Vitthalbhai Patel & Rajratna P. T. Patel Science College
(Autonomous)
(Reaccredited with 'A' Grade by NAAC (CGPA 3.13)
Affiliated to SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar, Gujarat
Syllabus effective from the Academic Year 2024-2025

(Bachelor of Science) (Undergraduate) (NEP-2020)
B. Sc. (UG) Semester-I

Course Code	**US01MACSC01**	Title of the Course	**Computer Fundamentals - I**
Total Credits of the Course	4	Hours per Week	4

Course Objectives:	To make students familiar with: 1. To provide basic understanding of computer organization and problemsolving using algorithms and flowcharts. 2. To impart knowledge on fundamental concepts of number systems. To provide knowledge on office automation tools.

Course Content		
Unit	Description	Weightage* (%)
1.	**Basics of Computer Organization** – Meaning of the terms: hardware and software – Block diagram of a simple computer – Processor – function and major components – Memory – function and types – I/O devices – functions and examples – Applications of computer technology – Classification of Computer by data processed (Analog, Digital and Hybrid Computers)	**25**
2.	**Problem Solving Through Logic Development** – Introduction to flowcharts – Introduction to algorithms – Examples of problem solvingthrough flowcharts andalgorithms	**25**
3.	**Number Systems and Codes** – Introduction to Binary codes / Nibble / Bit / Byte / Carry Bit / Parity Bit / Sign Bit / KB / MB / GB / TB / HB (etc…) – Introduction to the number systems: binary, octal, decimal and hexadecimal	**25**

	– Conversions: Binary, Decimal, Octal and Hexadecimal – Binary Arithmetic : Addition, Subtraction (1's compliment and 2's compliment) – Types of Codes : ASCII / BCD / EBCDIC / UniCode	
4.	**Office Automation Tools- Word Processors** – Introduction to word processing – Uses of word processors – Creation, editing, and formatting of documents – Global search & replacement of text – Page layout and printing of a document – Spelling checker, Tables, Templates, Advanced features – Mail Merge	**25**

Teaching-Learning Methodology	Conventional method (classroom blackboard teaching), ICT. Courses for B. Sc. Computer Science programme are delivered through classroom, laboratory work in a challenging, engaging, and inclusive manner that accommodates a variety of learning styles and tools (PowerPoint presentations, audio visual resources, e-resources, seminars, workshops, models).

Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage* (%)
1.	Internal Continuous Assessment in the form of Class test/Internal Written test 15 Marks (30%), Quiz 15 Marks (30%) Active learning 05 Marks (10%), Home Assignments 05 Marks (10%), Class Assignments 05 Marks (10%), Attendance 05 Marks (10%) [Total 50 Marks (50%)].	50
2.	Semester End Examination [Total 50 Marks (50%)].	50 %

Course Outcomes: Having completed this course, the learner will be able to	
1.	Understand computer organization and problem solving using algorithms and flowcharts.
2.	Impart knowledge on fundamental concepts of number systems.
3.	Provide knowledge on office automation tools.

Suggested References:	
Sr. No.	References
1.	Rajaraman V, Computer Fundamentals, Prentice-Hall of India Pvt. Ltd.(4th Edition), 2003.
2.	P.K. Sinha, Priti Sinha, Computer Fundamentals, 6th Edition, 2003.
3.	Tanenbaum A.S., Structured Computer Organization, Prentice-Hall of India Pvt. Ltd, 5th edition, 2005.
4.	R.G.Dromey, "How to Solve it by Computer", Pearson Education India, 2008.
5.	R.K. Taxali, PC Software for Windows 98 Made Simple, Mc Graw Hill Pub. 2017.
6.	Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, "Introduction to Algorithms" 3rd Edition, The MIT Press Cambridge, Massachusetts London, England, 2009.
7.	Steven S. Skiena, "The Algorithm Design Module", 2nd Edition, Springer-Verlag London Limited, 2008.
8.	Donald E. Knuth, The Art of Computer Programming, Volume 1:Fundamental Algorithms, 3rd Edition, Addison Wesley Longman, 1997.

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(Bachelor of Science) (Undergraduate) (NEP-2020)

B. Sc. (UG) Semester-I

Course Code	**US01MACSC02**	Title of the Course	**Practical Based on US01MACSC01**
Total Credits of the Course	**4**	Hours per Week	**8**
Course Objectives:	1. To provide basic understanding of computer organization and problem solving using algorithms and flowcharts. 2. To impart knowledge on fundamental concepts of number systems. 3. To provide knowledge on office automation tools.		

Course Content		
	Description	Weightage* (%)
	Part-1 : Practical based on US01MACSC01 (Unit-1 and Unit-2)	50
	Part-2 : Practical based on US01MACSC01 (Unit-3 and Unit-4)	50

Teaching-Learning Methodology	Hands on training through required ICT tools.

Evaluation Pattern		
Sr.No	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination (As per CCSC R.6.8.3)	-
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CCSC R.6.8.3)	-
3.	University Examination	100%

Course Outcomes: Having completed this course, the learner will be able to	
1.	Design algorithms and flowcharts.
2.	Able to use number systems and office automation tools.

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(Bachelor of Science) (Undergraduate) (NEP-2020)
B. Sc. (UG) Semester-I

Course Code	**US01MICSC01**	Title of the Course	**Computer Organization and Problem Solving**
Total Credits of the Course	**2**	Hours per Week	**2**

Course Objectives:	1. To provide basic understanding of computer organization. 2. To understand the concepts of algorithms and flowcharts.

Course Content		
Unit	Description	Weightage* (%)
1.	**Basics of Computer Organization** – Meaning of the terms: hardware and software – Block diagram of a simple computer – Processor – function and major components – Memory – function and types – I/O devices – functions and examples – Applications of computer technology – Classification of Computer by data processed (Analog, Digital and Hybrid Computers)	50
2.	**Problem Solving Through Logic Development** – Introduction to flowcharts – Introduction to algorithms – Examples of problem solvingthrough flowcharts andalgorithms	50

Teaching-Learning Methodology	Material for this course will be presented using multiple teaching approaches: lecture and discussion, exploration and inquiry, cooperative group work, demonstrations, and presentations

Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1	Internal Continuous Assessment in the form of Class test / Internal Written test 10 Marks (40%), Quiz 5 Marks (20%) , Home Assignments 05 Marks (20%), Attendance 05 Marks (20%) [Total 25 Marks (100%)].	50%
2.	External Examination	50%

Course Outcomes: Having completed this course, the learner will be able to	
1.	Understand basics of computer organization.
2.	Understand the concepts of algorithms and flowcharts.

Suggested References:	
Sr. No.	References
1.	Rajaraman V, Computer Fundamentals, Prentice-Hall of India Pvt. Ltd.(4th Edition), 2003.
2.	Tanenbaum A.S., Structured Computer Organization, Prentice-Hall of India Pvt. Ltd, 5th edition, 2005.
3.	P.K. Sinha, Priti Sinha, Computer Fundamentals, 6th Edition, 2003.
4.	R.G.Dromey, "How to Solve it by Computer", Pearson Education India, 2008.
5.	Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, " Introduction to Algorithms" 3rd Edition, The MIT Press Cambridge, Massachusetts London, England, 2009.
6.	Steven S. Skiena, "The Algorithm Design Module", 2nd Edition, Springer-Verlag London Limited, 2008.
7.	Donald E. Knuth, The Art of Computer Programming, Volume 1:Fundamental Algorithms, 3rd Edition, Addison Wesley Longman, 1997.

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(Bachelor of Science) (Undergraduate) (NEP-2020)

B. Sc. (UG) Semester-I

Course Code	**US01MICSC02**	Title of the Course	**Practical Based on US01MICSC01**
Total Credits of the Course	**2**	Hours per Week	**4**

Course Objectives:	1. To impart knowledge on basic understanding of computer organization. 2. To impart fundamentals of using algorithms and flowcharts.

Course Content		
	Description	Weightage* (%)
	Practical based on US1MICSC01	100

Teaching-Learning Methodology	Hands on training through required ICT tools.

Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination (As per CCSC R.6.8.3)	-
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CCSC R.6.8.3)	-
3.	University Examination	100%

Course Outcomes: Having completed this course, the learner will be able to	
1.	Design algorithms and flowcharts.
2.	Impart knowledge on basic understanding of computer organization.

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(Bachelor of Science) (Undergraduate) (NEP-2020)

B. Sc. (UG) Semester-I

Course Code	**US01IDCSC01**	Title of the Course	**Basics of Computers-I**
Total Credits of the Course	**2**	Hours per Week	**2**
Course Objectives:	1. To provide basic understanding of computer organization. 2. To understand the concepts of algorithms and flowcharts.		

Course Content		
Unit	Description	Weightage* (%)
1.	**Basics of Computer Organization** – Meaning of the terms: hardware and software – Block diagram of a simple computer – Processor – function and major components – Memory – function and types – I/O devices – functions and examples – Applications of computer technology – Classification of Computer by data processed (Analog, Digital and Hybrid Computers)	50
2.	**Problem Solving Through Logic Development** – Introduction to flowcharts – Introduction to algorithms – Examples of problem solvingthrough flowcharts andalgorithms	50

Teaching-Learning Methodology	Material for this course will be presented using multiple teaching approaches: lecture and discussion, exploration and inquiry, cooperative group work, demonstrations, and presentations

Evaluation Pattern		
Sr.No	Details of the Evaluation	Weightage
1	Internal Continuous Assessment in the form of Class test / Internal Written test 10 Marks (40%), Quiz 5 Marks (20%) , Home Assignments 05 Marks (20%), Attendance 05 Marks (20%) [Total 25 Marks (100%)].	50%
2.	External Examination	50%

Course Outcomes: Having completed this course, the learner will be able to	
1.	Understand basics of computer organization.
2.	Understand the concepts of algorithms and flowcharts.

Suggested References:	
Sr. No.	References
1.	Rajaraman V, Computer Fundamentals, Prentice-Hall of India Pvt. Ltd.(4th Edition), 2003.
2.	Tanenbaum A.S., Structured Computer Organization, Prentice-Hall of India Pvt. Ltd, 5th edition, 2005.
3.	P.K. Sinha, Priti Sinha, Computer Fundamentals, 6th Edition, 2003.
4.	R.G.Dromey, "How to Solve it by Computer", Pearson Education India, 2008.
5.	Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, " Introduction to Algorithms" 3rd Edition, The MIT Press Cambridge, Massachusetts London, England, 2009.
6.	Steven S. Skiena, "The Algorithm Design Module", 2nd Edition, Springer-Verlag London Limited, 2008.
7.	Donald E. Knuth, The Art of Computer Programming, Volume 1:Fundamental Algorithms, 3rd Edition, Addison Wesley Longman, 1997.

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(Bachelor of Science) (Undergraduate) (NEP-2020)
B. Sc. (UG) Semester-I

Course Code	**US01IDCSC02**	Title of the Course	**Practical Based on US01IDCSC01**
Total Credits of the Course	**2**	Hours per Week	**4**
Course Objectives:	1. To impart knowledge on basic understanding of computer organization. 2. To impart fundamentals of using algorithms and flowcharts.		

Course Content		
	Description	Weightage* (%)
	Practical based on US1IDCSC01	100

Teaching-Learning Methodology	Hands on training through required ICT tools.

Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination (As per CCSC R.6.8.3)	-
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CCSC R.6.8.3)	-
3.	University Examination	100%

Course Outcomes: Having completed this course, the learner will be able to	
1.	Design algorithms and flowcharts.
2.	Impart knowledge on basic understanding of computer organization.

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(Bachelor of Science) (Undergraduate) (NEP-2020)
B. Sc. (UG) Semester-I

Course Code	**US01SECSC01**	**Title of the Course**	**Information Technology Fundamentals-I (ITF-I)**
Total Credits of the Course	**2**	**Hours per Week**	**2**

Course Objectives:	1. To understand the basic fundamentals of E-Commerce. 2. To study the social impacts of an Information Technology

Course Content		
Unit	Description	Weightage* (%)
1.	**E-Commerce** – Introduction to E-Commerce – Advantages and disadvantages of E-Commerce – Classification by nature of transaction: B2B, B2C, C2C etc. – Digital Signature, Payment Schemes – Electronics Data Exchange – Benefits to organizations, consumers, and society – Limitations of EC, framework of EC, future of EC	50
2.	**Social Impacts of IT** – Introduction – Elements of Web (WWW, URL, webpage, web site, web servers, web browsers, HTML, search engines, etc.) – Privacy, security and Integrity of Information – Disaster Recovery – Intellectual Property Rights – Careers in IT	50

Teaching-Learning Methodology	Multiple teaching approaches: lecture and discussion, exploration and inquiry, cooperative group work, demonstrations, and presentations

Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination (As per CBCS R.6.8.3)	-
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	-
3.	University Examination	100%

Course Outcomes: Having completed this course, the learner will be able to	
1.	Gain understanding of the basic fundamentals of E-Commerce.
2.	Understand the social impacts of an Information Technology.

Suggested References:	
Sr. No.	References
1.	Rajaraman V. : Introduction to Information Technology, Third Edition, Prentice-Hall Learning Private Limited, 2018.
2.	Elias. M. Awad, " Electronic Commerce", Prentice-Hall of India Pvt Ltd.

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