Department	International College of Liberal Arts		
Semester	Spring 2023	Year Offered (Odd/Even/Every Year)	Every Year
Course Number	DATA100		
Course Title	Introduction to Computer Science		
Prerequisites	None		
Course Instructor	PARIDA Abhishek	Year Available (Grade Level)	1
Subject Area	Data Science	Number of Credits	3
Class Style	Lecture	Class Methods	Face to face

(NOTE 1) Class Methods are subject to change

(NOTE 2) Depending on the class size and the capacity of the facility, we may not be able to accommodate all students who wish to register for the course"

Course Description	Computer Science is a vast field, encompassing various topics ranging from organization and architecture designs, operating systems, programming languages, data structures, software engineering techniques, communication and networking, and many others. The field is growing faster than any other profession and offers many opportunities provided one thoroughly adopts the current developments. And knowledge about various technical concepts develops critical thinking that helps one understand technology profoundly. The course is intended for all students and articulates multiple essential topics in Computer Science and Information Technology. It is specially crafted for students in Liberal Arts and describes all the vital topics required to understand the newly emerging field of Data Science and more. After covering the essentials, the course orients students toward data used in society and several areas of Artificial Intelligence in the present scenario.
Class plan based on course evaluation from previous academic year	The course curriculum has been updated based on the performance and feedback of previous year's students. After careful evaluation, certain topics heavy in Mathematics have been removed, as they appear to be covered in other courses. In their place, new and exciting topics in AI and other emerging technologies have been introduced to make the course more relevant and engaging for students.
Course related to the instructor's practical experience (Summary of experience)	None
Learning Goals	The course is prepared for beginners to Computer Science and intended mainly for students from a non-technical background like the Liberal Arts and related. After completing the course, students would have a moderate level of computer basics. The subject's scope is vast and builds a pavement for the Data Science curriculum by covering all essential materials.

iCLA Diploma Policy	DP1／DP2

iCLA Diploma Policy

(DP1) To Value Knowledge - Having high oral and written communication skills to be able to both comprehend and transfer knowledge

(DP2) To Be Able to Adapt to a Changing World - Having critical, creative, problem-solving, intercultural skills, global and independent mindset to adopt to a changing world

(DP3) To Believe in Collaboration - Having a disposition to work effectively and inclusively in teams

(DP4) To Act from a Sense of Personal and Social Responsibility - Having good ethical and moral values to make positive impacts in the world

Active Learning Methods	None
Use of ICT in Class	None

Use of ICT outside Class	None
Expected study hours outside class	A = Course credit: 3 B = Prescribed Class hours per credit: 20 C = Prescribed Total Study hours: 135 D = Total class hours: 60 (1 period of 75 minutes = 2 hours; A*B) Preparation and review hours: C – D = 75
Feedback Methods	There will be written remarks on the assignments. And after every quiz, a model answer will be discussed or circulated among the students to aid their understanding.

Grading Criteria		
Grading Methods	Grading Weights	Grading Content
Assignments	40%	
Quizes	60%	

Required Textbook(s)	William Stallings – Computer Organization and Architecture William Stallings – Operating Systems: Internals and Design Principles Thomas L. Floyd – Digital Fundamentals Kenneth H. Rosen – Discrete Mathematics and Its Applications (Refer to the URLs)
Other Reading Materials/URL	http://home.ustc.edu.cn/~louwenqi/reference_books_tools/Computer%20Organization%20and%20Architecture%2010th%20-%20William%20Stallings.pdf https://engineering.futureuniversity.com/BOOKS%20FOR%20IT/William%20Stallings%20-%20Operating%20Systems%20(1).pdf https://bpcbirgunj.edu.np/wp-content/uploads/2019/10/DIGITAL_ELECTRONICS-by-Flyod.pdf https://www.houstonisd.org/cms/lib2/TX01001591/Centricity/Domain/26781/DiscreteMathematics.pdf
Plagiarism Policy	Plagiarism is the dishonest presentation of others' work as if it were one's own. Duplicate submission is also treated as plagiarism. Depending on the nature of plagiarism, one may fail the assignment or the course. The repeated act of plagiarism will be reported to the University, which may apply additional penalties.
Other Additional Notes	None

(NOTE 3) Class schedule is subject to change

Class Schedule	
Class Number	Content
Class 1	Opening remarks and relevance of studying Computers fundamentals; Overview of a Computer system; History/ Evolution of Computers; How do Computers Work- Input-Process-Output model

Class 2	Fundamentals of Computer Organization- (John) von Neumann Architecture. Types of Computer Systems
Class 3	Classification of Computer Language; Classification of software; Operating system basics: Introduction and objectives (functions)
Class 4	Types of Operating Systems, Process, and Threads
Class 5	Number Systems: Positional versus non-positional numbering systems; Binary, Octal, Decimal, Hexadecimal;
Class 6	Number System Conversion; Signed and unsigned numbers
Class 7	The language of 0s and 1s: Representation of data in Computer memory; Binary arithmetic; Representing floating point numbers
Class 8	Practice Exercises
Class 9	Module 2: Discrete Mathematics (Propositional Logic) Set Theory: Operations, Power sets, Sequences, Cardinality; Mathematical Logic
Class 10	Practice exercises
Class 11	Logical Equivalence; Tautology and Contradictions; Arguments
Class 12	Practice exercises
Class 13	Module 3: Theory of Computation Theory of Computation: Introduction, Preliminaries
Class 14	Finite State Machines; Difference between DFA and NFA
Class 15	Practice exercises
Class 16	Practice exercises

Class 17	Minimizing the DFA, Pushdown automata, Turing Machine
Class 18	Practice exercises
Class 19	Module 4: Data Structures and Algorithms Fundamental Data Structure: arrays, lists, hashmaps, and others
Class 20	Data Structures continued
Class 21	Module 5: Introduction to Flowcharts and Pseudocode
Class 22	Practice exercises
Class 23	Practice exercises
Class 24	Module 6: Computer Networks Introduction; OSI model; different layers in communication; APIs; Monoliths versus Microservices
Class 25	Computer Networks continued
Class 26	Practice exercises
Class 27	Module 6: New Technologies (Data used in Society/ Artificial Intelligence) Blockchain
Class 28	AI and the Internet of Things
Class 29	Practice exercises
Class 30	Practice exercises