



Astronautical Engineering (ASTE)

DEN Viterbi Orientation
Spring 2021



AGENDA

- Welcome
- Department Overview
- Degree Requirements
- Department Policies, Procedures, Tips
- ASTE DEN
- Academic Advising
- Questions?

Master of Science in Astronautical Engineering (MS ASTE)



- 27 units of course work (9 classes)
- 3.0 minimum GPA required to fulfill degree requirements
- 5-year limit to satisfy degree requirements
- Thesis *not* required but is possible (for on-campus students)

ASTE Director Master's Program

Dr. Mike Gruntman, mikeg@usc.edu



Helpful websites:

<https://viterbigradadmission.usc.edu/programs/masters/msprograms/astronautical-engineering/ms-astronautical-engineering/>

<http://astronauticsnow.com/msaste/faq.html>



Welcome to **ASTE @USC & DEN@Viterbi!**



Luis Saballos, ASTE Student Advisor

Contact Information

Email Lsaballo@usc.edu

Phone (213) 821-4234

- Advise undergraduate, certificate, master, and doctoral students
- Advise for the Astronautical Engineering (ASTE) and the Systems Architecting and Engineering (SAE) degree programs



Department of Astronautical Engineering

- Unique pure-space-engineering department (established in 2004)
- Offers the full set of degrees in **Astronautical Engineering (ASTE)**



- Bachelor of Science
- Bachelor of Science Minor
- Master of Science
- Engineer
- PhD
- Graduate Certificate

- Among largest national programs in space engineering on Master's level
- Mission:
to provide forefront research and education in astronautical (space) engineering



Department of Astronautical Engineering Faculty, Adjunct faculty, and Lecturers



Faculty

- Prof. Daniel Erwin
(Chairman; Director, Bachelors of Science Program)
- Prof. Mike Gruntman
(Director, Masters of Science Program)
- Prof. Joseph Wang
(Director, PhD Program)
- Prof. Azad Madni (SAE executive director)
- Prof. Joseph A. Kunc
- Prof. Stan Settles
(joint appt.; ISE/SAE)

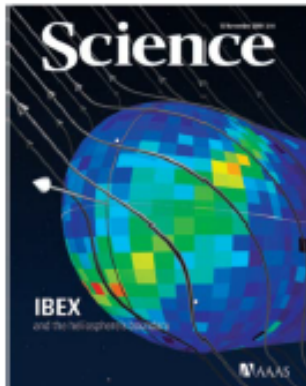
Research Faculty

- Prof. David Barnhart
- Prof. Sergei Gimelshein
- Prof. Herb Schorr (joint.; ISI)
- Prof. Peter Will (joint.; ISI)

Adjunct Faculty and Lecturers (grad courses)

- Dr. Mohamed Abid (JPL)
- Dr. Oscar Alvarez-Salazar (JPL)
- Dr. Rodney Anderson (JPL)
- Dr. Kirstie Bellman (Aerospace Corp)
- Prof Bruce Cordell (21st Century Waves)
- Prof Don Edberg (Cal Poly Pomona)
- Dr. Anthony Freeman (JPL)
- Dr. Michael Gabor (TASC)
- Dr. Keith Goodfellow (Aerojet Rocketdyne)
- Dr. Troy Goodson (JPL)
- Prof. Gerald Hintz (ret., JPL, Aerospace Corp)
- Prof Michael Kezirian (IAASS, ISSF)
- Mr. Steve Matousek (JPL)
- Dr. Leila Meshkat (JPL)
- Prof Ryan Park (JPL)
- Dr. G.P. Purohit (Aerospace Corp)
- Prof. Anita Sengupta
- Mr. Madhu Thangavelu (AAA Visioneering)
- Prof. Kent Tobiska (Space Environm. Techn.)
- Prof. James Wentz (Microcosm)
- Dr. Bret Williams (Raytheon)

Department of Astronautical Engineering Research Areas

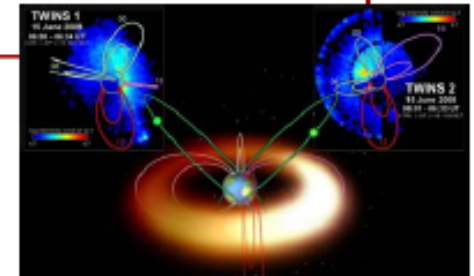
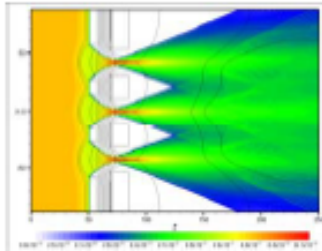


- Astronautics
- Space environment and spacecraft interactions
- Space science
- Space instrumentation and sensors
- Spacecraft propulsion
- Space mission and spacecraft design
- Non-equilibrium processes in gases and plasmas
- Computational physics and high performance computing



- Faculty are Principal Investigators (PI's) and Co-Investigators (Co-I's) on programs supported by NASA, Air Force, Navy, NSF, industry
- Served on science teams (members, investigators, development, analysis): *Pioneer 10/11*, *SOHO*, *Deep Space 1*, *IMAGE*, *Dawn*
- Current NASA missions Co-I: *TWINS* and *IBEX*

- Student (undergraduate and Master's) projects
 - Rocket propulsion lab
 - Liquid-propulsion lab
 - Lunar lander
 - Student microsatellites and cubesats



Department of Astronautical Engineering Interdisciplinary Collaborations



- Interdisciplinary collaborations with other USC programs/departments/schools
 - ❑ Systems Architecting and Engineering
 - ❑ Electrical Engineering
 - ❑ Mechanical Engineering
 - ❑ Information Sciences Institute (ISI), VSOE
 - ❑ Physics and Astronomy
- External collaborations
 - ❑ U.S. Universities (Harvard, UC Berkeley, U of Az., BU, U Mass., ...)
 - ❑ NASA centers (JPL, Goddard)
 - ❑ DoE National Labs (Los Alamos, Princeton Plasma Physics Lab)
 - ❑ R&D centers and institutes (Applied Physics Laboratory; Southwest Research Institute, ...)
 - ❑ Industry (Northrop-Grumman, Lockheed-Martin, Boeing, ...)
 - ❑ Foreign R&D centers and universities (Germany, Japan, ...)

Master of Science Program in *Astronautical Engineering*

– Common Questions –



- Typical time to complete the program
 - ❑ Full-time students: 1.5 years (3 semesters)
 - ❑ Part-time student: 3 – 4 years (1 – 2 courses per semester)
- Course sequence (e.g., required courses before electives?)
 - ❑ Course sequence is entirely up to students. Advisors help as needed. Few exceptions: space navigation requires orbital mechanics; advanced propulsion requires propulsion, ...
- Waiver of required courses – yes
 - ❑ Required courses waived if a student had similar level courses elsewhere.
- Technical electives from other departments – yes
 - ❑ Almost any graduate science and engineering course approved

Degree Requirements for the ASTE Master's Program



Core Required Courses (4 courses, 3 units each)
Core Electives (3 courses, 3 units each)
Technical Electives (2 courses, 6 units total)

- **Four Core Requirements, 3 units each:**
 - ASTE 470 Spacecraft Propulsion
 - ASTE 520 Spacecraft System Design
 - ASTE 535 Space Environments and Spacecraft Interactions
 - ASTE 580 Orbital Mechanics I
- **Three Core Electives, 3 units each:**
 - ASTE 501ab Physical Gas Dynamics
 - ASTE 523 Design of Low Cost Space Missions
 - ASTE 524 Human Spaceflight Systems
 - ASTE 527 Space Studio Architecting
 - ASTE 529 Safety of Space Systems and Space Missions
 - ASTE 552 Spacecraft Thermal Control

Degree Requirements for the ASTE Master's Program cont'd



Core Electives Continued

ASTE 553 Systems for Remote Sensing from Space

ASTE 554 Spacecraft Sensors

ASTE 556 Spacecraft Structural Dynamics

ASTE 562-

ASTE 524-

ASTE 577-

ASTE 557 Spacecraft Structural Strength and Materials

ASTE 570 Liquid Rocket Propulsion

ASTE 572 Advanced Spacecraft Propulsion

ASTE 574 Space Launch Vehicle Design

ASTE 581 Orbital Mechanics II

ASTE 583 Space Navigation: Principles and Practice

ASTE 584 Spacecraft Power Systems

ASTE 585 Spacecraft Attitude Control (*summer only*)

ASTE 586 Spacecraft Attitude Dynamics

ASTE 589 Solar system Navigation



Degree Requirements for the ASTE Master's Program continued

Two Technical Electives, 500-level, 6 units total.

Courses that apply as technical electives:

- Any course from the list of ASTE Core Electives
- ASTE 599 Special Topics courses. They are not offered every semester, so check the Schedule of Classes for availability (<http://classes.usc.edu/>)
- A course from another engineering department must be approved by Dr. Mike Gruntman (copy Isaballo@usc.edu to the email) prior to registration. More information can be found here: <http://astronauticsnow.com/msaste/faq.html>

Full curriculum requirements found here:

https://catalogue.usc.edu/preview_program.php?catoid=11&poid=10854&hl=aste&returnto=search



Five Areas of Concentration in ASTE

Spacecraft Propulsion
Spacecraft Dynamics
Space Systems Design
Spacecraft Systems
Space Applications

Students are *not* required to identify an area of specialization. These concentrations act as a guide for students in order to meet their educational or professional objectives.



Five Areas of Concentration in ASTE cont'd

Spacecraft Propulsion

- ASTE 501ab Physical Gas Dynamics
- ASTE 570 Liquid Rocket Propulsion
- ASTE 572 Advanced Spacecraft Propulsion
- ASTE 584 Spacecraft Power Systems

Spacecraft Dynamics

- ASTE 556 Spacecraft Structural Dynamics
- ASTE 557 Spacecraft Structural Strength and Materials
- ASTE 581 Orbital Mechanics II
- ASTE 583 Space Navigation: Principles and Practice
- ASTE 585 Spacecraft Attitude Control (*summer only*)
- ASTE 586 Spacecraft Attitude Dynamics



Five Areas of Concentration in ASTE cont'd

Space Systems Design

- ASTE 523 Design of Low Cost Space Missions
- ASTE 527 Space Studio Architecting
- ASTE 529 Safety of Space Systems and Space Missions
- ASTE 557 Spacecraft Structural Strength and Materials

Spacecraft Systems

- ASTE 552 Spacecraft Thermal Control
- ASTE 553 Systems for Remote Sensing from Space
- ASTE 554 Spacecraft Sensors
- ASTE 584 Spacecraft Power Systems

Space Applications

- ASTE 527 Space Studio Architecting
- ASTE 553 Systems for Remote Sensing from Space
- ASTE 554 Spacecraft Sensors

ASTE Policies, Procedures, Tips



- Maintain a 3.0 grade point average
- Review your STARS Report every semester.
 - The STARS Report includes the degree and major you are currently pursuing, GPA, Catalogue year, admission term, the number of units and course required to fulfill your degree requirements.
 - You can access it through the “OASIS” section of the myUSC portal (<http://my.usc.edu>).
 - Your STARS Report is manually activated after you enroll in your first course as an officially admitted student.
- Check your USC email regularly
- It is possible to transfer in previous graduate coursework (please contact me for the full policy)
- If you desire to change majors, you can do so after your first semester if you receive a 3.0 or higher (contact the other department for the transfer procedures)
- USC requires graduate students to maintain continuous enrollment every Fall and Spring semester (more detailed information provided on the next slide).

ASTE Policies, Procedures, Tips Cont.d



USC Schedule of Classes:

<http://classes.usc.edu/>

ASTE Future Courses List:

http://astronauticsnow.com/msaste/astd_ms_class_schedule.pdf

ASTE Curriculum Requirements:

https://catalogue.usc.edu/preview_program.php?catoid=11&poid=10854&hl=aste&returnto=search

- Since some electives may be offered in specific semesters, it is recommended to plan out those courses first (use the future courses list above for reference). Most of the core classes can then be filled in between.
- If you will be working full-time, we strongly recommend only taking 1 class in your first semester. If you will be a full-time student, it is recommended you enroll in no more than 3 classes per semester



ASTE Policies, Procedures, Tips Cont.d

Continuous Enrollment/Leave of Absence/Withdrawal/Reinstatement

- Once admitted to a graduate degree program, students must enroll at USC each fall and spring semester each year until she or he has satisfactorily completed all degree requirements.
- If a student must skip a semester, the student must petition for a leave of absence. Leave of absence request forms are available by emailing Isaballo@usc.edu.
- An approved leave may not exceed one academic year (and a total of 4 semesters are granted). A student who fails to maintain continuous enrollment without obtaining an approved leave must, when ready to return to school, may have to apply for readmission to the program.



ASTE DEN (Distance Education Network)



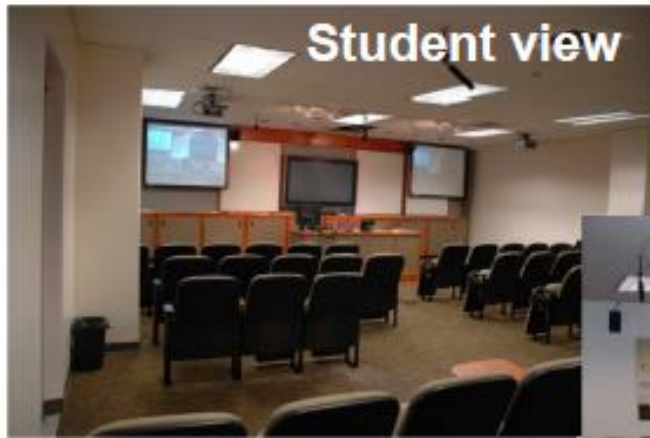
Broadcast master control



Distance Education Network (DEN)

- webcast over the Internet, with lectures viewed anywhere in the world on PC (standard high-speed connection; no special software)
- on-campus students attend lectures in class
- password-protected lectures can be viewed asynchronously any time during the entire semester
- class notes, homework assignments, and handouts transmitted electronically
- exams: on campus for students in the Greater Los Angeles area and proctored (e.g., at local community colleges) for remote students

VSOE's Distance Education Network (DEN@Viterbi)



DEN classrooms



- face camera
- overhead camera
- laptop connection
- broad(web)cast monitor





DESIRE2LEARN LOGIN & TRAINING

<https://courses.uscden.net/d2l/login>

USC Viterbi
School of Engineering

USC Viterbi School of Engineering – DEN@Viterbi

Log in to view your courses offered through DEN@Viterbi, explore tools and features, and customize your eLearning experience for programs and courses supported by DEN@Viterbi. Students must be registered and approved to view select courses. If you are having problems logging on, please try the forgot password link.

If you have problems logging on or seeing your courses, please contact DEN@Viterbi Technical Support Center office at dentsc@usc.edu or 213-740-9356.

DEN@Viterbi Students: First Time Logging In?

You must [create a profile](#) first before you can log in.

On-campus students don't need to create a profile as it is generated automatically.

Note: DEN Blackboard users logging into DEN Desire2Learn for the first time should use the "forgot your password" link below to set your password before trying to log in.

Username *

Password *
 [Forgot your password?](#)

1. Bookmark <https://courses.uscden.net>
2. Your D2L username is your full USC Email Address
3. If you do not remember your D2L password, click "Forgot your password?"

Sign up for an exclusive one-on-one training session inside a virtual classroom to learn all about Desire2Learn: <https://viterbigrad.usc.edu/technical-support/training-options/>



HOW TO REQUEST D-CLEARANCE FROM DEN

All DEN courses require D-clearance.



Student FAQ **DEN@Viterbi Tools**

29071D-AME541_20163
29073D-AME541(DIS)_20163
29092D-AME578_20163
29093D-AME581_20163
29095D-AME588_20163
11288D-ARCH511_20163
29157D-ASTE470_20163
Please Select a Course

DEN@Viterbi Tools

Enrollments

- Request D-Clearance
- Check D-Clearance Status
- DEN Terms of Service

Profile

- Update Profile

To begin D-Clearance, Please select a term to apply for D Clearance

Summer 2019 Select Term

1. Login to DEN Desire2Learn: <http://courses.uscden.net>
2. Go to DEN@Viterbi Tools on the navigation bar
3. Select “Request D-clearance” link, select the term, and select a course
4. Approval process takes 1-2 business days. To view the status of a request, click on “Check D-Clearance Status”
5. You can register once your request has been processed. D-clearances expire **7 days** from when it is issued so register as soon as you obtain it to secure a seat in a course.

For questions on D-Clearance status, contact den@vase.usc.edu



DEN@Viterbi Contacts

Viterbi Admission & Student Engagement Office

Location: Olin Hall of Engineering (OHE), Rm. 106

Hours: Mon. - Fri. 8:30 am - 5 pm (Pacific Time)

Phone: (213) 740-4488 | **Fax:** (213) 821-0851 | <https://viterbigrad.usc.edu/>

DEN d-clearance inquiries den@vase.usc.edu

DEN@Viterbi Support	Contact Information	Staff
Technical support, Desire2Learn training, Homework	dentsc@usc.edu 213-740-9356	Bianca Richter
DEN d-clearance inquiries	den@vase.usc.edu	
Exams	denexam@usc.edu 213-740-9356	Shirley Schutt
VASE Advisor	ptrinida@usc.edu 213-740-0116	Patty Rinehart
<ul style="list-style-type: none">• General advisement• Policies & Procedures		



Academic Advising Appointments

Luis Saballos, ASTE & SAE Student Advisor

Email: Lsaballo@usc.edu Phone: (213) 821-4234

- **I am available by email if you have any questions.**
- **If you send an email, please include your 10-digit USC ID number and we can set up an appointment to have a zoom meeting.**



Resource Links:

<http://astronauticsnow.com/msaste/>

<http://astronauticsnow.com/msaste/faq.html>

http://astronauticsnow.com/msaste/astd_ms_class_schedule.pdf



THANK YOU!

HAVE A GREAT Spring 2021 SEMESTER!

A recording of this online orientation and presentation will be available for viewing and download on the VASE website at <https://viterbigrad.usc.edu/academic-services/denarchive/>.

FLIGHT ON!