

**Course Title:** DMEI 4315 Advanced Alloys for Defense Manufacturing (MECE 4333)

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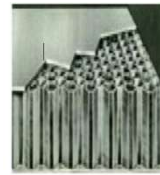
### Course Description:

The study of metallurgy and materials science is crucial for developing advanced materials for diverse applications. This course covers recent developments and current status of various materials, designs, and manufacturing practices which together contribute towards weight reduction of systems used in defense, aerospace, and automotive sectors. The topics covered range from new manufacturing methods such as additive manufacturing (AM), inter-metallics, aluminum-based solutions, near net-shaped processes, ultra-light weight metal foam and honeycomb based sandwich structures, advanced high strength steels, and magnesium alloy castings. This course also covers specific manufacturing and characterization techniques, property variability and reliability of light weight components.

### Topics covered:

- Light weighting and the Future of Aerospace Metals
- Microstructure, Mechanical Properties, and Design Considerations for Additive Manufacturing (AM)
- Light-Weighting in Transportation and Defense Using Aluminum Foam Sandwich Structures
- Innovations in Materials and Engineering for Light-Weighting Aircraft
- Trends in Automotive Light Weighting
- Advances in Test Techniques to Characterize Fatigue and Fracture Properties

Upon accomplishing this course, students will be prepared for potential interns and jobs at companies such as:



**For more information about this course, Contact:**

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Dr. Douglas Timmer at [Douglas.timmer@utrgv.edu](mailto:Douglas.timmer@utrgv.edu)

**For Internship opportunity, visit:**

<https://idream4d.org/interns/>

To be offered in  
Fall 2021!