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To: **Aeronautics (ASTE) Students**
Students Enrolled in Aeronautics (ASTE) Classes
Aeronautics Program Faculty and Instructors
Aeronautics Program Friends

Aeronautics Program Update

I am delighted to report that the University of Southern California has approved a major revision of the program *Master of Science in Aeronautical Engineering*, or MS ASTE. The new degree requirements are effective from Fall 2009 semester.

Aeronautics and
Space Technology
Division

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Our Master's program has been spectacularly growing during the last several years, clearly showing that it successfully meets important demands of the main customer – the space/defense industry and government space research and development centers. Engineers have a choice among various institutions of higher learning to pursue Master's degrees, and increasing numbers are choosing the Viterbi's program in Aeronautical Engineering. The growth of the program convincingly confirms the wisdom and timeliness of establishing, in 2004, a new independent space-focused academic unit in aeronautical engineering, Aeronautics and Space Technology Division (ASTD).

The MS ASTE program revision restructures the balance of required, core elective, and engineering mathematics courses. The increased set of required aeronautical engineering courses will insure that all program graduates gain basic knowledge in the four key areas of aeronautical engineering: fundamentals of space systems; space environment and spacecraft interactions; orbital mechanics; and spacecraft propulsion. The new program requirements will solidify the USC leadership on the Master's level in space-engineering education in the United States.

ASTD and Distance Education Network (DEN) are committed to make the transition easy. **All students currently pursuing the MS ASTE degree have a one-time choice either (1) to complete the coursework and obtain the MS ASTE degree following the current ("old") requirements, or (2) to switch to the "new" course requirements.** We will contact our students during the next few months to determine their choices. All new students entering the MS ASTE program will follow the new course requirements. The admission, total number of required units, and other main program requirements remain unchanged.

The following pages describe the new program requirements as they will appear in the USC Catalog. Please also consult the frequently asked questions FAQ web site at <http://aeronauticsnow.com/msaste/> (also site <http://den.usc.edu/astro> at DEN). Do not hesitate contact our ASTD Student Affairs Ms. Dell Cuason (RRB-228; tel. 213-821-5817; cuason@usc.edu) for answers to additional questions.

In addition, I have attached a two-page fact sheet about the new program requirements. Please post it at your companies and distribute among your interested colleagues. If you want to receive hard copies of the fact sheet, please email ASTD's Marguerite Webley (webley@usc.edu) and we will gladly mail you the desired number of copies.

Ad Astra!

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Master of Science in Astronautical Engineering Effective from Fall 2009

This degree is in the highly dynamic and technologically advanced area of astronautics and space technology. The program is designed for those with B.S. degrees in science and engineering who work or wish to work in the space sector of the defense/aerospace industry, government research and development centers and laboratories and academia. The program is available through the USC Distance Education Network (DEN).

The general portion of the Graduate Record Examinations (GRE) and two letters of recommendation are required.

Required courses: 27 units

CORE REQUIREMENT (12 units)		Units
ASET 470	Spacecraft Propulsion	3
ASTE 520	Spacecraft System Design	3
ASTE 535	Space Environment and Spacecraft Interactions	3
ASTE 580	Orbital Mechanics I	3
CORE ELECTIVE REQUIREMENT (6 units - choose two courses)		Units
ASTE 501ab	Physical Gas Dynamics	3-3
ASTE 523	Design of Low Cost Space Missions	3
ASTE 527	Space Studio Architecting	3
ASTE 552	Spacecraft Thermal Control	3
ASTE 553	Systems for Remote Sensing from Space	3
ASTE 554	Spacecraft Sensors	3
ASTE 556	Spacecraft Structural Dynamics	3
ASTE 570	Liquid Rocket Propulsion	3
ASTE 572	Advanced Spacecraft Propulsion	3
ASTE 581	Orbital Mechanics II	3
ASTE 583	Space Navigation: Principles and Practice	3
ASTE 584	Spacecraft Power Systems	3
ASTE 585	Spacecraft Attitude Control	3
ASTE 586	Spacecraft Attitude Dynamics	3

TECHNICAL ELECTIVE REQUIREMENT (6 Units)

Two 3-unit courses. Students are advised to select these two elective courses from the list of core electives or from other courses in astronautical engineering or from other science and engineering graduate courses, as approved by faculty advisor. No more than 3 units of directed research (ASTE 590) can be applied to the 27-unit requirement. New courses on emerging space technologies are often offered; consult the current semester's course offerings, particularly for ASTE 599 Special Topics.

ENGINEERING MATHEMATICS REQUIREMENT (3 UNITS)

One 3-unit course. Choose one from the following:

AME 525	Engineering Analysis	3
AME 526	Engineering Analytical Methods	3
CE 529a	Finite Element Analysis	3
EE 517	Statistics for Engineers	3
PHYS 510	Methods of Theoretical Physics	3

At least 21 units must be at the 500 or 600 level.

Areas of concentration:

Students choose core elective and technical elective courses that best meet their educational objectives. Students can also concentrate their studies in the desired areas by selecting corresponding core elective courses. Presently, ASTD faculty suggests the following areas of concentration:

Spacecraft propulsion	Choose two core electives from	
ASTE 501ab	Physical Gas Dynamics	3-3
ASTE 570	Liquid Rocket Propulsion	3
ASTE 572	Advanced Spacecraft Propulsion	3
ASTE 584	Spacecraft Power Systems	3

Spacecraft dynamics	Choose two core electives from	
ASTE 556	Spacecraft Structural Dynamics	3
ASTE 581	Orbital Mechanics II	3
ASTE 583	Space Navigation: Principles and Practice	3
ASTE 585	Spacecraft Attitude Control	3
ASTE 586	Spacecraft Attitude Dynamics	3

Space system design	Choose two core electives from	
ASTE 523	Design of Low Cost Space Missions	3
ASTE 527	Space Studio Architecting	3
(SAE 549 System Architecting I, 3 units, is also suggested as technical elective for this area of concentration.)		

Spacecraft systems	Choose two core electives from	
ASTE 552	Spacecraft Thermal Control	3
ASTE 553	Systems for Remote Sensing from Space	3
ASTE 554	Spacecraft Sensors	3
ASTE 584	Spacecraft Power Systems	3

Space applications	Choose two core electives from	
ASTE 527	Space Studio Architecting	3
ASTE 553	Systems for Remote Sensing from Space	3
ASTE 554	Spacecraft Sensors	3

Note to students:

Please note that tracks, or areas of specialization (concentration), within the program do not appear in transcripts or have separate post-codes. Faculty uses tracks in advising students on different routes to the degrees meeting their educational objectives. The tracks are usually listed in the catalog to help describe the program to perspective students.