



Structure for B.C.A. – CBCS Programme

**Semester-IV (SY)**

COURSE NO.	COURSE TYPE	SUBJECT	CREDIT
BCA-EC-401	ELECTIVE	Nano-Materials & Nano-Technology	02
BCA-FC-402	FOUNDATION	Business Communication – IV	02
BCA-CC-403	CORE	Advanced Operating System and Linux	03
BCA-CC-404	CORE	Application Development Using Vb.Net	03
BCA-CC-405	CORE	Web Application Development Using PHP	03
BCA-CC-406	CORE	Object Oriented Analysis and Design	03
BCA-CC-407	CORE	Practical (Based on BCA-CC-404 & BCA-CC-405)	12
<b>TOTAL</b>			<b>28</b>

Internal Continuous Evaluation:

1. There will be Internal Continuous Evaluation in Theory papers of Core Course.
2. There will be 30 marks for Assignments in Course No: BCA-CC-403, BCA-CC-404, BCA-CC-405, BCA-CC-405



B.C.A.  
SEMESTER - IV

BCA-EC-401: Nano-Materials & Nano-Technology

Credit: 02

Total Marks: 100 Marks  
Semester End Examination 70 Marks  
Continuous Internal Evaluation: 30 Marks

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
1	<b>Introduction and preparation</b> Introduction to Nanomaterials, Optical, magnetic and chemical properties of Nanomaterials, Preparation of Nanoparticles: Chemical Approaches: Chemical reduction: sonochemical synthesis, Sol-Gel Synthesis, Self assembly. Physical Approaches, Aerosol, Laser vaporization and vapour deposition, sputtering.	09	20
2	<b>Nanostructured materials</b> Quantum dots, wells & wires, Carbon Nanotubes (CNTs), Single walled carbon nanotubes (SWCNTs), Multiwalled carbon nanotubes (MWNTs), Graphenes. Fullerenes. Metal Oxide nanoparticles (NPs), Nanorods, Nanotubes and Nanofibers, Semiconductor quantum dots Polymer NPs.	09	20
3	<b>Characterization Techniques for Nanomaterials-1:</b> Particle size Analyser (Laser scattering), Optical Microscopy, Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), Scanning Tunnel Microscopy (STM).	09	20
4	<b>Characterization Techniques for Nanomaterials-2:</b> Particle size Analyser (Laser scattering), Optical Microscopy, Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), Scanning Tunnel Microscopy (STM). X-ray Diffraction (XRD), Auger Emission Spectroscopy, Electron Spectroscopy for Chemical Analysis (ESCA)	09	20
5	<b>Application of Nanomaterials:</b> Application Solar energy conversion and catalysis, Polymer with a special architecture: Liquid crystalline systems, Application in displays and other devices, Advanced organic materials, data storage, Photonics, Chemical and biosensors, Nanomedicine and Nanobiotechnology.	09	20

:: REFERENCE BOOK ::

1. Introduction To Nanotechnology: Understanding The Essentials, By Risal Singh And Shipra Mital Gupta
2. Textbook of Nanoscience And Nanotechnology, Textbook By B.S. Murty, Baldev Raj, James Murday, And P. Shankar



B.C.A.  
SEMESTER – IV

**FOUNDATION COURSE:**

**BCA-FC-402: Business Communication – IV**

**Credit: 02**

**Total Marks: 100 Marks**  
Semester End Examination 70 Marks  
Continuous Internal Evaluation: 30 Marks

UNIT	Detailed Syllabus	Teaching Hours	Marks/Weight
<b>Unit- 1</b>	<i>Communication: An Overview.</i> Meaning & Definition of Communication. Nature & Attributes of Communication. Purpose of Communication. Types of Communication. Internal & External Communication. Channels of Communication. Verbal & Non Verbal Communication.	09	14+06
<b>Unit -2</b>	<i>Written Communication.</i> Introduction. Essentials of a Good Business Letter. Basis Considerations while Writing Business Letters. Parts of Business Letter. Styles & Layout of Business Letter.	09	14+06
<b>Unit-3</b>	<i>Corporate Communication.</i> Corporate & Communication. Defining Corporate Communication. Employee Relations & Communication. Crisis & Disaster: Managing & Communicating.	09	14+06
<b>Unit-4</b>	<i>Conflict and Negotiation in Organizations.</i> What is Conflict? Defining Conflict. Origins of Conflict. Guidelines for Effective Conflict Management. Guidelines for Effective Conflict Management. Conflict and Negotiations in Industrial Relations. Guidelines for successful Negotiations Rights & Wrong.	09	14+06
<b>Unit-5</b>	<i>Tenses</i> Introduction of Tenses. Verb Forms. Active & Passive Voice.	09	14+06

**Reference Books**

- 1 Business Communication. Sathya Swaroop Debasish & Bhagaban Das. PHI Learning Private Limited. New Delhi.
- 2 Business Communication and Organization & Management. Rohini Aggarawal Taxman Publisher. New Delhi.
- 3 Business and Managerial Communication. Sailesh Sengupta. PHI Learning Private Limited. New Delhi.
- 4 A Practical English Grammar. A.J. Thomson & A.V. Martinet. Oxford University Press. New Delhi.



**Recommended reading:**

1. Business Communication - K. K. Sinha - Galgotia Publishing Company, New Delhi.
2. Media and Communication Management - C. S. Rayudu - Himalaya Publishing House, Bombay.
3. Essentials of Business Communication - Rajendra Pal and J. S. Korlhalli - Sultan Chand & Sons, New Delhi.
4. Business Communication – HomaiPradhan, Bhende D.S., Thakur Vijaya
5. Business Communication (Principles, Methods and Techniques) Nirmal Singh - Deep & Deep Publications Pvt. Ltd., New Delhi.
6. Business Communication - Dr. S.V. Kadvekar, Prin. Dr. C. N. Rawal and Prof. Ravindra Kothavade - Diamond Publications, Pune.
7. Business Correspondence and Report Writing - R. C. Sharma, Krishna Mohan - Tata McGraw-Hill Publishing Company Limited, New Delhi.
8. Business Communication and Organisational Management – RohiniAggrawal – Taxman
9. Business Communication Strategies – MonipallyMathukutty M.- Tata McGraw –Hill Publishing Company Limited, New Delhi.
10. Handbook of Communication – Narula Uma
11. A Handbook of Commercial Correspondence – A. Ashley – Oxford University Press
12. Business Communication and Organisational Management – C.B.Gupta
13. Comprehensive Business Communication – SarojKarnik, P.P.Mehta,- P.V.Kulkarni



<b>B.C.A.</b>	<b>Course:</b> Advanced Operating System and Linux	<b>Course No:</b> BCA-CC-403	
<b>Semester:</b> 04	<b>Type of Course :</b> Core Course		
<b>Marking Scheme:</b> External Examination: 70 + Internal Examination: 30 = 100			
<b>Credits:</b> 03	<b>Theory Sessions per Week:</b> 03	<b>Teaching Hours:</b> 45 Hours	
Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
<b>Unit-1</b>	<b>File Management</b>	<b>9</b>	<b>14</b>
	<ul style="list-style-type: none"><li>– File format, Characteristics of file, File operations, File system structure,</li><li>– File access methods: Sequential , direct and Index sequential.</li></ul>		
<b>Unit-2</b>	<b>Directory Management</b>	<b>9</b>	<b>14</b>
	<ul style="list-style-type: none"><li>– Directory structure: single level, two level, tree level ,</li><li>– Directory operations, directory implementation: Linear list, Hash table</li><li>– Disk Space Allocation Method : Continuous, Linked, Index, Free Space Management.</li></ul>		
<b>Unit-3</b>	<b>I/O Management</b>	<b>9</b>	<b>14</b>
	<ul style="list-style-type: none"><li>– Typical PC Bus structure, Pooling and Interrupts, DMA Controller , Kernel I/O Subsystem: I/O Scheduling, Buffering, Caching, Spooling, Error Handling.</li><li>– Mass Storage Structure and Disk scheduling algorithm (FIFO, SSTF, SCAN, C- SCAN.)</li></ul>		
<b>Unit-4</b>	<b>Introduction to Unix and Linux Operating System (Open Source)</b>	<b>9</b>	<b>14</b>
	<ul style="list-style-type: none"><li>– History of Unix Operating System Definition of Kernel, Shell, File, Process,</li><li>– System Calls., Linux Operating System, Features of Unix and Linux Operating System, Application area of Linux Operating System , Various Linux Flavors, Desktop Environment : (a) X Window Basics (b) KDE Basics (c) GNOME Basics, Advantages and Disadvantages of Linux</li></ul>		
<b>Unit-5</b>	<b>File Structure and Linux Shells.</b>	<b>9</b>	<b>14</b>
	<ul style="list-style-type: none"><li>– Understanding File system hierarchy standard, Directory Commands, File and Directory commands, Understanding Job (process).</li><li>– Process Commands, User commands: Misc Commands, Keyboard commands using ctrl key.</li></ul>		
<b>Reference Books</b>			
<ol style="list-style-type: none"><li>1. Silberschatz, Galvin and Gange: Operating System Concepts, Wesley.</li><li>2. Tanenbaum A.S., "Modern Operating Systems", 4th Edition, PHI, 2001</li><li>3. Stallings W, "Operating Systems", 6th edition, Prentice Hall India.</li><li>4. Sumitabha Das: Concepts and Application of UNIX 4th edition Tata McGraw Hill</li><li>5. Yashwant Kanitkar: Unix Shell Programing, BPB Publication</li></ol>			



<b>B.C.A.</b>	<b>Course:</b> Application Development Using VB.NET	<b>Course No:</b> BCA-CC-404	
<b>Semester:</b> 04	<b>Type of Course :</b> Core Course		
<b>Marking Scheme:</b> External Examination: 70 + Internal Examination: 30 = 100			
<b>Credits:</b> 03	<b>Theory Sessions per Week:</b> 03	<b>Teaching Hours:</b> 45 Hours	
<b>Unit</b>	<b>Detailed Syllabus</b>	<b>Teaching Hours</b>	<b>Marks/Weight</b>
<b>Unit-1</b>	<b>Introduction</b>	<b>09</b>	<b>14</b>
	<ul style="list-style-type: none"><li>– .Net Framework, Common Language Runtime</li><li>– Feature &amp; Advantages of CLR.</li><li>– JIT &amp; It's Types : Pre-JIT, Econo-JIT, Normal-JIT</li><li>– Introduction to Integrated Development Environment (IDE)</li><li>– Programming Construct – Variable, Datatype, Type Casting, control structure, looping statement, array, function &amp; procedure, Exception Handling.</li></ul>		
<b>Unit-2</b>	<b>Basic Controls</b>	<b>09</b>	<b>14</b>
	<ul style="list-style-type: none"><li>– Introduction of form.</li><li>– Label, Textbox, Button.</li><li>– Link Label, Combo box, List box, Checkbox, Radio button, Scrollbar.</li><li>– Timer Control, Group box, Panel</li><li>– Event Handling, Method &amp; Property of controls.</li></ul>		
<b>Unit-3</b>	<b>Advance Control</b>	<b>09</b>	<b>14</b>
	<ul style="list-style-type: none"><li>– MDI &amp; SDI form, Main Menu Strip &amp; Context Menu.</li><li>– Rich text box, Picture box, Date time Picker.</li><li>– Track bar, Notify Icon, Progress Bar, Tool tip</li><li>– Built In Dialog box (Open File Dialog, Save File Dialog, Color Dialog, Font Dialog, Folder Browser Dialog)</li></ul>		
<b>Unit-4</b>	<b>Database Connectivity</b>	<b>09</b>	<b>14</b>
	<ul style="list-style-type: none"><li>– ADO.Net Architecture.</li><li>– Create database using MS Access and accessing database using server explorer.</li><li>– Database connectivity using programming code.</li><li>– Database binding with Data Grid View &amp; combo box.</li><li>– Crystal Report.</li></ul>		
<b>Unit-5</b>	<b>Object Oriented Programming</b>	<b>09</b>	<b>14</b>
	<ul style="list-style-type: none"><li>– Class, Object &amp; it's characteristics</li><li>– Inheritance, Polymorphism.</li><li>– Function Overloading</li><li>– Properties: Read Only Properties, Write Only Properties.</li><li>– Constructor &amp; Destructor.</li><li>– Small application development.</li></ul>		
<b>Reference Books</b>			
1. Steven Holzner: Visual Basic .NET Programming Black Book DeramTech Press.			
2. Rod Stephens: Visual Basic 2005 Programmer's			



# MAHARAJA KRISHNAKUMARSINHJI BHAVNAGAR UNIVERSITY

NAAC Accreditation Grade "B"  
(With effect from Academic Year: 2017-18)

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
<b>Unit-1</b>	<b>Introduction</b>	<b>09</b>	<b>14</b>
	<ul style="list-style-type: none"><li>– Fundamental of webpage, website and apache server</li><li>– Static and Dyanamic Website</li><li>– Introduction of PHP-Features, Advantages and Limitations</li><li>– Data Type, Variable, Constant</li><li>– Operator in PHP</li></ul>		
<b>Unit-2</b>	<b>Basic of PHP</b>	<b>09</b>	<b>14</b>
	<ul style="list-style-type: none"><li>– Conditional Statement</li><li>– Looping Statement</li><li>– Array- Types of Array(Numeric, Associative, Multi-dimensional)</li><li>– PHP Server variables</li><li>– Built-in-functions:<ul style="list-style-type: none"><li>○ <b>String</b> (print(), echo(), chr(), trim(), ltrim(), rtrim(), soundex(), str_word_count(), strcmp(), strcmpi(), strstr(), strlen(), strpos(), strrchr(), substr(), strtolower(), ucfirst(), ucwords(), substr_replace())</li><li>○ <b>Mathematical</b> (abs(), sqrt(), log(), floor(), ceil(), pow(), max(), min())</li><li>○ <b>Date/Time</b> (Date(), time(), getdate(), gettimeofday(), localtime(), checkdate())</li></ul></li></ul>		
<b>Unit-3</b>	<b>Working with form</b>	<b>09</b>	<b>14</b>
	<ul style="list-style-type: none"><li>– Form elements- TextBox, TextArea, Password, RadioButton, Check Box, Combo Box, Image</li><li>– Buttons – Submit and Reset</li><li>– Uploading File to webserver</li><li>– POST &amp; GET method</li><li>– PHP include and require statement</li></ul>		
<b>Unit-4</b>	<b>Cookie, Session and Error Handling</b>	<b>09</b>	<b>14</b>
	<ul style="list-style-type: none"><li>– Basic of Cookie-Setting Cookies, Accessing Cookies, Deleting Cookies.</li><li>– Basic of Session- Starting a Session, Destroying a session.</li><li>– Error Handling- Try, Catch and Throw block, die() function</li><li>– Page redirection in PHP</li></ul>		
<b>Unit-5</b>	<b>Database Connectivity</b>	<b>09</b>	<b>14</b>
	<ul style="list-style-type: none"><li>– PHP-MySQL architecture</li><li>– Database interaction –Creating and connecting database</li><li>– Executing commands- Selecting, Inserting, Updating, Deleting</li><li>– Small application development</li></ul>		

## Reference Books

1. Ivan Bayross,Sharanam Shah:PHP 5.1 For Beginners,Sh off Publishers & Distributors(SPD)
2. Janet Valade: PHP5 & MYSQL Projects,Wiley Dreamtech
3. Dave W. Mercer: Beginning PHP5,Wiley India Edition
4. Steven Holzer:The Complete Reference PHP,Tata McGRAW-HiLL,New Delhi.



<b>B.C.A.</b>	<b>Course:</b> Object Oriented Analysis and Design	<b>Course No:</b> BCA-CC-406	
<b>Semester:</b> 04	<b>Type of Course :</b> Core Course		
<b>Marking Scheme:</b> External Examination: 70 + Internal Examination: 30 = 100			
<b>Credits:</b> 03	<b>Theory Sessions per Week:</b> 03	<b>Teaching Hours:</b> 45 Hours	
Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
<b>Unit-1</b>	<b>SYSTEM DESIGN</b>	<b>9</b>	<b>14</b>
	<ul style="list-style-type: none"><li>- Introduction to database?</li><li>- System development in database environment</li><li>- Design of database – Normalization</li><li>- Principles of Software Design</li></ul>		
<b>Unit-2</b>	<b>SYSTEM TESTING &amp; IMPLEMENTATION</b>	<b>9</b>	<b>14</b>
	<ul style="list-style-type: none"><li>- System Testing</li><li>- Testing Strategies</li><li>- Types of system testing</li><li>- Level of Testing</li><li>- System conversion methods – parallel, direct cut over, pilot &amp; phase-in method.</li></ul>		
<b>Unit-3</b>	<b>OBJECT ORIENTED MODEL</b>	<b>9</b>	<b>14</b>
	<ul style="list-style-type: none"><li>- What is object oriented model?</li><li>- Characteristics of OOM – class &amp; object, Link &amp; association, Generalization &amp; Inheritance.</li><li>- Benefits of OOM</li><li>- Introduction to OOA &amp; Advantages &amp; Disadvantages of OOA</li></ul>		
<b>Unit-4</b>	<b>OBJECT ORIENTED ANALYSIS &amp; DESIGN</b>	<b>9</b>	<b>14</b>
	<ul style="list-style-type: none"><li>- Analysis Techniques – Object Modeling, Dynamic Modeling &amp; Functional Modeling.</li><li>- Object design process, steps &amp; solution</li><li>- Defining classes &amp; its implementation, inheritance, association &amp; object representation.</li><li>- Breaking system into sub system &amp; managing data store.</li></ul>		
<b>Unit-5</b>	<b>MODELING &amp; IMPLEMENTATION STRATEGIES</b>	<b>9</b>	<b>14</b>
	<ul style="list-style-type: none"><li>- Object modeling – identifying object classes, user object model , object modeling notations.</li><li>- Dynamic modeling – state diagram</li><li>- Functional modeling – steps of constructing function model, DFD</li><li>- Structural Diagram – what is structural diagram &amp; class Diagram.</li><li>- Implementation strategies</li></ul>		
<b>Reference Books</b>			
<ol style="list-style-type: none"><li>1. James A Senn: Analysis and Design of Information Systems, McGraw Hill Intl. Std. Edn</li><li>2. Yourdon E. and Constantine L. L : Structured Analysis &amp; Design Yourdon press NY</li><li>3. Object Oriented Analysis and Design by James Rumbaugh, Michael Blaha, William Premerlain, Frederick Eddy, William Lorensen</li></ol>			





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NAAC Accreditation Grade "B"  
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<b>B.C.A.</b>	<b>Course:</b> Practical	<b>Course No:</b> BCA-CC-407
<b>Semester:</b> 04	<b>Type of Course:</b> Core Course	
<b>Marking Scheme:</b> External Examination: 100 + Internal Examination: 00 = 100 Marks		
<b>Credits:</b> 12	<b>Practical Sessions per Week:</b> 12	<b>Teaching Hours:</b> 180 Hours

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit-1	Practical Based on 404	90	50
Unit-2	Practical Based on 405	90	50