# ECG702 Interconnection Networks for Parallel Processing

## UNIVERSITY OF NEVADA LAS VEGAS Department of Electrical and Computer Engineering Spring 2023

Time: TBA Class Location: TBA Office Hours: MW 10:00am-12:00pm WebCampus: https://webcampus.unlv.edu

*Note:* The instructor reserves the right to change the syllabus as it relates to how the course is administered.

#### **Course Description**

This course covers topics in interconnection network architecture and design, including network topology, routing strategies, flow control methods, deadlock and deadlock avoidance, congestion control, and network performance analysis. We will also examine applications of networks to parallel computer interconnect, main-memory interconnect in multiprocessors, and switching fabric in Internet routers. 3 credit hours.

#### Textbook

Interconnection Networks: An Engineering Approach, J. Duato, S. Yalamanchili, and L. Ni, Morgan Kaufmann Publishers, 2003, ISBN: 9781558608528. (required)

Introduction to Parallel Processing: Algorithms and Architectures, B. Parhami, Plenum Press, New York and London, 1999, available in electronic version at Lied library.

Parallel Computer Architecture: A Hardware/Software Approach, D. Culler, J.P. Singh, and A. Gupta, 2nd Edition, Morgan Kaufmann Publishers, 1999.

## **Learning Outcomes**

After completing ECG 702, students will be able to:

- 1. Explain the difference between direct networks and indirect networks and the properties of different interconnection network topology.
- 2. Select the interconnection network and design the parallel algorithm to satisfy the requirements of different applications.

Module/Week #	Content	Work Assigned/Due
4	Topology & Related Algorithms (indirect networks: MINs, Omega network, Banyan and Banyan-Like, Batcher sorter, Clos and Benes network	

# **University Policies**

# **Public Health Directives**

Face coverings are currently mandatory for all faculty and students in the classroom. Students must follow all active UNLV public health directives while enrolled in this class. UNLV public health directives are found at <u>Health Requirements for Returning to Campus</u>, https://www.unlv.edu/coronavirus/health-requirements. Students who do not comply with these directives may be asked to leave the classroom. Refusal to follow the guidelines may result in further disciplinary action according to the <u>UNLV Student Conduct Code</u>, https://www.unlv.edu/sites/default/files/page\_files/27/StudentConduct-Code.pdf, including being administratively withdrawn from the course.

## Academic Misconduct

Academic integrity is a legitimate concern for every member of the University community. We all share in upholding the fundamental values of honesty, trust, respect, fairness, responsibility, and professionalism. By choosing to join the UNLV community, students accept the expectations of the Student Academic Misconduct Policy, and are encouraged to always take the ethical path whenever faced with choices. Students enrolling at UNLV assume the obligation to conduct themselves in a manner compatible with UNLV's educational mission. An example of academic misconduct is plagiarism. Plagiarism is using the words or ideas of another person, from the Internet or any other source without proper citation of the source(s). See the

Since the COVID-

UNLV students enrolled in online or hybrid courses are expected to read and adhere to the <u>Student Academic Misconduct Policy</u>, https://www.unlv.edu/studentconduct/misconduct/policy, which states that "acting or attempting to act as a substitute for another, or using or attempting to use a substitute, in any academic evaluation or assignment" is a form of academic misconduct. Intentionally sharing ACE login credentials with another person may be considered an attempt to use a substitute, and could result in investigation and sanctions, as outlined in the Student Academic Misconduct Policy.

UNLV students enrolled in online courses are also expected to read and adhere to the <u>Acceptable</u> <u>Use of Computing and Information Technology Resources Policy</u>, https://www.it.unlv.edu/policies/acceptable-use-computing-and-information-technologyresources-policy, which prohibits sharing university accounts with other persons without

authorization.

To the greatest extent possible, all graded assignments and assessments in UNLV online courses should be hosted in WebCampus-Canvas or another UNLV-managed platform that requires ACE login credentials for access.

# **Incomplete Grades**

The grade of "I" (Incomplete) may be granted when a student has satisfactorily completed three

of the Lied Library, and on the second floor of the College of Engineering building (TBE A 207).

## **UNLV Writing Center**

One-on-one or small group assistance with writing is available free of charge to UNLV students at the <u>Writing Center</u>, https://writingcenter.unlv.edu/, located in the Central Desert Complex, Building 3, Room 301 (CDC 3–301). Walk-in consultations are sometimes available, but students with appointments receive priority assistance. Students may make appointments in person or by calling the Center, telephone 702-895-3908. Students are requested to bring to their appointments their Rebel ID Card, a copy of the instructions for their assignment, and two copies of any writing they have completed on their assignment.

Optional statements for inclusion in syllabi.

## **Diversity Statement**

As an institution of higher learning, UNLV represents a rich diversity of human beings among its faculty, staff, and students, and is committed to aspiring to maintain a Campus environment that values that diversity. Accordingly, the University supports understanding and appreciation of all members of its community, regardless of race, sex, age, color, national origin, ethnicity, creed, religion, disability, sexual orientation, gender, gender identity, marital status, pregnancy, genetic information, veteran status, or political affiliation. Please see <u>University Statements and</u> <u>Compliance</u>, https://www.unlv.edu/about/statements-compliance.

A successful learning experience requires mutual respect and trust between the students and the instructor. Accordingly, the instructor asks that students be willing to listen to one another's points of view, acknowledging that there may be disagreements, keep discussion and comments on topic, and use first person, positive language when expressing their perspectives.

## **UNLV Land Acknowledgement**

UNLV is situated on the traditional homelands of Indigenous groups, including the Nuwu or Nuwuvi, Southern Paiute People, descendants of the Tudinu, or Desert People. We honor and offer gratitude for those who have stewarded the land; for the land itself; and for the opportunity to cultivate a thriving, diverse, inclusive, and just scholarly community here today that works for a better tomorrow for all.