

**2014 - 2015**



**Engineering Students Academic Handbook**





# VIRGINIA STATE UNIVERSITY

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July 18, 2012

Welcome to Virginia State University Department of Engineering. Our Department is dedicated to nurturing and challenging our students to become problem solvers, industrial leaders, communicators, and ethical professional citizens of a global community.

The Department of Engineering consists of Computer Engineering and Manufacturing Engineering programs that offer ABET-accredited Bachelor of Science Degrees. These undergraduate programs prepare students for careers in industry and for engineering graduate programs. Both programs are committed to engineering innovation and interdisciplinary research. Our highly qualified faculty prepares our students for rapidly evolving fields of science and engineering through an innovative curriculum and through a continuous improvement of the educational process. Research is an integral part of our department. Our close collaboration within our School of Engineering Science and Technology and with the University's other excellent professional schools creates a rich array of research. Our students work collaboratively on projects in diverse areas such as robotics, sustainable energy, and automotive technology. Our new engineering building has a state-of-the-art laboratory that facilitates our research activities. In addition to benefits from academic climate of the Virginia State University campus, engineering students also greatly benefit from the University's proximity to the area's industrial facilities, many of which offer internship opportunities including Alstom, Altria, Dominion Power, DuPont, Honeywell, and Rolls-Royce.

I invite you to become better acquainted with the Department of Engineering by searching our department, school, and university websites, where you will discover not only engineering excellence, but also a campus alive with cultural, artistic, and intellectual activity.

Sincerely,

Nasser Ghariban, Ph.D.  
Interim Chairman of Engineering Department  
Virginia State University

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## DEPARTMENT OF ENGINEERING

Chairperson: Nasser Ghariban, Box 9032, 301 Engineering Building,  
Phone: 524-1105

Professors: Ali Ansari, Singli Garcia-Otero, Pamela Leigh-Mack, Ehsan Sheybani  
Associate Professors: Shahzad Akbar, Jahangir Ansari, Nasser Ghariban,  
Amir Javaheri, Jinmyun Jo

Assistant Professors: Zhenhua Wu

Instructors:

The Department of Engineering consists of Computer Engineering and Manufacturing Engineering programs that offer ABET-accredited Bachelor of Science Degrees. These undergraduate programs prepare students for careers in industry and for engineering graduate programs. Both programs are committed to engineering innovation and interdisciplinary research. Our highly qualified faculty prepares our students for rapidly evolving fields of science and engineering through an innovative curriculum and through a continuous improvement of the educational process. Research is an integral part of our department. Our close collaboration within our School of Engineering Science and Technology and with the University's other excellent professional schools creates a rich array of research. Our students work collaboratively on projects in diverse areas such as automation and robotics, sustainable energy, and automotive technology.

### **Mission of Department**

The mission of the Department of Engineering at Virginia State University is to provide excellent education and research opportunities to a diverse student body to prepare them for productive careers at industrial and academic settings in the rapidly evolving fields of science and engineering.

### **Description of Department**

The Department of Engineering offers two degrees: B.S. in Computer Engineering, and B.S. in Manufacturing Engineering.

### **Department Objectives**

Engineers work very closely with other members of the engineering team consisting of scientists, technologists, technicians, and craftsmen. The engineers typically design, develop, optimize systems and processes.

1. Provide opportunities for students to develop the ability to contribute analytical, laboratory, and computer skills to develop new engineering analysis and design tools.
2. Provide opportunities for students to develop the ability to analyze and design systems with solid perspectives on the societal impact of these designs.
3. Prepare students to work effectively as team members and leaders within the global context for engineering.
4. Produce students who use proficiency in written and oral communication to assume personal and professional responsibility.

5. Produce students who use high standards of personal and professional integrity and ethical responsibility in their roles as engineers.
6. Prepare students to successfully complete graduate programs in engineering or related subjects.

## **Computer Engineering**

Computer engineers design, produce, operate, and maintain computers and digital systems. It includes the design of computer based real-time data acquisition systems, analysis and design of computer hardware, software, and their tradeoffs. In addition, computer engineers are used in an ever-growing number of positions involved with the applications of computers and digital technology.

Our program offers a Bachelor of Science Degree in Computer Engineering, which prepares students by providing a strong background in mathematics, statistics, sciences and engineering, with emphasis in computer hardware, software, interfacing, and design. Our program also grants elective flexibility for specialization in all aspects of computing and related areas. In addition, our students participate in undergraduate research, summer internships, professional societies and leadership skills development.

Course Requirements for the B.S. in Computer Engineering:

Earn at least a “C” or higher in major courses (ENGR, CPEG, and restricted electives), MATH 260, and MATH 261.

### **Computer Engineering Student Outcomes**

- (a) an ability to apply knowledge of mathematics, statistics, science, and engineering
- (b) an ability to design and conduct experiments, as well as to analyze and interpret data
- (c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- (d) an ability to function on multidisciplinary teams
- (e) an ability to identify, formulate, and solve engineering problems
- (f) an understanding of professional and ethical responsibility
- (g) an ability to communicate effectively
- (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- (i) a recognition of the need for, and an ability to engage in life-long learning
- (j) a knowledge of contemporary issues
- (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

## **Computer Engineering Program Objectives**

Within a few years after graduation, graduates of the Computer Engineering program will:

1. Advance in professional responsibilities in computer engineering or related field.
2. Utilize effective communications and team skills in professional settings to enhance individual and organizational productivity, and solve multifaceted problem.
3. Continually practice their profession responsibly and with high ethical standards considering the societal impact of engineering decisions.
4. Engage in professional development throughout their careers to meet the demands of a rapidly changing technological and global society.

## **Manufacturing Engineering**

Manufacturing engineers plan, direct, and coordinate new products from the design stage to the production and delivery to customers. Our program offers a Bachelor of Science Degree in Manufacturing Engineering that prepares students with a strong technical foundation in conventional manufacturing engineering and provides them with the tools to face the challenges of globalized marketplaces, ecologically conscious and interdisciplinary business environments.

Through innovative curricula, teamwork approach, and leadership-building experience, our graduates take technical and managerial responsibilities in a wide spectrum of industries. Our curriculum is developed to provide a balanced knowledge of product design, material, manufacturing process, manufacturing systems, manufacturing automation and robotics, quality assurance, and project management. This curriculum is implemented in conjunction with hands-on experimental activities in our advanced machining, computer integrated manufacturing, material engineering, manufacturing automation, and quality control laboratories. Besides laboratory experiences, we offer our students a rich educational experience in interdisciplinary research through senior projects, manufacturing design implementation, extra curriculum activities, and interaction with our exceptional faculty at the forefront of their fields. Through all these concerted endeavors we have been successful in offering our students flexibility in building a path to fit their professional goals and needs.

Course Requirements for the B.S. in Manufacturing Engineering:

Earn at least a “C” or higher in major courses (ENGR, MANE, and restricted electives), MATH 260, and MATH 261.

## **Manufacturing Engineering Student Outcomes**

1. Ability to apply comprehensive knowledge in mathematics, science and engineering science to manufacturing engineering.

2. Ability to perform engineering analysis by designing and conducting appropriate experiments and analyzing and interpreting results.
3. Ability to design products, equipment, tooling and environment for manufacturing systems.
4. Ability to function effectively in team or group setting.
5. Ability to identify, formulate, and solve engineering problems.
6. Ability to practice engineering profession at highest ethical standards.
7. Ability to communicate effectively.
8. Ability to implement technology with an awareness of important social issues and understand the impact of engineering solution in a global and societal context.
9. Recognition of the need to engage in lifelong learning.
10. Knowledge of contemporary issues such as understanding the creation of competitive advantage through manufacturing planning, strategy, and control.
11. Ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
12. Understanding of the behavior and properties of materials as they are altered and influenced by manufacturing processes.
13. Ability to use statistical and calculus based methods to analyze and control manufacturing operations.
14. Ability to measure manufacturing process variables in a manufacturing laboratory and make technical inference about the process.

### **Manufacturing Engineering Program Objectives**

1. Understand and apply math and engineering principles to new challenges in the manufacturing engineering profession.
2. Understand and apply problem solving and analysis skills to meet the challenging demands and responsibilities of a career.
3. Demonstrate continuous learning and growth in their profession using both oral and written communication skills to contribute as team members or leaders in solving problems.
4. Demonstrate high standards of professionalism and ethics in fulfilling their responsibilities as employees and as citizens.
5. Demonstrate the ability to pursue a variety of career paths including in industry and government or as graduate student.



**Course Descriptions**  
**COMPUTER ENGINEERING**

**CPEG 207 INTRODUCTION TO DIGITAL SYSTEMS - 3 semester hours** **F**

Boolean algebra and logic design of combinational and sequential circuits. Gate and flip-flop characteristics for TTL technology adders, multipliers, register transfer language, general-purpose processor design, basic computer organization, machine level programming, relationships between software and hardware.

**Prerequisite: ENGR102 Introduction to Engineering II**

**Co-requisite: CPEG 227 Digital Systems Laboratory**

**CPEG 208 MICROPROCESSORS - 3 semester hours** **Sp**

Principles of operation of modern microprocessors, including, internal architecture, timing analysis, and interfacing techniques. Special emphasis will be placed on hardware-software interactions using assembly language programming and utilization of programmable peripheral devices.

**Prerequisite: CPEG 207 Introduction to Digital Systems**

**Co-requisite: CPEG 228 Microprocessors**

**CPEG 227 DIGITAL SYSTEMS LABORATORY - 1 semester hour** **F**

Design and implement digital systems. Build combinational and sequential logic circuits. Measure/troubleshoot the logic circuits using general electronic test equipment. Reinforce the concepts learned in CPEG 207 Introduction to Digital Systems.

**Co-requisite: CPEG 207 Digital Systems**

**CPEG 228 MICROPROCESSORS LABORATORY - 1 semester hour** **Sp**

Microprocessor-based laboratory utilizing computer programming language. Emphasis is on writing and running programs on modern microprocessor systems. Lab includes both software and hardware.

**Prerequisite: CPEG 207 Introduction to Digital Systems**

**Co-requisite: CPEG 208 Microprocessors**

**CPEG 303 INTRODUCTION TO ELECTRONICS - 3 semester hours** **F**

Basic semiconductor physics, theory of p-n junctions; diodes, field effect transistors, and bipolar transistors; modeling of diode and transistor devices; analysis and design of diode switching and rectifier circuits; basic transistor switching circuits and single stage amplifiers; multistage transistor amplifier biasing; op amps, and output stages; electronic simulation using PSPICE.

**Prerequisite: ENGR 201 Circuit Analysis, PHYS 113 General Physics II**

**Co-requisite: CPEG 323 Introduction to Electronics Laboratory**

**CPEG 305 OPERATING SYSTEMS - 3 semester hours** **Sp**

Functions and components of an operating system, including process synchronization, job scheduling, memory management, file systems protection, and deadlocks. Related system software, such as loaders, linkers, assemblers, and windowing systems.

**Prerequisite: ENGR 203 Introduction to Programming**

**CPEG 306 COMPUTER ARCHITECTURE I - 3 semester hours** **Sp**

Hardware and software structures found in modern digital computers. Instruction set architecture, hardwired design of the processor, microprogramming, I/Q and memory units, analysis of instruction usage, and hardware complexity.

**Prerequisite: CPEG 208 Microprocessors**

**CPEG 307 LINEAR SYSTEM ANALYSIS - 3 semester hours** **F**

Transient response of linear time-invariant, continuous-time and discrete-time dynamic systems by various methods including Laplace transform, and z-transform; properties of sampling; input-output characteristics; frequency response analysis.

**Prerequisites: ENGR 201 Circuit Analysis**

**Co-requisite: MATH 350 Differential Equations**

**CPEG 308 ANALOG COMMUNICATION - 3 semester hours**

Filter design, noise, signal-to-noise ratio, amplitude modulation, frequency modulation.

**Prerequisites: CPEG 303 Introduction to Electronics; PHYS 113 General Physics II**

**CPEG 309 ADVANCED DIGITAL SYSTEM DESIGN - 3 semester hours** **Sp**

Design of digital systems using programmable logic devices and high-level design techniques. Emphasizes the application of state-of-the-art hardware devices as well as design and simulation tools.

**Prerequisite: CPEG 207 Introduction to Digital Systems**

**Co-requisite: CPEG 329 Advanced Digital System Design Laboratory**

**CPEG 320 INTEGRATED CIRCUIT DEVICE DESIGN - 3 semester hours** **Sp**

Introduction to VLSIC semiconductor device physics, operation, design and physical layout techniques for semiconductor devices.

**Prerequisites: CPEG 303 Introduction to Electronics (or Consent of Instructor)**

**CPEG 323 INTRODUCTION TO ELECTRONICS LABORATORY - 1 semester hour** **F**

Prototype bread-board electronic circuits using diodes, bipolar junction transistors, MOSFETS with DC biasing configurations and with superimposition of AC signals. Operational and differential amplifier and active filter circuits.

**Co-requisite: CPEG 303 Introduction to Electronics**

**CPEG 329 ADVANCED DIGITAL SYSTEM DESIGN LABORATORY - 1 semester hour** **Sp**

System design using programmable logic devices and high-level design techniques. Application of state-of-the-art hardware devices as well as design and simulation tools.

**Co-requisite: CPEG 309 Advanced Digital System Design**

**CPEG 400 SENIOR SEMINAR - 1 semester hour (3 contact hours)** **Sp**

Engineering design, literature searches, industry vs. graduate school career options, ethics, professionalism, and safety. The Fundamentals of Engineering (FE) Exam review for students seeking certification as an Engineer-in-Training (EIT) and subsequently as a professional Engineer (PE). A departmental assessment exam on fundamentals of engineering will be administered.

**Prerequisite: senior standing**

**CPEG 403 ENGINEERING COMPUTATIONS - 3 semester hours**

Linear algebra, complex analysis and phasor calculus; algorithms for roots of equations. Programming in C and use of the application language, such as, MATLAB.

**Prerequisite: senior standing**

**CPEG 404 REAL-TIME DATA ACQUISITION AND CONTROL SYSTEM - 3 semester hours** **Sp**

Advanced course in design of data acquisition systems with real time control applications.

Emphasis is placed on sensors in control systems; signal conditioning; actuators; controllers; and data acquisition using A/D and D/A conversion.

**Prerequisite: senior standing**

**CPEG 406 COMPUTER ARCHITECTURE II - 3 semester hours** **Sp**

Pipelined control and ALU designs, parallel processor organizations including SIMD and shared memory MIMD, message passing MIMD, data-flow processing, cache memory design, and processor-memory interconnections.

**Prerequisite: CPEG 306 Computer Architecture I**

**CPEG 407 LINEAR CONTROL SYSTEM DESIGN - 3 semester hours**

Classical and modern techniques for design and compensation of linear feedback control systems. Includes Bode design, root locus design, state variable pole placement design.

**Prerequisites: CPEG 307 Linear System Analysis; PHYS 112 General Physics I**

**CPEG 410 DIGITAL COMMUNICATION - 3 semester hours**

Discrete Fourier Transforms. Binary and M-ary Signaling, Digital Communication in the Presence of Noise, Matched Filtering and Equalization, Introduction to Information Theory.

**Prerequisite: CPEG 307 Linear System Analysis; CPEG 308 Analog Communication**

**CPEG 411 COMMUNICATION SYSTEM DESIGN - 3 semester hours**

Application of communication theory to system design. Development of communication system specifications. System simulation utilizing a graphical programming language. Hardware and software design and simulation. Design of a complete analog or digital transmitter and receiver or significant subsystems.

**Prerequisite: CPEG 410 Digital Communication**

**CPEG 412 ORGANIZATION AND DESIGN OF DIGITAL SYSTEMS AND COMPUTERS - 3 semester hours**

Considerations for hardware organization of computer and digital systems; includes ALU and CPU structures, control unit organization, storage systems, and the I/O channels. Microprogramming the control unit and different interrupt structures.

**Prerequisite: CPEG 208 Microprocessors**

**CPEG 413 DIGITAL SIGNAL PROCESSING AND FILTER DESIGN -3 semester hoursSp**

Discrete-time signals and systems, sampling, discrete Fourier transforms, analog filter characteristics, non-recursive and recursive filter design, and CAD tools for filter design.

**Prerequisite: CPEG 307 Linear System Analysis**

**Co-requisite: CPEG 423 Digital Signal Processing and Filter Design Laboratory**

**CPEG 414 INTRODUCTION TO PATTERN RECOGNITION - 3 semester hours**

Design of learning and adaptive machines. Elementary decision theory, perception algorithm, Bayes classification rule, learning algorithms, elements of syntactic pattern recognition, adaptive classifiers.

**Prerequisite: Senior standing in CPEG. Non-majors require consent of instructor.**

**CPEG 415 INTRODUCTION TO DIGITAL IMAGE PROCESSING - 3 semester hours**

Basic methods for digitizing, storing, processing, and displaying images. Computational procedures for image enhancement, restoration, coding, and segmentation.

**Prerequisite: Senior standing in CPEG. Non majors require consent of instructor.**

**CPEG 416 EMBEDDED CONTROLLERS –3 semester hours**

**F**

Project oriented course in design of a special purpose computing system with hardware/software tradeoffs which encapsulates all the devices such as processor, memory, interface and control in single package.

**Prerequisite: CPEG 208 Microprocessors**

**Co-requisite: CPEG 426 Embedded Controllers Lab**

**CPEG 420 NANOTECHNOLOGY FABRICATION PRINCIPLES - 3 semester hours**

Introduction to semiconductor fabrication principles and technology, including crystal growth, oxidation, diffusion, ion implantation, photolithography, chemical vapor deposition, physical vapor deposition, plasma reactive ion etching, chemical mechanical polishing and other nanotechnology manufacturing techniques.

**CPEG 422 ADVANCED INTEGRATED CIRCUIT DESIGN -3 semester hours**

Advanced designed topics will be addressed, including digital design circuits, propagation delay, noise margins, power dissipation, various design styles and architectures as well as the issues that designers must face, such as the influence of technology scaling on circuit performance and the impact of interconnect parasitics for optimizing the speed, area or power. CAD Tools for layout, extraction and simulation will be used for assignments.

**CPEG 423 DIGITAL SIGNAL PROCESSING AND FILTER DESIGN LAB**

**- 1 semester hour**

**Sp**

Implement digital signal processing algorithms including: sampling, digital filtering, and simulation. Develop and test Finite Impulse Response (FIR) filters, Infinite Impulse Response (IIR) filters, and Digital Signal Processor (DSP) applications on DSP microprocessors. Reinforce the concepts learned in CPEG 413 Digital Signal Processing and Filter Design.

**Co-requisite: CPEG 413 Digital Signal Processing and Filter Design**

**CPEG 426 EMBEDDED CONTROLLERS LAB 1 semester hour F**

Experiments in design of a special purpose computing system with hardware/software tradeoffs which encapsulates all the devices such as processor, memory, interface and control in single package.

**Prerequisite: CPEG 208 Microprocessors**

**Co-requisite: CPEG 416 Embedded**

**CPEG 461 SENIOR DESIGN I - 2 semester hour (3 contact hours) F**

Capstone design projects that focus on the early stages of project development: design methodology, literature review, specifications development, design alternatives, project plan, and project management. Written and oral communications. Team building. Ethics and professionalism.

**Prerequisite: Senior standing**

**CPEG 462 SENIOR DESIGN II - 2 semester hour (3 contact hours) Sp**

Hardware and Software implementation of the capstone design projects proposed in CPEG 431 SENIOR DESIGN I. Design prototyping, testing, evaluation, project reports and project presentation.

**Prerequisite: CPEG 461**

**CPEG 499 SPECIAL TOPICS -1 to 3 semester hours**

Topics relating to basic design and current practice. Maximum three hours.

**Prerequisite: Completion of all junior CPEG courses or consent of instructor**

## ENGINEERING COURSES

**ENGR 101 INTRODUCTION TO ENGINEERING I - 2 semester hours F,Sp**

Introduction to the engineering profession, Introduction to problem solving using analytical, graphical, and computer tools including scientific word processors, spreadsheets and database packages, mathematical computation software. Introduction to logic. Engineering ethics and professional responsibilities. This course includes lab sessions.

**ENGR 102 INTRODUCTION TO ENGINEERING II - 2 semester hours F,Sp**

Introduction to problem solving using analytical, graphical, and computer tools including scientific word processors, spreadsheets and database packages, mathematical computation software. Introduction to engineering analyses. Engineering ethics and professional responsibilities. This course includes lab sessions.

**Prerequisite: ENGR 101 Introduction to Engineering I**

**ENGR 200 ENGINEERING GRAPHICS (Lab included) - 2 semester hour Sp**

Freehand sketching, lettering scales, use of instruments, layout drawings, orthogonal projection, descriptive geometry, pictorials, and basic dimensioning. Technical communication in design, engineering, and manufacturing. Introduction to computer-aided design and drafting. Introduction to solid modeling.

**ENGR 201 CIRCUIT ANALYSIS - 3 semester hours** **F,Sp**

Fundamentals laws of circuit analysis. Ohm's Law, Kirchhoff's current and voltage laws, the law of conservation of energy, circuits containing independent and dependent voltage and current sources, resistance, conductance, capacitance and inductance analyzed using mesh and nodal analysis, superposition and source transformations, and Norton's and Thevenin's Theorems. Steady state analysis of DC and AC circuits. Complete solution for transient analysis for circuits with one and two storage elements.

**Prerequisite: MATH 260 Calculus I**

**Co-requisite: ENGR 221 Analog Circuits Laboratory**

**ENGR 203 INTRODUCTION TO PROGRAMMING - 3 semester hours** **F**

An introduction to the computer, to the algorithmic process, and to programming in C using standard control structures. Windows and UNIX operating systems are used.

**Prerequisite: ENGR 101 Introduction to Engineering I**

**ENGR 204 INTRODUCTION TO OBJECT ORIENTED PROGRAMMING**  
**- 3 semester hours** **Sp**

Advanced program design and implementation in the C++ programming language. Object-oriented programming with concepts including class structure and behavior, objects, inheritance and reuse, virtual functions and polymorphism, exception handling, templates, and the Standard Template Library. The Windows and/or UNIX operating are used.

**Prerequisite: ENGR 203 Introduction to Programming**

**ENGR 210 STATICS AND STRENGTH OF MATERIALS - 3 semester hours** **F**

The first part of this course covers the application of the principles of engineering mechanics to problems involving equilibrium of particles and solids. Topics include resultants, equilibrium, friction, trusses, center of gravity and moments of inertia. The second part of this course introduces the principles of mechanics necessary for the solution of engineering problems relating to strength, stiffness and material selection. Topics covered include stress, strain, torsion, beams, columns and combined stresses at a point.

**Prerequisite: ENGR 101 Introduction to Engineering I**

**Co-requisite: MATH 261 Calculus II**

**ENGR 221 ANALOG CIRCUITS LABORATORY - 1 semester hour** **F, Sp**

Measurement techniques and experiments on fundamental laws. Circuit analysis techniques including: Ohm's Law, Kirchhoff's current and voltage laws, the law of conservation of energy, Norton's and Thevenin's Theorems, mesh and nodal analysis, superposition, and source transformations. Reinforce the concepts learned in ENGR 201 Circuit Analysis.

**Co-requisite: ENGR 201 Circuit Analysis**

**ENGR 301 ENGINEERING STATISTICS - 3 semester hours** **F**

Engineering applications of the concepts of probability, statistical distributions, statistical analysis, regression and correlation analysis, analysis of variance and covariance, design of experiments.

**Prerequisite: MATH 260 Calculus I**

**ENGR 305 MATERIALS ENGINEERING - 3 semester hours** **F**  
Structure of matter. Physical and mechanical properties of materials including metals, polymers, ceramics, composites, and electronic materials. Equilibrium diagrams. Heat treatments, material selection and testing and corrosion phenomena.  
**Prerequisite: CHEM 151**

**ENGR 310 ENGINEERING ECONOMICS - 3 semester hours** **F**  
Analysis of the time value of money as applied to the manufacturing environment. Economic analysis of engineering decisions. Determining rates of return on investments. Effects of inflation, depreciation and income taxes. Sensitivity, uncertainty, and risk analysis. Application of basic principles and tools of analysis using case studies.  
**Prerequisite: MATH 260 Calculus I**

**ENGR 313 Thermal Engineering - 3 semester hours** **Sp**  
Basic concepts and definitions, properties of pure substance, work and heat, first law of thermodynamics, second law of thermodynamics, and introduction to conductive, convective, and radiative heat transfer.  
**Prerequisite: PHYS 112 General Physics I**  
**Co-requisite: MATH 350 Differential Equations**

**ENGR 315 Dynamics – 3 semester hours** **Sp**  
Kinematics of particles and rigid bodies. Rectilinear motion, Curvilinear motion, Coordinates systems, velocity, acceleration, relative motion. Newton's second law. Kinetics of particles, Angular momentum, Work-energy methods, Impulse and momentum. Vector mathematics where appropriate.  
**Prerequisite: PHYS 112 General Physics I, ENGR 210 Statics/Strength of Materials**

**ENGR 430 QUALITY ENGINEERING - 3 semester hours** **Sp**  
An analysis of the basic principles of quality control, including Total Quality Management and design and analysis of process control charts and sampling plans.  
**Prerequisite: ENGR 301 Engineering Statistics**

## **MANUFACTURING ENGINEERING COURSES**

**MANE 205 MANUFACTURING PROCESS I-3 semester hours** **F**  
The types and properties of engineering materials including metals and polymers as employed in contemporary practice. The traditional manufacturing processing methods by which this materials are shaped into products such as machining, casting, forming, and fabricating techniques. Several experiments will be conducted.  
**Prerequisite: ENGR 102 Introduction to Engineering II**

**MANE 210 MANUFACTURING PROCESS II-3 semester hoursSp**

Modern manufacturing processes and related topics. Includes ceramics, composites, powder metallurgy, property enhancing and surface processing operations, rapid prototyping, and micro-fabricating. An introductory review of manufacturing support system including production planning and control, quality control, and measurement and inspection.

**Prerequisite: MANE 205 Manufacturing Process I**

**MANE 310 – COMPUTED-AIDED MANUFACTURING WITH LAB -3 semester hours F**

Design components and assemblies using wire-frame, surface and solid model generation. Manual NC part programming. Benefits, limitations, and selection of CAD and CAM systems. CAD as an input to CAM, and graphics-based NC programming. Configuration of CAD/CAM software, post-processor generation.

**Prerequisite: ENGR 200 Engineering Graphics; MANE 210 Manufacturing Process II**

**MANE 315 MANUFACTURING AUTOMATION WITH LAB - 3 semester hours Sp**

Design of integrated production systems including flexible, programmed automatic control for fabrication, assembly, packaging, movement, and storage. Introduction to numerical control, industrial robotics, programmable logic controllers, and computer integrated manufacturing. Several experiments will be conducted.

**Prerequisite: ENGR 201 Circuit Analysis, ENGR 315 Dynamics, MANE 210 Manufacturing Process II**

**MANE 400 SENIOR SEMINAR -1 semester hour Sp**

Engineering design, literature searches, industry vs graduate school career options, ethics, professionalism and safety. The Fundamentals of Engineering (FE) Exam will be reviewed for students seeking certification as an Engineer-in-Training and subsequently as Professional Engineer. A departmental assessment examination on fundamental of engineering will be administrated.

**Prerequisite: Senior standing in MANE.**

**MANE 410 Production Planning and Inventory Control - 3 semester hours F**

Analysis and design of systems for planning, scheduling and controlling production, inventory and service operations and activities using operations research and dynamic systems method. Inventory analysis and control for single and multi-item systems. Production control methods like MRP, MRP-II, JIT, and Kanban. Manufacturing Strategy and competitiveness.

**MANE 415 Project Engineering and Management - 2 semester hours F**

This course introduces Project Management skills needed to define, plan, monitor and complete projects as well as to identify the tools and techniques to resolve problems associated with bringing projects in on time and within an established budget and with high quality. Discussion will include application of network flow and sensitivity analysis in managing, scheduling and controlling a project with GANTT, CPM and PERT method. We will combines theories, techniques, group activities, and computer tools such as Microsoft Project.



**MANE 420 SIMULATIONS - 3 semester hours**

**Sp**

An introduction to discrete event simulation methods with emphasis on applications in manufacturing. The operations research topic of queuing theory is used to illustrate the importance of simulation as a problem-solving tool. Concepts and techniques of simulation modeling are covered as well as the statistical concepts and techniques required to obtain representative data, apply it to the model, and evaluate the results. A current high-level simulation language will be used to code the model for running on the computer.

**Prerequisites: ENGR 301 Engineering Statistics; ENGR 203 Introduction to Programming**

**MANE 440 MANUFACTURING STRATEGY/ERP – 3 semester hours**

**F**

A study of development of economic production systems for discrete products in a competitive manufacturing environment. Emphasis is on the interrelationships between product design and production process selection. Concepts of design for manufacture and assembly, tool engineering, and manufacturing systems design are included.

**Prerequisite: Senior standing in MANE**

**MANE 450 MANUFACTURING DESIGN IMPLEMENTATION (Lab included) – 3 semester hours**

**S**

A mix of industry and in-house structured group projects, using process, toll, computer control, quality knowledge, and societal considerations. Projects will progress through a complete manufacturing cycle from design through implementation. Field trips to manufacturing centers.

**Prerequisite: Senior standing**

**MANE 461, 462 SENIOR PROJECT 1, 11, - 3 semester hours per course**

Faculty supervised projects typical of problems which graduates encounter in their professions and which involve costs, planning scheduling and research. Formal written reports suitable for reference library, that include discussions of methodology, results, and conclusions.

**Prerequisite: Senior standing in MANE**

**MANE 499 SPECIAL TOPICS IN MANUFACTURING ENGINEERING – 3 semester hours**

A course of independent study covering topics in Manufacturing Engineering as technical elective. Goal is to enhance student skills and knowledge in relevant topic.

**Prerequisite: Permission of the instructor**

**DEPARTMENT OF ENGINEERING**  
**Computer Engineering**  
**Bachelor of Science Degree**  
**(2012-2013)**

		Semester Hours		
		1 <sup>st</sup> Sem	2 <sup>nd</sup> Sem	Total Hours
<b>FRESHMAN YEAR</b>				
MATH 260	Calculus I	4	-	4
ENGL 110	Composition I	3	-	3
ENGR 101	Introduction to Engineering I	2	-	2
GE	Social Sciences Elective	3	-	3
GE	History Elective	3	-	3
MATH 261	Calculus II	-	4	4
ENGL 111	Composition II	-	3	3
Restricted <sup>1</sup>	Elective	-	3	3
ENGR 102	Introduction to Engineering II	-	2	2
ENGR 203	Introduction to Programming	-	3	3
HPER	Wellness/Health	-	2	2
		15	17	32
<b>SOPHOMORE YEAR</b>				
PHYS 112	Physics I with Lab	4	-	4
ENGL 342	Technical Communication	3	-	3
CPEG 207	Digital Systems	3	-	3
CPEG 227	Digital Systems Lab	1	-	1
ENGR 204	Object Oriented Programming	3	-	3
Elective		3	-	3
PHYS 113	Physics II with Lab	-	4	4
ENGR 201	Circuit Analysis	-	3	3
ENGR 221	Analog Circuits Lab	-	1	1
MATH 350	Differential Equations	-	3	3
CPEG 208	Microprocessors	-	3	3
CPEG 228	Microprocessors Lab	-	1	1
		17	15	32
<b>JUNIOR YEAR</b>				
CHEM 151	General Chemistry	3	-	3
CHEM 153	General Chemistry Lab	1	-	1
MATH 284	Discrete Math	3	-	3
MATH/SCI	Elective	3	-	3
CPEG 303	Introduction to Electronics	3	-	3
CPEG 323	Introduction to Electronics Lab	1	-	1
CPEG 307	Linear System Analysis	3	-	3
CPEG 305	Operating System	-	3	3
CPEG 309	Advanced Digital System Design	-	3	3
CPEG 329	Advanced Digital System Design Lab	-	1	1
ENGR 310	Engineering Economy	-	3	3
GEEN 310	Advanced Communication Skills	-	3	3
Restricted <sup>2</sup>	Elective	-	3	3
		17	16	33
<b>SENIOR YEAR</b>				
CPEG 416	Embedded Controllers	3	-	3
CPEG 426	Embedded Controllers Lab	1	-	1
ENGR 301	Engineering Statistics	3	-	3
CPEG 461	Senior Design I	2	-	2
GE	Global Studies Elective	3	-	3
Restricted <sup>3</sup>	Elective	3	-	3
CPEG 404	Real Time Data Acquisition and Control	-	3	3
CPEG 413	Digital Signal Processing and Filter Design	-	3	3
CPEG 423	Digital Signal Processing and Filter Design Lab	-	1	1
CPEG 462	Senior Design II	-	2	2
PHIL 450	Applied Ethics	-	3	3
ENGL	Literature Elective	-	3	3
		15	15	30

**DEPARTMENT OF ENGINEERING**  
**Manufacturing Engineering**  
**Bachelor of Science Degree**  
**(2012-2013)**

		Semester Hours		
		1 <sup>st</sup> Sem	2 <sup>nd</sup> Sem	Total Hours
<b>FRESHMAN YEAR</b>				
MATH 260	Calculus I	4	-	4
ENGL 110	Composition I	3	-	3
GESO	History Elective	3	-	3
ENGR 101	Introduction to Engineering I	2	-	2
GESO	Social Science Elective	3	-	3
CHEM 151	General Chemistry	-	3	3
CHEM 153	General Chemistry Lab	-	1	1
MATH 261	Calculus II	-	4	4
ENGL 111	Composition II	-	3	3
HPER	Wellness/Health	-	2	2
ENGR 102	Introduction to Engineering II	-	2	2
ENGR 200	Engineering Graphics with Lab	-	2	2
		15	17	32
<b>SOPHOMORE YEAR</b>				
PHYS 112	Physics I with Lab	4	-	4
GESO	Global Studies Elective	3	-	3
ENGR 210	Statics and Strength of Material	3	-	3
MANE 205	Manufacturing Process I	3	-	3
	Elective	3	-	3
PHYS 113	Physics II with Lab	-	4	4
ENGL	Literature Elective	-	3	3
MATH 350	Differential Equations	-	3	3
MANE 210	Manufacturing Process II	-	3	3
ENGR 315	Dynamics	-	3	3
		16	16	32
<b>JUNIOR YEAR</b>				
MANE 310	CAD/CAM with Lab	3	-	3
ENGR 305	Materials Engineering	3	-	3
ENGR 203	Introduction to Programming	3	-	3
ENGR 301	Engineering Statistics	3	-	3
ENGR 201	Electronic Circuits	3	-	3
ENGR 313	Thermal Engineering	-	3	3
ENGR 430	Quality Control with Lab	-	3	3
	Elective Math/Science	-	3	3
ENGL 342	Technical Communication	-	3	3
MANE 315	Manufacturing Automation	-	3	3
		15	15	30
<b>SENIOR YEAR</b>				
MANE 410	Production Planning and Inventory Control	3	-	3
ENGR/MANE	Elective	3	-	3
	Elective	3	-	3
MATH 392	Linear Programming	3	-	3
ENGR 310	Engineering Economy	3	-	3
MANE 415	Project Engineering and Management	2	-	2
MANE 420	Simulation	-	3	3
MANE 450	Manufacturing Design Implementation with Lab	-	3	3
ENGR/MANE	Elective	-	3	3
PHIL 275/450	Ethics/Applied Ethics	-	3	3
ENGR/MANE	Elective	-	3	3
MANE 400	Senior Seminar	-	1	1
		17	16	33

## General Education

The General Education course framework represents a balanced menu of courses designed to enhance core skill sets. The following list provides menu to select courses in each area.

**Global Studies – 3 credit hours from the following menu (students should enroll in courses for which they have appropriate prerequisites and academic background)**

AGRI	295	3 credit hours	<i>Contemporary Global Studies</i>
ARTS	301	3 credit hours	<i>World Art Survey I</i>
ARTS	405	3 credit hours	<i>Survey of African Art</i>
ECON	451	3 credit hours	<i>International Economics</i>
ENGL	314	3 credit hours	<i>Readings in Multicultural Literature</i>
ENGL	315	3 credit hours	<i>African Literature</i>
ENGL	322	3 credit hours	<i>Post-Colonial Literature</i>
ENGL	411	3 credit hours	<i>Readings in African Literature and Culture</i>
ENGL	412	3 credit hours	<i>Caribbean Literature</i>
ENGL	326	3 credit hours	<i>Mythology (cross-listed as PHIL 326)</i>
FREN	110	3 credit hours	<i>Elementary French I</i>
FREN	111	3 credit hours	<i>Elementary French II</i>
FREN	212	3 credit hours	<i>Intermediate French I</i>
FREN	213	3 credit hours	<i>Intermediate French II</i>
HIST	114	3 credit hours	<i>World History to 1500</i>
HIST	115	3 credit hours	<i>World History after 1500</i>
GEOG	210	3 credit hours	<i>World Geography</i>
GERM	110	3 credit hours	<i>Elementary German I</i>
GERM	111	3 credit hours	<i>Elementary German II</i>
GERM	212	3 credit hours	<i>Intermediate German I</i>
GERM	213	3 credit hours	<i>Intermediate German II</i>
IDUP	270	3 credit hours	<i>Introduction to Africana Studies</i>
POLI	207	3 credit hours	<i>International Relations</i>
POLI	210	3 credit hours	<i>Comparative Government</i>
SPAN	110	3 credit hours	<i>Elementary Spanish I</i>
SPAN	111	3 credit hours	<i>Elementary Spanish II</i>
SPAN	212	3 credit hours	<i>Intermediate Spanish I</i>
SPAN	213	3 credit hours	<i>Intermediate Spanish II</i>

**History – 3 credit hours from the following menu:**

HIST	114	3 credit hours	<i>World History to 1500</i>
HIST	115	3 credit hours	<i>World History after 1500</i>
HIST	122	3 credit hours	<i>US History to 1865</i>
HIST	123	3 credit hours	<i>US History after 1865</i>
POLI	150	3 credit hours	<i>United States Government</i>

**Literature – 3 credit hours from the following menu (ENGL 201 and ENGL 202 are designed for most students. ENGL 210, 211, 212, 213, 214, and 215 are intended for students with a strong background in literature)**

ENGL	201	3 credit hours	<i>Introduction to Literature</i>
ENGL	202	3 credit hours	<i>Introduction to African American Literature</i>
ENGL	210	3 credit hours	<i>English Literature I</i>
ENGL	211	3 credit hours	<i>English Literature II</i>
ENGL	212	3 credit hours	<i>American Literature I</i>
ENGL	213	3 credit hours	<i>American Literature II</i>
ENGL	214	3 credit hours	<i>World Literature I</i>
ENGL	215	3 credit hours	<i>World Literature II</i>

**Social Science-3 credit hours from the following menu**

CJUS	116	3 credit hours	<i>Introduction to Criminal Justice</i>
ECON	100	3 credit hours	<i>Basic Economics</i>
ECON	210	3 credit hours	<i>Principles of Microeconomics</i>
ECON	211	3 credit hours	<i>Principles of Macroeconomics</i>
FACS	201	3 credit hours	<i>Consumer Economics</i>
POLI	150	3 credit hours	<i>United States Government</i>
PSYC	101	3 credit hours	<i>Introduction to Psychology</i>
POLI	202	3 credit hours	<i>Contemporary Political Thought</i>
PSYC	212	3 credit hours	<i>Human Growth and Development</i>
SOCI	101	3 credit hours	<i>Introduction to Sociology</i>
SOCI	102	3 credit hours	<i>Introduction to Anthropology</i>

**Wellness and Health – 2 credit hours from the following menu** (this requirement can be satisfied by completing one two-semester-hour course or two one-semester-hour courses):

HPER	170	2 credit hours	<i>Health and Wellness</i>
HPER	160	1 credit hour	<i>Team Sports I</i>
HPER	161	1 credit hour	<i>Team Sports II</i>
HPER	165	1 credit hour	<i>Personal Fitness</i>
HPER	166	1 credit hour	<i>Beginning Swimming</i>
HPER	168	1 credit hour	<i>Aerobics and Conditioning</i>
HPER	169	1 credit hour	<i>Gymnastics</i>
HPER	171	1 credit hour	<i>Lifetime Sports I</i>
HPER	172	1 credit hour	<i>Lifetime Sports II</i>
HPER	175	1 credit hour	<i>Dance as Art/Wellness</i>

# COMPUTER ENGINEERING

**Department of Engineering**  
**Computer Engineering Program Faculty**

**Dr. Ali Ansari**

**Professor**

**Contact Information**

1 Hayden Drive, Box 9032  
Petersburg, VA 23806  
Office: (804) 524-1083  
Fax: (804) 524-6732  
Email: [aansari@vsu.edu](mailto:aansari@vsu.edu)



**Education**

- Ph.D. in Control System Theory, University of Texas at Arlington, 1990
- MS in Electrical Engineering, University of Texas at Arlington, 1981
- BS in Electrical, University of Texas at Arlington, 1980

**Research Interests:**

- Control System Theory

**Dr. Singli Garcia-Otero**

**Professor**

**Contact Information**

1 Hayden Drive, Box 9032  
Petersburg, VA 23806  
Office: (804) 524-1126  
Fax: (804) 524-6732  
Email: [sgarcia-otero@vsu.edu](mailto:sgarcia-otero@vsu.edu)



**Education**

- Ph.D. in Electrical Engineering, University of Missouri, MO
- MS in Electrical Engineering, University of Missouri, MO
- BS in Electrical Engineering, Xian Jiaotong University, China

**Research Interests:**

- Digital Signal Processing
- Digital Systems
- Data Fusion
- Power Electronics

## Dr. Jinmyun (Jim) Jo

### Associate Professor Contact Information

1 Hayden Drive, Box 9032  
Petersburg, VA 23806  
Office: (804) 524-2449  
Fax: (804) 524-6732  
Email: [jjo@vsu.edu](mailto:jjo@vsu.edu)



### Education

- Ph.D. in Materials Engineering and Science, Virginia Tech, Blacksburg, 1989
- M.S. in Mechanical Engineering, University of Nevada, Reno, Nevada, 1984
- B.S. in Mechanical Engineering, University of Nevada, Reno, Nevada, 1983.

### Research Interest:

- Distortion and residual stresses
- Nondestructive analysis
- Sensors, micro-controllers, and robotics

## Dr. Pamela Leigh-Mack

### Professor Contact Information

1 Hayden Drive, Box 9032  
Petersburg, VA 23806  
Office: (804) 524-1080  
Fax: (804) 524-6732  
Email: [pleigh-mack@vsu.edu](mailto:pleigh-mack@vsu.edu)



### Education

- Ph.D. in Electrical Engineering, University of Delaware, DE
- MS in Electrical Engineering, Howard University, DC
- BS in Electrical Engineering, Howard University, DC
- BS Virginia Union University, DC

### Research Interests:

- Teaching and Learning in STEM Education
- Retention in STEM Education
- Diversity in Engineering



## **Dr. Ehsan Sheybani**

### **Professor**

#### **Contact Information**

1 Hayden Drive, Box 9032

Petersburg, VA 23806

Office: (804) 524-1124

Fax: (804) 524-6732

Email: [esheyban@vsu.edu](mailto:esheyban@vsu.edu)



#### **Education**

- Ph.D. in Electrical and Computer Engineering, University of South Florida, 2002
- MS in Electrical and Computer Engineering, Florida State University, 1992
- BS in Electrical and Computer Engineering, University of Florida, 1998

#### **Research Interests:**

- Communication Systems and Digital Signal Processing
- Telecommunications and Networking
- Wireless Communications

## Advising

As a student, you play an essential role in your academic advising process. It is your responsibility to monitor your academic progress and seek advising on a regular basis. Academic advisors can help you develop educational plans that are compatible with your career and life goals and assist you in completing your chosen program quickly and successfully. To make the most of your advising sessions, you need to prepare for the sessions. The following are some hints for an effective meeting with your advisor:

- Bring your curriculum and your questions.
- Establish a target graduation date in consultation with your academic advisor.
- Work with your academic advisor to establish a program of study and an outline of the classes that you plan to take in the next two or three semesters.
- Ask any and all additional questions that you might have. Your academic advisor can help you best when you explain your academic/career goals and concerns.
- Keep notes from your advising meetings to remind you of what was discussed. These periodic advising meetings will better prepare you for your "advising" appointments to select courses.

Following is the list of advisors in your program:

Computer Engineering Program		
Student Last Name	Advisor	Room #
A-C	Dr. Sheybani	300H
D-H	Dr. Garcia	300F
I-M	Dr. Ansari	300A
N-R	Dr. Jo	300E
S-Z	Dr. Leigh-Mack	300D



# Computer Engineering Checklist

## 2012-2014 Catalog

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Name \_\_\_\_\_ ID # \_\_\_\_\_ Semester Entered \_\_\_\_\_

### Gen Ed – English (12 hrs)

	Sem	Credit	Grade
ENGL 110 Composition I		3	
ENGL 111 Composition II		3	
ENGL 342 Tech Comm.		3	
ENGL Literature Elective <sup>1</sup>		3	

### Gen-ED Social Science (9 hrs)

	Sem	Credit	Grade
GE Social Sci Elective <sup>2</sup>		3	
GESO History Elective <sup>3</sup>		3	
GESO Glob Studies Elective <sup>4</sup>		3	

### Gen Ed – Hum & Fine Arts(6 hrs)

GEEN 310 Adv Commun		3	
PHIL 450 Applied Ethics		3	

### Gen Ed- Health & PE (2 hrs)

Health/ Wellness Elective		2	

### Gen Ed - Math (17 hrs)

MATH 260 Calculus I		4	
MATH 261 Calculus II		4	
MATH 350 Diff. Eqns		3	
MATH 284 Discrete Math		3	
MATH/SCI Elective <sup>5</sup>		3	

### Gen Ed- Science (12 hrs)

PHYS 112 Physics I w/ Lab		4	
PHYS 113 Physics II w/ Lab		4	
CHEM 151 Gene Chem.		3	
CHEM 153 Gene Chem. Lab		1	

### Computer Engineering Core (37 hrs)

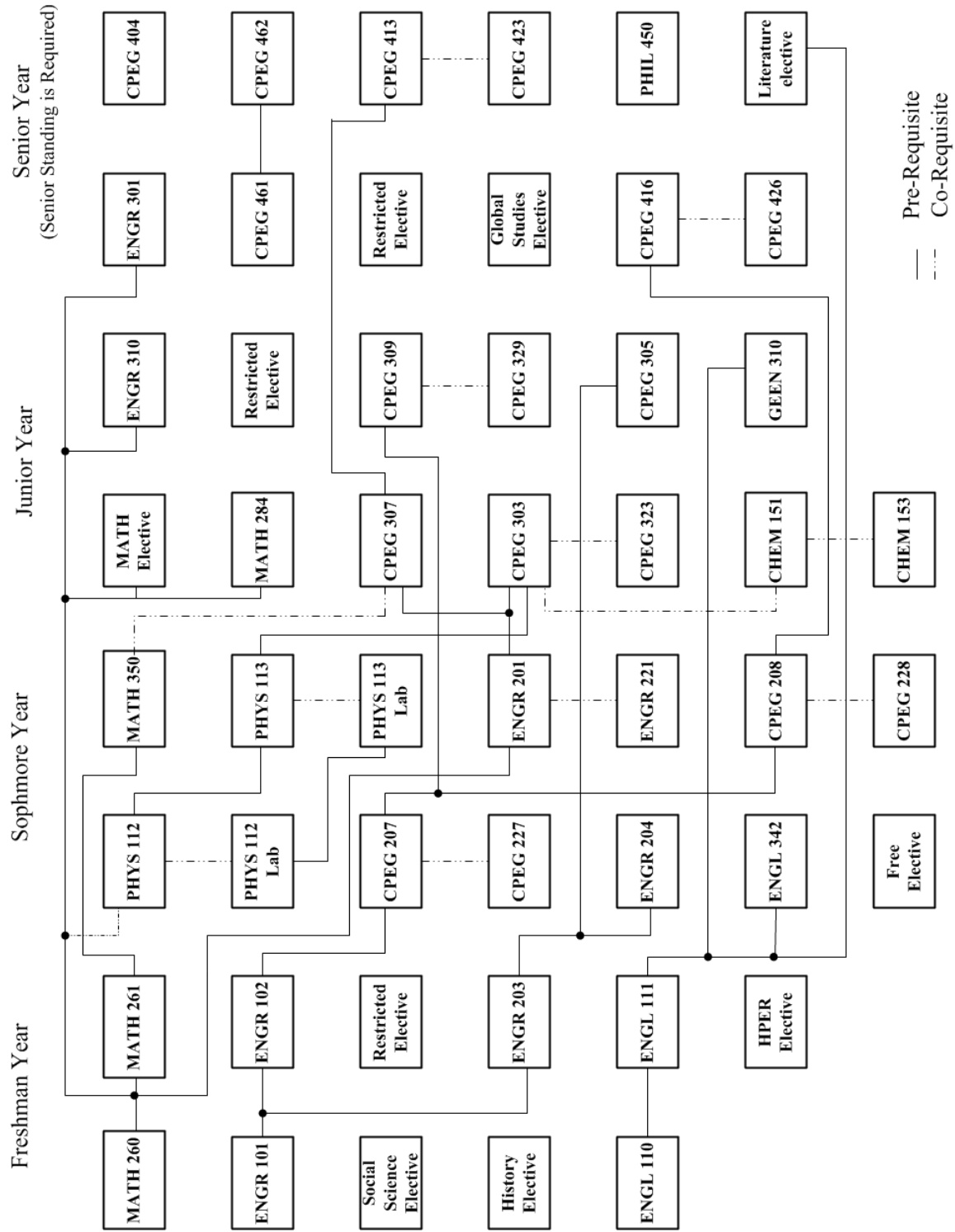
CPEG 207 Digital Systems		3	
CPEG 227 Digital Systems Lab		1	
CPEG 208 Microprocessors		3	
CPEG 228 Microprocessors Lab		1	
CPEG 303 Intro to Electronics		3	
CPEG 323 Intro to Electronics Lab		1	
CPEG 305 Operating Sys.		3	
CPEG 307 Lin. Sys Analysis		3	
CPEG 309 Adv Dig Sys Dsgn		3	
CPEG 329 Adv Dig Sys Degn Lab		1	
CPEG 404 Data Acquisition		3	
CPEG 413 Dig Signals & Filt		3	
CPEG 423 Dig Signals & Fit Lab		1	
CPEG 416 Embedded Controllers		3	
CPEG 426 Embedded Cont. Lab		1	
CPEG 461 Senior Design I		2	
GPEG 462 Senior Design II		2	

### Engineering Fundamentals (29 hrs)+3 hrs free elective

ENGR 101 Intro to Engineering I		2	
ENGR 102 Intro to Engineering II		2	
ENGR 201 Circuit Analysis		3	
ENGR 221 Circuit Analysis Lab		1	
ENGR 203 Intro to Programming		3	
ENGR 204 Obj Orient Prog.		3	
ENGR 301 Engr Statistics		3	
ENGR 310 Engr. Economics		3	
Restricted Elective <sup>6</sup>		3	
Restricted Elective <sup>7</sup>		3	
Restricted Elective <sup>8</sup>		3	
Free elective		3	

1. ENGL Literature Elective  
ENG 201, ENG 202
2. GE Social Science Elective  
CJUS 116, ECON 100, ECON 210, ECON 211, FACS 201, GEPO 150,  
GEPS 124, POLI 202, PSYC 212, GESO 211, SOCI 101, SOCI 102
3. GESO History Elective  
GEHI 114, GEHI 115, GEHI 122, GEHI 123, POLI 150
4. GESO Glob Studies Elective  
FREN 119, GEHI 114, GEHI 115, GEOG 210, GERM 110, IDUP 270, POLI 207, POLI 210, SPAN 111
5. Math/Science Elective  
MATH 301, MATH 325, MATH 452, CHEM 102, PHYS 214, BIOL 100
6. Any courses from CPEG, ENGR, ENGT, INTC, CSCI, and CISY.
7. Any 200 level and above courses from CPEG, ENGR, ENGT, INTC, CSCI, and CISY.
8. Any 300 level and above courses from CPEG, ENGR, ENGT, INTC, CSCI, and CISY.
9. Students must complete all of the CPEG, ENGR, MATH 260, and MATH 261, ENGL 101, and ENGL 111 courses with a grade C or better.
10. Students may enroll in a course if they have a D grade in the pre-requisite courses for that course. But, they still need to satisfy the requirement that is stated above.

# Computer Engineering Curriculum Flowchart



# **MANUFACTURING ENGINEERING**

**Department of Engineering  
Manufacturing Engineering Program Faculty**

**Dr. Shahzad Akbar**

**Associate Professor  
Contact Information**

1 Hayden Drive, Box 9032  
Petersburg, VA 23806  
Office: (804) 524-1130  
Fax: (804) 524-6732  
Email: [sakbar@vsu.edu](mailto:sakbar@vsu.edu)



**Education**

- Ph.D. in Electrical Engineering, Cornell University, 1989
- MS in Nuclear Engineering, Massachusetts Institute of Technology, 1980
- BS in Chemical Engineering, Lafayette College, 1973

**Research Interests:**

- Semiconductor Integrated Circuits
- Materials Science and Processing
- Fiber Optics
- Energy

**Dr. Jahangir Ansari**

**Associate Professor  
Contact Information**

1 Hayden Drive, Box 9032  
Petersburg, VA 23806  
Office: (804) 524-1021  
Fax: (804) 524-6732  
Email: [jansari@vsu.edu](mailto:jansari@vsu.edu)



**Education**

- Ph.D. in Mechanical Design and Production Engineering, Seoul National University , 1983
- MS in Mechanical Engineering, Seoul National University , 1979
- BS in Manufacturing (Production) Engineering, Iran University of Science and technology, 1972

**Research Interests:**

- Computer Integrated Manufacturing
- CAD/CAM/CAE
- Virtual Manufacturing
- Structural Vibration and Modal Analysis

## **Dr. Nasser Ghariban**

### **Associate Professor**

#### **Contact Information**

1 Hayden Drive, Box 9032  
Petersburg, VA 23806  
Office: (804) 524-1105  
Fax: (804) 524-6732  
Email: [nghariba@vsu.edu](mailto:nghariba@vsu.edu)



#### **Education**

- Ph.D. in Engineering, major Mechanical Engineering, University of Texas at Arlington, 1994
- MS in Engineering, Mechanical Engineering University of Texas at Arlington, 1990
- BS in Engineering, Mechanical Engineering, Sharif University of Technology, 1982

#### **Research Interests:**

- Industrial process control
- Automation and robotics
- Heat and mass transfer
- Electronics component cooling

## **Dr. Amir Javaheri**

### **Associate Professor**

#### **Contact Information**

1 Hayden Drive, Box 9032  
Petersburg, VA 23806  
Office: (804) 524-1111  
Fax: (804) 524-6732  
Email: [ajavaher@vsu.edu](mailto:ajavaher@vsu.edu)



#### **Education**

- Ph.D. in Industrial Engineering, University of Cincinnati, 1998.
- M. S. in Operations Research, Case Western Reserve University, 1993.
- BS in Industrial Engineering, Tehran Polytechnic, 1991.

#### **Research Interests:**

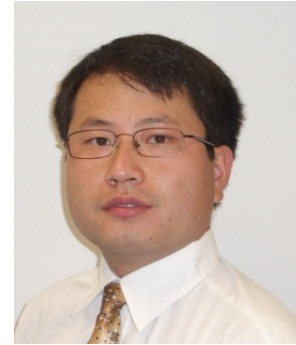
- Assessment and Evaluation
- Six Sigma and Quality Management
- Project Management



**Dr. Zhenhua (David) Wu**

**Assistant Professor  
Contact Information**

1 Hayden Drive, Box 9032  
Petersburg, VA 23806  
Office: (804) 524-1079  
Fax: (804) 524-6732  
Email: [zwu@vsu.edu](mailto:zwu@vsu.edu)



**Education**

- Ph.D. in Mechanical Engineering, Texas A&M University, 2012.
- M. S. in Manufacturing Engineering, the University of Texas-Pan American, 2007.
- M. S. in Mechanical Engineering, Hefei University of Technology, 2005.
- BS in in Mechanical Engineering, Hefei University of Technology, 2002.

**Research Interests:**

- Control and Diagnose Manufacturing Automation System
- Sustainable Manufacturing and Product Life Cycle Assessment
- Vehicle Noise Vibration and Harshness

## Advising

As a student, you play an essential role in your academic advising process. It is your responsibility to monitor your academic progress and seek advising on a regular basis. Academic advisors can help you develop educational plans that are compatible with your career and life goals and assist you in completing your chosen program quickly and successfully. To make the most of your advising sessions, you need to prepare for the sessions. Followings are some hits for an effective meeting with your advisor:

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- Work with your academic advisor to establish a program of study and an outline of the classes that you plan to take in the next two or three semesters.
- Ask any and all additional questions that you might have. Your academic advisor can help you best when you explain your academic/career goals and concerns.
- Keep notes from your advising meetings to remind you of what was discussed. These periodic advising meetings will better prepare you for your "advising appointments to select courses.

Following is the list of advisors in your program:

Manufacturing Engineering Program		
Student Last Name	Advisor	Room #
A-D	Dr. Ansari	300C
E-I	Dr. Wu	300G
J-R	Dr. Akbar	300B
S-Z	Dr. Javaheri	300I



# Manufacturing Engineering Checklist

**2012 - 2014**

Name \_\_\_\_\_ ID# \_\_\_\_\_ Semester Entered \_\_\_\_\_

### Gen Ed (26hrs)

	Sem	Credit	Grade
<b>Composition</b>			
ENGL 110 Composition I		3	
ENGL 111 Composition II		3	
<b>Global Study</b>			
Global Studies Elective		3	
<b>History</b>			
History Elective		3	
<b>Humanities</b>			
ENGL 342 Tech Comm.		3	
PHIL 450 Applied Ethics		3	
<b>Literature</b>			
ENGL Literature Elective		3	
<b>Social Science</b>			
Social Science Elective		3	
<b>Wellness and Health</b>			
Wellness/Health Elective		2	

### Gen Ed-Math (17hrs)

	Sem	Credit	Grade
MATH 260 calculus I		4	
MATH 261 calculus II		4	
MATH 350 Diff Eqs.		3	
MATH 392 Linear Program		3	
Math/Science Elective		3	

### Gen Ed-Science (12hrs)

	Sem	Credit	Grade
PHYS 112 Pysics I w/Lab		4	
PHYS 113 Pysics II w/Lab		4	
CHEM 151 Gene Chem.		3	
CHEM 153 Gene Chem. Lab		1	

### Free Electives (6hrs)

Elective	Sem	Credit	Grade
Elective		3	
Elective		3	

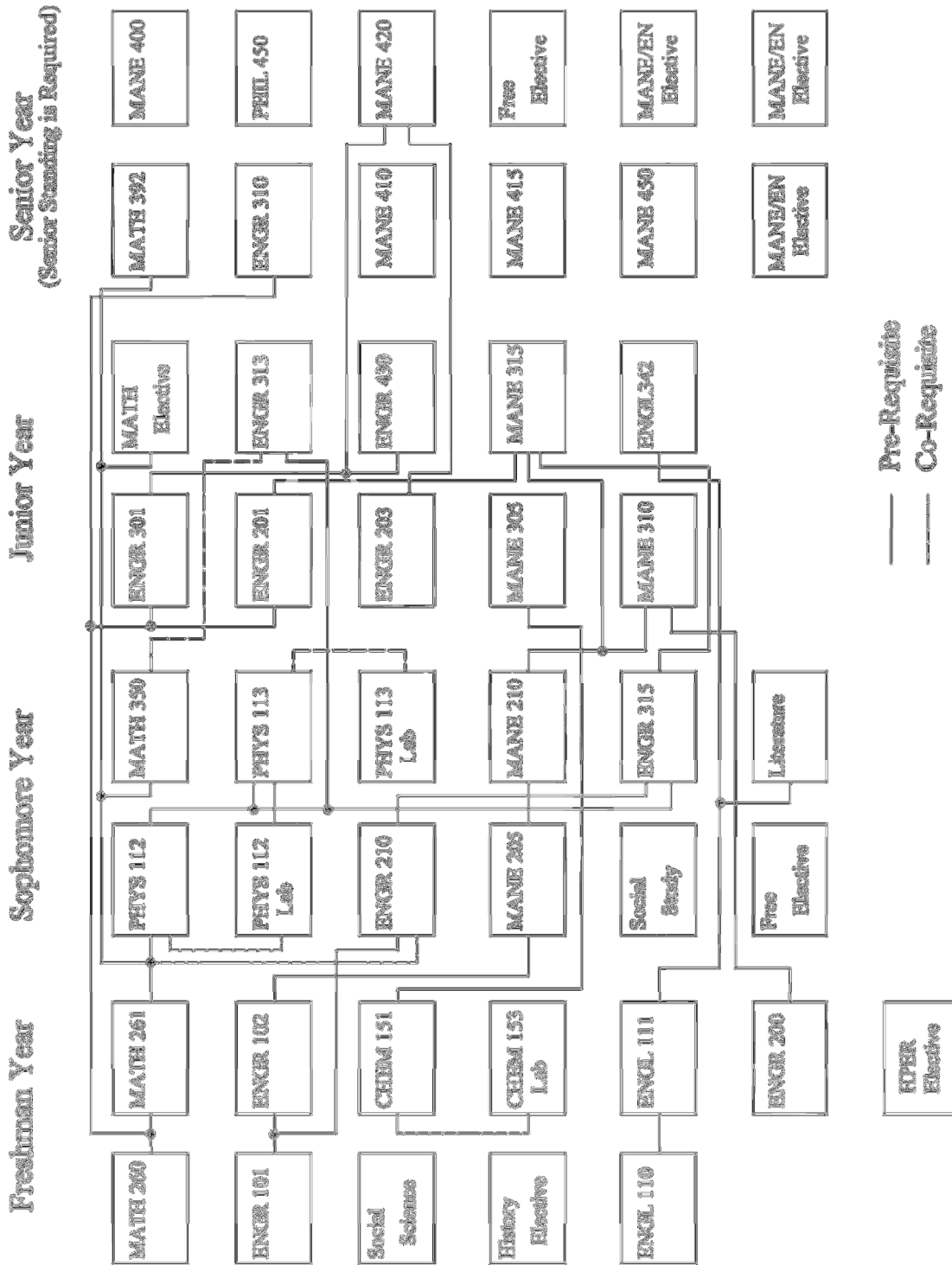
### Manufacturing Engineering Core (24 hrs)

	Sem	Credit	Grade
MANE 205 Man Process I		3	
MANE 210 Man Process II		3	
MANE 310 CAD/CAM		3	
MANE 315 Manu Autom		3	
MANE 400 Senior Seminar		1	
MANE 410 Prod Plan Invent		3	
MANE 415 Project Manu		2	
MANE 420 Simulation		3	
MANE 450 Design Implem		3	

### Engineering Fundamentals (42 hrs)

	Sem	Credit	Grade
ENGR 101 Intro to Eng I		2	
ENGR 102 Intro to Eng II		2	
ENGR 200 Graphics		2	
ENGR 201 Circuit Analysis		3	
ENGR 203 Intro to Programm		3	
ENGR 210 Statics & Strength		3	
ENGR 301 Engr Statistics		3	
ENGR 305 Materials Enging		3	
ENGR 310 Engineering Econ		3	
ENGR 313 Thermal Engin		3	
ENGR 315 Dynamics		3	
ENGR 430 Quality Control		3	
ENGR/MANE Elective		3	
ENGR/MANE Elective		3	
ENGR/MANE Elective		3	

## Manufacturing Engineering Curriculum Flowchart





**VIRGINIA STATE UNIVERSITY**  
**DEPARTMENT OF ENGINEERING**  
**P.O. Box 9032**  
**Petersburg, Virginia 23806**  
**(804) 524-1105**