



**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-II

Course Code	<b>US02MACSC01</b>	Title of the Course	<b>Computer Fundamentals – II</b>
Total Credits of the Course	4	Hours per Week	4

Course Objectives:	<ol style="list-style-type: none"> <li>1. To provide basic understanding of information and parallel instruction execution.</li> <li>2. To impart knowledge on Problem Solving Through Logic Development, Gates and Boolean Algebra.</li> <li>3. To provide knowledge on spreadsheets and presentation tools.</li> </ol>
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Course Content		
Unit	Description	Weightage* (%)
1.	<b>Representation of Information and Parallel Instruction Execution</b> <ul style="list-style-type: none"> <li>– Representation of numbers in different number systems</li> <li>– Division, Multiplication of two binary numbers using register method.</li> <li>– Error detection and correction codes, Hamming code</li> <li>– Array processors, Multiprocessors, Multifunctional units, Pipelining</li> </ul>	25
2.	<b>Problem Solving Through Logic Development, Gates and Boolean Algebra</b> <ul style="list-style-type: none"> <li>– Examples of advanced problem solving through logic development</li> <li>– Gates, Boolean Algebra</li> <li>– Truth Tables</li> <li>– Logic circuits for given Boolean expressions</li> <li>– De Morgan's Theorems</li> <li>– Word Comparator, Inverter</li> <li>– Multiplexer</li> </ul>	25



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3.	<b>Office Automation Tools – Spreadsheets</b> <ul style="list-style-type: none"> <li>– Introduction to spreadsheets with features and applications</li> <li>– Working with workbook, worksheets and cells               <ul style="list-style-type: none"> <li>- Creating, opening and sharing workbook</li> <li>- Adding, removing, copying and renaming worksheets</li> <li>- Modifying columns, rows and cells, formatting cells</li> </ul> </li> <li>– Working with formulas and functions (Text function, Maths fuction, Date &amp; Time function, Logical function, HLOOKUP, VLOOKUP), sorting and filtering the data</li> <li>– Making charts (Bar chart, pie charts)</li> <li>– Pivot Table</li> </ul>	25
4.	<b>Presentation Tools</b> <ul style="list-style-type: none"> <li>– Introduction to PowerPoint with features and applications</li> <li>– Creating a presentation: working with slides</li> <li>– Applying Themes and Slide Transitions</li> <li>– Inserting and formatting: picture, clip arts, shapes, lists, slides</li> <li>– Animating Text and Objects</li> <li>– Working with tables, charts and PowerPoint presentation view</li> <li>– Master Slides and Templates</li> </ul>	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 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%), (As per SPU Letter No. E-3/2748 dated 02/02/2024) [Total 50 Marks (50%)].	50 %
2.	Semester End Examination [Total 50 Marks (50%)].	50 %



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Course Outcomes: Having completed this course, the learner will be able to	
1.	Understanding the fundamentals of information and parallel instruction execution.
2.	Impart knowledge on Problem Solving Through Logic Development, Gates and BooleanAlgebra.
3.	Provide knowledge on spreadsheets and presentation tools.

Suggested References:	
Sr. No.	References
1.	Rajaraman V, Computer Fundamentals, Prentice-Hall of India Pvt. Ltd.(4 <sup>th</sup> Edition), 2003.
2.	P.K. Sinha, Priti Sinha, Computer Fundamentals, 6 <sup>th</sup> Edition, 2003.
3.	Malvino A. P.: Digital Computer Electronics, 2 <sup>nd</sup> Edition, Tata McGraw, Hill Pub. Co. Ltd.,New Delhi, 1990.
4.	Gothmann, William H. : Digital Electronics - An Introduction to Theory and Practice, 2nd Edition,PHI,1982.
5.	Taxali R K : PC Software made simple for Windows, Tata McGraw-Hill Publishing Co. Ltd., 2000.
6.	Manuals of PC software.

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

Course Code	<b>US02MACSC02</b>	Title of the Course	<b>Practical Based on US02MACSC01</b>
Total Credits of the Course	<b>4</b>	Hours per Week	<b>8</b>
Course Objectives:	1. To provide basic understanding of information and parallel instruction execution. 2. To impart knowledge on Problem Solving Through Logic Development, Gates and Boolean Algebra. 3. To provide knowledge on spreadsheets and presentation tools.		

Course Content		
	Description	Weightage* (%)
	Part-1 : Practical based on US02MACSC01 (Unit-1 and Unit-2)	50%
	Part-2 : Practical based on US02MACSC01 (Unit-3 and Unit-4)	50%

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 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.	Understanding the fundamentals of information and parallel instruction execution.
2.	Impart knowledge on Problem Solving Through Logic Development, Gates and Boolean Algebra.
3.	Provide knowledge on spreadsheets and presentation tools.

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

Course Code	<b>US02MICSC01</b>	Title of the Course	<b>Computer Basics and Logic Gates</b>
Total Credits of the Course	<b>2</b>	Hours per Week	<b>2</b>

Course Objectives:	<ol style="list-style-type: none"> <li>1. To provide basic understanding of information and parallel instruction execution.</li> <li>2. To impart knowledge on Problem Solving Through Logic Development, Gates and Boolean Algebra.</li> </ol>
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Course Content		
Unit	Description	Weightage* (%)
1.	<b>Representation of Information and Parallel Instruction Execution</b> <ul style="list-style-type: none"> <li>– Representation of numbers in different number systems</li> <li>– Division, Multiplication of two binary numbers using register method.</li> <li>– Error detection and correction codes, Hamming code</li> <li>– Array processors, Multiprocessors, Multifunctional units, Pipelining</li> </ul>	50
2.	<b>Problem Solving Through Logic Development, Gates and Boolean Algebra</b> <ul style="list-style-type: none"> <li>– Examples of advanced problem solving through logic development</li> <li>– Gates, Boolean Algebra</li> <li>– Truth Tables</li> <li>– Logic circuits for given Boolean expressions</li> <li>– De Morgan's Theorems</li> <li>– Word Comparator, Inverter</li> <li>– Multiplexer</li> </ul>	50



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<b>Teaching-Learning Methodology</b>	Material for this course will be presented using 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 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%

<b>Course Outcomes:</b> Having completed this course, the learner will be able to	
1.	Understanding the fundamentals of information and parallel instruction execution.
2.	Impart knowledge on Problem Solving Through Logic Development, Gates and Boolean Algebra.

Suggested References:	
1.	Rajaraman V, Computer Fundamentals, Prentice-Hall of India Pvt. Ltd.(4 <sup>th</sup> 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, 6 <sup>th</sup> Edition, 2003.
4.	Malvino A. P.: Digital Computer Electronics, 2 <sup>nd</sup> Edition, Tata McGraw, Hill Pub. Co. Ltd.,New Delhi, 1990.
5.	Gothmann, William H. : Digital Electronics - An Introduction to Theory and Practice, 2nd Edition,PHI,1982.
6.	Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, “Introduction to Algorithms” 3 <sup>rd</sup> Edition, The MIT Press Cambridge, Massachusetts London, England, 2009.

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

B. Sc. (UG) Semester-II

Course Code	<b>US02MICSC02</b>	Title of the Course	<b>Practical Based on US02MICSC01</b>
Total Credits of the Course	<b>2</b>	Hours per Week	<b>4</b>

Course Objectives:	<ol style="list-style-type: none"> <li>1. To provide basic understanding of information and parallel instruction execution.</li> <li>2. To impart knowledge on Problem Solving Through Logic Development, Gates and Boolean Algebra.</li> </ol>
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Course Content		
	Description	Weightage* (%)
	Practical based on US02MICSC01	100%

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 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.	Understanding the fundamentals of information and parallel instruction execution.
2.	Impart knowledge on Problem Solving Through Logic Development, Gates and Boolean Algebra.

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

Course Code	<b>US02IDCSC01</b>	Title of the Course	<b>Basics of Computers-II</b>
Total Credits of the Course	<b>2</b>	Hours per Week	<b>2</b>
Course Objectives:	1. To provide basic understanding of information and parallel instruction execution. 2. To impart knowledge on Problem Solving Through Logic Development, Gates and Boolean Algebra.		

Course Content		
Unit	Description	Weightage* (%)
1.	<b>Representation of Information and Parallel Instruction Execution</b> <ul style="list-style-type: none"> <li>Representation of numbers in different number systems</li> <li>Division, Multiplication of two binary numbers using register method.</li> <li>Error detection and correction codes, Hamming code</li> <li>Array processors, Multiprocessors, Multifunctional units, Pipelining</li> </ul>	50
2.	<b>Problem Solving Through Logic Development, Gates and Boolean Algebra</b> <ul style="list-style-type: none"> <li>Examples of advanced problem solving through logic development</li> <li>Gates, Boolean Algebra</li> <li>Truth Tables</li> <li>Logic circuits for given Boolean expressions</li> <li>De Morgan's Theorems</li> <li>Word Comparator, Inverter</li> <li>Multiplexer</li> </ul>	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
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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.	Understanding the fundamentals of information and parallel instruction execution.
2.	Impart knowledge on Problem Solving Through Logic Development, Gates and Boolean Algebra.

Suggested References:	
1.	Rajaraman V, Computer Fundamentals, Prentice-Hall of India Pvt. Ltd.(4 <sup>th</sup> Edition), 2003.
2.	Tanenbaum A.S., Structured Computer Organization, Prentice-Hall of India Pvt. Ltd, 5 <sup>th</sup> edition, 2005.
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6.	Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, “ Introduction to Algorithms” 3 <sup>rd</sup> Edition, The MIT Press Cambridge, Massachusetts London, England, 2009.
7.	Steven S. Skiena, “The Algorithm Design Module”, 2 <sup>nd</sup> Edition, Springer-Verlag London Limited, 2008.
8.	Donald E. Knuth, The Art of Computer Programming, Volume 1:Fundamental Algorithms, 3 <sup>rd</sup> Edition, Addison Wesley Longman, 1997.

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

B. Sc. (UG) Semester-II

Course Code	<b>US02IDCSC02</b>	Title of the Course	<b>Practical Based on US02IDCSC01</b>
Total Credits of the Course	<b>2</b>	Hours per Week	<b>4</b>
Course Objectives:	1. To provide basic understanding of information and parallel instruction execution. 2. To impart knowledge on Problem Solving Through Logic Development, Gates and Boolean Algebra.		

Course Content		
	Description	Weightage* (%)
	Practical based on US02IDCSC01	100%

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 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.	Understanding the fundamentals of information and parallel instruction execution.
2.	Impart knowledge on Problem Solving Through Logic Development, Gates and Boolean Algebra.

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

Course Code	US02SECSC01	Title of the Course	Information Technology Fundamentals – II (ITF-II)
Total Credits of the Course	2	Hours per Week	2

Course Objectives:	1. To impart basic knowledge on Internet, web browsers, search engines and social networks 2. To learn different types of communication technologies
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Course Content		
Unit	Description	Weightage* (%)
1.	<b>Internet Usage for E-learning</b> <ul style="list-style-type: none"><li>- Introduction to Internet and Web Browsers</li><li>- Basics of search engines and their functionalities, Searching information, saving web pages, downloading files, etc.</li><li>- Open learning sites- Wikipedia, Wikispaces, Wikieducator, etc.</li><li>- Open Freewares – Introduction and examples</li><li>- Advanced Social Networking</li><li>- ChatGpt, Gemini</li></ul>	50
2.	<b>Communication Technologies</b> <ul style="list-style-type: none"><li>- Different communication mechanisms</li><li>- E-mail: Writing e-mails to single and multiple users, attaching a file, Marking CC and BCC, Creating exclusive communication groups.</li><li>- LCD Projectors: Using LCD projectors for making an audio-visual presentation</li><li>- Tele/Video Conferencing</li><li>- Blogging and chatting</li><li>- Fax and Mobiles</li></ul>	50

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 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.	Understand the basics of Information and communication technology
2.	Explore the applications of ICT in infrastructure

Suggested References:	
Sr.No	References
1.	Online relevant references.
2.	Behrouz Forouzan, introduction to data communications and networking, Tata McGraw-Hill Publishing co. Ltd., New Delhi, 1998, 4 <sup>th</sup> edition.
3.	Tanenbaum A. S., Computer Networks, 3 <sup>rd</sup> Edition Prentice-Hall of India Pvt. Ltd., New Delhi, 1997.

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