

UNLV RADIOGRAPHY PROGRAM

COURSE NUMBER RAD 350

COURSE TITLE PHYSICS OF X-RAY PRODUCTION

PREREQUISITE MUST BE TAKEN CONCURRENTLY WITH RAD 351

CLOCK HOURS 45

COURSE INSTRUCTOR George Pales, Ph.D., R.T.(R)(MR)(T)

COURSE DESCRIPTION

Discussion of x-ray machines, transformers, rectifiers, circuits and their operation. Theory of x-ray production.

COURSE OBJECTIVES:

1. Explain how an electromagnetic force is produced.
2. Properly employ Ohm's law.
3. Draw and interpret a diagram of a simple electrical circuit.
4. Determine the effect of voltage, resistance and current in series and parallel circuits.
5. Identify the various types of transformers in an x-ray circuit and explain their function.
6. Explain the various types of rectification and its function in the x-ray circuit.
7. Explain the various types of exposure timers and their relationship in the production of x-rays.
8. Describe how x-rays are produced.
9. Identify the safety practices that should be adhered to when operating an x-ray unit.
10. Given a simple diagram of an x-ray unit, identify the components, explain their function and discuss how they perform their function.
11. Identify accessory equipment that may be added to an x-ray circuit/unit.
12. Summarize computer applications in medical imaging.
13. Discuss the layout and planning for computerized imaging.

GRADING BREAKDOWN:

A=94-100% A-=89-93% B+=83-88% B= 80-82% B-=76-79%

C+=72-75% C=70-71% C-=68-69% D+=66-67% D=64-65

D-=62-63 F-0-61%

REQUIRED TEXT:

Bushong, Stewart C., Radiologic Science for Technologists, 10th Edition, Elsevier Mosby

OUTLINE OF INSTRUCTION:

1. Radiologic physics; x-ray circuitry and production; math for radiography.
2. The x-ray beam; its production and protection from.
3. Radiologic timers, electrodynamics, electrical symbols, resistance, Ohm's Law, multitestors, transformers, heel effect, kVp, mA, mAs, tomography, digital imaging, darkroom layout and chemicals.

PROCEDURES FOR INDIVIDUAL DIFFERENCES:

Students with exceptional interest and/or ability will have every opportunity for in-depth study of area(s) of interest to them.

STUDENTS WITH DISABILITIES:

If you have a documented disability that requires assistance, you will need to go to Disability Services (DS) for coordination in you academic accommodations. DS is located withing the Learning Enhancement Services Office.

STUDENT HONOR CODE:

The UNLV student Honor Code will be strictly enforced.

CELL PHONE/IPOD POLICY IN THE CLASSROOM:

There are to be NO cell phones or IPODs in the classroom without obtaining the consent of the instructor (for emergency only and on vibrate only if approved).

UNIVERSITY 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://studentconduct.unlv.edu/misconduct/policy.html>.

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 before or after class 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, **September 22, 2015** 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. 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. Please note – Students cannot enroll in other nursing courses if they have an incomplete (I) in a course that is designated as a prerequisite to that course. (Per School of Nursing Policy C-12).

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/>.

UNLV Writing Center – One-on-one or small group assistance with writing is available free of charge to UNLV students at the Writing Center, located in CDC-3-301. Although walk-in consultations are sometimes available, students with appointments will receive priority assistance. Appointments may be made in person or by calling 702-895-3908. The student’s Rebel ID Card, a copy of the assignment (if possible), and two copies of any writing to be reviewed are requested for the consultation. More information can be found at: <http://writingcenter.unlv.edu/>

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.

Library Resources –Students may consult with a librarian (www.library.unlv.edu/ consultation) about research needs. For this class, the subject librarian is Xan Goodman. 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 www.library.unlv.edu/