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Database Management IS&M Option

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Lecture Plan

1. Introduction to Databases
2. Data Modelling with the Entity-Relationship Model
3. The Basic Relational Model
 - (a) Tables, Attributes and Domains
 - (b) Primary and Foreign Keys, Entity and Referential Integrity
4. Querying a Relational Database
 - (a) Querying a Single Table
 - (b) Aggregating and Grouping Data
 - (c) Querying Multiple Tables
 - (d) Removing Duplicates
 - (e) Null Values
 - (f) Transaction Management and Concurrency Control

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Lecture Plan - Continued

5. Designing a Relational Database

- (a) The three levels of a Database System and Data Independence
- (b) The Normalization Problem
- (c) Boyce-Codd Normal Form

6. Object-Relational Databases

7. Retrieving Information from the World-Wide-Web

8. A brief introduction to XML

There will be coursework !

Recommended books:

1. [CB02] – Comprehensive introductions to Database Management, over 1000 pages.
2. [WM00] – Introduction to Access.
3. [WM01] – Relational databases using Access.
4. [LL99] – Comprehensive treatment of the theory underpinning relational databases and recent extensions of the basic model.
5. [Cel00] – For those of you interested in a book on SQL programming.

Apart from the books I have recommended, there are many more good database books at all levels.

References

- [CB02] T. Connolly and C. Begg. *Database Systems: A Practical Approach to Design, Implementation, and Management*. Addison-Wesley, Harlow, Essex, 3rd edition, 2002.
- [Cel00] J. Celko. *Joe Celko's SQL for Smarties: Advanced SQL Programming*. Morgan Kaufmann, San Francisco, Ca., 2nd edition, 2000.
- [LL99] M. Levene and G. Loizou. *A Guided Tour of Relational Databases and Beyond*. Springer-Verlag, London, 1999.
- [WM00] M. Whitehorn and B. Marklyn. *Accessible Access 2000*. Springer-Verlag, London, 2000.
- [WM01] M. Whitehorn and B. Marklyn. *Inside Relational Databases*. Springer-Verlag, London, 2nd edition, 2001.