Pre - Revision

Study & Evaluation Scheme

of

Bachelor of Computer Application
(BCA)

[Applicable for the Batch 2017-18]

COLLEGE OF COMPUTING SCIENCES & INFORMATION TECHNOLOGY

TEERTHANKER MAHAVEER UNIVERSITY

Delhi Road, Moradabad, Uttar Pradesh-244001

Website: www.tmu.ac.in

Teerthanker Mahaveer University, Moradabad-244001
Registrar

Study & Evaluation Scheme
Bachelor of Computer Application

Semester-I

S. No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	BCA 101	Mathematics -I	4	1	0	5	40	60	100
2	BCA 107	Fundamental of Computer's and MS — Office	4	1	0	5	40	60	100
3	BCA 108	Digital Electronics	4	1	0	5	40	60	100
	Elective (Select Any One)								
4	BCA 109 / 213	Management concept and Organization Behaviors	4	0	0	4	40	60	100
	BCA 112 / 214	Environmental Studies							
5	BCA149	English Communication & Soft Skills – I	3	0	2	4	40	60	100
6	BCA 151	MS-Office and Internet Lab	0	0	4	2	50	50	100
7	BCA 153	Digital Electronics Lab	0	0	4	2	50	50	100
Total			**19**	**3**	**10**	**27**	**300**	**400**	**700**

Semester-II

S. No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	BCA 202	Programming in C	5	1	0	6	40	60	100
2	BCA 207	Computer Organization and Architecture	4	1	0	5	40	60	100
3	BCA 212	Web Technologies	4	1	0	5	40	60	100
	Elective (Select Any One)								
4	BCA 210	Fundamentals of E—Commerce	4	1	0	5	40	60	100
	BCA 208	Numerical Methods							
	BCA 211	Information Security Fundamental							
	Elective (Select Any One)								
5	BCA 109 / 213	Management concept and Organization Behaviors	4	0	0	4	40	60	100
	BCA 112 / 214	Environmental Studies							
6	BCA249	English Communication & Soft Skills – II	3	0	2	4	40	60	100
7	BCA 251	C Language Lab	0	0	4	2	50	50	100
8	BCA 255	Web Technologies Lab	0	0	4	2	50	50	100
Total			**24**	**4**	**10**	**33**	**340**	**460**	**800**

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Semester-III

S. No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	BCA 302	Data Structure using C	4	1	0	5	40	60	100
2	BCA 306	Operating System	4	1	0	5	40	60	100
3	BCA 312	Database Management System	4	1	0	5	40	60	100
4	BCA 309	Computer Network	3	1	0	4	40	60	100
Elective (Select Any One)									
5	BCA 308	System Analysis and Design	3	1	0	4	40	60	100
	BCA 310	Object Oriented Programming Concept and UML							
	BCA 311	Microprocessor and Peripherals							
6	BCA349	English Communication & Soft Skills – III	3	0	2	4	40	60	100
7	BCA 354	Data Structure lab Using C	0	0	4	2	50	50	100
8	BCA 353	Data Base Systems Lab	0	0	4	2	50	50	100
Total			**21**	**05**	**10**	**31**	**340**	**460**	**800**

Semester-IV

S. No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	BCA 402	Software Engineering	4	1	0	5	40	60	100
2	BCA 404	OOPs & C++	5	1	0	6	40	60	100
3	BCA 407	Computer Graphics	4	1	0	5	40	60	100
Elective (Select Any One)									
4	BCA408	Fundamentals Of Accounting	5	1	0	6	40	60	100
	BCA 409	IT Governance, Risk & Information Security Management							
	BCA 410	Scientific Computing							
	BCA 411	Ethical Hacking Fundamental							
	BCA 412	Mobile Device and Network Architecture							
	BCA 413	Management Information System							
5	BCA449	English Communication & Soft Skills – IV	3	0	2	4	40	60	100
6	BCA 452	OOPs & C++ Lab	0	0	4	2	50	50	100
7	BCA 453	Computer Graphics Lab	0	0	4	2	50	50	100
Total			**21**	**04**	**10**	**30**	**300**	**400**	**700**

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Semester-V

S. No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	BCA 501	Linux Internals	4	1	0	5	40	60	100
2	BCA 512	Core Java Programming	4	1	0	5	40	60	100
3	BCA 513	PHP	4	1	0	5	40	60	100
Elective (Select Any One)									
4	BCA 510	Multimedia and Animation	4	1	0	5	40	60	100
	BCA 514	Distributed Operating System							
	BCA 515	Enterprise Resource Planning							
	BCA 516	Operation Research							
	BCA 517	Discrete Mathematics							
	BCA 518	Computer Forensics and Investigation							
5	BCA 551	Mini Project (Industrial Training)	0	0	0	3	50	50	100
6	BCA 555	Core Java Programming Lab	0	0	4	2	50	50	100
7	BCA 556	PHP Lab	0	0	4	2	50	50	100
8	BCA 557	Linux Lab	0	0	4	2	50	50	100
Total			**16**	**04**	**12**	**29**	**360**	**440**	**800**

Semester-VI

S. No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	BCA 609	Programming with C#	4	1	0	5	40	60	100
2	BCA 610	Android Programming	4	1	0	5	40	60	100
Elective (Select Any One)									
3	BCA 611	Data Warehouse and Data Mining	4	1	0	5	40	60	100
	BCA 612	Cloud Computing							
	BCA 613	Cryptography and Network Security							
	BCA 614	Python Programming							
	BCA 615	Computer Ethics and Cyber Laws							
4	BCA 653	Project Work	0	0	6	3	50	50	100
5	BCA 657	C# Lab	0	0	6	3	50	50	100
6	BCA 658	Android Lab	0	0	6	3	50	50	100
Total			**12**	**3**	**18**	**24**	**270**	**330**	**600**

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Post Revision

Study & Evaluation Scheme

of

Bachelor of Computer Application

[Applicable w.e.f. Academic Session – 2019-20 till revised]

[As per CBCS guidelines given by UGC]

COLLEGE OF COMPUTING SCIENCES & INFORMATION TECHNOLOGY

TEERTHANKER MAHAVEER UNIVERSITY

N.H.-24, Delhi Road, Moradabad, Uttar Pradesh-244001

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BCA Curriculum

Semester-I

S. No.	Category name	Course Code	Course Name	Periods			Credit	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	CC-1	BCA 107	Fundamental of Computer's and MS - Office	2	1	0	3	40	60	100
2	CC-2	BCA 110	Digital Logic and basics of Computer Organization	2	1	0	3	40	60	100
3	AECC-1	BCA 111	Human Values & Professional Ethics	2	1	0	3	40	60	100
4	AECC-2	TMU 101	Environmental Studies	2	1	0	3	40	60	100
5	AECC-3	TMUGE 101	English Communication – I	2	0	2	3	40	60	100
6	LC-1	BCA 151	MS-Office and Internet Lab	0	0	4	2	50	50	100
7	LC-2	BCA 153	Digital Electronics Lab	0	0	4	2	50	50	100
			Total	**10**	**4**	**10**	**19**	**300**	**400**	**700**

Value Added Course / Semester- I

Value added course is an audit course which will be compulsory to pass with 45% marks. However, it will not be added towards overall result.

S. No.	Category name	Course Code	Course Name	Periods			Credit	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	VAC-1	TMUGA-101	Foundation in Quantitative Aptitude	2	1	0	0	40	60	100

Semester-II

S. No.	Category name	Course Code	Course Name	Periods			Credit	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	CC-3	BCA 202	Programming in C	2	1	0	3	40	60	100
2	SEC-1	BCA 212	Web Technologies	2	1	0	3	40	60	100
3	CC-4	BCA 215	Mathematics –I	2	1	0	3	40	60	100
4	AECC-4	BCA 213	Management concept and Organization Behaviors	3	0	0	3	40	60	100
5	AECC-5	TMUGE 201	English Communication – II	2	0	2	3	40	60	100
6	LC-3	BCA 251	C Language Lab	0	0	4	2	50	50	100
7	LC-4	BCA 255	Web Technologies Lab	0	0	4	2	50	50	100
			Total	**11**	**3**	**10**	**19**	**300**	**400**	**700**

Value Added Course / Semester - II

Value added course is an audit course which will be compulsory to pass with 45% marks. However, it will not be added towards overall result.

S. No.	Category name	Course Code	Course Name	Periods			Credit	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	VAC-2	TMUGA-201	Analytical Reasoning	2	1	0	0	40	60	100

Semester-III

S. No.	Category name	Course Code	Course Name	Periods			Credit	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	CC-5	BCA 306	Operating System	2	1	0	3	40	60	100
2	CC-6	BCA 309	Computer Network	2	1	0	3	40	60	100
3	CC-7	BCA 313	Data Structure using C++	2	1	0	3	40	60	100
4	CC-8	BCA 314	OOPs & C++	2	1	0	3	40	60	100
5	**Select one out of list GEC-I**			2	1	0	3	40	60	100
6	AECC-6	TMUGE 301	English Communication – III	2	0	2	3	40	60	100
7	LC-5	BCA 355	Data Structure lab Using C++	0	0	4	2	50	50	100
8	LC-6	BCA 356	OOPs & C++ Lab	0	0	4	2	50	50	100
			Total	**12**	**05**	**10**	**22**	**340**	**460**	**800**

Generic Elective Courses - I

Semester- III

S. No.	Course Name Type	Course Code	Course Name
1	GEC-I	BCA 308	System Analysis and Design
		BCA 315	Management Information System

Value Added Course / Semester - III

Value added course is an audit course which will be compulsory to pass with 45% marks. However, it will not be added towards overall result.

S. No.	Category name	Course Code	Course Name	Periods			Credit	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	VAC-3	TMUGA-302	Modern Algebra and Data Management	2	1	0	0	40	60	100
2	VAC-4	TMUGS-301	Managing Self	2	1	0	0	50	50	100

Semester-IV

S. No.	Category name	Course Code	Course Name	Periods			Credit	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	CC-9	BCA 402	Software Engineering	2	1	0	3	40	60	100
2	CC-10	BCA 407	Computer Graphics	2	1	0	3	40	60	100
3	CC-11	BCA 416	Database Management System	2	1	0	3	40	60	100
4	**Select one out of list DSE - I**			2	1	0	3	40	60	100
5	**Select one out of list GEC - II**			2	1	0	3	40	60	100
6	AECC-7	TMUGE 401	English Communication – IV	2	0	2	3	40	60	100
	OEC-1	**Open Elective - I**		3	0	0	3	40	60	100
7	LC-7	BCA 454	DBMS Lab	0	0	4	2	50	50	100
8	LC-8	BCA 453	Computer Graphics Lab	0	0	4	2	50	50	100
			Total	**15**	**5**	**10**	**25**	**380**	**520**	**900**

Departmental Specific Elective - I, Semester- IV

Sr. No.	Course Name Type	Course Code	Course Name
1	DSE-I	BCA 411	Ethical Hacking Fundamental
		BCA 412	Mobile Device and Network Architecture
		BCA 417	Discrete Mathematics
		BCA 418	Enterprise Resource Planning

Generic Elective Courses - II, Semester- IV

Sr. No.	Course Name Type	Course Code	Course Name
1	GEC-II	BCA408	Fundamentals Of Accounting
		BCA 414	Retail Management
		BCA 415	Digital Marketing
		BCA 419	Sales and Production Management

Value Added Course / Semester - IV

Value added course is an audit course which will be compulsory to pass with 45% marks. However, it will not be added towards overall result.

S. No.	Category name	Course Code	Course Name	Periods			Credit	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	VAC-5	TMUGA-402	Advance Algebra and Geometry	2	1	0	0	40	60	100
2	VAC-6	TMUGS-401	Managing Work and Others	2	1	0	0	50	50	100

Semester-V

S. No.	Category name	Course Code	Course Name	Periods			Credit	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	CC-12	BCA 512	Core Java Programming	3	1	0	4	40	60	100
2	SEC-2	BCA 519	PHP & MySQL	3	1	0	4	40	60	100
	AECC-8	BCA 515	Entrepreneurship	2	1	0	3	40	60	100
3	**Select one out of list DSE- II**			2	1	0	3	40	60	100
4	OEC-2	**Open Elective - II**		3	0	0	3	40	60	100
5	LC-9	BCA 551	Mini Project (Industrial Training)	0	0	12	6	50	50	100
6	LC-10	BCA 555	Core Java Programming Lab	0	0	4	2	50	50	100
7	LC-11	BCA 558	PHP & MySql Lab	0	0	4	2	50	50	100
8	**Select one out of list Lab Based on DSE-II**			0	0	4	2	50	50	100
			Total	**13**	**04**	**24**	**29**	**400**	**500**	**900**

Departmental Specific Elective - II, Semester- V

S. No.	Course Name Type	Course Code	Course Name
1	DSE-II	BCA 522	Linux Administration
		BCA 514	Distributed Operating System
		BCA 510	Multimedia And Animation
		BCA 518	Digital Forensics and Investigation
		BCA 524	Gamification

Lab based on Departmental Specific Elective - II (P), Semester- V

S. No.	Course Name Type	Course Code	Course Name
1	DSE-II (P)	BCA 559	Linux Administration Lab
		BCA 560	Distributed Operating System Lab
		BCA 561	Multimedia And Animation Lab
		BCA 562	Digital Forensics and Investigation Lab
		BCA 563	Gamification Lab

Semester-VI

S. No.	Subject Type	Course Code	Subject	Periods			Credit	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	CC-13	BCA 609	Programming with C#	2	1	0	3	40	60	100
2	SEC-3	BCA 610	Android Programming	3	1	0	4	40	60	100
3	SEC-4	BCA 614	Python Programming	2	1	0	3	40	60	100
4	LC-12	BCA 660	In-house Project	0	0	12	6	50	50	100
5	LC-13	BCA 657	Programming with C# Lab	0	0	4	2	50	50	100
6	LC-14	BCA 658	Android Programming Lab	0	0	4	2	50	50	100
7	LC-15	BCA 659	Python Programming Lab	0	0	4	2	50	50	100
			Total	**7**	**03**	**24**	**22**	**320**	**380**	**700**

New course Added

Course Code: BCA 313	BCA- Semester-III Core Course (CC-7) **DATA STRUCTURE USING C++**	L-2 T-1 P-0 C-3
Course Outcomes:	**On completion of the course, the students will be:**	
CO1.	Understanding and remembering the basic terminologies, compute the time complexities and analyze the usage of array.	
CO2.	Analyzing the concept of Data Structures through ADT like stack, queue and linked list, also understand the basic usage and operations to be performed on them.	
CO3.	Understanding, analyzing and applying the learnt concept to solve problems related to various sorting and searching algorithm, later performing a comparative analysis of each one of them.	
CO4.	Understanding various representations of trees and graphs and analyzing different methods to solve various problems related with them.	
CO5.	Applying algorithm for solving problems like sorting, searching, insertion and deletion of data.	
Course Content:		
Unit-1:	**Introduction**: Basic Terminology, Elementary Data Organization, Data Structure operations, Algorithm, Complexity and Time-Space trade-off. **Arrays:** Array Definition, Representation and analysis, Single and Multidimensional Arrays, address calculation, application of arrays, Character String in C++, Character string operation.	**7 Hours**
Unit-2:	**Stack**: Array Representation and Implementation of stack, Operations on Stack: Push & Pop, Linked Representation of Stack and Operations Associated with Stack, Applications of stack: Conversion of Infix to Prefix and Postfix Expressions, Evaluation of postfix expression using Stack. **Queue:** Array and linked representation and implementation of queues, Operations on Queue: Create, Add, Delete, and Circular queue.	**7 Hours**
Unit-3:	**Linked list:** Representation and Implementation of Singly Linked List, Traversing and Searching of linked List, Overflow and Underflow, Insertion and deletion to/from Linked List, Insertion and deletion algorithms, Doubly linked list, Circular List, Linked List v/s Array.	**8 Hours**
Unit-4:	**Sorting:** Bubble Sort, Selection Sort, Insertion Sort, Quick Sort, Merge Sort, and Heap Sort. Comparative Analysis of above Sorting algorithms. **Searching:** Sequential search, Binary Search.	**7 Hours**

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Unit-5:	**Trees:** Basic terminology, Binary Trees, Binary tree representation, algebaric Expressions, Complete Binary Tree, Array and Linked Representation of Binary trees, Traversing Binary tree, Binary Search Tree. **Graph:** Basic terminology, Graph representation using adjacency matrix, Graph representation using adjacency list.	**7 Hours**
Text Books:	1. Lipschutz, Data Structure, Tata McGraw Hill.	
Reference Books:	1. Horowitz and Sahani, Fundamentals of Data Structures, Galgotia. 2. Kruse et.al R., Data Structures and Program Design in C, Pearson Education. 3. Cormen T. H., Introduction to Algorithms, Prentice Hall of India. 4. Loudon K., Mastering Algorithms with C, Shroff Publisher & Distributors. 5. Bruno R Preiss, Data Structures and Algorithms with Object Oriented Design Pattern in C++, John Wiley & Sons Inc. 6. Adam Drozdek, Data Structures and Algorithms in C++, Thomson Asia. 7. Tenenbaumet. al A.M., Data Structures Using C & C++, Prentice Hall of India. 8. KanitkarYashwant, Data Structure Using C, BPB. 9. Salaria R.S., Data Structure Using C, Khanna Publishers. *** Latest editions of all the suggested books are recommended.**	
Additional Electronic Reference Material:	1. https://www.geeksforgeeks.org/data-structures/ 2. https://www.studytonight.com/data-structures/	

New Course Added

Course Code: BCA 355	BCA- Semester-III Laboratory Course (LC-5) **DATA STRUCTURE USING C++ LAB**	L-0 T-0 P-4 C-2
Course Outcomes:	**On completion of the course, the students will be:**	
CO1.	Applying the learnt concept for evaluating the operations on arrays, stack, queue and linked list.	
CO2.	Analyzing and applying the techniques for solving problems related to searching and sorting.	
CO3.	Understanding the use of array representation.	
CO4.	Understanding the use of Binary Search Tree and applying the concept to evaluate the operations to be performed on it.	
CO5.	Understanding and evaluating the time complexities of various algorithms and data structure implemented for solving the problems.	
Course Content:		
	Array: Insertion of element in an array, deletion of element from an array.	
	Sorting: Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Two Way Merge Sort and Heap Sort.	
	Searching: Sequential search, binary search.	
	Stack: Array Representation and Implementation of stack, Operations on Stacks: Push & Pop, Conversion of Infix to Prefix and Postfix Expressions.	
	Queue: Array and linked representation and implementation of queues, Operations on Queue: Create, Add, Delete, Circular queue.	
	Linked list: Representation and Implementation of Singly Linked List, Traversing and Searching, Inserting and Deleting of Linked List. Same operation in Doubly Linked List, Circular Linked List.	
	Binary Search Tree: Creation, searching and traversal.	
Text Books:	1. Lipschutz, Data Structure, Tata McGraw Hill.	
Reference Books:	1. Kruse et.al R., Data Structures and Program Design in C, Pearson Education. 2. Tenenbaumet. al A.M., Data Structures Using C & C++, Prentice Hall of India. *** Latest editions of all the suggested books are recommended.**	

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Additional Electronic Reference Material:	1. https://www.geeksforgeeks.org/data-structures/ 2. https://www.studytonight.com/data-structures/	

New course Added

Course Code: BCA 414	BCA- Semester-IV General Elective Course (GEC) - II **RETAIL MANAGEMENT**	L-2 T-1 P-0 C-3
Course Outcomes:	**On completion of the course, the students will be:**	
CO1.	Understanding the concepts of effective retailing.	
CO2.	Know the recent trends in retailing in India.	
CO3.	Possess the knowledge of various retail formats and will be understand the retail customer.	
CO4.	Understanding the functionality of merchandise management.	
CO5.	Understanding the relationship marketing strategies.	
Course Content:		
Unit-1:	**Introduction to Retailing:** Concept of retailing, Functions of retailing, Terms & Definition, Retail formats and types, Retailing Channels, Retail Industry in India, Importance of retailing, changing trends in retailing.	**7 Hours**
Unit-2:	**Understanding the Retail Consumer:** Retail consumer behavior, Factors influencing the Retail consumer, Customer decision making process, Types of decision making, Market research for understanding retail consume .	**7 Hours**
Unit-3:	**Retail Market Segmentation and Strategies:** Market Segmentation and its benefits, Kinds of markets, Definition of Retail strategy, Strategy for effective market segmentation, Strategies for penetration of new markets, Growth strategies, Retail value chain.	**8 Hours**
Unit-4:	**Merchandise Management:** Meaning of Merchandising, Factors influencing Merchandising, Functions of Merchandising Manager, Merchandise planning, Merchandise buying, Analyzing Merchandise performance.	**7 Hours**
Unit-5:	**Retail Space Management and Marketing**: Definition of Space Management, Store layout and Design, Visual Merchandising, Promotions Strategy, Relationship Marketing Strategies, CRM, Retail Marketing Mix, Retail Communication Mix, POP Displays.	**7 Hours**
Text Books:	1. David Gilbert, "Retail Marketing Management" by Pearson.	
Reference Books:	2. "Retailing Management: Text and Cases" – Swapna Pradhan, Macgraw Hill Education. *** Latest editions of all the suggested books are recommended.**	
Additional Electronic Reference Material:	https://www.tutorialspoint.com/retail_management/retail_management_tutorial.pdf	

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New course Added

Course Code: BCA 415	BCA- Semester-IV General Elective Course (GEC) - II **DIGITAL MARKETING**	L-2 T-1 P-0 C-3
Course Outcomes:	**On completion of the course, the students will be:**	
CO1.	Understanding digital marketing knowledge to business solutions in local and global environment.	
CO2.	Identify and applying research digital marketing issues in business situations.	
CO3.	Analyzing the issues, draw appropriate and well justified solutions, and develop and evaluate an effective digital marketing plan.	
CO4.	Effectively communicate digital marketing knowledge in oral and written contexts.	
CO5.	Critically review digital marketing decisions on the basis of social, environmental and cultural considerations.	
Course Content:		
Unit-1:	**Introduction to Digital Marketing:** Definition, Key concept of Digital Marketing, Traditional vs. Digital Marketing, Benefits of using Digital media, Opportunity of Digital Marketing, Inbound and Outbound Marketing, Components of Online Marketing – Email, Forum, Social Network, Banner, BLOG, Newsletter Understanding Traffic & Leads.	**7 Hours**
Unit-2:	**Search Marketing:** Introduction to Search Engine Optimization (SEO), Need of an SEO friendly website, Benefits of Search Positioning, Role of Keywords in SEO, Meta Tags and Meta Description, On-page & Off-page optimization, Internal & External Links, Organic vs. non-organic SEO.	**7 Hours**
Unit-3:	**Email Marketing:** Introduction to Email Marketing, Elements of Email, Email List Generation, Email Structure, Email Delivery, Online Data Capture, Off Line data Capture. **Digital Display Advertising:** Concepts, Benefits, Challenges.	**8 Hours**
Unit-4:	**Social Media Marketing:** Key Concepts, Different Social Media Channels – Facebook, YouTube, Twitter, Instagram, Business Page-Setup and Profile, About Content Marketing, About Online Advertising, Basic concepts – CPC, PPC, CPM, CTR, CR, Overview of Google AdWords.	**7 Hours**
Unit-5:	**Mobile Marketing:** Key Concepts, Different kind of Mobile Marketing, Opportunities and Risks, SMS Content, SMS Strategy, Mobile Advertising.	**7 Hours**

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	Web Analytics: About Web Analytics, Types of Web Analytics (On-site, Off-site), Importance of Web Analytics, Reporting.	
Text Books:	1. Ian Dobson "The Art of Digital Marketing: The Definitive Guide to Creating Strategic, Targeted, and Measurable Online Campaigns", Wiley.	
Reference Books:	1. Vandana Ahuja, "Digital Marketing", Oxford Universty Press. 2. Pearson, Puneet Singh Bhatia "Fundamentals of Digital Marketing". *** Latest editions of all the suggested books are recommended.**	
Additional Electronic Reference Material:	https://www.edureka.co/blog/digital-marketing-tutorial/ https://www.guru99.com/free-digital-marketing-tutorial.html	

New course Added

Course Code: BCA 418	BCA- Semester-IV Departmental Specific Elective (DSE) - I **ENTERPRISE RESOURCE PLANNING**	L-2 T-1 P-0 C-3
Course Outcomes:	**On completion of the course, the students will be:**	
CO1.	Undersatnding use of Enterprise software, and its role in integrating business functions.	
CO2.	Analyzing the strategic options for ERP identification and adoption.	
CO3.	Designing the ERP implementation strategies.	
CO4.	Creating reengineered business processes for successful ERP implementation.	
CO5.	Understanding future and scope of Enterprise Integration Application.	
Course Content:		
Unit-1:	**ERP: An Overview:** Concept of ERP, Reasons for Growth Of ERP, Problem areas in ERP implementations, The future of ERP Characteristics and features of ERP, Benefits of ERP.	**7 Hours**
Unit-2:	**Enterprise Modeling and Integration for ERP:** Enterprise: An overview, Integrated Management Information, The role of enterprise, Business modeling, Integrated Data Model Scope of Enterprise system, Generic Model of ERP System, Client/Server Architecture Characteristics of client/Server Architecture, Different Components of ERP Client/Server Architecture.	**7 Hours**
Unit-3:	**ERP and related Technologies:** BPR(Business Process reengineering), BPR –The different phases, BPR and IT, Data Warehousing, Data Warehouse Components, Structure and Uses of Data Warehouse, Data Mining, Data Mining Process, Advantages and Technologies Used In Data Mining, OLAP, Supply Chain Management, ERP Vs SCM, CRM.	**8 Hours**
Unit-4:	**ERP Implementation:** .Evolution of ERP, Evolution of Packaged Software Solutions, The Obstacles in ERP implementation, ERP Implementation Lifecycle (Different Phases), Implementation Methodology, ERP Implementation, The Hidden Costs, In-house Implementation-Pros and Cons, Vendors and role of vendors for ERP, Consultants and role of consultants for ERP.	**7 Hours**
Unit-5:	**ERP Present and Future:** Limitations of ERP, EIA (Enterprise Integration Application), EIA Products, ERP And E-Commerce, ERP and Internet, Future Directions in ERP.	**7 Hours**

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Text Books:	1. Alexis Leon, "ERP Demystified", Tata McGraw Hill.	
Reference Books:	1. Vinod Kumar Garg and Venkitakrishnan N K, "Enterprise Resource Planning – Concepts and Practice", PHI. 2. Joseph A Brady, Ellen F Monk, Bret Wagner, "Concepts in Enterprise Resource Planning", Thompson Course Technology. 3. Mary Summer, "Enterprise Resource Planning"-Pearson Education. 4. Ellen Mon, Bret Wagner "Concepts in ERP", Second Edition of Cengage Learning. 5. Rahul V. Altekar "Enterprisewide Resource Planning", Tata McGraw Hill. *** Latest editions of all the suggested books are recommended.**	
Additional Electronic Reference Material:	https://www.tutorialspoint.com/management_concepts /enterprise_resource_planning.htm	

New course Added

Course Code: BCA 419	BCA- Semester-IV General Elective Course (GEC) - II **SALES AND PRODUCTION MANAGEMENT**	L-2 T-1 P-0 C-3
Course Outcomes:	**On completion of the course, the students will be:**	
CO1.	Understanding the sales and sales area for effective production, material and quality.	
CO2.	Understanding the psychology of buyers, recruitment and selection of sales force, also to understand the importance of six sigma and quality assurance.	
CO3.	Applying the process of training, Total Quality Management (TQM), inventory management and apply different sampling techniques.	
CO4.	Analyzing the process of TQM, quality assurance, six sigma, sales and production outcome.	
CO5.	Evaluating the sales performance, aggregate planning and work measurement.	
CO6.	Creating a mechanism of sales oriented, motivated, trained sales force.	
Course Content:		
Unit-1:	**Introduction to Sales Management:** Evolution of Sales management, Scope and Importance: Skills of a Sales Personnel, Types of Sales Managers; Personal Selling- Theories, Psychology in Selling, Buying Situations, Sales Process; Sales Forecasting; Sales Territory Design.	**7 Hours**
Unit-2:	**Sales Force Management**: Sales Organization Structure; Sales Force Size; Recruitment& Selection of Sales Force; Training , motivation and compensation of Sales Force; Sales Quotas and Contests; Evalution of Sales Performance.	**7 Hours**
Unit-3:	**Introduction to Production:** Meaning, Nature, Scope and Major decision areas of production management, production system, Facilities location, Facility layout, Line balancing, Capacity Planning, Aggregate Planning.	**8 Hours**
Unit-4:	**Method Study & Work Measurement:** Work Study, Time Study, Method Study - Objectives, Pre-requisites and procedures, Productivity measures.	**7 Hours**
Unit-5:	**Materials Management and Quality Assurance: Materials** Management: Materials Handling, Material Requirement Planning Meaning, Importance, purchases management, Store management	**7 Hours**

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	and Inventory Management. Acceptance Sampling, Statistical Quality Control, Maintenance Management, Total Quality Management, Concept of JIT, Six- Sigma.	
Text Books:	1. Adam Jr., Everett E. R J, Production and Operations Management, Prentice-Hall, 2000.	
Reference Books:	1. McGregor D, Operations Management, McGraw-Hill, 1960. 2. Morton, Production and Operations Management, Vikas Publications. 3. Haleem A, Production and Operations Management, Galgotia Books, 2004. 4. Panda, T.K. and Sahadev, S., Sales and Production Management, Oxford University Press, New Delhi, (2nd Ed., 2012). 5. Chary, Production and Operations Management, Tata McGraw-Hill. 6. Still.K.R, Cundiff.E.W & Govoni.N.A.P (6th Ed.,2014). Sales Management, Pearson Education, New Delhi. 7. Tanner Jr.,J.F., Honeycutt Jr., E.D. and Erffmeyer, R.C. (1st Ed.,2015), Sales Management, Pearson Education ,New Delhi. *** Latest editions of all the suggested books are recommended.**	
Additional Electronic Reference Material:	https://theinvestorsbook.com/sales-management.html https://www.univie.ac.at/prolog/teaching/LVAs/KFK-PM/SS08/pm_ch7.pdf	

New Course Added

Course Code: BCA 515	BCA- Semester-V Ability Enhancement Compulsory Course (AECC-8) **ENTREPRENEURSHIP**	L-2 T-1 P-0 C-3
Course Outcomes:	**On completion of the course, the students will be:**	
CO1.	Understanding the meaning and concepts of entrepreneurship.	
CO2.	Understanding and apply the concepts and theories of motivation.	
CO3.	Understanding and analysing different facet and forms of business.	
CO4.	Understanding, applying and evaluating different financing options.	
CO5.	Understanding the government support policies and its applications.	
CO6.	Understanding and applying remedies to sick businesses.	
Course Content:		
Unit-1:	**Entrepreneurship:** Entrepreneur – Types of Entrepreneurs – Difference between Entrepreneur and Intrapreneur Entrepreneurship in Economic Growth, Factors Affecting Entrepreneurial Growth.	7 Hours
Unit-2:	**Motivation:** Major Motives Influencing an Entrepreneur – Achievement Motivation Training, Self-Rating, Business Games, Thematic Apperception Test – Stress Management, Entrepreneurship Development Programs – Need, Objectives.	7 Hours
Unit-3:	**Business:** Small Enterprises – Definition, Classification – Characteristics, Ownership Structures – Project Formulation – Steps involved in setting up a Business – identifying, selecting a Good Business opportunity, Market Survey and Research, Techno Economic Feasibility Assessment – Preparation of Preliminary Project Reports – Project Appraisal – Sources of Information – Classification of Needs and Agencies.	8 Hours
Unit-4:	**Financing and Accounting:** Need – Sources of Finance, Term Loans, Capital Structure, Financial Institution, Management of working Capital, Costing, Break Even Analysis, Taxation – Income Tax, Excise Duty – Sales Tax.	7 Hours
Unit-5:	**Support to Entrepreneurs:** Sickness in small Business – Concept, Magnitude, Causes and Consequences, Corrective Measures – Business Incubators –	7 Hours

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	Government Policy for Small Scale Enterprises – Growth Strategies in small industry – Expansion, Diversification, Joint Venture, Merger and Sub Contracting.	
Text Books:	1. Khanka. S.S., "Entrepreneurial Development" S. Chand & Co. Ltd., Ram Nagar, New Delhi.	
Reference Books:	1. Hisrich R D, Peters M P, "Entrepreneurship" 8th Edition, Tata McGraw-Hill. 2. Mathew J Manimala, "Entrepreneurship theory at cross roads: paradigms and praxis" 2nd Edition Dream tech. 3. Rajeev Roy, 'Entrepreneurship', Oxford University Press. 4. EDII "Faulty and External Experts – A Hand Book for New Entrepreneurs Publishers: Entrepreneurship Development", Institute of India, Ahmadabad. 5. Donald F Kuratko, "Entrepreneurship – Theory, Process and Practice", Cengage Learning. *** Latest editions of all the suggested books are recommended.**	
Additional Electronic Reference Material:	1.https://www.tutorialspoint.com/entrepreneurship_development/entrepreneurshipdevelopment_tutorial.pdf 2. http://www.crectirupati.com/sites/default/files/lecture_notes/Entreprenuer%20ship.pdf	

New course Added

Course Code: BCA 524	BCA- Semester-V Departmental Specific Elective (DSE) - II **GAMIFICATION**	L-2 T-1 P-0 C-3
Course Outcomes:	**On completion of the course, the students will be:**	
CO1.	Understanding the fundamentals of game programming, its architecture, state controls and ACTOR management.	
CO2.	Understanding the role of 3D Graphics, Coordinate Systems, Rasterization, Illumination and Texturing in developing animated games.	
CO3.	Understanding the game design principles such as character development and core mechanics used for designing and developing of 3D animated game.	
CO4.	Applying the techniques of rendering, controlling, sorting and collision detection in designing game engine.	
CO5.	Understanding the importance of various frameworks and platforms such as Adventure Game Studio in designing games.	
CO6.	Understanding the basic principles, importance of tools like OpenGL and DirectX in game development.	
Course Content:		
Unit-1:	Fundamental of Game Programming: Input, Applying Game Logic, Game Loops, Game Timings, Core Architecture Using State Controls , ACTOR Management , Collision Detection , Artificial Intelligence, 2D Graphics Programming: Rendering ,Render Loop, Handling Window Events.	**7 Hours**
Unit-2:	3D Transformations, Quaternions, 3D Modeling and Rendering, Ray Tracing, Shader Models, Lighting, Color, Texturing, Camera and Projections, Culling and Clipping, Character Animation, Physics based Simulation, Scene Graphs. 3D Graphics Foundations: 3D Graphics in Computer Animation and Real Time, 3D Hardware Acceleration,3D Game History, 3D Graphics Condensed Soup , Creating Game Audio Using : Overview of Audio Components, Basics, OpenAL Basics, Tinkering with Source and Listener Properties, Sound Rendering Contexts.	**7 Hours**
Unit-3:	Game engine architecture, Engine support systems, Resources and File systems, Game loop and real-time simulation, Human Interface devices, Collision and rigid body dynamics, Game profiling.	**8 Hours**
Unit-4:	Gaming platform and frame work: Flash, Direct X, open GL, Java, python, Mobile gaming for android, Game engines :Adventure game studio, Dx studio, Unity.	**7 Hours**

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Unit-5:	Developing 2D and 3D interactive games using DirectX or Python Isometric and Tile Based Games, Puzzle games, Single Player games, Multi Player games.	**7 Hours**
Text Books:	1. Mike McShaffrfy and David Graham, "Game Coding Complete", Fourth Edition, Cengage Learning, PTR, 2012.	
Reference Books:	1. Ernest Adams and Andrew Rollings, "Fundamentals of Game Design", 2ndEditionPrenticeHall / New Riders, 2009. 2. Eric Lengyel, "Mathematics for 3D Game Programming and Computer Graphics", 3rd Edition, Course Technology PTR, 2011. 3. Jesse Schell, The Art of Game Design: A book of lenses, 1stEdition, CRC Press, 2008. 4. Jason Gregory"Game Engine Architecture",CRC Press / A K Peters, 2009. 5. David H. Eberly, "3D Game Engine Design, Second Edition: A Practical Approach to Real-Time Computer Graphics" 2ndEditions, Morgan Kaufmann, 2006. *** Latest editions of all the suggested books are recommended.**	
Additional Electronic Reference Material:	https://www.learning-theories.com/gamification-in-education.html	

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