Arab Academy for Science and Technology and Maritime Transport
Information Systems Curriculum
Course Syllabus

Course Code: IS374	Course Title: Advanced Database Systems	Classification: R	Coordinator: Prof. Ossama M. Badawy Lecturer: Prof. Ossama M. Badawy	Credit Hours: 3
Pre-requisites: IS273	Co-requisites:	Schedule: Lecture: W, 8:30, and 10:30 am Tutorial-Lab: W, 8:30 am, 12:30, and 14:30 pm		

Office Hours:
TH 8:30 – 10:30 am

Course Description:
This course is an extension of Database Systems course. It covers advanced topics and divergences in DB field. Advanced topics would include data warehousing, OLAP, data mining, web databases, XML databases, NOSQL databases, cloud databases, and mobile databases. This course will be studying how to develop robust transactional database applications using standard database connectivity JDBC and the role of persistence frameworks & application servers with a persistence service in DB application development. Personal and team projects on databases and database application components development will be key components of the course using the open-source object-relational DB systems.

Textbook:
Jiawei Han, Micheline Kamber, and Jian Pei, Data Mining: Concepts and Techniques, 3rd Ed., Morgan Kaufmann, 2011.

References:
- Thomas Connolly, C. Begg, Database Systems, 6th Ed., Addison Wesley, 2015.
- Nenad Jukic, Susan Vrbsky, Svetlozar Nestorov, Database Systems: Introduction to Databases and Data Warehouses, Prentice Hall, 2016.
- Elmasri, R., Navathe, S., Fundamentals of Database Systems (7th ed.) Pearson, 2016.
- Date, C. J., An Introduction to Database Systems (8th ed.), Addison-Wesley, 2004.
- Journals: ACM Transactions on Database Systems (TODS), ACM New York, NY, USA ISSN: 0362-5915.
- Websites: ACM Digital Library & IEEE Xplore/IET Digital Library

Course Objective:
1. Explain the concepts for modeling, designing, querying and managing large databases.
2. Experiment with the modeling and design of data warehousing and OLAP, data mining, web databases, XML databases, and mobile cloud databases.
3. Develop Transactional web-database applications using suitable database connectivity.
4. Develop cloud mobile database application components using the open-source DB systems.

Course Objective/Course Learning Outcome:	**Contribution to Program Student Outcomes:**
1. Explain the concepts for modeling, designing, querying and managing large databases.	(SO-2) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.
2. Experiment with the modeling and design of data warehousing and OLAP, data mining, web databases, XML databases, and mobile cloud databases.	**(SO-3)** An ability to design, implement, and evaluate a computer-based system, pro-cess, component, or program to meet desired needs.
3. Develop Transactional web-database applications using suitable database connectivity.	(SO-4) An ability to function effectively on teams to accomplish a common goal.
4. Develop cloud mobile database application components using the open-source DB systems.	(SO-4) An ability to function effectively on teams to accomplish a common goal.

Course Outline:

1. Introduction	8. Data warehousing and business intelligence
2. DB Design Methodology & Use of UML Diag.	9. Multidimensional modelling and OLAP
3. Web DB Basics & Cloud Databases	10. Introduction To Data Mining
4. Approaches to Integrate Web and DBs	11. Data Mining Techniques
5. NOSQL Databases	12. **12th Week Exam**
6. Mobile Databases	13. Big Data and Hadoop, and Map Reduce
7. **7th Week Exam**	14. Student Seminars
	15. Student Seminars
	16. **Final Exam**

Grade Distribution:

  7th Week Assessment (30%): Exam (15%) + Homework Assignments 5%
                               +Practical Assignments 10%
  12th Week Assessment (20%): Exam (10%) + Project Design and implementation
                               (10%)
  Year Work (10%): Project Presentation and Discussion (10%)
  Final Exam (40%)

Policies:
Attendance:
AASTMT Education and Study Regulations (available at aast.edu)
Academic Honesty:
AASTMT Education and Study Regulations (available at aast.edu)
Late Submission:
Late submissions are graded out of 75% (1 week late), 50% (2 weeks late), 25% (3 weeks late), 0% (more than 3 weeks late)