Seneca | SCHOOL OF SOFTWARE
DESIGN & DATA SCIENCE

Course Addendum

Approved by: _____

Kathy Dumanski, Chair, School of Software Design and Data Science

Please read this addendum to the general course outline carefully. It is your guide to the course requirements and activities.

Please refer to the course outline for learning outcomes, course description and text and materials.

Please also visit ict.senecacollege.ca for key information on courses, graduation requirements, transfer credit, and more from the School of Software Design and Data Science.

Assessment Summary

Evaluation:

10 Labs	30%
02 Projects	35%
02 Tests	20%
Final Exam	15%

Course Policies

Promotion Policy:

To obtain a credit in this subject, a student must:
Achieve a weighted combined average of 50% or better for the midterm test (test 1 and test 2) and the final assessment.
Achieve a grade of 50% or better on the overall course.

Academic Policies:
http://www.senecacollege.ca/about/policies/academics-and-student-services.html

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TENTATIVE WEEKLY SCHEDULE
Fall Semester 2022

Week	Topic or Skill	Reading	Assessment	Weight
Week 1	**Introduction:** Different Requirements Beget Different Databases, Big Data: Volume, Velocity, Variety, Hadoop: framework and ecosystem, NoSQL: The rise of NoSQL systems, Overview of NoSQL concepts	**Required**: Sadalage, Fowler Ch.1 **Recommended**: Harrison Ch.1	**Lab 1:** NoSQL case study	3%
Week 2	**Data Models** Aggregates, Models for NoSQL systems, Key-Value, Document, Column, & Graph Data Models, Schemaless Databases	**Required**: Sadalage, Fowler Ch.2	**Lab 2**: Document Data Model case study	3%
Week 3	**Data Models** Key-Value, Document, Column, & Graph Data Models, Schemaless Databases	**Required**: Sadalage, Fowler Ch.3		
Week 4	**Distribution Models and Consistency** Sharding, Master-Slave and Peer-to-Peer Replication, Combining Sharding and Replication, Update, Read, and Relaxing Consistency, The CAP Theorem	**Required**: Sadalage, Fowler Ch.4 **Recommended**: Guy Harrison Ch.3	**Lab 3**: Sharding and CAP Theorem case study	3%
Week 5	**Document Databases: an Introduction** Definition of a Document Database, Features: Consistency, Transactions, Availability, Query Features, and Scaling	**Required**: Sadalage, Fowler Ch.9 **Recommended**: Guy Harrison Ch.4	**Lab 4**: Prepare data with document databases	3%
Week 6	**Document Databases Using MongoDB** Features and constraints, Database design, Database queries, Database modeling, Schema definition Performing CRUD Operations	**Required**: Gaurav Vaish Ch.6, **Recommended**: Tiwari, Ch. 5 Perkins, Ch. 5	**Lab 5**: Explore data with document databases	3%
Week 7	**Document Databases Using MongoDB** Querying NoSQL Stores Queries for a single entity, simple result Queries for a single entity, Aggregate Queries for one-to-one, one-to-many, and many-to-many relationships	**Required**: Gaurav Vaish Ch. 6 **Recommended**: Tiwari, Ch. 6	**Lab 6**: Extract data with document databases **Project 1**: NoSQL Assign. (Individual) **Midterm Test 1**	3% 15% 10%
		Study Week		

Week	Topic or Skill	Reading	Assessment	Weight
Week 8	**Column-Family Stores** Concepts of columnar databases, Features: Consistency, Transactions, Availability, Query Features, Scaling	**Required**: Sadalage, Fowler Ch.10	**Lab 7**: Prepare data for Cassandra	3%
Week 9	**Column-Family Stores (continued)** Suitable Use Cases, Event Logging Content Management Systems, Blogging Platforms Counters, Expiring Usage	**Required**: Sadalage, Fowler Ch.10	**Lab 8**: Load data into Cassandra	3%
Week 10	**Graph Databases** Definition of a Graph Database, Features: Consistency, Transactions, Availability, Query Features, Scaling	**Required**: Sadalage, Fowler Ch.11	**Lab 9**: Prepare data with graph databases **Project 1** due	3%
Week 11	**Graph Databases Using Neo4j** Suitable Use Cases, Connected Data, Routing, Dispatch, and Location-Based Services	**Required**: Sadalage, Fowler Ch.11 **Recommended**: Perkins, Ch. 6	**Lab 10**: Explore data with graph databases **Final Project Assigned**: MongoDB Design & Implement. (team) **Midterm Test 2**	3% 20% 10%
Week 12	**Key-Value Databases** Definition of Key-Value Stores Features: Consistency, Transactions, Query Features, Structure of Data, Scaling	**Required**: Sadalage, Fowler Ch.8	Work on **Final Project**	
Week 13	**Guidelines for Selecting a Database** Choosing a NoSQL Database Criteria for Selecting Key-Value Databases, Document Databases, Column Family Databases, and Graph Databases Using NoSQL and Relational Databases Together	**Recommended::** Dan Sullivan Ch.15	**Final Project** due	
Week 14			Final Exam	15%

Textbooks:

Required: Sadalage, P. & Fowler, M (2012). *NoSQL Distilled: A Brief Guide to the Emerging World of Polyglot Persistence.* Addison-Wesley.

Recommended: Readings will also be selected from the following:

a) Harrison, G. (2015). *Next Generation Databases: NoSQL, NewSQL, and Big Data_ What every professional needs to know about the future of databases in a world of NoSQL and Big Data*. Apress.

b) Vaish, G. (2013). *Getting Started with NoSQL*. Packt Publishing.
c) Sullivan, D. (2015). *NoSQL for Mere Mortals*. Pearson Education.
d) Tiwari, S. (2011). *Professional NoSQL.* John Wiley & Sons.
e) Perkins, L., Redmond, E., & Wilson, J. R. (2017). *Seven databases in seven weeks: A guide to modern databases and the NoSQL movement*.

All the above textbooks are available at our Seneca Library online access.

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