

# **Matthew Magnuson**

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## **Education**

- Louisiana Tech University, Ruston, Louisiana. Bachelor of Science in Biomedical Engineering, concentration in Electrical Engineering (GPA: 3.519 out of 4), May 2006
- Hammond High School, Hammond, Louisiana (GPA: 3.8 out of 4), May 2002

## **Achievements**

### ***Educational Achievements***

- Louisiana Tech cum laude graduate; Dean's List (6 quarters)
- Outstanding Junior Engineer Award, Louisiana Tech University
- Student representative for internal evaluation committee, College of Engineering and Science, Louisiana Tech University
- Superior Juniors Program for high school seniors at Southeastern Louisiana University (GPA 4.0 out of 4), August 2001 – May 2002
- Winner of Louisiana Tech's "Top Dawg" Business Plan Competition (Spring 2006)

### ***Personal Achievements and Leadership***

- Vice-President of Louisiana Tech Union Board (2003-2004)
- College of Engineering and Science and Union Board Senator, Student Government Association
- Eagle Scout and Senior Patrol Leader (Boy Scout Troop 170; Hammond, Louisiana)

## **Relevant Experience**

### ***Technical, Research, and Communication Experience***

- Undergraduate Student Research Grant, Texas A&M University, Summer 2005; Design of Artificial Coarctation Devices to Evaluate the Effects on Vascular Endothelial Cells
  - Vascular Biomechanics
  - Cell Culture
  - 3D-Modeling
- College of Engineering and Science teaching assistant and paper grader (2002-2006)
- Union Board Technology Chairman and web page designer (2003-2004)
- Tour Guide for a 1300 acre wildlife reserve, responsible for hundreds of visitors each day
- Senior Design Project: development of an at-home biological diagnostic device

### ***Mechanical Experience***

- Landscaping, construction, operation of large farm tractors, and plumbing repair

### ***Professional Organizations***

- Biomedical Engineering Society, Tau Beta Pi, Louisiana Tech Engineering Association

## **Skills and Interests**

- Excellent communication and people skills
- Experience with Excel, MathCad, PSpice, MatLab, SolidEdge, MS Word (formatting)
- Backpacking, reading, cooking, tennis, table tennis, automotive repair, fishing, music

## **Relevant Coursework:**

### **Biomedical Engineering**

202 Biomedical Principles I- Basic qualitative and quantitative principles of biomedical engineering are presented. The general field of biomedical engineering is reviewed with introduction of conservation and modeling concepts.

203 Biomedical Principles II- An introduction to the role of engineering in analyzing physiological systems and in designing devices and instrumentation to study and treat biomedical problems.

225 Biomedical Systems- Analysis techniques for frequency and time domain signals that occur in linear and non-linear physiological systems. Lumped modeling of physiological phenomena.

230 Biomaterials- Compatibility of materials for use in biomedical applications.

301 Fluid Mechanics and Energy Transfer- The principles of fluid mechanics and thermal energy exchange (momentum and energy balances) in biomedical systems. Analysis of engineering and physiological systems and incorporation of these principles into design of such systems.

325 Bioinstrumentation- Analysis and design of biomedical instrumentation. Basic circuitry, electronics, and laboratory techniques including transducers, biopotentials, amplifiers, measurement, and safety.

401 Biomedical Mass Transport- The principles of mass balances and transport phenomena in biomedical systems. Analysis of engineering and physiological systems and incorporation of these principles into the design of such systems.

425 Advanced Biomedical Instrument Systems- Further analysis and design of biomedical instrumentation. Practical aspects of ideal and real operational amplifiers, and an introduction to microprocessor interfacing.

### **Biological Sciences**

225 Human Anatomy and Physiology I- Introduction to human anatomy and physiology including structure and function of cells, tissues, organs and the integumentary, skeletal, muscular, and nervous systems.

227 Human Anatomy and Physiology II- A continuation of 225. Including structure and function of circulatory, respiratory, digestive, excretory, endocrine and reproductive systems.

## **Chemistry**

100 General Chemistry- Fundamental principles of chemistry: chemistry and measurement, atomic symbols and chemical formulas, stoichiometry, gases and thermochemistry.

101 General Chemistry- Continuation of CHEM 100: Atomic and molecular structure, theories of molecular bonding, liquids, solids and solutions.

102 General Chemistry- Rates of reaction, study of chemical equilibria including those involving acids, bases, sparingly soluble salts and complex ions, thermodynamics of equilibrium and introductory electrochemistry.

103 General Chemistry Lab- Laboratory practice in general chemistry.

104 General Chemistry Lab- Laboratory practice in general chemistry.

## **Engineering**

120 Engineering Problem Solving I- The engineering profession, engineering problem solving, computer applications.

121 Engineering Problem Solving II- Introduction to engineering design, engineering problem solving, computer applications.

122 Engineering Problem Solving III- Engineering design, engineering problem solving, computer applications.

220 Statics and Mechanics of Materials- Resultants and equilibrium of force systems, stress and strain, truss and frame analysis, torsion, bending, deflections of beams, combined loading.

221 Electrical Engineering and Circuits I- Fundamental concepts, units and laws. Network theorems, network simplification, phasors and AC solution of circuits, power and electronic applications.

222 Thermodynamics- Fundamental concepts, properties of pure substance, work, heat, first and second laws of thermodynamics, entropy, cycle analysis.

## **Speech**

377 Professional Speaking- Designed to establish a foundation for effective speaking in informative speaking, in the interview, and in communication from the manuscript.

## **Physics**

201 Physics for Engineering and Science I- Thorough treatment of fundamental principles and their application, with emphasis on mechanics.

202- Physics for Engineering and Science II- A continuation of PHYS 201, with emphasis on electromagnetic phenomena and optics.

## **Electrical Engineering**

311 Introduction to Electric and Magnetic Fields- Vector analysis. Energy and potential. Static magnetic fields. Magnetic circuits and inductance.

335 Analog Electronics- Diode and transistor characteristics and models. Design of power supplies, single- and multiple-stage amplifiers. Design and application of operational amplifiers.

## **Mathematics**

Trigonometry  
Calculus I

241 Math for Engineering and Science II- Differentiation rules; trigonometric reduction formulas, trigonometric equations, derivatives of algebraic, exponential, logarithmic, and trigonometric functions; application of differentiation; optimization.

242 Math for Engineering and Science III- Antidifferentiation, definite integrals, techniques of integration, areas and volumes, separable differential equations and linear constant coefficient differential equations (homogenous and inhomogenous).

243 Math for Engineering and Science IV- Numerical integration, improper integrals, single variable continuous statistics, vectors, three-dimensional coordinates, introduction to multivariate integration.

244 Math for Engineering and Science V- Triple integrals, space curves, differentiation of functions of several variables, vector calculus, Green's and Stokes' theorem.

245 Math for Engineering and Science VI- Infinite sequences, power series, Taylor series, elementary partial differential equations, use of series to solve differential equations, LaPlace transforms.

**\*All course descriptions from Louisiana Tech course catalog.**

## **Career Aspirations:**

My long-term goal is to work in the technology transfer sector of biomedical engineering. In the early stages of my career, I hope to work for a biomedical company in public relations and/or research and development.

## **Immediate Goals:**

I plan on obtaining employment in the biomedical industry in Atlanta, Georgia. In the recent future I would like to pursue graduate studies in Biomedical Engineering and Marketing.

## **Honors:**

Achieved Rank of Eagle Scout - 2002

Dean's List - 2002, 2004, 2004, 2005

Served as a student representative for alumni evaluation of the Louisiana Tech College of Engineering and Science

Earned second place overall in freshman design competition in 2003 (team project)

Named an outstanding junior engineer (2005)

Graduated Cum Laude from Louisiana Tech University (3.519)

Finished first place in the Louisiana Tech Top Dawg Business plan competition winning \$8,000 in prize money

## **Organizational Involvement:**

Louisiana Tech Engineer's Association

Student Government Association- College of Engineering and Science Senator, Union Board Senator, Member at Large

Biomedical Engineering Society

Tau Beta Pi

Union Board- Technology Director, Vice President, Fall Fling Director

## **Personal Interests:**

Attending college sporting events, Fishing, Reading, Backpacking, Tennis, Table tennis, Volleyball, Darts, New Orleans Saints.