Dept. of CSE
Varendra University

Course Introduction

Computer Algorithms

Course Instructor:

Sumaiya Tasnim

Lecturer, Department of CSE

Varendra University

Overview:

Course Title: Computer Algorithms

Course Code: CSE 2203

Course Type: Theory

Credits: 3

Prerequisite Knowledge: Object Oriented Programming, Data Structure

Year and Semester: 2nd Year, Summer Semester

Instructor's Detail:

Name: Sumaiya Tasnim

Designation: Lecturer

WhatsApp: 01799-011979

Web at Varendra University: https://vu.edu.bd/academics/departments/computer-science-and-engineering/faculty-members/02404/sumaiya-tasnim

Office Room: (Ground Floor, Academic Block)

Contact Email: sumaiya@vu.edu.bd

Older Power Point Slide's Web Link: CSE_2203

Course Outcomes (COs), Program Outcomes (POs) and Assessment:

COs	Description	Taxonomy domain/level	POs	K	P	A
CO1	Apply runtime analysis techniques	Cognitive/ Apply	PO-a	K2		
CO2	Design necessary algorithms to solve problems in real life.	Cognitive/ Creating	PO-c	K5		
CO3	Analyze the requirements for approximation of Complexity Classes.	Cognitive/ Analyze	PO-b	K4		

Program Outcomes:

a) Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization as specified in K1 to K4 respectively to the solution of complex engineering problems.

b) Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences. (K1 to K4)

c) Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations. (K5)

Knowledge Profile (K1–K8):

Code	Description
K1	Mathematics, science, engineering fundamentals
K2	**Engineering specialization fundamentals**
K3	Advanced engineering knowledge
K4	**Research literature and methods**
K5	**Engineering design**
K6	Engineering practices, tools, and resources
K7	Effects of engineering on society and environment
K8	Principles of project management and finance

Complex Engineering Problem Solving (P1–P7):

Code	Description
P1	Depth of knowledge needed
P2	Breadth of engineering disciplines involved
P3	Familiarity with codes, standards, or specifications
P4	Involve wide-ranging or conflicting technical and non-technical issues
P5	Have no obvious solution and require original thinking
P6	Involve multiple stakeholders and have significant consequences
P7	Can be solved by structured approaches but involve uncertainty

Complex Engineering Activities (A1–A5):

Code	Description
A1	Involve use of diverse resources (e.g., software, hardware, literature)
A2	Require resolution of significant interactions within technical systems
A3	Involve design and development under constraints
A4	Require a wide range of tools and techniques
A5	Involve multidisciplinary teams or interactions

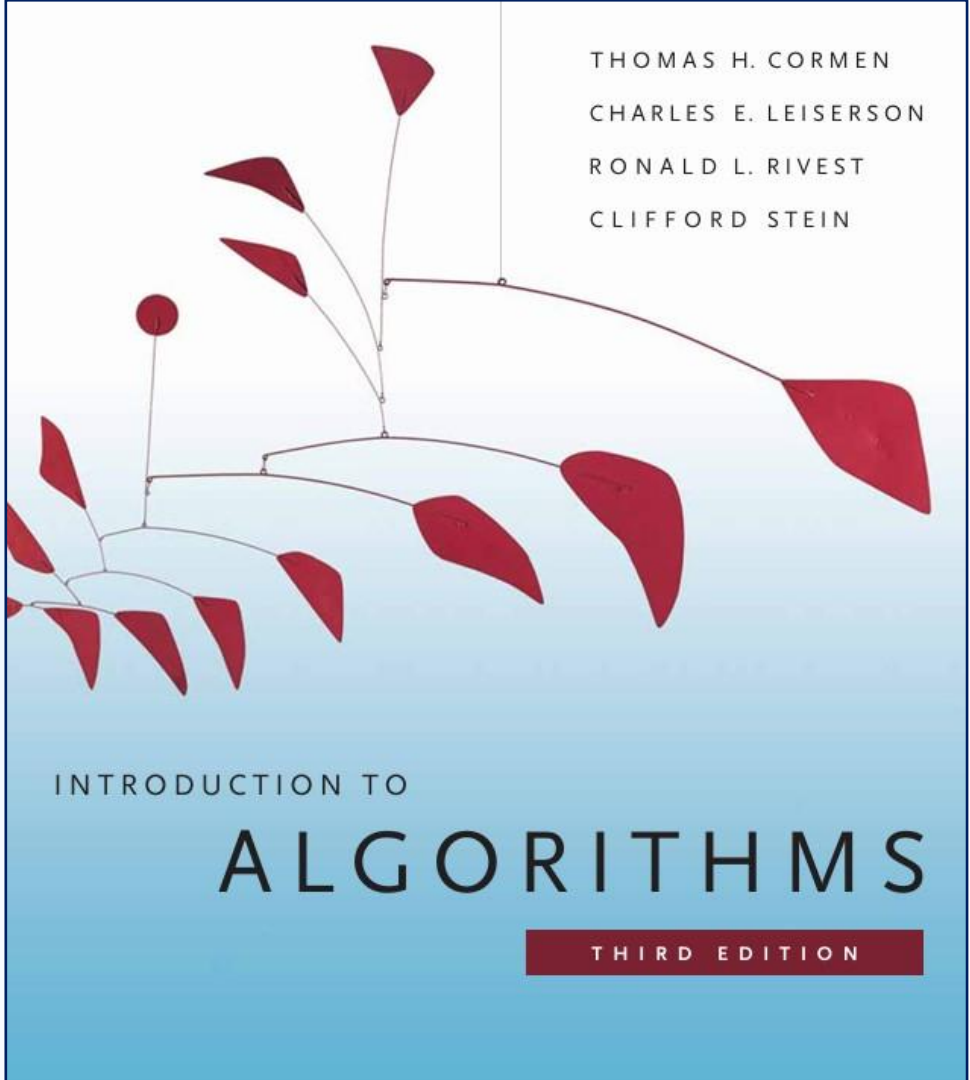
Teaching-Learning Method:

COs	Teaching-Learning strategy	Assessment strategy
CO1	Lectures, Power Point Slide, Book	Mid-Term exam
CO2	Lectures, Power Point Slide, Book	Final Exam
CO3	Lectures, Power Point Slide, Book	Presentation

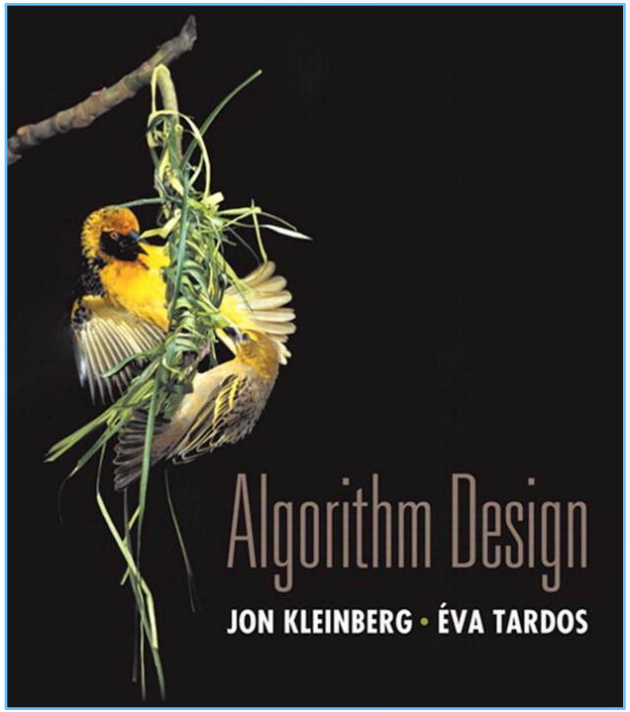
Assessment Detail :

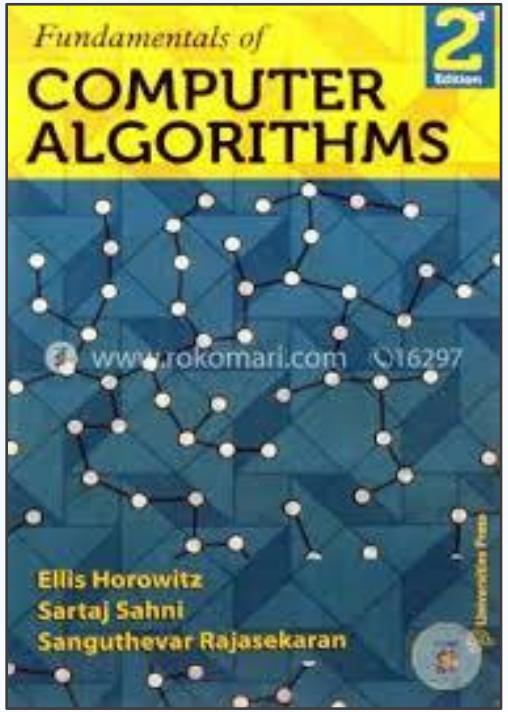
Assessment Tools		Marks (%)	
Continuous Assessment (CA)	Class Participation	10%	40%
	Class Test, Presentation	30%	
Summative Assessment (SA)	Mid-term Examination	24%	60%
	Final Examination	36%	
	Total	100%	

Textbook:


THOMAS H. CORMEN
CHARLES E. LEISERSON
RONALD L. RIVEST
CLIFFORD STEIN
INTRODUCTION TO
ALGORITHMS
THIRD EDITION

Reference Books:





Lecture Plan:

Sessions	Topics	Readings
Week-1	Introduction and Basics of Algorithms, Searching Algorithms	PowerPoint slides & Text Book
Week-2	Sorting Algorithms	PowerPoint slides & Text Book
Week-3	Runtime Analysis Techniques	PowerPoint slides & Text Book
Week-4	Runtime Analysis Techniques (Practice Problems), Divide & Conquer Algorithms	PowerPoint slides & Text Book
Week-5	Divide & Conquer Algorithms	PowerPoint slides & Text Book
Week-6	Greedy Design	PowerPoint slides & Text Book
Week-7	Class Test and Review Class	
Mid Term Examination		

Lecture Plan:

Sessions	Topics	Readings
Week-8	Greedy Design	PowerPoint slides & Text Book
Week-9	Graph Theory	PowerPoint slides & Text Book
Week-10	Graph Theory, Dynamic Programming	PowerPoint slides & Text Book
Week-11	Dynamic Programming	PowerPoint slides & Text Book
Week-12	Computational Complexity	PowerPoint slides & Text Book
Week-13	Presentation	
Week-14	Class Test and Review Class	
Final Examination		

Course Conducting Policies

Missing Lectures	• It is the student's responsibility to gather information about the assignments and covered topics if he/she does miss the lecture.
No Late Entry	• The students must enter the classroom in time to get the attendance. **No student** will be allowed to enter the classroom after the attendance has been done.
Attendance	• Without 50% of attendance, sitting for final exam is NOT allowed.

Leaving Classroom	• Once the attendance is done, a student can leave the class if he or she thinks that he or she is not getting benefits from the class.
Course Materials	• The reading materials for each class will be available at Microsoft Teams (inside the Course Materials section of a Team dedicated to this course)
Schedule	• The date and syllabus of quiz/class test will be announced in time in Microsoft Team

Leaving Classroom	• Once the attendance is done, a student can leave the class if he or she thinks that he or she is not getting benefits from the class.
Course Materials	• The reading materials for each class will be available at Microsoft Teams (inside the Course Materials section of a Team dedicated to this course)
Schedule	• The date and syllabus of quiz/class test will be announced in time in Microsoft Team

Notification	• Students will be notified in due time for class cancelation, extra class, make-up class and tutorial class.
Q/A	• Students are encouraged to participate in the class discussion and to ask questions. The student can ask any question without any hesitation as long as he or she can't understand the topics being discussed; please keep in mind that if you don't understand, it's not your fault, it's my limitation that I could not make you understand. The class is expected to be interactive.
Presentation	• Each student will have to present an oral presentation for 5 minutes on Computational Complexity related topics.

Knowledge Sharing	• It is expected that the student will also provide some new knowledge related to the curriculum and then make the class as a place of knowledge sharing among all participants, both teacher and students.
Unfair Means	• Any attempt for unfair means in the examination is strictly prohibited.

Ice-breaker Session

"Students shouldn't go out into life without the ability to communicate. Your success in life will be determined largely by:

- your ability to speak,
- your ability to write &
- the quality of your ideas,

in that order."

— Late MIT Prof. Patrick Winston