



Bachelor of Science (Computer Science)
B. Sc. (CS) Semester VII
(Without Research)

Course Code	US07HMACSC01	Title of the Course	Computer Networks
Total Credits of the Course	4	Hours per Week	4

Course Objectives:	1. To understand the basic concepts of computer networks and data communication. 2. To acquire knowledge of basic concepts related to network protocols and standards. 3. To learn fundamentals of wireless networking.
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Course Content		
Unit	Description	Weightage (%)
1.	Introduction - Computer networks: definition, advantages-disadvantages - Classification of computer networks - Categories of computer network: local area networks, metropolitan area networks, wide area networks - Uses of Computer Network - Meaning of the basic terms : topology, data rate, modulation rate, spectrum, bandwidth, server, host	25%
2.	Data Communication Fundamentals - Various types of transmission media - Guided transmission media: magnetic media, twisted pair, coaxial cables, fiber optics - Introduction to the concept of modulation, Types of modulation - Serial transmission vs. Parallel transmission - Circuit switching, packet switching, message switching - Concept of multiplexing: frequency division multiplexing (FDM), time division multiplexing (TDM)	25%
3.	Layered Protocols and Satellite Communication - Protocol significance and hierarchies - Design issues for the layers - The OSI reference model - Examples of protocols for different layers of the OSI model - Introduction communication satellites and categories (LEO, MEO, GEO)	25%





4.	Introduction to Wireless Networks and Networking Devices – Introduction to wireless networks: Bluetooth – LAN topologies with advantages and disadvantages: bus, star, ring, tree, mesh – Introduction to carrier sense multiple access (CSMA), carrier sense multiple access with collision detection (CSMA/CD) protocol for LAN – Functions of various network connecting devices: modems, amplifiers, repeaters, hubs, switches, bridges, routers, gateway	25%
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Teaching-Learning Methodology	Blended learning approach incorporating both traditional classroom teaching as well as usage of ICT tools.
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Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Examination	50%
2.	University Examination	50%

Course Outcomes: Having completed this course, the learner will have	
1.	ability to describe the significance and functioning of computer networks.
2.	understanding of the fundamental concepts related to data communication.
3.	knowledge of various network protocols and standards.
4.	knowledge of basic concepts related to wireless networking.

Suggested References:	
Sr. No.	References
1.	Tanenbaum A. S., computer networks, 3rd edition prentice-hall of India Pvt. Ltd., New Delhi, 1997.
2.	Behrouz Forouzan, introduction to data communications and networking, Tata McGraw-hill publishing co. Ltd., New Delhi, 4th edition, 1998.
3.	Stallings W., Data and Computer Communications, 3rd edition, Macmillan Pub. Company, New York, 1991.





Bachelor of Science (Computer Science)
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Course Code	US07HMACSC02	Title of the Course	Visual Programming Through VB.NET
Total Credits Of the Course	4	Hours per Week	4

Course Objectives:	1. To enable students to develop graphical programs using the .NET framework and the VB.NET programming language. 2. To learn how to access databases and files in .NET programs
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Course Content		
Unit	Description	Weightage (%)
1.	Introduction to .NET Framework and VB.NET – .NET Architecture, .NET Languages, Microsoft Intermediate Language (MSIL), The Just-In-Time (JIT) compiler, Working with Assemblies, The .NET framework class library – VB.NET - introduction, applications and types of project – Introduction to Visual Studio IDE – Creating simple Windows Application using VB.NET – Variables, data types, constants and operators – Type casting, Boxing and Unboxing, – Working with arrays and strings – Creating simple Windows Application using VB.NET	25%
2.	VB.NET Basics – Use of conditional statement (if), multi-branching statement (select) and with...End with statement, – Looping Statement: DO, FOR, FOR EACH... NEXT and WHILE, working with EXIT, CONTINUE and WITH statements – Working with procedures – Introduction, types, use of parameters, parameter passing, calling procedures – OOP concepts - Encapsulation, Inheritance, Interfaces and Polymorphism – Working with modules, classes (partial) and namespaces – Working with Windows Forms – Introduction, life cycle, basic properties, methods and events, use of simple windows forms control. – Working with SDI and MDI forms	25%





3.	Developing Windows Forms, Exception Handling - Working with basic controls – Button, CheckBox, CheckedListBox, ComboBox, DateTimePicker, GroupBox, HScrollBar, RadioButton, VscrollBar, Label, ListBox, PictureBox, TextBox and Time controls. - Working with advanced controls – LinkLabel, RichTextBox, ColorDialog, FontDialog, TreeView, Working with modules, classes (partial) and namespaces - Error Handling: exception, structured exception using try...catch and final statement.	25%
4.	Database Programming with ADO.NET and working with Files - ADO.NET – introduction and applications - ADO.NET – architecture (connected and disconnected) - Database connectivity using ADO.NET - Use of Data sources, Server Explorer and working with Dataset - Populating data in a DataGridView	25%

Teaching- Learning Methodology	Multiple teaching approaches: lecture and discussion, exploration and inquiry, cooperative group work, demonstrations and presentations.
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Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Examination	50%
2.	University Examination	50%

Course Outcomes: Having completed this course, the learner will be able to	
1.	Develop graphical programs using the .NET framework and the VB.NET programming language.
2.	Access databases and files in .NET programs





Suggested References:

Sr. No.	References
1.	Steven Holzner; VB.NET Black Book by Dreamtech publication, 2005.
2.	Francesco Balena: Programming Microsoft Visual Basic.NET, Microsoft Press, 2003.
3.	Bill Evjen, Billy Hollis, Bill Sheldon, Kent Sharkey and Tim McCarthy: Professional VB 2005 with .NET 3.0, 2007.

On-line resources to be used if available as reference material

On-line Resources

1. <https://www.tutorialspoint.com/>

2. <https://www.w3schools.com/>

3. <https://www.javatpoint.com/>





Bachelor of Science (Computer Science)
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Course Code	US07HMACSC03	Title of the Course	Practicals
Total Credits of the Course	4	Hours per Week	8

Course Objectives:	1. To describe the basic structure of a Visual Basic .NET project and use main features of the Integrated Development Environment (IDE). 2. To understand Exception handling. 3. To understand and create applications that use ADO.NET 4. To understand the network topology and network establishment in organization / institution
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Course Content		
Part	Description	Weightage (%)
I	Practical based on US07MACSC01	30%
II	Practical based on US07MACSC02	70%

Teaching-Learning Methodology	Hands-on training through required ICT tools.
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Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Examination	50%
2.	University Examination	50%

Course Outcomes: After completing this course, the learner will be able to understand	
1.	the basic structure of a VisualBasic. NET project and use main features of the integrated development environment (IDE).
2.	how to create applications using Microsoft Windows Forms and Exception Handling





Bachelor of Science (Computer Science)
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Course Code	US07HMICSC01	Title of the Course	Computer Oriented Numerical and Statistical Methods
Total Credits Of the Course	2	Hours per Week	2

Course Objectives:	1. To study the fundamentals of Computer oriented numerical methods. 2. To learn the basics of Computer oriented statistical methods.
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Course Content		
Unit	Description	Weightage (%)
1.	Numerical Methods: • Bisection method • False-position method • Newton-Raphson method • Basics of forward and backward interpolation • Newton's divided interpolation formula • Iteration method	25%
2.	Statistical Methods: • Time Series- Secular trend, seasonal variation, cyclical variation and Irregular Variation. • Methods on measurement of components- the moving average method.	25%

Teaching- Learning Methodology	Blended learning approach incorporating both traditional classroom teaching as well as usage of ICT tools.
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Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Examination	50%
2.	University Examination	50%





Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Examination	50%
2.	University Examination	50%

Course Outcomes: Having completed this course, the learner will be able to understand	
1.	Computer oriented Numerical and Statistical methods
Suggested References:	
Sr. No.	References
1.	Sastry S.S: Introductory Methods of Numerical Analysis, Prentice Hall of India Pvt. Ltd., 1998.
2.	Salaria R.S.: Computer Oriented Numerical Methods, Book Publishing Co. Ltd., 2000.
3.	Fundamentals of Statistics by S.C.Gupta, Himalaya Publishing House, 2012.
4.	Rajaram V. Computer Oriented Numerical Methods, Prentice Hall of India Pvt. Ltd., 1983.
5.	Murray R. Spiegel: Theory and Problem of Statistics, McGraw Hill Schaum's Outline Series, 1981.
On-line resources to be used if available as reference material	
On-line Resources	
1. https://www.tutorialspoint.com/	
2. https://www.w3schools.com/	





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Course Code	US07HMICSC02	Title of the Course	Practicals
Total Credits of the Course	2	Hours per Week	4

Course Objectives:	To understand the Computer Oriented Numerical and Statistical methods.
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Course Content	
Description	Weightage (%)
Practical based on US07MICSC01	100%

Teaching-Learning Methodology	Practical-based learning in small groups and hands-on training through required ICT tools.
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Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Examination	50%
2.	University Examination	50%

Course Outcomes: After completing this course, the learner will be able to understand	
1.	how to implement numerical and statistical methods.

