



cu.png

University of Chittagong
Department of Computer Science & Engineering

Course Code: CSE 817

Course Title: Data Engineering

Credits Hour: 3

Instructor

Rokan Uddin Faruqui

Associate Professor

Dept. of Computer Science and Engineering

University of Chittagong, Chittagong

Email: rokan@cu.ac.bd

Textbook:

- Silberschatz, A., Korth, H. F., Sudarshan, S. (2010). *Database System Concepts*. 7th edition, New York: McGraw-Hill.
- Han, J., Kamber, M. & Pei, J. (2012). *Data Mining Concepts and Techniques*, 3rd edition, Morgan Kaufmann Publishers
- Kevin P. Murphy. (2012). *Machine Learning: A Probabilistic Perspective*. The MIT Press.
- Andreas K. (2019). *The Data Engineering Cookbook*.
Available at Cook Book https://www.darwinpricing.com/training/Data_Engineering_Cookbook.pdf

Course Outline:

Lectures	Content	Readings
Lecture 1	<ul style="list-style-type: none">• Course Overview• The Structure of a Compiler	<ul style="list-style-type: none">• Ch 1
Lecture 2	<ul style="list-style-type: none">• Specification of Tokens	<ul style="list-style-type: none">• Ch 3.3
Lecture 3	<ul style="list-style-type: none">• Recognition of Tokens	<ul style="list-style-type: none">• Ch 3.4
Lecture 4	<ul style="list-style-type: none">• Finite Automata	<ul style="list-style-type: none">• Ch 3.6 - 3.7
Lecture 5	<ul style="list-style-type: none">• Regular Expressions to Automata	<ul style="list-style-type: none">• Ch 3.7
Lecture 6	<ul style="list-style-type: none">• Context-Free Grammars	<ul style="list-style-type: none">• Ch 4.1-4.2
Lecture 7	<ul style="list-style-type: none">• Recursive-Descent Parsers	<ul style="list-style-type: none">• Ch 4.4.1
Lecture 8	<ul style="list-style-type: none">• Left Recursions	<ul style="list-style-type: none">• Ch 4.3.1-4
Lecture 9	<ul style="list-style-type: none">• The FIRST Function	<ul style="list-style-type: none">• Ch 4.4.2
Lecture 10	<ul style="list-style-type: none">• The Follow Function	<ul style="list-style-type: none">• Ch 4.4.2
Lecture 11	<ul style="list-style-type: none">• Predictive Parsing<ul style="list-style-type: none">– LL(1) Grammar	<ul style="list-style-type: none">• Ch 4.4.3
Lecture 12	<ul style="list-style-type: none">• Bottom-up Parsing<ul style="list-style-type: none">– Reductions– Handle Pruning	<ul style="list-style-type: none">• Ch 4.5.1 - 2
Lecture 13	<ul style="list-style-type: none">• Bottom-up Parsing<ul style="list-style-type: none">– Shift-reduce Parsing– Conflicts in SR Parsing– LR parsers	<ul style="list-style-type: none">• Ch 4.5.3-4, 4.6.1
Lecture 14	Review	
Lecture 15	<ul style="list-style-type: none">• Flex – Scanner Generator	<ul style="list-style-type: none">• Ch 3.8
Lecture 16	<ul style="list-style-type: none">• Bison – Parser Generator	<ul style="list-style-type: none">• Ch 4.9
Lecture 17	<ul style="list-style-type: none">• Abstract Syntax Trees<ul style="list-style-type: none">– Synthetic Attributes– Inherited Attributes	<ul style="list-style-type: none">• Ch 5.1 - 5.2
Lecture 18	<ul style="list-style-type: none">• Semantic Analysis<ul style="list-style-type: none">– Type Expressions– Type Equivalence	<ul style="list-style-type: none">• Ch 5.1 - 5.2

Lectures	Content	Readings
Lecture 19	<ul style="list-style-type: none"> • Semantic Analysis <ul style="list-style-type: none"> – Type Checking 	<ul style="list-style-type: none"> • Ch 5.3, 6.5
Lecture 20	<ul style="list-style-type: none"> • Runtime Environments <ul style="list-style-type: none"> – Storage organization – Static vs. Dynamic storage allocation 	<ul style="list-style-type: none"> • Ch 7.1 - 7.2
Lecture 21	<ul style="list-style-type: none"> • Runtime Environments <ul style="list-style-type: none"> – Activation trees – Activation records. 	<ul style="list-style-type: none"> • Ch 7.3
Lecture 22	<ul style="list-style-type: none"> • Intermediate Code Generation <ul style="list-style-type: none"> – DAG – Three-address code – Triples – Quadruples – SSA 	<ul style="list-style-type: none"> • Ch 6.1 - 6.3
Lecture 23	<ul style="list-style-type: none"> • Intermediate Code Generation <ul style="list-style-type: none"> – Expressions – Branching Statements – Loops 	<ul style="list-style-type: none"> • Ch 6.4, 6.6
Lecture 24	<ul style="list-style-type: none"> • Code Generations <ul style="list-style-type: none"> – Basic Blocks – Flow graphs 	<ul style="list-style-type: none"> • Ch 8.1 - 8.2
Lecture 25	<ul style="list-style-type: none"> • Code Generation <ul style="list-style-type: none"> – Optimization of Basic Blocks 	<ul style="list-style-type: none"> • Ch 8.3-8.4
Final Exam		