**ENGINEERING-GENERAL (ENGR)**

**ENGR 101 Introduction to Space Systems and Spacecraft Design**
3 credits
A systems engineering approach to space systems and overview of university type spacecraft design requirements and design methods. Recommended Preparation: Interest in engineering, space, and aerospace sciences. (Spring only)

**ENGR 105 Engineering Graphics**
2 credits
Freehand and computer aided drawing in pictorial and orthographic projection; section and auxiliary views; descriptive geometry; graphical presentation of data; scales, dimensioning, and measurements. Two lec and one 2-hr lab a wk.

**ENGR 204 (s) Special Topics**
Credit arranged.

**ENGR 205 Near Space Engineering**
1 credits, max 6
Idaho RISE (Research Involving Student Engineers and Educators) is the NASA Idaho Space Grant Consortium student high-altitude scientific balloon program at the University of Idaho. RISE is a multidisciplinary program involving students from all departments in the College of Engineering, as well as Physics, Chemistry, Life Sciences, Education, and many other departments. Students in ENGR 205 will participate in the design, development, testing, flight and flight operations, recovery, and data analysis of balloon-borne science and engineering instrumentation flown to altitudes of 100,000 feet and higher. Recommended Preparation: Interest in space, aerospace science and engineering.

**ENGR 206 Near Space Engineering II**
1 credits, max 6
Idaho RISE (Research Involving Student Engineers and Educators) is the NASA Idaho Space Grant Consortium student high-altitude scientific balloon program at the University of Idaho. RISE is a multidisciplinary program involving students from all departments in the College of Engineering, as well as Physics, Chemistry, Life Sciences, Education, and many other departments. Students in ENGR 206 will participate in the design, development, testing, flight and flight operations, recovery, and data analysis of balloon-borne science and engineering instrumentation flown to altitudes of 100,000 feet and higher. Recommended Preparation: Interest in engineering, space, and aerospace sciences. (Spring only)

**ENGR 210 Engineering Statics**
3 credits
Principles of statics with engineering applications; addition and resolution of forces, vector algebra, moments and couples, resultants and static equilibrium, equivalent force systems, centroids, center of gravity, free body method of analysis, two and three dimensional equilibrium, trusses, frames, and friction. Cooperative: open to WSU degree-seeking students.

**ENGR 220 Engineering Dynamics**
3 credits
Particle and rigid body kinematics and kinetics; rectilinear, curvilinear, and relative motion, equations of motion, work and energy, impulse and momentum, systems of particles, rotation, rotating axes, rigid body analysis, angular momentum, vibration, and time response. Cooperative: open to WSU degree-seeking students.

**ENGR 240 Introduction to Electrical Circuits**
3 credits
Not open for credit to electrical engineering majors. Circuit analysis, transient and steady state behavior, resonant systems, system analysis, and power and energy concepts; elementary differential equations will be introduced to solve basic transient problems.

**ENGR 250 Introduction to Engineering Thermodynamics and Heat Transfer**
3 credits
First and second laws of thermodynamics; thermodynamic processes; thermodynamic properties; flow processes; conversion of heat into work; conduction, convection, radiation, and heat exchangers. Recommended Preparation: ENGR 210 and MATH 310. Cooperative: open to WSU degree-seeking students.

**ENGR 335 Engineering Fluid Mechanics**
3 credits
Physical properties of fluids; fluid statics; continuity, energy, momentum relationships; laminar and turbulent flow; boundary layer effects; flow in pipes, open channels, and around objects. Cooperative: open to WSU degree-seeking students.

**ENGR 350 Engineering Mechanics of Materials**
3 credits
Elasticity, strength, and modes of failure of engineering materials; theory of stresses and strains for ties, shafts, beams, and columns. Cooperative: open to WSU degree-seeking students.

**ENGR 360 Engineering Economy**
2 credits
Economic analysis and comparison of engineering alternatives. This class meets for 3 lectures per week for the first 10 weeks of the semester. This is a class that meets for 3 lectures per week for the first 10 weeks of the semester.

**ENGR 398 (s) Internship**
Credit arranged.

**ENGR 404 (s) Special Topics**
Credit arranged.

**ENGR 428 Numerical Methods**
3 credits
Cross-listed with MATH 428, PHYS 428
Systems of equations, root finding, error analysis, numerical solution to differential equations, interpolation and data fitting, numerical integration, related topics and applications.

**ENGR 499 (s) Directed Study**
Credit arranged.

**ENGR 504 (s) Special Topics**
Credit arranged.
ENGR 573 Fuzzy Logic Control Systems
3 credits
Introduction to fuzzy logic systems and the methods used to design these systems.
Prereq: CHE 445, ECE 470, or ME 481 .