

# UNIVERSITY OF LUCKNOW

## STUDY AND EVALUATION SCHEME

### BACHELOR OF COMPUTER APPLICATION

#### YEAR: THIRD, SEMESTER –VI

Sl. No.	Paper Code	Subject	Periods			Evaluation Scheme				Sub Total	Credit
			L	T	P	Sessional Exam		Exam. ESE			
						CT	TA		Total		
1	BCA-601	E-Commerce	3	1	0	20	10	30	70	100	4
2	BCA-602	Cyber Law and Internet Security	3	1	0	20	10	30	70	100	4
3	BCA-603	Mobile Computing	3	0	0	20	10	30	70	100	3
4	BCA-604X	Elective-II	3	1	0	20	10	30	70	100	4
<b>PRACTICAL/PROJECT</b>											
5	BCA-605P	Advanced Technology ( Dot Net) Lab	0	0	3	10	10	20	30	50	2
6	BCA-Pro	Project	0	0	6	-	50	50	150	200	5
7	BCA-GP	General Proficiency	-	-	-	-	-	-	-	50	-
		Total	12	3	9					700	22

#### Elective-II

- |             |                         |
|-------------|-------------------------|
| 1. BCA-6041 | Optimization Techniques |
| 2. BCA-6042 | Microprocessor          |
| 3. BCA-6043 | Data Compression        |
| 4. BCA-6044 | Cryptography            |

**BCA-601**  
**E-Commerce**

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**Unit-1** **12**

**Introduction:** What is E-commerce, forces behind E-commerce industry framework, brief history of ecommerce, inter organizational E-commerce intra organizational E-commerce, and consumer to business electronic commerce, architectural framework.

**Unit-2** **08**

**Mobile Commerce:** Introduction to mobile commerce, mobile computing application, wireless application protocols, WAP technology, mobile information devices, web security introduction to web security, firewalls & transaction security, client server network, emerging client server security threats, firewalls and network security.

**Unit-3** **08**

**Encryption:** World wide web & security, encryption, transaction security, secret key encryption, public key encryption, virtual private network (VPN) and implementation management issues.

**Unit-4** **12**

**Electronic Payments:** Overview of electronics payments, digital token-based electronics payment system, smart cards, credit card I debit card-based EPS, emerging financial instruments, and online banking.

**Text Books:**

1. Greenstein and Feinman, "E-Commerce", TMH.
2. Ravi Kalakota, Andrew Whinston, "Frontiers of Electronic Commerce", Addison Wesley.
3. Pete Lohsin , John Vacca "Electronic Commerce", New Age.

**Reference Books:**

1. Denieal Amor, "The E-Business Revolution", Addison Wesley.
2. Diwan, Sharma, "E-Commerce", Excel.
3. Bajaj & Nag, "E-Commerce: The Cutting Edge of Business", TMH.

**BCA-602**  
**Cyber Law and Internet Security**

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**Unit-1** **12**

**Cyber Space Jurisdiction:** Jurisdiction issues under IT Act, 2000, traditional principals of jurisdiction, extra-terrestrial jurisdiction and case laws on cyber space jurisdiction.

**E-commerce and Laws in India:** Digital / Electronic signature in Indian laws, E-commerce; issues and provisions in Indian law, and E-Governance.

**Unit-2** **08**

**Intellectual Property Rights, Domain Names and Trademark Dispute:** Concept of trademarks in internet era, cybersquatting, reverse hijacking, jurisdiction in trademark disputes, copyright in the digital medium, and copyright in computer programs

**Unit-3** **10**

**Developing Secure Information Systems:** Information security governance & risk management, security architecture & design security issues in hardware, data storage & downloadable devices, physical security of IT assets, access control, CCTV and intrusion detection systems and backup security measures.

**Unit-4** **10**

**Security Policies:** Development of policies, WWW policies, email security policies, policy review process-corporate policies-sample security policies, publishing and notification requirement of the policies.

**Text Books:**

1. Prashant Mali, "Cyber Law & Cyber Crimes", Snow White publications, Mumbai.
2. Dr. Surya Prakash Tripathi, Ritendra Goyal and Praveen Kumar Shukla, "Introduction to Information Security and Cyber Law", Willey Dreamtech Press.
3. Sarika Gupta & Gaurav Gupta, "Information Security and Cyber Laws", Khanna Publishing House.

**Reference Books:**

1. Farooq Ahmad "Cyber Law in India", Pioneer Publications.
2. Vakul Sharma, "Information Technology Law and Practice", Universal Law Publishing Co. Pvt. Ltd.
3. Suresh T. Vishwanathan, "The Indian Cyber Law", Bharat Law House New Delhi.

**BCA-603**  
**Mobile Computing**

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**Unit-1** **10**

**Introduction:** Issues in mobile computing, characteristics of mobile computing, structure of mobile computing and overview of wireless telephony: cellular concept.

**Unit-2** **10**

**Evaluation of Mobile System and Wireless Network:** GSM, CDMA, FDMA, TDMA; **Wireless networking:** Wireless LAN overview, Bluetooth, wireless multiple access protocols, TCP over wireless, wireless applications, data broadcasting, mobile IP and WAP.

**Unit-3** **08**

**Data management issues:** Management issues, hoarding techniques, data replication for mobile computers, adaptive clustering for mobile wireless networks and file system.

**Unit-4** **12**

**Mobile Agents and Routing algorithms:** Mobile agent, security and fault tolerance, transaction processing in mobile computing environment, Mobile Adhoc Networks (MANETs), Routing protocols, Global State Routing (GSR), Destination Sequenced Distance Vector routing (DSDV) and Dynamic Source Routing (DSR) and Ad Hoc On-demand Distance Vector routing (AODV).

**Text Books:**

1. Jochen Schiller, "Mobile Communications", Addison-Wesley.
2. Raj Kamal, "Mobile Computing", Oxford University Press.
3. Asoke K Talukder, Hasan Ahmed, Roopa R Yavagal, "Mobile Computing, Technology Applications and Service Creation", Mc Graw Hill.

**Reference Books:**

1. Charles Perkins, "Mobile IP", Addison Wesley.
2. Charles Perkins, "Ad hoc Networks", Addison Wesley.
3. Upadhyaya, "Mobile Computing", Springer.

**BCA-6041**  
**Optimization Techniques**

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**Unit-1** **10**

**Linear programming:** Central problem of linear programming various definitions included statements of basic theorem and also their properties, simplex methods, primal and dual simplex method, transport problem, tic-tac problem, and its solution. Assignment problem and its solution. Graphical method formulation and linear programming problem.

**Unit-2** **10**

**Queuing Theory:** Characteristics of queuing system, classification of queuing model single channel queuing theory and generalization of steady state m/m/1 queuing models (model-I, model-II).

**Unit-3** **08**

**Replacement Theory:** Replacement of item that deteriorates replacement of items that fail. Group replacement and individual replacement.

**Unit-4** **12**

**Inventory Theory:** Cost involved in inventory problem- single item deterministic model economics long size model without shortage and with shorter having production rate infinite and finite. **Job Sequencing:** Introduction, solution of sequencing problem, and Johnson's algorithm for n jobs through two machines.

**Text Books:**

1. S S Rao, "Engineering Optimization – Theory and Applications", New Age International (P) Ltd.
2. A.M. Natarajan, P. Balasubramani, A. Tamilarasi, "Operations Research", Pearson Education.
3. Gupta V.G., "Optimization Theory Techniques of Operations Research", Oxford Book Company.

**Reference Books:**

1. Abidi Mongi A. "Optimization Techniques in Computer vision", Springer.
2. Falk Heiko, "Source Code Optimization Techniques for Data Flow Dominated Embedded Software", Springer Verlag New York.
3. Evtushenko Yuriy G. "Numerical Optimization Techniques", Springer Verlag New York.
4. Prakash Om, "Information Theory and Optimization Techniques in Scientific Research", VDM Verlag.

**BCA-6042**  
**Microprocessor**

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**Unit-1** **08**  
**Microprocessors:** Introduction, Advances in semiconductor technology, Organization of microprocessor-based system, and 8085 microprocessor.

**Unit-2** **10**  
**The 8085 MPU architecture:** 8085 bus organization, demultiplexing the bus AD7-AD0, generating control signals. ALU, timing and control unit, instruction register and decoder, register array, decoding and executing an instruction.

**Unit-3** **10**  
**8085 Machine:** Machine cycles and bus timings opcode fetch machine cycle, memory read machine cycle, memory k machine cycle, IO read machine cycle, IO write machine cycle and execution time of the instruction cycle.

**Unit-4** **12**  
**Counters and time delays:** Time delay using single register and register pair, Stack and subroutines, Call and return instructions, Advanced subroutine concept. Assembly language program Hexadecimal counter, Sum of odd and even numbers, Hex to BCD conversion and Interrupts.

**Text Books:**

1. Gaonkar, Ramesh S., “Microprocessor Architecture, Programming, and Applications with the 8085”, Pen Ram International Publishing.
2. Ray, A.K. & Burchandi, “Advanced Microprocessors and Peripherals: Architecture Programming and Interfacing”, Tata McGraw Hill.
3. B. Ram, “Fundamentals of microprocessor and microcontroller”, Dhanpat Rai Publishing Co Pvt Ltd.

**Reference Books:**

1. Hall D.V, “Microprocessor and Interfacing”, Tata McGraw Hill.
2. B.P. Singh & Renu Singh, “Microprocessors and Microcontrollers”, New Age International.
3. Deniel Tabak, “Advance Microprocessor”, TMH.
4. Triebel & Singh, “The 8088 and 8086 Microprocessors”, Pearson Education.

**BCA-6043**  
**Data Compression**

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**Unit-1** **10**

**Compression Techniques:** Loss less compression, lossy compression, measures of performance, modeling and coding, mathematical preliminaries for lossless compression: A brief introduction to information theory, models: Physical models, probability models, Markov models, composite source model, uniquely decodable codes and prefix codes.

**Unit-2** **10**

**Huffman coding algorithm:** Minimum variance Huffman codes, adaptive Huffman coding, update procedure, encoding procedure, decoding procedure, applications of Huffman coding: loss less image compression, text compression and audio compression.

**Unit-3** **12**

**Coding a sequence:** Generating a binary code, Comparison of Binary and Huffman coding, Applications, Bi-level image compression-The JBIG standard, JBIG2, Image compression, Introduction of Dictionary Techniques, **Static Dictionary:** Diagram Coding, and Adaptive Dictionary.

**Unit-4** **08**

**Distortion criteria, Models, Scalar Quantization:** The Quantization problem, uniform quantizer, adaptive quantization and non-uniform quantization.

**Text Books:**

1. Khalid Sayood, "Introduction to Data Compression", Morgan Kaufmann Publishers.
2. Peter D. Johnson Jr., Greg A. Harris, D.C. Hankerson, "Introduction to Information Theory and Data Compression", CRC.
3. David Salomon, "Data Compression: The Complete Reference 4th Edition", Springer.

**Reference Books:**

1. Drozdek, "Elements of Data Compression", Cengage Learning.
2. Timothy C., "Text Compression", Bell Prentice Hall.
3. Nitin Chikani, "The Complete Format of Data Compression & Decompression", Lambert.

**BCA-6044**  
**Cryptography**

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**Unit-1** **10**

**Introduction to Security:** Introduction to security: Attacks, services & mechanisms, security. Conventional encryption model, classical encryption techniques, steganography, modern techniques: simplified DES, block cipher principles, DES standard, DES strength, differential & linear cryptanalysis, block cipher design principles and block cipher modes of operation.

**Unit-2** **08**

**Conventional Encryption Algorithms:** Conventional Encryption Algorithms: Triples DES, blowfish, International data encryption algorithm, RC5, placement of encryption function and key distribution.

**Unit-3** **10**

**Public Key Encryption:** Public Key Encryption: public, key cryptography: principles of public, key cryptosystems, RSA algorithm, key management, Fermat's & Euler's theorem, primality test and the Chinese remainder theorem.

**Unit-4** **12**

**Message Authentication & Hash Functions:** Message Authentication & Hash Functions: Authentication requirements, authentication functions, message authentication codes, hash function, md5 message digest algorithm, secure hash algorithm (SHA), and digital signatures.

**Text Books:**

1. William Stallings, "Cryptography and Network Security: Principles and Practice", Prentice Hall, New Jersey.
2. Atul Kahate, "Cryptography and Network Security", TMH.
3. Douglas R. Stinson, "Cryptography: Theory and Practice", CRC press.

**Reference Books:**

1. William Stallings, "Network Security Essentials: Applications and Standards", Prentice Hall.
2. Johannes A. Buchmann, "Introduction to cryptography", Springer, Verlag.
3. Wenbo Mao, "Modern Cryptography: Theory and Practice", Prentice Hall PTR.
4. Simon Rubinstein Salzedo, "Cryptography", Springer.



**BCA-605P**  
**Advanced Technology (Dot Net) Lab**

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1. Familiarization with IDE.
2. Programming Console applications using VB.NET covering all the aspects of VB.NET fundamentals
3. Object oriented programming using VB.NET covering objects, Inheritance, Polymorphism, Constructors, Static Classes, and Interfaces.
4. Programme to illustrate Exception Handling concepts.
5. Programme to illustrate use of Collections.
6. Programme to perform File I/O Operations.
7. Programming Windows applications using VB.NET covering all major controls and components, Menus, MDI, Event Handling.
8. Creating windows installer.
9. Programme to interact with Database from a Windows Desktop Application.
10. Programming to build web applications using web controls, maintaining state.

Note: The Instructor may add/delete/modify/tune experiments, wherever he/she feels in a justified manner.