

COURSE PROPOSAL

TO: Office of Student Affairs
6426 Boelter Hall

Date: January 29, 1998

FROM: C. Zaniolo, D. S. Parker and R. Muntz, Computer Science
(Proposers) Department

Course No. CS240B Title Advanced Data and Knowledge Bases Units 4
New Course _____ Revision X Deletion _____
Prerequisites CS143, CS240A, or equivalent

CATALOG DESCRIPTION (Limit 40 words):

Logical models for data and knowledge representation. Rule-based languages and nonmonotonic reasoning. Temporal queries, spatial queries, and uncertainty in deductive databases and object relational databases (ORDBs). Abstract data types and user-defined column functions in ORDBs. Data mining algorithms. Semistructured information.

OBJECTIVES OF THE COURSE:

To expose graduate students to the principles and techniques of data and knowledge representation. To train the students in using said principles and techniques in the design and development of advanced information systems.

JUSTIFICATION FOR PROPOSAL:

This material is fundamental in research and development of next-generation information management systems.

REQUIRED TEXTBOOKS:

Author(s)	Title	Publisher	Publication Date
Zaniolo, C. et al.	<i>Advanced Database Systems</i>	Morgan-Kaufmann	1997

Selected research papers from the literature.

RECOMMENDED TEXTBOOKS:

Chamberlin, D.	<i>DB2 Universal Database</i>	Morgan-Kaufmann	1998
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New 1/28/99

HOURS PER WEEK REQUIRED OF EACH STUDENT Lecture 4

A full course should involve a total of Recitation

twelve (12) hours per week (in-class and Laboratory

outside class), and a half-course should

involve six (6) hours, or the equivalent.

Senate regulation 760 provides that credit Outside Study

be reckoned at the rate of one unit per & Preparation 8

three hours of work per week per term, or

the equivalent. (For laboratory courses Other (explain)

a minimum of (2) of these (3) hours must

be in the laboratory - UPC, May 17, 1978. TOTAL 12

Use of

SCHEDULING DATA: Computer Resources Yes NO x

To be offered in the , , , X

 SU F W SP

x, beginning with the SP Qtr., 2000

EVERY YEAR ALTERNATE YEARS

EXPANDED OUTLINE:

Logical models of Data and Knowledge [4 lectures]:
First-order logic; sentences, rules, derivation/proof;
Fixpoint semantics. Deductive Databases and Logic Programming.
Temporal Logic, temporal reasoning and spatial reasoning.
Expressive power and data complexity of query languages.
Recursive queries in Object/Relational DBs (ORDBs).

NonMonotonic Reasoning [4 lectures]:
Implicit negation, and Closed World Assumption;
Stratified programs, well-founded models and stable models.
Set aggregates, nondeterminism and uncertainty in logic and DBs.

Spatio/Temporal Reasoning and Uncertainty in DBs [6 lectures]:
Abstract data types and aggregates in ORDBs.
Efficient support for temporal queries, spatial queries,
and uncertainty in ORDBs.
Clustering, indexing, query optimization, and related
implementation techniques.
Time-series analysis.

Data Mining: Algorithms and Methods [4 lectures]
Decision support systems and data warehouses.
Methods and algorithms for discovering
associations, classifications and clusters.
Database-centric methods, and cache-and-mine techniques.

Semistructured Information and assorted advanced topics
XML and Query languages for semistructured information.
Versions and temporal management of XML and SGML documents.
Advanced topics a la mode.

GRADING BASIS:

- 30% Midterm;
- 30% Programming projects;
- 40% Final exam.

Does this modification affect major or minor field program?
 Yes No

Submit major field program sheets with handwritten correction.

This course is recommended to satisfy an elective constraint as indicated below:

	Suggested Units (please circle)	Constraints				
		Units Approved by UPC				
___ Design_____	0 1 2 3 4	0	1	2	3	4
___ Engineering Science_	0 1 2 3 4	0	1	2	3	4
___ Laboratory_____	0 1 2 3 4	0	1	2	3	4
___ Engineering and Science in Society		___DO_NOT_FILL_IN___				
___ Mathematics - Upper division						

RECOMMENDED

Signatures(s):

 DEPARTMENT CHAIRMAN

 PROPOSER

 DATE

 ACADEMIC POLICY COMMITTEE (CSD)
 CHAIRMAN

 PROPOSER

 DATE

 EXECUTIVE COMMITTEE (SEAS)
 CHAIRMAN

Signature: _____

 INSTRUCTOR IN CHARGE

 DATE

Information for the Academic Policy Committee:

(1) Approximately how many sessions of this course will be lectures by the instructor? 19

(2) How will the remaining sessions be conducted (e.g. student project presentations, exams, guest lecturers)?

One (Midterm)

(3) What is the intended basis of grading in this course?

The class will be graded on the basis of programming assignments, midterm, and a final exam.

(4) Is this course a standard course of a major or minor field? Yes X No _____

If yes explain:

This course integrates and supersedes CS249 "Deductive Databases and NonMonotonic Reasoning", and CS239 "Temporal Databases," which were offered in previous years, and used for major and minor field requirements (PL&S).

(5) If this is a standard course, has it been evaluated and approved by the major field group as a whole? Yes X No _____

If yes, which other faculty member(s) have agreed to teach the course in your absence? Carlo Zaniolo, Stott Parker, Richard Muntz

Optional:

(6) Is this a good course, and will you do a good job teaching it? Yes,yes X, Yes,no____, No,yes____, No,no____

(7) How hard is it?

Fairly hard.