Consistent with the mission of Saint Louis University, the mission of Parks College of Engineering, Aviation, and Technology (Parks College) is to prepare students to advance the frontiers of knowledge and technical expertise in engineering and aviation while instilling within them good ethical and professional character.

History
Oliver L. Parks founded Parks College, the first federally certified school of aviation in the United States, in 1927 in Cahokia, Illinois. After establishing a strong aviation program, the school’s founder entrusted his legacy to Saint Louis University in 1947. Now, Parks College offers a variety of engineering and aviation programs.

Program Objectives
The Parks College post-baccalaureate engineering and aviation programs are organized around a unique curriculum that prepares students with a solid theoretical and practical foundation to become effective leaders in all facets of their chosen discipline. By involving students in fundamental and applied research, encouraging collaboration across departments, and partnering within and outside institutions and organizations, Parks College of Engineering and Aviation students gain a rich education in their chosen discipline. The college offers Master of Science and Doctoral of Philosophy degrees in the areas of Aerospace and Mechanical Engineering, Biomedical Engineering, Civil Engineering, Electrical and Computer Engineering, and Aviation Science. For more information, please visit Parks Graduate Programs webpage at parks.slu.edu/grad.

The dedicated Parks College faculty and staff are prepared to mentor, guide, and support your education activities. Your program will be uniquely structured to provide a multi-disciplinary approach, curriculum design flexibility, and customized research opportunities to meet your specific career goals. Innovation and leadership will be emphasized throughout, producing highly-skilled professionals, well-prepared to pursue careers at multi-national firms, competitive government agencies, or prestigious academic institutions.

In parallel with these objectives and reflective of its mission, Saint Louis University also strives to engage its students in five interrelated dimensions: scholarship and knowledge; intellectual inquiry; community building; leadership and service; and spirituality and values. Graduates will be a part of the future workforce finding ethical solutions, meeting the needs of the society with emerging technologies, and educating leaders who are aware of their impact on the surrounding world from technical and ethical perspectives.

Criteria for Admission
Submission Deadlines: Complete applications must be submitted by March 1st for financial aid (fellowships or graduate research assistantships) for the Fall Semester.

Regular admission applications (without financial aid) should be submitted by June 30th for the Fall Semester or November 30th for the Spring Semester.

Criteria for Acceptance
A four-year undergraduate degree in engineering or a related field may be appropriate for admission to the engineering program. A four-year undergraduate degree in aviation or a related field may be appropriate for admission to the aviation program.
Admission Requirements:
1. Online application at www.slu.edu/graduate-admission-home/apply-now
2. Official GRE quantitative score
3. Official transcripts of all previous degrees
4. Three letters of recommendation & three Personal Potential Index (PPI) scores
5. Curriculum Vitae (CV)
6. Professional goals statement
7. Evidence of English language proficiency (when native language is not English).
   Minimum scores: TOEFL PBT 550, TOEFL IBT 80, or IELTS 6.5

Master of Science
The Master’s Degree (M.S.) requires minimum of 30 credits beyond a Bachelor’s degree. For students pursuing the research option, 6 of the total credits to the degree must be in Thesis Research. For students pursuing the project option, 3 of the total credits to the degree must be devoted to carrying out a project, approved by students’ Faculty Advisor. Up to 12 credit hours may be transferred from another institution. Students are expected to maintain a cumulative grade point average (GPA) of 3.00; lower GPA may result in probationary status and/or dismissal from the program due to unsatisfactory academic performance. Lastly, all students are required to enroll each semester until degree is received.

M.S. students prepare a program of study that must be approved by the Faculty Advisor, department chair, and the Parks College Graduate Programs Director. This program of study is developed within the context of background and career goals of students allowing them to customize their program to suit their professional goals.

Master of Science (Course only option)
Prior to registration, an admitted student, in consultation with the Faculty Advisor, will prepare a program of study. The program of study should include tentative courses to fulfill the requirement of 30 credits for an M.S. Degree.

Master of Science (Project option)
Prior to registration, an admitted student, in consultation with the Faculty Advisor, will prepare a program of study with tentative courses, to be taken over the course of the coming semesters, to fulfill the minimum of 30 credits required for an M.S. Degree. Three of the total credits will be dedicated to a project. Students’ project details could be decided at a later date, in consultation with their Faculty Advisor.

Master of Science (Thesis option)

First Semester in the M.S. Program
In the first semester, M.S. students will begin taking courses as indicated in the program of study. In parallel, students may also begin research in an identified research area, under the guidance of a Faculty Advisor.

The Faculty Advisor and student will form a Guidance Committee of at least three members. The Committee members should be persons who will likely provide expertise and guidance that will assist students in research. At least one member, besides the Faculty Advisor, must be in the home department of students. If the Faculty Advisor is in another department, then one Guidance Committee member in the home department will be designated as the Guidance Committee Chair.

Thesis Proposal
Students prepare a Thesis Proposal before the end of the first year activities. The title and outline for this proposal are approved by the Guidance Committee and reported on the Master’s Thesis Proposal/Prospectus form. After completing the thesis proposal, students meet with the Guidance Committee at least once every semester.

Thesis Defense
An oral Thesis Defense must be completed before graduation. The Defense typically includes a seminar that is open to the public. Following the open session, the student and Guidance Committee continue discussion in a closed session. A written Thesis report is submitted ~4 weeks prior to the oral defense.

Based on the Defense, the Guidance Committee may:
(1) Approve the Thesis,
(2) Conditionally approve, with specific instructions on revisions to the Thesis document, or
(3) Not approve the Thesis.

The Guidance Committee conveys the decision to the Department Chair and the Director of Graduate Programs.
Independent Studies and Special Topics Courses

For all independent studies and special topics courses an outline of the topic(s) covered and students’ evaluation process must be submitted and approved by the Faculty Advisor prior to registration. A copy of the outline or syllabus will be kept in the student’s file in the Graduate Programs Office.

Doctor of Philosophy

The Doctor of Philosophy (Ph.D.) programs focus on a specific research topic. The students are expected to conduct original academic research that culminates in a dissertation and peer-reviewed publications. Additional coursework related to the chosen research area is also required.

Ph.D. students prepare a program of study that must be approved by the Faculty Advisor, Department Chair, and the Director of Graduate Programs. This program of study is developed and then reviewed within the context of students’ background and career goals, allowing students to customize their program to suit their professional goals.

The Engineering Ph.D. degree requires a total of 60 credits beyond the Bachelor’s degree with a minimum of 36 credits of coursework and a minimum of 12 credits of dissertation research. Of the 60 credits, a maximum of 9 credit hours may be comprised of coursework at the 4000 level; all other course credits must be at the 5000 or 6000 level. Those students who earn a Master of Science degree may include the associated Master of Science degree coursework credits, but not the thesis or project credits, in the 60 credits which are needed for the Ph.D. degree.

The Aviation Ph.D. degree requires a total of 63 credits beyond the Bachelor of Science degree, including a minimum of 12 credits of dissertation. The curriculum will include a minimum of 24 credits comprised of at least 12 credits of coursework in research methodologies and 12 credits in a secondary discipline intended to complement knowledge of aviation. Students will work with their advisor and Ph.D. committee to determine the specific coursework to complete the program. Those students holding an appropriate Master of Science degree may include a maximum of 27 credits of the associated Master of Science degree course credits, but not the thesis or project credits, in the 63 credits required for the Ph.D. degree.

First Semester in Ph.D. Program

In the first semester, Ph.D. students will begin taking courses as indicated in the program of study. In parallel, students may also begin research in an identified research area under the guidance of a Faculty Advisor.

The Faculty Advisor and students will form a Guidance Committee of at least five members. The Committee members should be persons who will likely provide expertise and guidance that will assist students in their research. At least two members, besides the Faculty Advisor, must be in students’ home department. If the Faculty Advisor is in another department, then one Guidance Committee member in the home department will be designated as the Guidance Committee Chair.

Qualifying Exam

A qualifying exam will be administered according to the expectations of the academic discipline. For example, in engineering a qualifying exam may be administered relatively early in the doctoral studies. In aviation, the qualifying exam is structured to assess comprehensive knowledge of the discipline after all or nearly all of academic work has been completed and thus, it is administered closer to the completion of the degree.

The student’s Guidance Committee will advise students on preparation for the Qualifying Exam. Ideally, the Guidance Committee will continue after the Qualifying Exam and through the dissertation research.

The Qualifying Exam is designed to determine if students are prepared to continue Ph.D. studies. Normally, it is a written exam, with the option for follow-up with an oral exam. The details of the exam are determined by the home department.

Qualifying examinations are arranged and administered by the home department. The result of the exam may be a pass, no-pass, or conditional-pass. The conditional-pass will normally require that students correct specific weaknesses, with appropriate modifications to the plan of study.

Qualifying exam procedures can be accessed at the Parks College Graduate Programs website. [http://parks.slu.edu/academics/graduate-programs/doctoral-degree-programs/](http://parks.slu.edu/academics/graduate-programs/doctoral-degree-programs/)

Dissertation Proposal Exam

Typically, after a year following the Qualifying Exam, students will present and defend a Dissertation Proposal. This Exam is based on their written proposal, and their oral defense of the proposal. Both components will be evaluated by the Guidance Committee.

Doctoral Candidate status will be given to students after successful passage of the oral defense of the dissertation proposal.

Dissertation Defense

At a time selected by students and the Guidance Committee, the doctoral candidates present the dissertation research in both written and oral format. The Defense typically includes a seminar that is open to the public. Following the open session, students and
Guidance Committee continues the discussion in a closed session.

Based on the Defense, the Guidance Committee may: (1) approve the Dissertation, (2) conditionally approve, with specific instructions on revisions to the Dissertation document, or (3) not approve the Dissertation.

**Independent Studies and Special Topics Course**

For all independent studies and special topics courses, an outline of the topic(s) covered and the evaluation process must be submitted and approved by the mentor/advisor of students prior to registration. A copy of the outline or syllabus will be kept in the student’s file in the Graduate Programs Office.

**Annual Progress Review**

Admitted students are expected to meet with their Faculty Advisors at least once each semester. Students must have their Faculty Advisor's permission to enroll in new academic work in anticipation of a new academic term.

For all M.S. and Ph.D. students, an annual progress review must be evaluated and completed in consultation with the Faculty Advisor and submitted to a respective Department Chair or the Graduate Programs office.

The Annual Student Review form can be obtained from the Parks College Graduate Programs Office.

**Post-baccalaureate Course Listing**

**AEROSPACE ENGINEERING**

**Sridhar Condoor, Ph.D.,**

*Department Chair*

AENG.5009 Seminar (0)
AENG.5050 Space Mission Analysis and Design (3)
AENG.5060 Advanced Space Mission Design (3)
AENG.5150 Orbital Mechanics (3)
AENG.5230 Introduction to Computational Fluid Dynamics (3)
AENG 5240 Hypersonics (3)
AENG.5260 Unsteady Aerodynamics of Bluff Bodies (3)
AENG.5280 Applied Aerodynamics (3)
AENG.5400 Guidance, Navigation and Estimation for Dynamic Vehicles (3)
AENG.5410 Flight Simulation (3)
AENG.5450 Space Dynamics and Control (3)
AENG.5460 Modern Control Systems (3)
AENG.5470 Advanced Control Systems (3)
AENG.5530 Composite Materials for Structure and Design (3)
AENG.5700 Aeroelasticity (3)
AENG.5750 Parachute Systems & Design (3)
AENG.5800 Autonomous Systems Design (3)
AENG.5850 Space Mission Failures (3)
AENG.5910 Co-op with Industry (0-3)
AENG.5915 Internship with Industry (0-3)
AENG.5930 Special Topics (1-3)
AENG.5984 Independent Study (1-3)
AENG.5994 Master’s Thesis Research (0-6)
AENG.6910 Co-op with Industry (0-3)
AENG.6915 Internship with Industry (0-3)
AENG.6984 Independent Study (1-3)
AENG.6994 Doctoral Dissertation Research (0-6)

**AVIATION SCIENCE**

**Stephen Magoc, MBA**

*Department Chair*

ASCI.5010 Analysis of Aviation Safety Data (3)
ASCI.5020 Aviation Safety Data Analysis (3)
ASCI.5030 Aviation Security Management (3)
ASCI.5040 Human Factors in Aviation Safety (3)
ASCI.5080 Management of Aviation Safety Programs (3)
ASCI.5100 Aviation Safety Career and Personal Development (3)
ASCI.5120 Aviation Safety Quality Issues (3)
ASCI.5130 Aviation Safety Ethics (3)
ASCI.5150 Aviation Incident/Accident Analysis (3)
ASCI.5210 Aviation Org. Theory and Management (3)
ASCI.5220 Aviation Safety Programs (3)
ASCI.5230 Professional Ethics and Standards (3)
ASCI.5460 Quantitative Analysis (3)
ASCI.5910 Graduate Internship (3)
ASCI.5960 Project Guidance (3)
ASCI.5980 Graduate Reading Course (1-3)
ASCI.5990 Master’s Thesis Research (0-6)
ASCI.6010 Federal and International Regulatory Environment (3)
ASCI.6020 Flight Operations Business and Administration (3)
ASCI.6030 Aviation and Public Policy (3)
ASCI.6050 Legal and Ethical Issues in Collegiate Flight Education (3)
ASCI.6060 Aviation Curriculum Development and Management (3)
ASCI.6070 Aviation Training Methods and Practice (3)
ASCI.6990 Doctoral Dissertation Research (0-6) 100
FSCL.5230 Economics of Air Transportation (3)
BIOMEDICAL ENGINEERING

Michelle Sabick, Ph.D.,
Department Chair

BME.5000 Seminars (0)
BME.5010 Research Analysis (2)
BME.5020 Accelerated Introduction to Biomechanics & Biomaterials (2)
BME.5030 Accelerated Introduction to Neuroengineering and Bioimaging (2)
BME.5050 Data Handling (3)
BME.5060 Ethics & Compromise (3)
BME.5200 Continuum Biomechanics (3)
BME.5400 Tissue-Material Interfaces (3)
BME.5410 Tissue Engineering (3)
BME.5420 Tissue engineering Scaffold Fabrication Techniques (3)
BME.5450 AFM Techniques and Training (3)
BME.5500 Experimental Techniques and Design (0-2)
BME.5600 Quantitative Physiology I (3)
BME.5650 Quantitative Physiology II (3)
BME.5800 Research Rotation (1-3)
BME.5930 Special Topics (1-3)
BME.5960 Project Guidance (1-3)
BME.5970 Research Topics (1-3)
BME.5980 Graduate Reading Course (1-3)
BME.5990 Master’s Thesis Research (0-6)
BME.6930 Special Topics (1-3)
BME.6970 Research Topics (1-3)
BME.6980 Graduate Reading Course (1-3)
BME.6990 Doctoral Dissertation Research (0-6)

CIVIL ENGINEERING

Ronaldo Luna, Ph.D.,
Department Chair

CVNG.5000 Seminar (0)
CVNG.5050 Advanced Structural Analysis (3)
CVNG.5070 Structural Dynamics (3)
CVNG.5090 Advanced Reinforced Concrete (3)
CVNG.5110 Advanced Steel Design (3)
CVNG.5130 Bridge Engineering (3)
CVNG.5150 Prestressed Concrete (3)
CVNG.5170 Seismic Design (3)
CVNG.5190 Sustainable Land Development Engineering (3)
CVNG.5210 Sustainable Water Management (3)
CVNG.5230 Biological Treatment Systems (3)
CVNG.5250 Physical/Chemical Treatment Systems (3)
CVNG.5270 Design of Wastewater Treatment Facilities (3)
CVNG.5290 Design of Drinking Water Treatment Facilities (3)
CVNG.5310 Air Pollution (3)
CVNG.5450 Traffic Engineering (3)
CVNG.5470 Urban Transportation Planning (3)
CVNG.5930 Special Topics (1-3)
CVNG.5960 Master’s Project (1-3)
CVNG.5990 Master’s Thesis Research (0-6)
CVNG.6990 Doctoral Dissertation Research (0-6)

ELECTRICAL AND COMPUTER ENGINEERING

Huliyar Mallikarjuna, Ph.D.,
Department Chair

ECE.5000 Seminar (0)
ECE.5055 Stochastic Processing (3)
ECE.5110 Power Systems I (3)
ECE.5111 Power Systems II (3)
ECE.5120 Modern Control Theory (3)
ECE.5130 Advanced Semiconductor Devices (3)
ECE.5131 Low Noise Electronics Design (3)
ECE.5132 Analog Integrated Circuit Design (3)
ECE.5141 Radar System Design and Analysis (3)
ECE.5142 Microwave Theory and Techniques (3)
ECE.5143 Antenna Theory and Design (3)
ECE.5150 Advanced Filter Design (3)
ECE.5151 Digital Signal Processing (3)
ECE.5160 Communication Systems (3)
ECE.5161 Spacecraft Communications (3)
ECE.5162 Cellular Communications (3)
ECE.5170 Energy Technologies I (3)
ECE.5225 Hardware Software Co-design (3)
ECE.5226 Robotics (3)
ECE.5235 Digital IC Design (3)
ECE.5910 Co-op with Industry (0-3)
ECE.5915 Internship with Industry (0-3)
ECE.5930 Special Topics (1-3)
ECE.5960 Master’s Project (3)
ECE.5970 Research Topics (1-3)
ECE.5980 Independent Study (1-3)
ECE.5990 Master’s Thesis Research (0-6)
ECE.6910 Co-op with Industry (0-3)
ECE.6915 Internship with Industry (0-3)
ECE 6970 Research Topics (1-3)
ECE.6980 Independent Study (1-3)
ECE.6990 Doctoral Dissertation Research (0)
ENGINEERING PHYSICS

William Thacker, Ph.D.,
Department Chair

PHYS.5010 Nanoscience and Nanofabrication Frontiers (required core course) (3)
PHYS.5020 Experimental Physics (3)
PHYS.5030 Mathematical Methods in Physics with Elements of Classical Mechanics (3)

PHYS.5060 Numerical Analysis and Computational Physics (required core course) (3)
PHYS.5930 Special Topics (1-3)
PHYS.5980 Independent Study (1-3)
PHYS.5990 Thesis Research (0-6)

MECHANICAL ENGINEERING

Sridhar Condoor, Ph.D.,
Department Chair

MENG.5009 Seminar (0)
MENG.5100 Advanced Mechanics of Solids (3)
MENG.5110 Fracture Mechanics and Plasticity (3)
MENG.5120 Structural Reliability (3)
MENG.5150 Finite Element Analysis I (3)
MENG.5160 Finite Element Analysis II (3)
MENG.5200 Advanced Fluid Dynamics (3)
MENG.5220 Experimental Methods in Fluid Dynamics (3)
MENG.5230 Viscous Flows (3)
MENG.5240 An Introduction to Turbulence (3)
MENG.5530 Composite Materials for Structure and Design (3)
MENG.5700 Multidisciplinary Optimization (3)
MENG.5810 Technology Entrepreneurship (3)
MENG.5910 Co-op with Industry (0-3)
MENG.5915 Internship with Industry (0-3)
MENG.5930 Special Topics (1-3)
MENG.5980 Independent Study (1-3)
MENG.5990 Master’s Thesis Research (0-6)
MENG.6910 Co-op with Industry (0-3)
MENG.6915 Internship with Industry (0-3)
MENG.6994 Doctoral Dissertation Research (0-6)