

## EED 110:01 MATERIAL SCIENCE AND FABRICATION TECHNIQUES

Tuesday/Thursday 8:30-11:15

Instructors: Office: Phone: Office hours: Email:

### **Course Description:**

The objective of this course is to provide an overview of the many types of materials currently used in the entertainment industry; the science of these materials; fabrication methods using these materials; and hands-on experience with these materials and techniques.

### **Learning Objectives:**

Upon successful completion of this course, the student should be able to:

- ◆ define fundamental properties of materials such as ductility, tensile and compressive strength, thermal and electrical conductivity, viscosity and density.
- ◆ list typical values for properties of materials commonly used in the entertainment industry, e.g. metals, plastics, wood, ceramics, glass, fiberglass and styrofoam.
- ◆ summarize and explain differences in the physical properties of materials, e.g. why is steel more ductile than concrete?
- ◆ identify and describe fundamental manufacturing processes explain which fabrication processes can be used with which materials.
- ◆ use non-powered hand tools
- ◆ operate powered hand tools
- ◆ operate machine tools
- ◆ analyze and critique existing entertainment devices and structures
- ◆ design, build and evaluate entertainment components

The class will consist of approximately 1-2 hours per week of lectures and 4 hours per week of studio time. The lectures will cover the theory behind materials and fabrication techniques while the work sessions will allow the student to gain hands-on proficiency in these areas.

Grading for the class will be based on:

- Team projects (60%)
- In-class exercises (20%)
- Participation in in-class project critique sessions (10%)
- A written project notebook/journal (10%)

The bulk of the final grade for the class will be based on a number of hands-on projects that will assess the student's mastery of the practical aspects of this course. Students enrolled in the class will work in pairs, during the allotted studio time, on projects of 1-3 week's duration throughout the semester. The instructors will assign teams. Specific details on each of the projects will be provided when they are assigned. Upon completion of each of the projects, the teams' work will be reviewed in-group critique sessions. The members of the class are expected to take an active role in these sessions.

A number of in-class exercises will be assigned during the lecture portion of the class to assess the student's mastery of the theoretical aspects of this course. These quizzes and exercises are to reinforce the fact that this is not just a workshop class that will teach you how to work with a material, but will inform you on why one can work with that particular material.

Each student is expected to maintain a project notebook. The journals can be purchased from the instructor at the beginning of class. The notebook is to contain notes, drawings, and general thoughts on the design and progress of each project. The student should view the project notebook as an aid in the design process. The project notebook (or journal) is subject to periodic review by the instructor. Keep it current!

Cell phones are to be turned off and remain off for the duration of the class period. Proper attire is mandatory. No open-toe shoes, i.e. sandals, flip-flops, etc allowed. Long hair must be kept up and out of the face. When working with machinery, long hair must be tucked into the collar of the shirt. No loose hanging or dangling jewelry. Safety glasses are to be worn at all times. No food or drink other than water in sealed containers allowed in the classroom.

Instruction will be given for the safe and proper operation of tools and machinery to be used during this class. NO ONE will be allowed to use the equipment without having been instructed and tested on the safe operating procedures. Students will be allowed access to the classroom and equipment during class and at such times when the studio is staffed and open for general use.

Class will begin on time and students are expected to be in the classroom, prepared to begin at the designated time. Punctuality is imperative. If a student is absent, it is his/her responsibility to maintain the assigned timeline for projects. No extensions will be granted with few exceptions.

Each student should possess a set of hand tools. The following list is considered a minimum inventory and should be in your possession by the second week of class:

Safety Glasses or goggles that comply with ANSI Z87.1 2010  
16' – 25' tape measure, 1" wide (feet and inches, not metric)

12" Combination Square  
Utility knife and blades  
6" Compass  
Protractor  
Drill index for high-speed steel (1/6" to 3/8") Pen and/or Pencil  
Tool Box or Bag to contain these tools Gloves are optional

### **Library Resources**

Students may consult with a librarian on research needs. For this class, the subject librarian is Sue Wainscott. ([https://www.library.unlv.edu/contact/librarians\\_by\\_subject](https://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 <https://www.library.unlv.edu>.

## 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: <https://www.unlv.edu/studentconduct/student-conduct>.

**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 within the first 14 calendar days of the course for fall and spring courses (excepting modular courses), or within the first 7 calendar days of the course for summer and modular courses, 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>.

**Transparency in Learning and Teaching**—The University encourages application of the transparency method of constructing assignments for student success. Please see these two links

for further information:

<https://www.unlv.edu/provost/teachingandlearning>

<https://www.unlv.edu/provost/transparency>

**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 and Coaching**—The Academic Success Center (ASC) provides tutoring, academic success coaching and other academic assistance for all UNLV undergraduate students. For information regarding tutoring subjects, tutoring times, and other ASC programs and services, visit <http://www.unlv.edu/asc> or call [702-895-3177](tel:702-895-3177). The ASC building is located across from the Student Services Complex (SSC). Academic success coaching is located on the second floor of the SSC (ASC Coaching Spot). Drop-in tutoring is located on the second floor of the Lied Library and College of Engineering TEB second floor.

**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](mailto:@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>.