d	levelop a webpage having tw	o frames that divid	de the webpage into		
two equal r	ows and t	then divide the row into equator	ual columns fill e	each frame with a		
different bac	kground c	010r.				
6 Create you	ur resume	using HTML tags also exper	iment with colors,	, text, link, size and		
also other ta	also other tags you studied.					
Practical Set -2 CSS						
7 Design a web page of your home town with an attractive background color, text color						
an Image, fo	an Image, font etc. (use internal CSS).					
8 Use Inline CSS to format your resume that you created.						
9 Use Extern	nal CSS to	format your class timetable a	s you created.			
10 Use External, Internal, and Inline CSS to format college web page that you created.						

Practical Set -3 JavaScript

11 Develop a JavaScript to display today's date.

12 Develop simple calculator for addition, subtraction, multiplication and division operation using JavaScript

13 Create HTML Page with JavaScript which takes Integer number as input and tells whether the number is ODD or EVEN.

14 Create HTML Page that contains form with fields Name, Email, Mobile No, Gender, Favorite Color and a button now write a JavaScript code to combine and display the information in textbox when the button is clicked.

15 implement Validation in above Feedback Form.

16 Use regular expression for validation in Feedback Form.

17 Using ajax retrieve data from a TXT file and display it.

Practical Set -4 XML

18 Create XML file to store student information like Enrollment Number, Name, Mobile Number, Email Id.

19 Create DTD for above XML File.

20 Create XML Schema for above (Practical No. 18)

21 Create XSL file to convert above (refer Practical No. 17) XML file into XHTML file.

22 Using ajax fetch information from a database with AJAX

Practical Set -6 Website (Optional)

Students have to create a whole Website which contains above topics in Website

Programme/0 of Science	Class: Bachelor	Year: Th	nird	Sem	ester: Sixth
Subject: Information Technology					
Course Co	ode:		Course Title:	E-Commerce	
Course outc	comes:				
 Underst Underst Be awar To apply understa issues in 	 Understand the basic concepts and technologies used in the field of E-Commerce Understand the processes of developing and implementing information systems Be aware of the ethical, social, and security issues of information systems and To apply their computer science skills to the conduct of e-commerce with some understanding of the legal, security, commercial, economic, marketing and infrastructure issues involved 				
	Credits: 4			Core Compu	lsory
	Max. Marks: 2	5+75		Min. Passing N	Marks:
Unit		Торіс			
Ι	Unit 1: Introduction of E-commerce: Introduction, E-commerceor Electronic Commerce- An Overview, History of ElectronicCommerce, Electronic Commerce – Cutting edge, ElectronicCommerce Framework, Advantages and Disadvantage of E-commerce, Roadmap of E-commerce in India				
II	Unit 2: Net Introduction, N Hierarchy, Bas TCP/IP protoco Web, E-comm Infrastructure-A Software, Netw	2: Network and E-commerce Infrastructure: Luction, Network Infrastructure: An Overview, The Internet rchy, Basic Blocks of e-commerce, Networks layers & IP protocols, The Advantages of Internet, World Wide E-commerce Infrastructure: Introduction, E-commerce tructure-An Overview, Hardware, Server Operating System, vare, Network Website			
Ш	Unit 3: Manag Managing the between Conve of Business in Business Mode of Transaction Model	naging the e-Enterprise: Introduction, e-Enterprise, ne e-Enterprise, E-business Enterprise, Comparison nventional Design and E-organization, Organization in an e-Enterprise, Process Models: Introduction, odels, E-business Models Based on the Relationship on Parties, e-commerce Sales Life Cycle (ESLC)			
IV	Model Unit 4: Management of Risk: Introduction, Introduction, An Overview of Risks Associated with Internet Transactions, Internet Associated Risks, Intranet Associated Risks, risks associated with Business Transaction Data Transferred between Trading Partners, Bisk Management Director Bacquery Plans Bisk Management Director Bacquery Plans			Introduction, An asactions, Internet as associated with Trading Partners, isk Management	

Programm of Science	e/Class: Bachelor	Year: Third Semester: Six		Semester: Sixth
Subject: Information Technology				
Course Code: Course Title: Introduction to AI and Data Science				
Course outcomes:				
1.Abilit <u>y</u> 2. Abilit	y to learn and und ty to learn and un	derstand AI and D derstand machin	ata Science e learning	basics basics and neural network
	Credits: 4			Core Compulsory
	Max. Marks: 2	5+75		Min. Passing Marks:
Unit		Торіс		
I	AI and Machine Intelligence: What is AI, History, principles of AI, applications of AI, Goals of AI, what contributes to AI, AI with search techniques, What is intelligence and its type, composition of intelligence, difference between human and machine intelligence, machine learning basics			
II	Neural Networ basic structure ANNs	Neural Network: What are Artificial Neural Networks (ANNs), basic structure of ANNs, types of Artificial ANNs, working of ANNs		
III	Data Science: It tool boxes for Processing - Da on the data; visualization tec	Data Science: Introduction to Data Science; role of data scientist, tool boxes for data scientists, understanding databases, Data Processing - Data collection; Data preparation; Training a model on the data; Evaluation of the model performance; Data visualization techniques and inferences		
IVExploring Data Analytics: Mean, Standard Deviation, Skewness and Kurtosis, Correlation Statistics, ANOVA. Vector norms, distances & projections, Discriminants, least squares, Singular Value Decomposition, Normal distribution, evaluating normal distribution, Binomial distribution, Simple and Multiple Regression, Model Evaluation using Visualization, Polynomial Regression and Pipelines Prediction and Decision Making.				
1. Cath 2. Jojo 2016	Uggested Books: y O'Neil and Racl Moolayil, "Smarte	nel Schutt , "Doing er Decisions : The I	Data Scien	ce", O'Reilly, 2015. of IoT and Data Science", PACKT

3. Trevor Hastie, Robert Tibshirani, Jerome Friedman, The Elements Of Statistical Learning,

Second edition Springer 2007.

- 4. Artificial Intelligence A Modern Approach (3rd Edition), By Stuart Russell & Peter Norvig
- 5. Make Your Own Neural Network, *By Tariq Rashid*

Suggested Continuous Evaluation Methods:

5. Assessment Type: Class Tests (Max. Marks 14)

Suggested Usage:

Include all types of questions-essay, short answer, objective; Design to test all levels of domain; Exam Blue Print be prepared to ensure inclusion of all types & levels of questions and proper sampling of content; Marking Criteria made known to students; Teacher should provide written feedback selectively and discuss answers in the class; Only Role/Code numbers, not names be written to avoid bias in marking; Display of model answer copies.

After Completion of Unit I and Unit II, a first class test of max. marks of 7 shall be conducted.

After Completion of Unit III and IV, a second class test of max. marks of 7 shall be conducted.

If any student does not appear in any one or both class test, a makeup test shall be conducted of max. marks of 5 instead of total 14 marks.

6. Assessment Type: Quizzes/ Objective Tests / Recognition Type (such as MCQs; True or False; Matching; Classifying) /Recall Type -Filling Blanks; One word / Phrase Answers (Max Marks: 5)

Suggested Usage: Teachers be trained in construction, advantages, disadvantages and precautions while preparing different types of objective items; Go beyond factual information to High Order Thinking (HOT) Skills. It shall be "End of the class quiz".

6. Assessment Type: Assignments (Max Marks: 4)

Suggested Usage: Some class assignments shall be given to students at the end of each Unit. Note making techniques be taught to students; Not just direct questions from notes, but application analysis and synthesis of that knowledge.

Assessment Type: Class Interaction (Max. marks: 2)

Programme/Class: Bachelor of Science		Year: Third	Semester: Six	
		Subject: Information Techn	ology	
Course Code:		Course Title: Lab on developing AI models using Python		
Course outcomes: 1. Ability to learn and understand AI models 2. Ability to learn and understand developing AI models using Python				
Credits: 3	3	Max. Marks: 25+75 Min. Passing Marks:		
AI models using Python				

Common Guidelines for Course Code: and Course Code:

Research Project Guidelines for V and VI Semester

1. Objectives of the Project

- To facilitate the student to independently formulate and solve a social, philosophical, commercial, or technological problem and present the results in written and oral form.
- To render students to the real life problems.
- To provide opportunities to students to interact with people and present them confidently.

2. Types of Project

The students are expected to work on:

- (1) Application Oriented Project or
- (2) Research Oriented Project.

However, it is not mandatory for a student to work on a real-life project. The student can formulate a project problem with the help of his Guide and submit the project proposal of the same. **Approval of the project proposal is mandatory.** If approved, the student can commence working on it, and complete it. It is upon the student to carry the same project of V semester to VI semester OR choose a new project for VI semester. Use the latest versions of the software packages for the development of the project.

3. Software and Broad Ideas of Application

- Programming Language/ Application Software/Operating System etc could be any latest technology prevailing / being used as per the will of the student with the consent of the guide.
- Languages C, C++, Java, VC++, C#, R,Python
- Scripting Languages PHP, JSP, SHELL Scripts (Unix), TcL/TK
- .NET Platform F#,C#. Net, Visual C#. Net, ASP.Net
- Middle Ware(Component) Technologies COM/DCOM, Active-X, EJB
- Front-End/GUI Tools .Net Technologies, Java
- Back-End/DBMS Oracle, SQL Plus, MY SQL, SQL Server
- UNIX Internals Device Drivers, RPC, Threads, Socket programming
- Real time Operating Systems/Embedded Skills LINUX, Raspberry Pi, Arduino.
- Application and Research Areas Financial / Insurance / Manufacturing / Multimedia / Computer Graphics / Instructional Design/ Database Management System/ Internet / Intranet / Computer Networking-Communication Software development/ E-Commerce/ ERP/ MRP/ TCP-IP programming / Routing protocols programming/ Socket programming

4. Eligibility of the Guide

Guide should be a regular teacher of the University/College/Higher Education Institute. Student can also do the project under the guidance of regular teacher of Institute of National Importancewith the consent of the enrolled college/institute where the student is studying.

5. Introduction to the Project

The student should include the details in the project diary, in which they will record the progress of their project throughout the course. The project report should be documented with scientific approach to the solution of the problem that the students have sought to address. The project report should be prepared in order to solve the problem in a methodical and professional manner, making due references to appropriate techniques, technologies and professional standards. The project report should contain enough details to enable examiners to evaluate the work. The important points should be highlighted in the body of the report, with details often referred to appendices.

6. Structure and Format of the Project

Chapter 1 to 4 should be submitted in Semester V in spiral binding and these chapters have also to be included in Semester VI report if same project is carried from V to VI semester. If different projects are taken than complete project report is to be submitted in each semester. Semester VI report has to be hard bound with golden embossing. Students will be evaluated based on the project in V and VI semester independently.

(i) Title Page:

Sample format of Title page is given below. Students should follow the given format.



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(Dr. Upendra Kumar)