

## Bachelor of Science – Computer Science B.Sc. (C.S.) (NEP 2020)

### SEMESTER I

Subject Code	Subject Name	COs
1101111	Digital systems and architecture	<ol style="list-style-type: none"><li>1. Learn how number systems and codes are useful in computer system design.</li><li>2. Learn how Flip Flops are useful in memory design and data communication through CPU and Memory and I/O devices.</li><li>3. Learn about the basics of instruction sets and their types.</li><li>4. Learn about Processor Internal Architecture and Design.</li></ol>
1101112	Fundamentals of Database Systems	<ol style="list-style-type: none"><li>1. To appreciate the importance of database design.</li><li>2. Analyze database requirements and determine the entities involved in the system and their relationship to one another.</li><li>3. Write simple queries to MySQL related to String, Maths and Date Functions.</li><li>4. Create tables and insert/update/delete data, and query data in a relational DBMS using MySQL commands.</li></ol>

		<p>5. Understand the normalization and its role in the database design process.</p> <p>6. Handle data permissions.</p> <p>7. Create indexes and understand the role of Indexes in optimization search.</p>
<p>1101113</p>	<p>Computer Science Practical 1</p>	<p>1. Verify truth tables of various logic gates</p> <p>2. Simplify given Boolean expressions and implement them using Logisim.</p> <p>3. Design and validate the operation of various combinational circuits using Logisim.</p> <p>4. Understand the behavior and applications of flip-flops in digital systems.</p> <p>5. Design and implement expressions using multiplexers/demultiplexers in Logisim.</p> <p>6. Create and maintain relational databases, applying normalization principles.</p> <p>7. Write simple queries to MySQL related to String, Maths and Date Functions.</p> <p>8. Create tables and insert/update/delete data, and query data in a relational DBMS using MySQL commands.</p> <p>9. Handle data permissions.</p>

1171311	Introduction to Commerce	<ol style="list-style-type: none"> <li>1. Develop understanding about Commerce and Business</li> <li>2. Help understand the different forms of Business Organisations</li> <li>3. Help understand the Business Environment</li> <li>4. Understand the recent trends in Commerce.</li> </ol>
1281311	Marketing Mix - I	<ol style="list-style-type: none"> <li>1. The students will learn about the various elements of the Marketing Mix</li> <li>2. Understand the key concepts and components of product and price mix strategies</li> <li>3. Analyze the factors influencing product development, pricing decisions, and brand positioning</li> </ol>
1101411	Introduction to Programming with Python (PR)	<ol style="list-style-type: none"> <li>1. Apply Python features for diverse programming tasks confidently.</li> <li>2. Implement control flow statements for precise program execution.</li> <li>3. Manipulate arrays, strings, and data structures with precision and ease.</li> <li>4. Create modular, efficient code using functions, modules, and strings.</li> <li>5. Skillfully manage files, utilize regular expressions, and work with date and time for program efficiency.</li> </ol>

1101412	Statistics with R Programming (PR)	<ol style="list-style-type: none"> <li>1. Confidently navigate Studio, R GUI, and manage data in R.</li> <li>2. Fluent implementation of expressions, assignments, and loops in R.</li> <li>3. Use R data structures for effective data management.</li> <li>4. Efficiently manipulate and operate on character strings in R.</li> <li>5. Apply statistical functions, regression analysis, and distribution functions with confidence.</li> </ol>
2511511	Introduction to Communication Skill- I	<p>Demonstrate an understanding of essential aspects of communication skills</p> <ol style="list-style-type: none"> <li>1. Exhibit the ability to Read a variety of written text using subskills such as skimming and scanning.</li> <li>2. Identify and rectify common grammatical errors in English.</li> <li>3. Show competence in delivering compelling presentations and engage in articulate and effective conversations in English across different contexts.</li> <li>4. Display advanced formal writing skills in crafting job application letters, CVs, and Statements of Purpose.</li> </ol>
2541516	Environmental Management & Sustainable Development -I	<ol style="list-style-type: none"> <li>1. Use principles of Environmental Science for explaining sustainable development and its related ethical concerns</li> </ol>

		<p>2. Display scientific perspective for issues confronting our present day environment.</p> <p>3. Analyze the national and global environmental issues relating air, water, soil, and land use, biodiversity, and pollution.</p> <p>4. Explain the Role of an individual in relation to human population and environmental pollution.</p>
2531511	Indian Knowledge System Series(Generic)-I	<p>1. Learner will understand and appreciate the rich Indian Knowledge Tradition</p> <p>2. Learner will understand the contribution of Indians in various fields</p> <p>3. Learner will experience increase subject-awareness and self-esteem</p> <p>4. Learner will develop a comprehensive understanding of how all knowledge is ultimately intertwined.</p>
2521612	National Service Scheme	<p>1. The course will help students comprehend the foundations of the National Service Program.</p> <p>2. To understand the unique camping program.</p> <p>3. Students will learn about the regular activities of NSS.</p>
2521615	Introduction to Sports, Physical Literacy, health & Fitness & Yog	<p>1. The student will participate in various games, sports and physical activities and they will also learn the technical and tactical experience of it.</p>

		<p>2. Students will understand the importance and benefits of participation in any fitness activity or sports.</p> <p>3. Own choice based activities will be the stress buster for the students and this will inculcate healthy habits in the students</p> <p>4. Students will be able to organize, plan activities and will develop administrative qualities through these events</p> <p>5. Students acquire the knowledge of Physical Education, Sports and Yoga and understand the purpose and its development.</p> <p>6. The student learns to plan, organize and execute sports events.</p> <p>7. Student will learn theoretical and practical aspects of game of his choice to apply at various levels for teaching, learning and coaching purposes efficiently.</p> <p>8. Student acquires the knowledge of opted games, sports and yoga and also learns the technical and tactical experience of it.</p> <p>9. Student will learn to apply knowledge of Physical fitness and exercise management to lead a better quality life.</p> <p>10. Students will understand and learn different dimensions of an active lifestyle.</p>
2521616	Extension Work	<p>The Learners will be oriented to following activities and motivated to participate in:</p> <ol style="list-style-type: none"> <li>1. Seminar /conferences, discussion sessions, debate, rallies</li> <li>2. Competitions (essay/creative writing, elocution, poster/ video/ rangoli making etc.- Minimum 2 competitions)</li> <li>3. Extension Work group activities of other groups in the college.</li> <li>4. Prepare your PPT, design your posters / charts.</li> <li>5. Survey / short term academic courses / innovative programs.</li> </ol>

## SEMESTER 2

Subject Code	Subject Name	COs
1102111	Design & Analysis of Algorithms (TH)	<ol style="list-style-type: none"><li>1. Students should be able to understand and evaluate efficiency of the programs that they write based on performance of the algorithms used.</li><li>2. Students should be able to appreciate the use of various data structures as per need</li><li>3. To select, decide and apply appropriate design principles by understanding the requirements of any real life problems.</li></ol>
1102112	Object Oriented Programming (TH)	<ol style="list-style-type: none"><li>1. The learner will be able to understand, remember, demonstrate, explain and describe concept of OOP</li><li>2. The learner will be able to design UML based diagrams</li><li>3. The learner will be able to illustrate the different</li></ol>

		<p>types of control statements in C++</p> <p>4. The learner will be able to analyze and implement concept of OOP</p> <p>5. The learner will be able to write and create programs relating to OOP concepts</p>
<p>1102113</p>	<p>Computer Science Practical 2</p>	<p>1. Design and implement algorithms for various problem domains.</p> <p>2. Evaluate and compare the time and space complexities of algorithms.</p> <p>3. Apply divide and conquer strategies to solve computational problems.</p> <p>4. Utilize dynamic programming techniques for optimization problems.</p> <p>5. Implement and analyze algorithms based on greedy strategies.</p> <p>6. Design and implement classes and objects in C++.</p> <p>7. Apply inheritance and polymorphism concepts in program development.</p>

		<p>8. Implement operator overloading for enhanced class functionality.</p> <p>9. Utilize advanced features like friend functions, inline functions, and this pointer.</p> <p>10. Understand the impact of scope specifiers on class members.</p>
<p>1082211</p>	<p>Elementary statistics II</p>	<p>Students will be able to,</p> <ol style="list-style-type: none"> <li>1. Understand the concept of correlation and regression.</li> <li>2. Compute the correlation of bivariate data.</li> <li>3. Interpret the relationship between two numeric variables.</li> <li>4. Build a Simple Linear regression model to predict the response variable.</li> <li>5. Analysis and interpretation of daily household and business-related data using tools like index numbers</li> </ol>

	Introduction to Insurance	<ol style="list-style-type: none"> <li>1. Learn the terminologies related to insurance.</li> <li>2. Learn various insurance products in the market.</li> <li>3. Learners identify personal needs and learn insurance planning.</li> </ol>
1282311	Marketing Mix - II	<ol style="list-style-type: none"> <li>1. Students will understand thoroughly place and promotion as marketing mix variables so as to solve marketing problems.</li> <li>2. Learners should apply and analyze place and promotion marketing mix skills in marketing manager.</li> <li>3. Learners should evaluate and create marketing strategy with place and promotion as an important marketing</li> </ol>
1102411	Web Technologies	<ol style="list-style-type: none"> <li>1. Design valid, well-formed, scalable, and meaningful pages using emerging technologies.</li> <li>2. Understand the various platforms, devices, display resolutions,</li> </ol>

		<p>viewports, and browsers that render websites</p> <p>3. Develop and implement client-side and server-side scripting language programs.</p> <p>4. Develop and implement Database Driven Websites.</p> <p>5. Design and apply XML to create a markup language for data and document centric applications.</p>
<p>1102413</p>	<p>Advanced Python Programming</p>	<p>1. Demonstrate comprehensive OOPs proficiency, apply principles effectively.</p> <p>2. Develop efficient, reusable classes, successfully transfer members.</p> <p>3. Ability to implement inheritance and apply advanced polymorphism.</p> <p>4. Ability to implement abstract classes, demonstrate flexibility through interfaces.</p> <p>5. Ability to thread creation, synchronization, and effective deadlock resolution.</p>

	<p>French for hospitality</p>	<ol style="list-style-type: none"> <li>1. Understand basic french grammar and v abulary</li> <li>2. Learn and use v abulary related to french cuisine and gastronomy</li> <li>3. Acquire basic conversational skills and be able to greet french clients</li> <li>4. Explore french culture and gastronomy</li> </ol>
	<p>Environmental Management &amp; Sustainable Development -II</p>	<ol style="list-style-type: none"> <li>1. Use principles of Environmental Science for explaining sustainable development and its related ethical concerns</li> <li>2. Display scientific perspective for issues confronting our present day environment.</li> <li>3. Analyze the national and global environmental issues relating air, water, soil, and land use, biodiversity, and pollution.</li> <li>4. Explain the Role of an individual in relation to human population and environmental pollution.</li> <li>5. Recognize the importance of collective efforts for environmental sustainability as reflected in</li> </ol>

		various treaties, conventions and laws
2522617	National Service Scheme	<p>The students will be able to</p> <ol style="list-style-type: none"> <li>1. The course will help students comprehend the foundations of the National Service Program.</li> <li>2. To understand the unique camping program.</li> <li>3. Students will learn about the regular activities of NSS.</li> </ol>
2522620	Sports, Physical literacy, Health & Fitness & Yog	<ol style="list-style-type: none"> <li>1. The student will participate in various games, sports and physical activities and they will also learn the technical and tactical experience of it.</li> <li>2. Students will understand the importance and benefits of participation in any fitness activity or sports.</li> <li>3. Own choice based activities will be the stress buster for the students and this will inculcate healthy habits in the students</li> <li>4. Students will able to organize, plan activities and will develop administrative</li> </ol>

		<p>qualities through these events</p> <p>5. Students acquire the knowledge of Physical Education, Sports and Yoga and understand the purpose and its development.</p> <p>6. The student learns to plan, organize and execute sports events.</p> <p>7. Students will learn theoretical and practical aspects of the game of his choice to apply at various levels for teaching, learning and coaching purposes efficiently.</p> <p>8. Students acquire the knowledge of opted games, sports and yoga and also learn the technical and tactical experience of it.</p> <p>9. Students will learn to apply knowledge of Physical fitness and exercise management to lead better quality life.</p> <p>10. Students will understand and learn different dimensions of an active lifestyle.</p>
2522621	Extension Work	1.To ensure equal access to quality education and

		<p>educational opportunities to aspirants.</p> <p>2. To support the government initiatives in achieving universal foundational literacy and numeracy as per sustainable development program.</p> <p>3. To organize remedial programs to address the learning breaches among the youth and provide unending education opportunities.</p> <p>4. To offer more holistic, multidisciplinary, and flexible curricular activities with an emphasis on conceptual understanding and personality development.</p> <p>5. To offer a wide range of activities &amp; promote critical thinking, creativity, and innovation.</p> <p>6. To provide aspirants with multiple pathways for skill development and employment.</p> <p>7. To implement outreach programs to disseminate knowledge, provide services, and support community development.</p>
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