

Data Compression Systems
ECG 605

Spring 2016
T, R 11:30AM- 1:00 PM
Room TBE-B170

A. Course Objectives

To familiarize students with fundamentals of data compression techniques as well as basics of data compression systems. Topics include Huffman coding, Arithmetic coding, Dictionary techniques and facsimile encoding.

B. Prereq.: EE 220, MATH 431

C. Textbook

Khaled Sayood, Introduction to Data Compression, Fourth Edition (The Morgan Kaufmann Series in Multimedia Information and Systems) , 2012.

D. References

- Data Compression Conference Proceedings, IEEE Transactions

E. Grading Policy

Homework:	15 pts	(due one week after announcement)
Test 1	: 15 pts	Tuesday, February 23, 2016
Test 2	: 15 pts	Tuesday, April 12, 2016
Term Paper:	35 pts	(details will be given later)
Final	: 20 pts	Thursday, May 12, 10:10 AM-12:10 PM

Note: Test dates are **tentative** and subject to change. Sufficient advance notice will be given if any date needs to be changed.

F. Topics

1. Mathematical Preliminaries, Introduction to Information Theory
2. Fundamentals and Taxonomy of Compression Techniques
3. Huffman Coding
4. Arithmetic Coding
5. Dictionary Techniques
6. Facsimile Encoding and Progressive Image Transmission
7. Quantization
8. Compression Systems
9. Other Applications and Relevant Topics- Machine Learning, Health Care

G. Other Policies

- Final date to drop or withdraw from classes: **April 1, 2016.**
- No make up exam will be given under any circumstances. If the student presents convincing evidence for his/her absence on the exam day, he/she will be allowed to take the final with an additional weight equal to that of the missed exam
- The Grader will be in charge of grading homework assignments. Questions regarding your homework should be addressed to his. Her office hours and location will be announced shortly.
- If you have a documented disability that may require assistance, you will need to contact Disability Services (DS) for coordination in your academic accommodations. Disability Services is located

within Learning Enhancement Services (LES), in the Reynolds Student Services Complex, Suite 137. The phone number is 895-0866 (TDD 895-0652).

- Students who represent UNLV at any official extracurricular activity shall have the opportunity to make up assignments, but the student must provide official written notification to me no less than one week prior to the missed class(es).

H. Expected Learning Outcomes

Students are expected to learn the principles of compression techniques, become familiar with compression standards and systems, and applications.

I. Use of Library Resources

Students may consult <https://www.library.unlv.edu/consultation> with a librarian on research needs. For this class, the subject librarian is Sue Wainscott.

(http://www.library.unlv.edu/contact/librarians_by_subject). UNLV Libraries provides resources to support students' access to information. Discovery, access, and use of information are vital skills for academic work and for successful post-college life. Access library resources and ask questions at <http://www.library.unlv.edu>.

J. Term Paper

- Choose one topic relevant to the course in consultation with the instructor. Choices of the topics will be made on a "first-come first served" basis, to avoid duplication of topics. Contemporary topics dealing with modern applications are highly encouraged. Examples include sensor networks, wireless ad-hoc networks, mobile voice communications, biometric (finger print/retina's compression techniques) and security systems.
- Cover sheet should have title of the paper, course number, your name, and submission date.
- The length of the text should be 10-15 pages. Follow the IEEE guidelines in formatting your paper. (<http://www.computer.org/cspress/instruct.htm>)
- Submissions need to be made both electronically (including power point slides) and conventionally (hard copy).

K. UNLV Policies

Academic Misconduct – Academic integrity is a legitimate concern for every member of the campus community; 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 when faced with choices to always take the ethical path. Students enrolling in UNLV assume the obligation to conduct themselves in a manner compatible with UNLV's function as an educational institution.

An example of academic misconduct is plagiarism. Plagiarism is using the words or ideas of another, from the Internet or any source, without proper citation of the sources. See the *Student Academic Misconduct Policy* (approved December 9, 2005) located at:

http://www.unlv.edu/sites/default/files/page_files/27/UNLVStudentConductCode1212016.pdf.

Copyright – The University requires all members of the University Community to familiarize themselves with and to follow copyright and fair use requirements. **You are individually and solely responsible for violations of copyright and fair use laws. The university will neither protect nor defend you nor assume any responsibility for employee or student violations of fair use laws.** Violations of copyright laws could subject you to federal and state civil penalties and criminal liability, as well as disciplinary action under University policies. Additional information can be found at: <http://www.unlv.edu/provost/copyright>.

Disability Resource Center (DRC) – The UNLV Disability Resource Center (SSC-A 143, <http://drc.unlv.edu/>, 702-895-0866) provides resources for students with disabilities. If you feel that you have a disability, please make an appointment with a Disabilities Specialist at the DRC to discuss what options may be available to you. If you are registered with the UNLV Disability Resource Center, bring your Academic Accommodation Plan from the DRC to the instructor during office hours so that you may work together to develop strategies for implementing the accommodations to meet both your needs and the requirements of the course. Any information you provide is private and will be treated as such. To maintain the confidentiality of your request, please do not approach the instructor in front of others to discuss your accommodation needs.

Religious Holidays Policy – Any student missing class quizzes, examinations, or any other class or lab work because of observance of religious holidays shall be given an opportunity during that semester to make up

missed work. The make-up will apply to the religious holiday absence only. It shall be the responsibility of the student to notify the instructor no later than the end of the first two weeks of classes, **January 29, 2016**, of his or her intention to participate in religious holidays which do not fall on state holidays or periods of class recess. For additional information, please visit: <http://catalog.unlv.edu/content.php?catoid=6&navoid=531>.

Incomplete Grades - The grade of I – Incomplete – can be granted when a student has satisfactorily completed three-fourths of course work for that semester/session but for reason(s) beyond the student's control, and acceptable to the instructor, cannot complete the last part of the course, and the instructor believes that the student can finish the course without repeating it. The incomplete work must be made up before the end of the following regular semester for undergraduate courses. Graduate students receiving "I" grades in 500-, 600-, or 700-level courses have up to one calendar year to complete the work, at the discretion of the instructor. If course requirements are not completed within the time indicated, a grade of F will be recorded and the GPA will be adjusted accordingly. Students who are fulfilling an Incomplete do not register for the course but make individual arrangements with the instructor who assigned the I grade.

Tutoring – The Academic Success Center (ASC) provides tutoring and academic assistance for all UNLV students taking UNLV courses. Students are encouraged to stop by the ASC to learn more about subjects offered, tutoring times and other academic resources. The ASC is located across from the Student Services Complex (SSC). Students may learn more about tutoring services by calling 702-895-3177 or visiting the tutoring web site at: <http://academicsuccess.unlv.edu/tutoring/>.

Rebelmail – By policy, faculty and staff should e-mail students' Rebelmail accounts only. Rebelmail is UNLV's official e-mail system for students. It is one of the primary ways students receive official university communication such as information about deadlines, major campus events, and announcements. All UNLV students receive a Rebelmail account after they have been admitted to the university. Students' e-mail prefixes are listed on class rosters. The suffix is always @unlv.nevada.edu. **Emailing within WebCampus is acceptable.**

Final Examinations – The University requires that final exams given at the end of a course occur at the time and on the day specified in the final exam schedule. See the schedule at: <http://www.unlv.edu/registrar/calendars>.