

CIS 6302 - Distributed and Internet Systems

PROFESSOR: Dr. Sanjay Ahuja **Fall 2012**
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TEXTS:

Distributed Systems, Concepts and Design by George Coulouris et al., Addison-Wesley, 5th edition.
Java Enterprise in a Nutshell by David Flanagan, O'Reilly Publishing.

REFERENCES:

Selected papers from Journals and Conferences.

ABOUT THE COURSE: The course deals with the design of distributed systems, resource allocation, load balancing, security, reliability evaluation of distributed systems, and performance evaluation and comparison of distributed object architectures from a distributed application designer's viewpoint. Students will be exposed to graph-theoretic tools used to evaluate the reliability of distributed systems. The distributed object architecture will be studied using Java RMI and CORBA as case studies. Performance bottlenecks in the three-tier distributed system architecture will be studied and along with architectural enhancements to enhance the performance of distributed applications. The projects in this course will focus on performance evaluation and comparison of distributed object architectures from the application designer's point of view. Students will be required to provide demos of their projects to the instructor and write a research paper on their empirical findings. Students are also required to make presentations on topics to be decided in consultation with the professor. Such topics can include distributed security, distributed transactions, distributed file systems, distributed shared memory, web services, SOAP, Grid and Cloud Computing, and other advanced topics in distributed computing.

COURSE TOPICS:

Introduction to distributed computing systems
 Characterization of distributed systems
 System models for Distributed Computing
Enabling Technologies for Distributed Computing
Resource allocation in Distributed Systems
 Task assignment approach
 The File Allocation Problem (FAP)
Load balancing on distributed systems
 Issues in designing load-balancing algorithms
 Case Study: Application of a specific load-balancing algorithm from the literature
Reliability evaluation of distributed systems
 The Source-Terminal Reliability (STR) estimation parameter
 The Computer Network Reliability (CNR) estimation parameter

Applicability of the STR and DPR to the topological assignment of links of the distributed system

The Distributed Program Reliability (DPR) estimation parameter

Applicability of DPR to the File Allocation Problem (FAP)

Operating System Support

Processes and threads

Performance gain using threads

Three-tier distributed system architecture

Performance bottlenecks

Architectural enhancements

Distributed Object architectures

Need for distributed objects

Object Serialization

Architecture Case Study I: Remote objects using Java RMI

Architecture Case Study II: A CORBA version of distributing objects

Comparison of the Java RMI and CORBA architectures

Peer-to-peer computing model

METHOD OF EVALUATION:

Exam	130 points
Project 1	45 points
Project 2	45 points
Paper	50 points
Presentations	90 points
Assignment	50 points

GRADING:

A	90%	B	80%	C	70%	D	60%
F	< 60%						

Note:

- A student's grade will be determined by the total points earned out of 410 points.
- The last date to withdraw is Friday, November 2, 2012.

LATE ASSIGNMENTS:

There will be a penalty of five (5) points per day for late submission of assignments and projects (including weekends and holidays). **No credit will be given for work turned in more than one week late.**

ACADEMIC DISHONESTY:

No type of academic dishonesty will be tolerated. If you are caught cheating (on the assignments, exams, or project) the punishment will be the most severe penalty allowed by

the university policy. The policy on academic integrity, and misuse of computer equipment and computer accounts found at the departmental web-site <http://www.unf.edu/cocse/cis/> applies to this course.

EXAM POLICY:

Each student is **required** to take the exam at the scheduled time. **All** exceptions must be cleared with the professor **prior** to the exam time. An exam missed for insufficient reason and without being cleared with the professor prior to the exam time will be assigned a score of zero.

OTHER REMARKS:

- A grade of incomplete will not be given except for catastrophic illness or calamity.**
- All university rules regarding classroom behavior and attendance apply.**
- Assignments for extra credit will not be assigned.
- All assignments must be typed.
- Attendance is expected. If a student misses a class, the student is still responsible for the material that is covered and for completing any assignments by the due date that may have been handed out by the professor in class.
- Community Based Transformational Learning handout can be found at <http://www.unf.edu/ccec/soc/cbtl.pdf>
- Reminder: Please read the CIS Satisfactory Progress Policy at <http://www.unf.edu/cocse/cis/CIShtml/CIScourseRepeat.html> before withdrawal from a course and to review the "one repeat" rule for all CIS courses.**
- Reminder: Please read your UNF email**
Students are expected to check their UNF email on a regular basis. UNF email is the official notification source and is the student's responsibility to manage.
- Continuity of Instruction Planning**
In the event of disruption of normal classroom activities due to an emergency or pandemic event, the format for this course may be modified to enable completion of the course. In that event, you will be provided with an addendum to this syllabus that will supersede this version and an email will be sent to the class email list. Please check your UNF email on a regular basis.
- DRC statement regarding accommodations for students with disabilities**
"Students with disabilities who seek reasonable accommodations in the classroom or other aspects of performing their coursework must first register with the UNF Disability Resource Center (DRC) located in Honors Hall, Building 10, Room 1201. DRC staff members work with students to obtain required documentation of disability and to identify appropriate accommodations as required by applicable disability laws including the Americans with Disabilities Act (ADA). After receiving all necessary documentation, the DRC staff determines whether a student qualifies for services with the DRC and if so, the accommodations the student requires will be provided. DRC staff then will prepare a letter for the student to provide faculty advising them of approved accommodations. Military and veteran students who return from combat exposure may be utilizing the post-9/11 GI bill to continue postsecondary education goals. For further information, contact the DRC