Study and Evaluation Scheme

For

Bachelor of Computer Application (BCA)

(w.e.f 2019-2020)

DEPARTMENT OF COMPUTER APPLICATION

INTEGRAL UNIVERSITY, LUCKNOW

INTEGRAL UNIVERSITY, LUCKNOW

VISION

- To lead the teeming millions of the world through the wilderness of ignorance and illiteracy, as "Kindly Light" (Exodus 13:21) with the resounding divine proclamation "Read : Thy Lord is the most bounteous (Quran 30:96:3)." and to educate them in the most constructive and Innovative way.

- To inculcate a spirit of confidence, self-respect and firm commitment in students along with farsighted wisdom and understanding.

- To integrate the ebullience, intellect and dynamism of youth with decency, decorum, discipline and dedication through value-based quality education.

MISSION

- To make every student a role model of intellectuals and torch bearers for others all over the world through his / her inspiring existence.

- To make India a self-reliant and dominant G-1 country, recognized for quality education, higher economic growth and valuable moral practices.

OBJECTIVES

- To harness education in the service of mankind, and to enable the students to think globally and act nationally.

- To integrate spiritual and moral values with education and to develop human potential to its totality. To develop a sense of self-reliance and to create the awareness of the same in the young generations.

- To ignite the latent potentialities of young and budding generation through cutting-edge technology and state-of-the-art academic programmes.

- To bring about innovation in education by restructuring courses and adopting novel methods of teaching and learning to target multifaceted personality development.

DEPARTMENT OF COMPUTER APPLICATIONS
BCA PROGRAMME

VISION

The Vision of the Department is:

Visualizing the department as an academic distinction recognize for its total commitment to superiority in technical education and research with holistic concern for quality in life, environment, society and ethics through expanding the horizon.

MISSION

The Mission of the Department is:

- To entail the empirical knowledge of a new generation of interdisciplinary aspirants who build bridges and innovate at the intersection of multiple scientific domains.
- To thrive for qualitative skills for better endurance in diverse and consistent growing technological environment.

DEPARTMENT OF COMPUTER APPLICATIONS
BCA PROGRAMME

Programme Educational Objectives (PEO)

1. To acquaint students about principles of system analysis, design, development and project management.
2. To impact knowledge about various sub domains related to the field of computer science and applications.
3. To apply IT practices to model and analyze the real life problems and interpret the results.
4. To build and lead cross-functional teams, upholding the professional responsibilities & ethical values.

Programme Outcomes (PO)

1. Ability to demonstrate knowledge of Computer science and its applications in order to enhance basic understanding of various software technologies.
2. Ability to analyze and identify various business and technical problems to further solve problems with effective communication.
3. Ability to adapt analytical, logical and managerial skills with the technical aspects in order to design and deploy reliable software programs and application for real world problems.
4. Ability to investigate complex problems and provide computer-based solutions.
5. Ability to understand and deliver ethical, social and cultural responsibilities in professional environment as an individual and team.
6. Ability to adapt new technologies for upgrading their skills and contributing to a lifelong learning.
7. Ability to create and manage multidisciplinary projects and successfully apply software and project management principles.
8. Ability to become employable in a variety of IT companies and government sector and also seek entrepreneurship opportunities for the betterment of an individual and society at large.

Programme Specific Outcome (PSO)

1. Attain the ability to design and develop Computer Applications, evaluate and recognize potential skills and provide innovative solutions.
2. Explore technical knowledge in diverse areas of Computer Applications an experience and environment conducive in cultivating skills for successful career, entrepreneurship and higher studies.

Integral University, Lucknow
Department of Computer Application
STUDY & EVALUATION SCHEME

Choice Based Credit System

Bachelor of Computer Application (BCA)

Total Credits = 146

Year Ist, Semester Ist

S. No.	Course Category	Subject Code	Name of the Subject	Periods				Evaluation Scheme				Subject Total
								Sessional (CA)			End Sem Exam	
				L	T	P	C	CT	TA	Total	ESE	
1.	Foundation	MT103	Mathematics I	3	1	0	4	25	15	40	60	100
2.	Foundation	LN104	Essential Professional Communication	3	1	0	4	25	15	40	60	100
3.	Core	CA101	Programming in C	3	1	0	4	25	15	40	60	100
4.	Core	CA102	Computer Fundamentals and Programming Concepts	3	1	0	4	25	15	40	60	100
5.	Foundation	ES115	Fundamentals of Environmental Science	3	1	0	4	25	15	40	60	100
6.	Core	CA103	C Programming Lab	0	0	3	2	30	30	60	40	100
7.	Core	CA104	Computer Application Lab	0	0	3	2	30	30	60	40	100
8.	Foundation	LN152	Basic Professional Communication Lab	0	0	2	1	30	30	60	40	100
Total				**15**	**5**	**8**	**25**					**800**

L - Lecture **T** – Tutorial **P** – Practical **C** – Credit **CT** – Class Test **TA** – Teacher Assessment
Sessional Total (CA) = Class Test + Teacher Assessment

Subject Total = Sessional Total (CA) + End Semester Examination (ESE)

COURSE: PROGRAMMING IN C
CODE: CA101
COURSE CREDIT: 4

COURSE OBJECTIVES:

- Understand the basics of Programming.
- Understand functional hierarchical code generation.
- Understand the usage of characters, string, integers and special symbols in programming.
- Understand loops and decision-making statements in order to solve problems.
- Understand arrays and implementation of various operations on arrays.
- Understand the use of functions and pointer in programming.
- Understand the use of structure & union.
- Understand file operations and implement file operation in C programming for a set of problems.

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Identify the need and use of programming in real world environment.
CO2	Improve the understanding of using data types, variables and arithmetic operations in programming.
CO3	Understand the concept of functions and pointer. In addition, resolve real world problems using functions and pointers.
CO4	Understand Array and String concepts and implement array and string using functions and pointers.
CO5	Exercise user defined data types including structure and union.

CO-PO MAPPING:

PO	PO											
CO	**POI**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	1				1		1				
CO2		2	1	1	1							
CO3	1	3	2	2		2	1	2				
CO4	1	2	2	1	1		1					
CO5		2	2	1	1	3	1	1				

COURSE: COMPUTER FUNDAMENTAL AND PROGRAMMING CONCEPT
COURSE CODE: CA102
COURSE CREDIT: 4

COURSE OBJECTIVES:

- The main objective is to introduce Programming in a simple language to all undergraduate students, regardless of their specialization.
- It will help them to pursue specialized programs leading to technical and professional careers and certifications in the IT industry.
- The focus of the subject is on introducing skills relating to computer basics, computer applications, programming, interactive Medias, Internet basics etc.

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	To understand the fundamentals of Computer such as Block Diagram of Computer, Computer hardware, Memory Architecture, to perform conversion from one number system to another number system.
CO2	Will be able to analyze software, to identify type of software, to know the concept of Operating System and Functions of Operating System, to memorize the various commands of different Operating System.
CO3	Students will be able to know concept of networking, Networking based reference model, Internet and different term related to internet. Different types of protocols associated with internet.
CO4	Will be able to get idea about what is program and program paradigms, to develop strategies behind designing a program, to know the structure i.e. Top-Down and Bottom-Up approach of Modular Programming.
CO5	Will be able to learn about different generations of Programming language, to know different methodologies to solve computation task, using appropriate and suitable flow chart and algorithm.

CO-PO MAPPING:

PO	PO											
CO	**POI**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	1	1			1	1					
CO2	1	3	2	2	1		1					
CO3	2	2	1	1		1						
CO4		2	3	1	1	3	1					
CO5	1	3	2	2	1		1					

Integral University, Lucknow
Department of Computer Application
STUDY & EVALUATION SCHEME

Choice Based Credit System

Bachelor of Computer Application (BCA)

Year I[st], Semester II[nd]

S. No.	Course Category	Subject Code	Name of the Subject	Periods				Evaluation Scheme				Subject Total
								Sessional (CA)			End Sem Exam	
				L	T	P	C	CT	TA	Total	ESE	
1.	Foundation	MT114	Mathematics II	3	1	0	4	25	15	40	60	100
2.	Core	CA105	System Analysis and Design	3	1	0	4	25	15	40	60	100
3.	Foundation	LN201	Advanced Professional Communication	3	1	0	4	25	15	40	60	100
4.	Core	CA106	Computer Organization	3	1	0	4	25	15	40	60	100
5.	Core	CA107	Data Structure using C	3	1	0	4	25	15	40	60	100
6.	Core	CA108	Data Structure Lab	0	0	3	2	30	30	60	40	100
7.	Core	CA109	Computer Organization Lab	0	0	3	2	30	30	60	40	100
8.	Foundation	LN153	Advanced Professional Communication Lab	0	0	2	1	30	30	60	40	100
Total				**15**	**5**	**8**	**25**					**800**

L - Lecture **T** – Tutorial **P** – Practical **C** – Credit **CT** – Class Test **TA** – Teacher Assessment
Sessional Total (CA) = Class Test + Teacher Assessment

Subject Total = Sessional Total (CA) + End Semester Examination (ESE)

COURSE: SYSTEM ANALYSIS AND DESIGN
CODE: CA105
COURSE CREDIT: 4

COURSE OBJECTIVES:

- To study different types of system and life cycle of system development.
- To learn roles of system analyst and different information gathering tools.
- To learn use tools for structured analysis, cost/benefit strategies and feasibility study.
- To learn process and stages of system design and form design.
- To learn system testing and quality assurance with proper hardware and software selection.

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Implement different types of information system in an organization like MIS & DSS and understand the phases for SDLC.
CO2	Able to gather data to analyze and specify the requirements of a system.
CO3	Develop and analyze data flow diagrams and explain how to develop the project budget.
CO4	Design system input/output components and environments and also describe the process of moving from logical to physical data models.
CO5	Identify the techniques in testing phase for better quality assurance.

CO-PO MAPPING:

PO	PO											
CO	**POI**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	1	2			1	1	1				
CO2		3	2	2	1	3	1					
CO3	2	3	2	2			1	2				
CO4	2	3	2	2	1		1	1				
CO5		2		1	1	3						

COURSE: COMPUTER ORGANIZATION
COURSE CODE: CA106
COURSE CREDIT: 4

COURSE OBJECTIVES:

- This course is intended to teach the basics involved in data representation and digital logic circuits used in the computer system. This includes the general concepts in digital logic design, including logic elements, and their use in combinational and sequential logic circuit design. This course will also expose students to the basic architecture of processing, memory and i/o organization in a computer system.

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	To understand the fundamentals of computer such as block diagram of computer, Computer hardware, Memory Architecture, to perform conversion from one number system to another number system. Understand the digital representation of data in a computer system.
CO2	Understand the general concepts in digital logic design, including logic elements, and their use in combinational and sequential logic circuit design. Understand computer arithmetic formulate and solve problems.
CO3	To understand the basic organization of the computer. Understand the performance requirements of systems and BUS architecture of the system.
CO4	Will be able to get idea about memory, Memory classification, Memory mapping, and Memory management.
CO5	Will be able to learn about I/O organization, different types of peripheral devices, data transfer modes. To understand different communication schemes.

CO-PO MAPPING:

PO	PO											
CO	**POI**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	2	1	1		1						
CO2	1	3	1		1		1					
CO3	2	1	2			1	1					
CO4	1	2	1	1		2	1					
CO5	1	2	1	1		3						

COURSE: DATA STRUCTURE USING C
CODE: CA107
COURSE CREDIT: 4

COURSE OBJECTIVES:

- To learn basic knowledge about data structure and arrays.
- To learn how to create and use linked list and its applications.
- To learn the importance of static and dynamic use of stack and queues.
- To learn the basic terminology of trees.
- To learn basics of sorting and searching techniques.

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Able to understand basics of C programming language and arrays.
CO2	Able to understand basic concepts of linked list.
CO3	To understand the basic concepts of stack and queues through array and linked list .
CO4	To understand the basic knowledge of trees and graph.
CO5	Able to understand the concepts of sorting and searching techniques.

CO-PO MAPPING:

PO	PO											
CO	**POI**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	1	1		1							
CO2	2	2	1		1		1					
CO3	2	1	2		2		1					
CO4	3	1	1	1		1	1					
CO5	2	1		1		2	1					

Integral University, Lucknow
Department of Computer Application
STUDY & EVALUATION SCHEME
Choice Based Credit System

Bachelor of Computer Application (BCA)
w.e.f. Session 2016-17

Year II[nd], Semester III[rd]

S. No.	Course Category	Subject Code	Name of the Subject	Periods				Evaluation Scheme				Subject Total
								Sessional (CA)			End Sem. Exam	
				L	T	P	C	CT	TA	Total	ESE	
1.	Foundation	MT202	Computer Based Numerical and Statistical Techniques	3	1	0	4	25	15	40	60	100
2.	Elective - I	CA201	Combinatorics and Graph Theory	3	1	0	4	25	15	40	60	100
		CA202	Multimedia System									
3.	Core	CA203	Object Oriented Programming Concepts using C++	3	1	0	4	25	15	40	60	100
4.	Core	CA204	Database Management System	3	1	0	4	25	15	40	60	100
5.	Foundation	BM228	Accounting and Financial Management	3	1	0	4	25	15	40	60	100
6.	Core	CA205	Mini Project	0	0	3	2	30	30	60	40	100
7.	Core	CA206	C++ Lab	0	0	3	2	30	30	60	40	100
8.	Core	CA207	DBMS Lab	0	0	2	1	30	30	60	40	100
Total				**15**	**5**	**8**	**25**					**800**

L - Lecture **T** – Tutorial **P** – Practical **C** – Credit **CT** – Class Test **TA** – Teacher Assessment
Sessional Total (CA) = Class Test + Teacher Assessment

Subject Total = Sessional Total (CA) + End Semester Examination (ESE)

COURSE: COMBINATORICS AND GRAPH THEORY
CODE: CA201
COURSE CREDIT: 4

COURSE OBJECTIVES:

- To study the concepts of Fundamentals of permutation and combination and generating function.
- To learn recurrence relation and their fundamentals. Describe and solve problems using concepts of generating function and solution of recurrence relations
- To learn the basic concepts of graph theory and their application in the field of computer science to solve different problems.
- To learn Fundamentals of planar graph, dual graph and vector representation of graph, Introduction to matrix representation of graph.
- To learn coloring of graph, chromatic number of a graph and chromatic polynomial of a graph**.**

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Understand the different theoretical and cross-disciplinary problems and solve some real time problems using concepts of permutation, combination and concept of generating function.
CO2	Understand the structure of recurrence relation and Describe and solve some real time problems using concepts of generating function and solution of recurrence relations.
CO3	Understand the basic concepts of graph theory and all of the relevant theorems covered in the course.
CO4	Understand the concepts in planar graph and matrix representation of graph.
CO5	Understand the coloring concept of a graph, four color theorems, five color theorem and its applications.

CO-PO MAPPING:

PO	PO											
CO	**POI**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	1	3	1	2	1							
CO2	2	3	1	2	1		1					
CO3	3		2			1	1					
CO4	2	1	1	1		1						
CO5	2	1	3	1		2	1					

COURSE: MULTIMEDIA SYSTEM
COURSE CODE: CA202
COURSE CREDIT: 4

COURSE OBJECTIVES:

- To learn and understand technical aspect of Multimedia Systems.
- To understand the standards available for different audio, video and text applications.
- To Design and develop various Multimedia Systems applicable in real time.
- To learn various multimedia authoring systems.
- To understand various networking aspects used for multimedia applications.

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Developed understanding of technical aspect of Multimedia Systems.
CO2	Understand various file formats for audio, video and text media.
CO3	Develop various Multimedia Systems applicable in real time.
CO4	Design interactive multimedia software.
CO5	Apply various networking protocols for multimedia applications.

CO-PO MAPPING:

PO	PO											
CO	**POI**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	1	2	3	1	1		2	1				
CO2	3	1			1							
CO3		3	2	2	1	2	1	1				
CO4	1	1	3			1	2	2				
CO5		3	1	2	1	1						

COURSE: OBJECT ORIENTED PROGRAMMING CONCEPTS USING C++
CODE: CA203
COURSE CREDIT: 4

COURSE OBJECTIVES:

- To learn object oriented programming paradigms and various object oriented modeling.
- To learn basic concepts, structure syntax of C++.
- To learn & implement various programming problems in C++.
- To learn & implement advanced programming concepts in C++
- To learn error handling technique in C++ and improve problem solving ability.

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Know basic knowledge of object oriented modeling and its application in computer science.
CO2	Understand basic concepts & structure of object oriented programming language using C++.
CO3	Design and develop various programming problems using basic concepts of C++.
CO4	Learn and implement advance programming concepts of C++ like Inheritance, operator overloading, etc.
CO5	Learn and implement exception handling mechanism for debugging in C++.

CO-PO MAPPING:

PO	PO											
CO	**POI**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3		1		1		1					
CO2	3	1	2			1	1					
CO3		2	3	1	1	2	2					
CO4	1	1	3	1		2	2					
CO5	1	1	3	1		1	2					

COURSE: DATABASE MANAGEMENT SYSTEM
CODE: CA204
COURSE CREDIT: 4

COURSE OBJECTIVES:

- To learn the basic knowledge of Database Management System and various types of data models.
- To learn the concept and syntax of ER Diagram and the extended ER features.
- To learn various constraints and writing SQL queries.
- To learn the basic structure of Oracle system.
- To learn the concept of Normalization.
- To learn the various issues in transaction processing.
- To learn the recovery system and basics of concurrency control system.

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Able to understand the basic concepts of DBMS, Difference between DBMS and File Processing System, applications of DBMS and various DBMS Models.
CO2	Able to understand the basic concepts of ER Model and How to draw ER Diagrams.
CO3	Ability to define various constraints and writing queries using SQL syntax.
CO4	Applying the Relational algebra and Calculus to define expressions for queries and understanding various Normal forms used for Normalization approach.
CO5	Acquainted with the basic issues while implementing the concept of Transaction and recovery.

CO-PO MAPPING:

PO	PO											
CO	**POI**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	1			1	1						
CO2	3	1	2			1	1	2				
CO3		2	3	1	1	2	2					
CO4	1	3	2	2		2	1					
CO5		2	2	1	1	1		1				

Integral University, Lucknow
Department of Computer Application
STUDY & EVALUATION SCHEME
Choice Based Credit System

Bachelor of Computer Application (BCA)
w.e.f. Session 2016-17

Year II[nd], Semester IV[th]

S. No.	Course Category	Subject Code	Name of the Subject	Periods				Evaluation Scheme				Subject Total
								Sessional (CA)			End Sem. Exam	
				L	T	P	C	CT	TA	Total	ESE	
1.	Elective - II	CA208 / CA209	Discrete Mathematics / Data Compression	3	1	0	4	25	15	40	60	100
2.	Elective - III	CA210 / CA211	Software Engineering and Project Management / Software Security	3	1	0	4	25	15	40	60	100
3.	Core	CA212	Computer Architecture and Microprocessor	3	1	0	4	25	15	40	60	100
4.	Core	CA213	Operating System	3	1	0	4	25	15	40	60	100
5.	Core	CA214	JAVA Programming	3	1	0	4	25	15	40	60	100
6.	Core	CA215	Microprocessor Lab	0	0	3	2	30	30	60	40	100
7.	Core	CA216	JAVA Programming Lab	0	0	3	2	30	30	60	40	100
8.	Core	CA217	Seminar	0	0	2	1	30	30	60	40	100
Total				**15**	**5**	**8**	**25**					**800**

L - Lecture **T** – Tutorial **P** – Practical **C** – Credit **CT** – Class Test **TA** – Teacher Assessment
Sessional Total (CA) = Class Test + Teacher Assessment

Subject Total = Sessional Total (CA) + End Semester Examination (ESE)

COURSE: DISCRETE MATHEMATICS
CODE: CA208
COURSE CREDIT: 4

COURSE OBJECTIVES:

- To study the concepts Relation and functions.
- To learn: Algebraic Structures and Propositional Logic and their application in computer science.
- To learn Lattices: Ordered set, Posets and Introduction to Lattices, Properties of lattices.
- To learn Introduction of the Language, Kleene closure and finite automata with output and Finite Automata without output.
- To learn the concepts of Non-Regular language: Pumping lemma, Introduction to Pushdown Automata, Introduction to Turing Machine.

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Understand the concepts of relations and functions and terminology.
CO2	Understand the concept Algebraic Structures and Propositional Logic and their application in computer science.
CO3	Understand the concept of Lattices: Ordered set, Posets and Introduction to Lattices, Properties of lattices.
CO4	Understand the concepts of Introduction of the Language, Kleene closure and finite automata with output and Finite Automata with output.
CO5	To understand the concepts of Non-Regular language: Pumping lemma, Introduction to Pushdown Automata, Introduction to Turing Machine.

CO-PO MAPPING:

PO	PO											
CO	**POI**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	1			1	1		1				
CO2	3	1	2			1	1					
CO3	2	2	1	1		2						
CO4	2	1	1			2	1					
CO5	2	1	1	1		1						

COURSE: DATA COMPRESSION
COURSE CODE: CA209
COURSE CREDIT: 4

COURSE OBJECTIVES:

- Describe and apply various techniques for text compression and also evaluate performance of the coding technique.
- Explain digital audio, companding ,perceptual audio coding and MPEG audio compression standard
- Describe different lossless and lossy image and video compression techniques and standards
- Differentiate between symmetric and asymmetric cryptography and also describe different symmetric cryptographic techniques

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Describe and apply various techniques for text compression and also evaluate performance of the coding techniques.
CO2	Understand the operation of scalar and vector quantizer.
CO3	Describe different lossless and lossy image and video compression techniques and standards
CO4	Summarize the concepts associated speech, image and video compression.
CO5	Recognize the usage data compression in telecommunication engineering and to solve the corresponding problems.

CO-PO MAPPING:

PO	PO											
CO	**POI**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	1	1	3		1		2					
CO2	3	1	1			1						
CO3	2	2	1	1		2						
CO4		2	2	1	1	1	1					
CO5		3	1	2		1						

COURSE: SOFTWARE ENGINEERING AND PROJECT MANAGEMENT
COURSE CODE: CA210
COURSE CREDIT: 4

COURSE OBJECTIVES:

- To develop knowledge of phases in software development
- To develop good quality software and able to maintain quality of software
- To know the team required for project management.
- To develop knowledge of tools available for software development.
- Knowledge of testing and maintain robustness of software

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	To understand about designing model and practical implementation.
CO2	To take decision of project planning on the basis of cost evaluation.
CO3	To understand risk identification and management.
CO4	To use various tools for software design development.
CO5	To understand importance of quality of software.

CO-PO MAPPING:

PO	PO											
CO	**POI**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	1	2		1		1	1				
CO2	1	2	1	1		2		1				
CO3	3	2		1	1	1						
CO4		1	3		1	2	2	1				
CO5	2	1	1	1		2						

COURSE: SOFTWARE SECURITY
CODE: CA211
COURSE CREDIT: 4

COURSE OBJECTIVES:

- The course gives an overview of security issues for software, and provides programming methods for the development of secure applications.
- To understand the Risk Management Framework (RMF) and risk involved in software development.
- About different security policies and how they apply across a variety of application domains.
- About mechanisms designed to enforce a given policy and attacks meant to thwart that same policy.
- To understand the properties and security knowledge of a secure software.

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Understands security issues relating to system development.
CO2	Knows software development techniques to avoid security problems after resolving the risk involved in software development.
CO3	Explain the most common weaknesses in software security and how such problems can be mitigated in software.
CO4	Identify common security threats, risks, and attack vectors for software systems, and knows best practices to defend software systems.
CO5	Exchange opinions with other professionals and participate in developing best practices for secure software.

CO-PO MAPPING:

PO	PO											
CO	**POI**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	1			1	1						
CO2	1	3	1	2	1		1	1				
CO3	2	2		1	1	1		1				
CO4	1	3	2	2		2	1					
CO5		3	2	2	1	1	1					

COURSE: COMPUTER ARCHITECTURE AND MICROPROCESSOR
COURSE CODE: CA 212
COURSE CREDIT: 4

COURSE OBJECTIVES:

- To learn the concepts regarding microprocessor with 8 bit. To learn the concepts regarding microprocessor with 16 bit. To understand the basic idea of the internal architecture and register configuration of respective devices.
- To understand the programming techniques of with the help of Assembly Language Programming. To understand the basic concept of parallel computing.
- To understand significance of pipelining and parallelism, so that the devices used to perform according to the need of the designer so as to have appropriate results.
- To understand the concepts of Pipeline scheduling theory
- Understanding of the various types of interconnection networks.

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	For a microprocessor system, student should be able to deal with the internal architecture of 8 bits and 16 bit microprocessor to analyze the working operation and to know the pin configuration for the respective microprocessor. A student should be good enough to deal with interrupts internally or externally.
CO2	He/she should be able to understand the basic concepts of Assembly language programming. For a particular data instruction set, student should be having a clear idea of solving machine language programs using kit. He/she shall be having an idea to tackle with counter delays and subroutines.
CO3	He/she should be able to know the concept of pipelining and parallelism in uniprocessor system for hazard detection. Understand the basic concept of Parallel computing.
CO4	A student should have a basic idea of job levels that are governed by an organization on priority basis. He/she should know the Pipeline scheduling theory.
CO5	For good networking, a student should be able to draw SIMD interconnections and FFT or a butterfly method system for collision prevention and vector dispatching. He/she should be able to make Cube Interconnection Network, Shuffle-Exchange and Omega Network.

CO-PO MAPPING:

PO	PO											
CO	**POI**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	2	1		2	1	1						
CO2	3	2	1		1		1					
CO3	2	1		1	1	1						
CO4	2	1	2			2	1					
CO5		2	3	1	1	1	2					

COURSE: OPERATING SYSTEM
CODE: CA213
COURSE CREDIT: 4

COURSE OBJECTIVES:

- To understand various operating system types, Architecture design of OS and their services.
- To study process management concepts and various scheduling algorithm.
- To understand process synchronization concepts and dead lock handling mechanism.
- To learn various memory management schemes.
- To study file management and Disk management techniques.

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Know different OS types and basic component of OS Architecture.
CO2	Analyze issues in process management and evaluations of various scheduling algorithms.
CO3	Understand process synchronization problem and provide solution for critical section problem and deadlock management.
CO4	Analyze and implement various memory management techniques.
CO5	Identify the use of storage management techniques and solve various disk scheduling problems.

CO-PO MAPPING:

PO	PO											
CO	**POI**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	1			1	1						
CO2	1	3	1	2	1							
CO3	2	3		2	1	1		1				
CO4	1	2	2	1		2	1					
CO5		3	1	2	1	2		1				

COURSE: JAVA PROGRAMMING
CODE: CA214
COURSE CREDIT: 4

COURSE OBJECTIVES:

- To learn the various features of Java and comparing with C++.
- To learn the Java environment for writing programs and Java program structure.
- To learn the various Objects oriented features with Java.
- To learn the Array and String concepts in Java.
- To learn the method of Exception Handling in Java.
- To learn the concepts of Thread and Package.
- To learn the Applet concepts and implementing them in creating a web page.

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Able to understand the features of Java Programming Language with Syntax and structure of Java Programs and how to use various operators in Java.
CO2	Able to understand that how to implement the Object oriented features by writing Java programs.
CO3	Ability to define Arrays, Strings, Vectors, Packages etc. in Java and implementing the Exception handling Mechanism in Java.
CO4	Ability to understand the different concepts to create and use Threads and Packages in Java.
CO5	Ability to understand the different concepts of applets and adding them to a HTML File.

CO-PO MAPPING:

PO	PO											
CO	**POI**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	1		1	1							
CO2	2		1		1	2		2				
CO3	2	1	3	1		1	2	1				
CO4	1	1	2	1		3	1	2				
CO5	1	1	2	1		2	1					

Integral University, Lucknow

Department of Computer Application
STUDY & EVALUATION SCHEME
Choice Based Credit System

Bachelor of Computer Application (BCA)
w.e.f. Session 2017-18

Year III[rd], Semester V[th]

S. No.	Course Category	Subject Code	Name of the Subject	Periods				Evaluation Scheme				Subject Total
								Sessional (CA)			End Sem. Exam	
				L	T	P	C	CT	TA	Total	ESE	
1.	Core	CA301	Computer Graphics and Multimedia Application	3	1	0	4	25	15	40	60	100
2.	Core	CA302	UNIX and Shell Programming	3	1	0	4	25	15	40	60	100
3.	Core	CA303	Data Communication and Computer Networks	3	1	0	4	25	15	40	60	100
4.	Core	CA304	Web Designing Concepts	3	1	0	4	25	15	40	60	100
5.	Elective – IV			3	1	0	4	25	15	40	60	100
6.	Core	CA310	UNIX and Shell Programming Lab	0	0	3	2	30	30	60	40	100
7.	Core	CA311	Web Designing Lab	0	0	3	2	30	30	60	40	100
8.	Core	CA312	Computer Graphics and Multimedia Application Lab	0	0	2	1	30	30	60	40	100
Total				**15**	**5**	**8**	**25**					**800**

L - Lecture **T** – Tutorial **P** – Practical **C** – Credit **CT** – Class Test **TA** – Teacher Assessment
Sessional Total (CA) = Class Test + Teacher Assessment

Subject Total = Sessional Total (CA) + End Semester Examination (ESE)

Elective - IV
CA305 Optimization Technique
CA306 Simulation and Modeling
CA307 Image Processing
CA308 Elementary Algorithm
CA309 Knowledge Management

COURSE: COMPUTER GRAPHICS AND MULTIMEDIA APPLICATION
CODE: CA301
COURSE CREDIT: 4

COURSE OBJECTIVES:

- To learn the principles of hardware and software behind the graphical environment. To learn about the design and implementation of graphical object by understanding basic algorithms for scan conversion of different graphical primitives and filling their inner areas.
- To learn about transformation and modeling of original primitive and their clipped version into dimensional space by understanding the different algorithms.
- To learn projecting any graphical primitive from higher dimensional space to 2-D space.
- To learn the various aspects of rendering visible surfaces.
- To learn the creation of animated objects and their images by knowing various aspects of media and learn the concept of audio, images and videos. Also, to learn minimization of memory requirements for graphical objects by rendering objects and surfaces and compressing Images.

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Understand the basics of computer graphics, different graphics systems and applications of computer graphics.
CO2	Implement the various algorithms for scan conversion and filling of basic objects and their comparative analysis.
CO3	Apply geometric transformations on original and clipped graphics objects and their application in composite form in 2D and 3D.
CO4	Apply projection techniques for improving the object appearance from3D scene on 2D screen.
CO5	Implement interactive graphics applications and games that use animation techniques, audio, video by minimizing memory requirements through compression techniques.

CO-PO MAPPING:

PO	PO											
CO	**POI**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	1	2		1		1					
CO2		2	3	1	1	1	2					
CO3		2	3		1	3	1	2				
CO4	1	2	3	1		2	1					
CO5	1	1	3			2	1	2				

COURSE: UNIX and Shell Programming
CODE: CA302
COURSE CREDIT: 4

COURSE OBJECTIVES:

- To learn basic knowledge about architecture of Unix/Linux and different basic Commands of Unix/Linux.
- To learn how to use process management.
- To learn the importance of system administration tasks.
- To learn the shell programming.
- To learn basics of filter commands.

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Able to understand architecture and basic commands of Unix/Linux.
CO2	Able to understand creation of process and scheduling of process.
CO3	Understand how to perform administration task.
CO4	To understand the basic structure of shell programming and understand the conditional statements and looping statements.
CO5	Able to understand the concepts of basic filter commands.

CO-PO MAPPING:

PO	PO											
CO	**POI**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	1	1		1			1				
CO2	3	1	2	1		2	1					
CO3	1	1	3		1		2					
CO4	2	1	1	1		2						
CO5	2	1	2		1		1					

COURSE: DATA COMMUNICATION AND COMPUTER NETWORKS
COURSE CODE: CA 303
COURSE CREDIT: 4

COURSE OBJECTIVES:

- Build an understanding of the fundamental concepts of Data communication. Familiarize the student with the basic taxonomy and terminology of signals.
- To learn about the Modulation and Data Encoding methods. To study about the Multiplexing Techniques and different switching technique.
- Get knowledge about the Network and its application. Study about the different Network Topologies. Introduce the student to OSI Model, preparing the student for entry Advanced courses in computer networking.
- To understand the concepts of TCP/IP protocol suite. Build an understanding of the various data link layer protocol and its applications.
- Understanding of the various the various internetworking devices. To study the IEEE 802 Project.

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Understand the basic data communication network System. Identify the different types of signals. Able to understand Microwave Transmission System. Distinguish between the concepts and principles behind various data transmission Techniques.
CO2	Able to understand about the Data Modulation and Data Encoding methods. Able to understand about the Multiplexing Techniques. Able to understand about the Switching techniques.
CO3	Understand the basic idea of network. Able to understand virtual circuit network. Familiar with the layers of the OSI model. Identify the different types of network topologies and protocols.
CO4	Understand about the TCP/IP protocol suite. Able to understand various types of Flow control technique. Distinguish between the concepts behind various protocols.
CO5	Able to identify and correct use of various types of communication channels. Able to demonstrate knowledge and understanding of relevant data communications standards.

CO-PO MAPPING:

PO	PO											
CO	**POI**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	2	2	1	1	1							
CO2	3	1	2			1	1					
CO3	2	2	1	1		2						
CO4	3	2	1	1		1						
CO5	1	3	2	1		2	1					

COURSE: WEB DESIGNING CONCEPTS
CODE: CA304
COURSE CREDIT: 4

COURSE OBJECTIVES:

- To learn basic knowledge of project planning and development.
- To learn how to communicate throughout the project.
- To learn the role of Quality Assurance and technological advances.
- To learn fundamental language of internet i.e. HTML, DHTML and CSS.
- To learn basics of client side Java Script and Server Side programming constructs.

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Able to manage project team and successful development.
CO2	Ability to perform effective communication through system.
CO3	Upgrading skill set according to latest market needs and use web testing tools.
CO4	Hands on practice on HTML and learn the need and basics of CSS and the concepts of Client Side JavaScript.
CO5	Acquainted with the difference between Client Side and Server Side Scripting.

CO-PO MAPPING:

PO	PO											
CO	**POI**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	1	2	3	1	3		2					
CO2		3		2	1							
CO3						3		2				
CO4	2	3	2	2		2	1	2				
CO5	2	3		2				3				

COURSE: OPTIMIZATION TECHNIQUE
CODE: CA305
COURSE CREDIT: 4

COURSE OBJECTIVES:

- To learn basic OR concepts, models, OR theory and its application in business model.
- To build capabilities for analyzing various industrial situation and find the optimum solution for the problem given.
- To learn concepts and tools in order to understood various OR mathematical methods to solve business problem.
- To formulate various model in ordered to solve decision making problem in business.
- To learn quantitative methods and techniques for effective decision making process.

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Understand OR concepts, its application in decision making and various decision making approaches.
CO2	Formulate and solve various mathematical problem using Linux programming techniques.
CO3	Develop and solve transportation model and assignment problem Model.
CO4	Analyze and solve decision making situation in inventory management.
CO5	Understand various queuing conditions and identify the best optimal solution using various models.

CO-PO MAPPING:

PO	PO											
CO	**POI**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	1	2		1		1					
CO2		3	2	2	1	1	1					
CO3	1	2	3	1		2	2					
CO4		2	2	1	1	2	1	1				
CO5	2	2	1	1		1		2				

COURSE: SIMULATION AND MODELING
CODE: CA306
COURSE CREDIT: 4

COURSE OBJECTIVES:

- To learn the basics of System, Simulation modeling and various types of simulation models.
- To learn the concept of Corporate and Full Corporate Model, types of System study along with System analysis and design
- To learn the comparison of Simulation with Analytical methods.
- To learn the numerical computational techniques for continuous and discrete models.
- To learn the concept of Continuous system Simulation Language and Real time simulation.
- To learn the experimental models and generalization of Growth models.
- To learn the drawing of Simple System Dynamic diagrams.

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Able to understand the basic concepts of System, System Modeling, Physical Models and Dynamic models.
CO2	Able to understand the basic concepts of Corporate model System Study, Analysis and Design with System Postulation.
CO3	Ability to learn the difference between simulation methods and Analytical methods and study of various numerical techniques for discrete models.
CO4	Ability to learn the Continuous System Simulation and Autopilot simulation.
CO5	Acquainted with the growth models and Delay models, System dynamic diagrams and multi segment models.

CO-PO MAPPING:

PO	PO											
CO	**POI**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	1	2		1		1					
CO2	3	1	1	1		1						
CO3	1	2	3	1		2	2					
CO4		2	2	1	1	2	1					
CO5	1	1	3			1	2					

COURSE: IMAGE PROCESSING
COURSE CODE: CA 307
COURSE CREDIT: 4

COURSE OBJECTIVES:

- To understand basic components that constitutes an image.
- To understand concepts of filtering of image.
- To understand various processes those are applied on image.

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to learn

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Digital Image Fundamentals Element of Visual Perception, A Simple Image Model, Coordinate Conventions, Image Sampling and Quantization,
CO2	Filtering, Smoothing and frequency domain analysis of an image.
CO3	Filtering in Frequency Domain: Fourier Transform and the Frequency Domain, Basics of Gaussian Low pass Filters**.**
CO4	Image Restoration Process, Least Mean Square Filtering, Blind Image Restoration, Pseudo Inverse, Singular Value Decomposition
CO5	Color Image Processing, Color Segmentation. Morphological Image Processing, Morphological Algorithms: Boundary Extraction, Region Filling.

CO-PO MAPPING:

PO	PO											
CO	**POI**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	2	1	2		1		1					
CO2	1	2	1	1		2						
CO3	1	2	2	1		2	1					
CO4		1	3		1	1	2					
CO5	1	1	3	1		2	2					

COURSE: ELEMENTARY ALGORITHM
CODE: CA308
COURSE CREDIT: 4

COURSE OBJECTIVES:

- To study the concepts of complexity of algorithms and understand the analysis of algorithms based on input size.
- To learn advanced data structure and their fundamentals for application development.
- To learn use of greedy and dynamic programming techniques and their application in the field of computer science to solve problems.
- To learn algorithms for graph theory problem like spanning tree problem, single source shortest path and advance features of graph application in field of computer science.
- To learn string matching algorithms and, P, NP problem in computer science domain.

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Understand the algorithms and notation, including order notation, and how to analyze the complexity of the algorithms.
CO2	Understand the concept of hashing and sorting.
CO3	Compare, contrast, and apply the key algorithmic design paradigms: divide and conquer, greedy method, dynamic programming techniques.
CO4	Understand the concepts of Graph algorithms to solve problem using Greedy method as well as dynamic programming techniques.
CO5	To understand the concepts of Randomized, and exact vs. approximate. Implement, empirically compare, and apply fundamental algorithms and string matching, P, NP and NP complete real-world problems.

CO-PO MAPPING:

PO	PO											
CO	POI	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	2		1		1					
CO2	3	1	1			2						
CO3		2	3	1	1	2	2					
CO4	3	2	2	1		1	1					
CO5	2	1	2	1		2	1					

COURSE: KNOWLEDGE MANAGEMENT
CODE: CA309
COURSE CREDIT: 4

COURSE OBJECTIVES:

- To learn the basic concepts of KM, establish a foundation of key terms and concepts, historical events and contributions, organizational benefits, and guiding principles on which to build greater understanding of knowledge management.
- To learn the life cycle of KM, Knowledge Creation and Knowledge Architecture.
- To understand the Capturing Tacit Knowledge to Increase information and understanding about knowledge transfer using low and high technology strategies.
- To learn Knowledge Capture Techniques, Knowledge Codification, Case Based Reasoning, Knowledge based Agents, Knowledge Developer's Skill Set.
- To study of Quality and Quality assurance rules to implement in System Testing and Deployment, Explore the future of knowledge management and its influence on our jobs, communities, and society.

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Able to KM, demonstrate an understanding of the history, learning organizations, intellectual capital and related terminologies in clear terms and understand the role of knowledge management in organizations.
CO2	Able to Demonstrate an understanding of the life cycle, concepts, and the antecedents of management of knowledge and describe several successful knowledge management systems.
CO3	Able to Evaluate the impact of technology including telecommunications, networks, and Internet/intranet role in managing knowledge.
CO4	Able to understand how and why a device is designed as it is can be valuable, Economy Ponder KM's current and future impact on individuals, organizations and society at large.
CO5	Able to know Quality and Quality Assurance rules. Discuss new jobs, roles and responsibilities.

CO-PO MAPPING:

PO	PO											
CO	**POI**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	1	2		1		1					
CO2	3	1	1			1	1					
CO3		2	1	1	1	2						
CO4	2	1	2	1		1	1					
CO5	3	1		1	1	1						

Integral University, Lucknow
Department of Computer Application
STUDY & EVALUATION SCHEME
Choice Based Credit System

Bachelor of Computer Application (BCA)
w.e.f. Session 2017-18

Year III[rd], Semester VI[th]

S. No.	Course Category	Subject Code	Name of the Subject	Periods				Evaluation Scheme				Subject Total
								Sessional (CA)			End Sem. Exam	
				L	T	P	C	CT	TA	Total	ESE	
1.	Core	CA313	.NET Framework with VB. NET	3	1	0	4	25	15	40	60	100
2.	Core	CA314	Introduction to Open Source Environment	3	1	0	4	25	15	40	60	100
3.	Core	CA315	Cyber Law and Internet Security	3	1	0	4	25	15	40	60	100
4.	Elective – V			3	1	0	4	25	15	40	60	100
5.	Core	CA321	Project Lab	0	0	6	3	30	30	60	40	100
6.	Core	CA322	Advanced Technology Lab	0	0	2	1	30	30	60	40	100
7.	Core	CA323	Open Source Lab	0	0	2	1	30	30	60	40	100
Total				**12**	**4**	**10**	**21**					**700**

L - Lecture **T** – Tutorial **P** – Practical **C** – Credit **CT** – Class Test **TA** – Teacher Assessment
Sessional Total (CA) = Class Test + Teacher Assessment

Subject Total = Sessional Total (CA) + End Semester Examination (ESE)

Elective - V
CA316 Management Information System
CA317 E-Governance
CA318 Fundamentals of E-Commerce
CA319 ERP Systems
CA320 AI and Expert Systems

COURSE: .NET FRAMEWORK WITH VB .NET
CODE: CA313
COURSE CREDIT: 4

COURSE OBJECTIVES:

- To understand basics knowledge of .NET Framework architecture and Visual Basic.
- To learn programming concepts of Visual Basic in .NET Framework environment.
- To learn advance programming concepts of .NET Framework architecture.
- To learn advance features of Visual Basic and exception handling techniques.
- To learn ADO. NET and object model.

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Understand .NET Framework architecture, its components and basics of Visual Studio.
CO2	Analyze the problem and create window based program with Visual Basic.
CO3	Develop and implement window based application using Visual Basic.
CO4	Investigate and solve difficulties in the implementation of VB applications using advanced features of Visual Basic and exception handling techniques.
CO5	Know database concepts of ADO.NET technology and develop applications using ADO. NET

CO-PO MAPPING:

PO	PO											
CO	**POI**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	1	1		1							
CO2	1	3	3			2						
CO3		1	3		1	1						
CO4	1	2	3			3						
CO5	2	1	3		1	1						

COURSE: INTRODUCTION TO OPEN SOURCE ENVIRONMENT
CODE: CA314
COURSE CREDIT: 4

COURSE OBJECTIVES:

- To learn basic concepts, syntax and uses of PHP as server side scripting language.
- To learn and implement PHP script and Arrays.
- To learn and implement decision making ,looping and object oriented features supported by PHP
- To learn various tools and implement forms in PHP
- To demonstrate the use of MySQL database in phpMyAdmin and build dynamic web site using server side PHP Programming and MySQL

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Able to understand the basic concepts, syntax and uses of PHP as general purpose language.
CO2	Able to understand basic of PHP as scripting Language and implement Arrays in PHP.
CO3	Able to understand and implement decision making, looping and other object oriented features supported by PHP.
CO4	Students able to understand latest framework supported by PHP and implement forms using PHP.
CO5	Students able to develop a web application using PHP and MySQL as database.

CO-PO MAPPING:

PO	PO											
CO	**POI**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3		1		1		1					
CO2	3	1	2	1		2	1					
CO3	2	1	2		1	2	1					
CO4	1	1	2	1		3	1	2				
CO5		1	3		1	2	2	3				

COURSE: CYBER LAW AND INTERNET SECURITY
CODE: CA315
COURSE CREDIT: 4

COURSE OBJECTIVES:

- To study the concepts of Fundamentals of E-commerce and understand the Impact of E-Commerce on Business, Issues, Problems and Prospects of E-commerce.
- To learn Internet Security and their fundamentals for securing Transactions on web, issue related to firewall.
- To learn use of Encryption Techniques and their application in the field of computer science to solve security problems and digital signature.
- To learn Fundamentals of Cyber Law like Object and Scope of the IT Act 2000, Introduction to Indian Cyber Law, and Law related to Semiconductor Layout and Design.
- To learn Investigation and Ethics and, Internet Security Treats.

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Understand the different theoretical and cross-disciplinary approaches (criminological, political, legal and information security/management) to the study of cyber-security and the regulation of the Internet and the Internet of Things.
CO2	Understand the structure, mechanics and evolution of the Internet in the context of emerging crime threats and technological and other trends in cyberspace.
CO3	Understand how to Distinguish and classify the forms of cybercriminal activity and the technological and 'social engineering' methods used to undertake such crimes.
CO4	Understand to Analyze and assess the impact of cybercrime on government, businesses, individuals and society. Evaluate the effectiveness of cyber-security, cyber-laws and other countermeasures against cybercrime and cyber warfare.
CO5	Understand to Investigate assumptions about the behavior and role of offenders and victims in cyberspace, and use basic web-tools to explore behavior on-line .

CO-PO MAPPING:

PO	PO											
CO	**POI**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3		1		1							
CO2	3	1	2			1	1					
CO3	2	2	1	1	2	1						
CO4	2	2	2	1	1		1					
CO5	2	1	3			2	2					

COURSE: MANAGEMENT INFORMATION SYSTEM
CODE: CA316
COURSE CREDIT: 4

COURSE OBJECTIVES:

- To learn the basic knowledge and fundamentals of Information System and various types of Information System.
- To learn the concepts of Management Information System and Decision Support Systems.
- To learn the overall perspective of Planning and Control in an Organization.
- To learn how internet, E-Commerce and other technologies help in business processes.
- To learn the management of Information Technologies in organizations.
- To learn the role of various advance concepts in managing the business.

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Able to understand the basic concepts of Information Systems and applying the same to solve the business problems.
CO2	Able to develop the knowledge of Management Information system and how it differs from other Information systems.
CO3	Able to define Control and Planning process in an Organization with the characteristics and nature of control process.
CO4	Able to use various technologies like Internet, Intranet, Extranet and E-Commerce in business operations and for Managerial decision support.
CO5	Acquainted with the facing challenges in management and using various advance systems such as ERP,SCM,CRM etc.

CO-PO MAPPING:

PO	PO											
CO	**POI**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	2	1	1	1							
CO2	3	1	2			1	1					
CO3	2	2	1	1	1							
CO4		1	2		1	3	1					
CO5	1	2	2	1		1	1					

COURSE: E-GOVERNANCE
CODE: CA317
COURSE CREDIT: 4

COURSE OBJECTIVES:

- To learn Concept of E-Governance and E-Kranti framework.
- To provide an idea of using various open source software's and Framework for Adoption of Open Source Software in E-Governance Systems.
- To learn basic concept of Policy on Open Application Programming Interfaces (APIs) for Government of India and Email Policy of Government of India.
- To learn basics concept of Policy on Use of IT Resources of Government of India and Policy on Collaborative Application Development by Opening the Source Code of Government Applications.
- To learn basics concept of Application Development & Re-Engineering Guidelines for Cloud Ready Applications.

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Able to understand basics of E-Governance and E-Kranti framework.
CO2	Able to understand various open source software's and Framework for adoption of Open Source in E-Governance Systems.
CO3	To understand the basic concepts of Policy on Open Application Programming Interfaces (APIs) and for Government of India and Email Policy of Government of India
CO4	To understand the basics concept of Policy on Use of IT Resources of Government of India and Policy on Collaborative Application Development by Opening the Source Code of Government Applications.
CO5	Able to understand basics concept of Application Development & Re-Engineering Guidelines for Cloud Ready Applications.

CO-PO MAPPING:

PO	PO											
CO	**POI**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	1	1		1		1					
CO2	3	1	2	1		2	1					
CO3	1	1	2		2		1					
CO4	1	1	3		1	2	2					
CO5	2	1	2	1		1	1					

COURSE: FUNDAMENTALS OF E-COMMERCE
COURSE CODE: CA318
COURSE CREDIT: 4

COURSE OBJECTIVES:

- To provide knowledge of e-commerce with its technology, benefits, limitations and impact on business.
- To enhance practical knowledge for different applications of e-commerce such as e-banking, e-learning and e-shopping etc.
- To give knowledge for architecture framework and security aspects in e-commerce.
- To offer knowledge of encryption techniques used in e-commerce.
- To construct the concept of process of electronic payment in e-commerce along with its risk.
- To give the implementation knowledge about Electronic Data Interchange with respect to architecture and standards.
- To provide the practical knowledge of security issues in Electronic Data Interchange.
- To develop business skill and techniques for digital marketing.

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Gain knowledge of e-commerce with its technology, benefits, limitations, impact on business.
CO2	Understand practical knowledge of applications of e-commerce such as e-banking, e-learning and e-shopping etc.
CO3	Learn about the knowledge of architecture framework and security aspects in e-commerce
CO4	Apply knowledge of encryption techniques used in e-commerce.
CO5	Understand the concept of process of electronic payment in e-commerce along with its risk.
CO6	Implementation knowledge about Electronic Data Interchange with respect to architecture and standards.
CO7	Apply practical knowledge of security issues in Electronic Data Interchange.
CO8	Establish business skill and techniques for digital marketing.

CO-PO MAPPING:

PO	PO											
CO	**POI**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	1	1		1							
CO2	2	1	1			3						
CO3	2	2	1	1		2						
CO4		1	2		1	3	1	1				
CO5	3	1	2	1		1	1					
CO6	1	1	3		1		2	1				
CO7		1	2		1	3	1					
CO8	1	2	2	1		2	1					

COURSE: ERP SYSTEMS (ENTERPRISE RESOURCE PLANNING)
CODE: CA319
COURSE CREDIT: 4

COURSE OBJECTIVES:

- To learn the basic concepts of Enterprise Resource Planning.
- To learn different technologies used in ERP.
- To learn the concepts of ERP Manufacturing Perspective and ERP Modules.
- To learn what are the benefits of ERP
- To study and understand the ERP life cycle.
- To learn the different tools used in ERP.

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Able to understand the basic knowledge of Enterprise Resource Planning.
CO2	Abel to Identify different technologies used in Enterprise Resource Planning.
CO3	Abel to understand and apply the concepts of ERP Manufacturing Perspective and ERP Modules.
CO4	Discuss the benefits, Success and Failure Factors of an ERP Implementation.
CO5	Abel to understand and implement the ERP life Cycle. Apply different tools and Software used in ERP.

CO-PO MAPPING:

PO	PO											
CO	**POI**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3		1		1							
CO2	2	3	1	2		1		1				
CO3	2	1	2	1		2	1					
CO4	1	1	2		1		1					
CO5	2	1	3	1		2	2	1				

COURSE: ERP AI AND EXPERT SYSTEMS
CODE: CA320
COURSE CREDIT: 4

COURSE OBJECTIVES:

- To learn the concepts of Artificial Intelligence (AI).
- Understand the concepts of searching techniques.
- To develop the logical skills of knowledge and its representational structure.
- Learn the concepts how to design the program in LISP.
- Understand the concepts of Expert system.

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Study the concepts of AI.
CO2	Develop the searching algorithms.
CO3	Understand the knowledge skills and it's representational structure in AI.
CO4	Study the concepts of Learn the concepts how to design the program in LISP.
CO5	To learn the concepts of Expert system.

CO-PO MAPPING:

PO	PO											
CO	**POI**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	1			1							
CO2	1	1	3	1		2	2	1				
CO3	3	1	1	1		1	1					
CO4	2	1	3		1		2					
CO5	2	1	1	1		1						