

**NEW MEXICO AMP  
PARTNER CAMPUS PROFILE FOR: UNM-LOS ALAMOS  
COMPLETED BY: CEDRIC D. PAGE DATE: FEBRUARY 23, 2009**

**Selected Campus Data**

Campus Enrollment (all disciplines): **762**

Percentage of Underrepresented Students: **378 (50%)**

Number of Faculty: **92**

Number of Degree Programs: **19**

**Selected STEM Data**

STEM Enrollment: **80**

Percentage of Underrepresented Students: **46 (58%)**

Number of STEM Faculty: **45**

Number of STEM Degree Programs: **10 Associate degree programs**  
**8 academic certificate programs**  
**7 employability certificates**  
\*\*Please see program descriptions

**1. Pre-transfer Preparation Associate Degrees:**

**a. Associate of Science in Environmental Science**

This program provides students with the first two years of study toward a Bachelor's degree in Environmental Science or Earth and Planetary Science at UNM Albuquerque Campus or other four-year institutions. It can also be applied toward a B.S. in Biology with a Concentration in Conservation Science. As a terminal degree, it is sufficient preparation for certain technician jobs in areas such as environmental testing and remediation.

**b. Associate of Science in Pre-Engineering**

This program represents the course work for the first two years of the baccalaureate degree at UNM Albuquerque Campus. The courses are pertinent to all fields of engineering: mechanical, chemical, nuclear, civil, and computer. Students with this degree are qualified to enter the work force as technicians in various engineering fields or to continue their studies to the baccalaureate level.

**c. Associate of Science in Science**

This program represents the first two years of course work in general science with an emphasis in physics, chemistry, and biology. Completion of this degree will enable students to transfer to a four-year institution for additional studies leading to a bachelor's degree. It will also provide background studies for students wishing to enter the work force as technicians in science.

**d. Associate of Applied Science in Computer Science**

This program provides students with a broad set of skills and knowledge in the basic areas of computer programming and computer science. The core requirements in mathematics, computer science, and electrical engineering cover basic principles and methodologies of discrete mathematics, problem analysis and algorithm development, high-level programming languages, operating systems, computer architecture, and software engineering. Students completing this degree will be qualified for entry-level programming positions with skills in program design, code development, testing and debugging, maintenance, and code documentation. Students will have a large exposure to problem solving techniques and program applications. Students will also be qualified to work as part of a software development team.

***Programming Concentration***

Building on the basic core skills and techniques taught in the Associate of Applied Science in Computer Science, the *Programming Concentration* highlights classic software design and development principles. The student will focus on areas of the software development life cycle that include problem analysis, algorithm development, efficiency of algorithms, code readability, and professional testing techniques. Students will be exposed to a wide

array of programming applications. *This concentration is valuable as a stand-alone degree or as a transfer degree to the Bachelor of Science In Computer Science, which may be earned at UNM-Los Alamos or by transferring to UNM-Albuquerque.*

### ***Game Developer Concentration***

Building on the basic core skills and techniques taught In the AAS In Computer Science, students in the *Game Developer Concentration* will learn basic programming techniques such as problem analysis, code development, and code testing techniques. In addition, students will focus are specialized topics for the application of computer game development. Students will learn simple drawing techniques, two and three-dimensional design techniques, coding techniques unique to computer games, and animation techniques. *This concentration is valuable as a stand-alone degree or as a transfer degree to the Bachelor of Science In Game Development at University of Denver (or similar gaming degrees across the country).*

## **2. Other STEM specific degree program that tend to be terminal work-preparation programs:**

### **a. Associate of Applied Science in Digital Media Arts**

This degree program instructs the student in graphics, animation and multimedia using digital tools—hardware and software—to produce visual content based projects for screen display or the World Wide Web, for “land-based” traditional output or printing. It addresses simultaneously the impact of digital media on our culture and graphic design/visual problem-solving issues. Students are prepared for employment in the fields of graphic design, multimedia design, and web multimedia content.

### **b. Associate of Applied Science in Applied Technologies**

This program is designed to develop skills that will assist students in gaining employment as entry level technicians. Program content is intended to provide a balance of performance skills in electro-mechanical technology, manufacturing technology, and nanotechnology. Students will be provided with quality training and career pathways in modern applied technologies. Students will learn to use the techniques, skills, and modern applied science tools necessary for professional practice in their chosen area of concentration.

#### ***About the Electro-Mechanical Concentration***

Building on the basic technical core courses, students in the Electro-mechanical Concentration will learn the basic elements of DC circuits, AC electronic components, and electronic devices. Students will also be introduced to fundamental mechanical systems (vacuum, cryogenic, and hydraulic systems) and their design, assembly, and operation. In addition to the general education core curriculum, students must complete a set of required technical core classes and 20 credit hours in this concentration.

#### ***About the Manufacturing Concentration***

Students in the Manufacturing Concentration will learn about the three basic engineering materials (metals, ceramics, and polymers) and their manufacturing processes. This concentration emphasizes theoretical and practical applications of measurement principles and introduces students to the fundamental behavior of materials. The early stages of mechanical design concepts are presented using CADD, prototyping, and patent search skills. In addition to the general education core curriculum, students must complete a set of required technical core classes and 16 credit hours in this concentration.

#### ***About the Nanotechnology Concentration***

In the Nanotechnology Concentration, students will learn about the materials, tools, and current and emerging applications of nanotechnology. Students will study the relationship between the structural characteristics and the physical and mechanical properties of metals, alloys, and nonmetallic materials. Basic concepts of micro and nano fabrication as well as coating principles and processing techniques with regard to applications of nanostructures and nanomaterials will be emphasized. Students will investigate manufacturing measurements using mechanical, electronic, optical, microscopic, and interferometric methods. In addition to the general education core curriculum, students must complete a set of required technical core classes and 16 credit hours in this concentration.

### **c. Associate of Applied Science in Network Administration**

This degree program is designed to teach students the skills to install and maintain a networked environment. It covers foundation skills in the area of basic system administration and basic network administration. Students learn about such concepts as network servers and workstations, network organizations, data administration, hardware and software

installation, and the integration of multiple platform environments. Students graduating with this degree will be able to work as system and network administrators in a small business environment with a networked computing facility.

#### ***About the Windows Concentration***

Building on the basic core skills and techniques taught In the Associate of Applied Science In Network Administration, the *Windows Concentration* highlights the technical and customer service skills necessary to troubleshoot hardware and Microsoft-based software operation issues in the workplace. Students will also learn to administer, troubleshoot, and support Microsoft-based network systems. *This concentration is valuable as a stand-alone degree and will prepare the student to take Microsoft Certification Exams for the: MCP, MCDST, and MCSA certifications as well as the CompTIA A+, Network+ and Security + exams.*

#### ***About the LINUX/UNIX Concentration***

Building on the basic core skills and techniques taught In the AAS in Network Administration, students in the *Linux/UNIX Concentration* will learn foundational proficiency in everyday management of Linux-based clients and basic management of server systems. In addition, students will focus on specialized topics in fundamental management of Linux systems from the command line, demonstrate knowledge of user administration, and understand file permissions, software configurations, and management of Linux-based clients, server systems and security. *This concentration is valuable as a stand-alone degree or may assist students who wish to transfer to a Computer Science degree at some four-year Institutions.*

#### **d. Associate of Applied Science in Office Communications and Technology**

The Associate of Applied Science Degree in Office Communications and Technology covers the skills required for effective administrative support. The program is designed for students seeking positions as administrative assistants, office assistants, and secretaries in technical/scientific government or private business office environments.

#### **e. Associate of Applied Science in Technical Support**

The Associate of Applied Science in Technical Support will provide customer and technical support through analysis and problem solving to facilitate installation, implementation, maintenance, education, and documentation of a variety of computer-related technologies. A student with this degree will be able to field customer calls, gather appropriate information about customer software and hardware problems, and help the customer solve their problem

#### **f. Associate of Applied Science in Web Technologies**

The Associate of Applied Science Degree in Web Technologies prepares students to design and develop websites. The kinds of websites students will learn to design and develop include a range from relatively simple websites that provide information, to complex, large-scale websites that provide information, and interactive websites that allow users to perform transactions. Students will learn the fundamental tools of web design and development: HTML (Hypertext Markup Language), CSS (Cascading Style Sheets), JavaScript, DHTML (Dynamic HTML). Students will integrate these tools, techniques, and principles in the design and development of complex websites in a course on creating a web portfolio. Upon graduation, they will be prepared to work in web design companies, in small businesses and institutions as the sole web designer and developer, or in large businesses and institutions as part of a team of web designers and developers.

#### ***About the Web Design Concentration***

Building on the basic core technologies and techniques of web development, the Web Technologies Web Design Concentration highlights classic design principles. The student will learn how color, fonts, white space, and other design principles can enhance their web site along with advanced techniques using multimedia, graphics, and digital photography. They will learn the techniques of information architecture and the principles of web usability.

#### ***About the Web Development Concentration***

Building on the basic core technologies and techniques of web development, students in the Web Technologies Web Development Concentration will learn how to create forms for transactional websites using Perl, PHP, CGI, AJAX, XML, and other server-side tools and techniques. Advanced techniques using web server-side technologies (middle-ware) to interact with standard relational databases to enhance the interactivity and usability of a web site to collect and share data will be emphasized. Students will learn basic programming principles, as well as advanced web techniques such as AJAX.

### **3. STEM specific academic certificate programs that tend to be terminal work-preparation programs:**

#### **a. Certificate in Computer Science**

The intent of this program is to provide students with a set of skills and knowledge in the area of computer programming. The course requirements cover the basic principles and methodologies of discrete mathematics, problem analysis and algorithm development, high-level programming languages, and techniques for software engineering. Students completing this certificate will have the skills to do some entry-level code writing, code maintenance, and code testing. Students will select one of two concentrations: a Programming Concentration or a Game Development Concentration. Students earning the Programming Concentration will focus on software development tools. Students earning the Game Development Concentration will focus on game development techniques, animation, and simple character development.

#### **b. Certificate in Digital Media Arts**

This program of study instructs the student in graphics, animation and multimedia using digital tools -- hardware and software—to produce visual content-based projects for screen display or the World Wide Web, for “land-based” traditional output or printing. It addresses simultaneously the impact of digital media on our culture and graphic design/visual problem-solving issues. Students are prepared for employment in the fields of graphic design, multimedia design, and web multimedia content.

#### **c. Certificate in Electro Mechanical Technology**

This certificate represents completion of a course of studies related to the field of Electro Mechanical Technology. It may be used as a terminal certificate with subsequent entrance into the work force, or it may form the basis for additional course work leading to an associate degree in this or another field.

#### **d. Certificate in Materials Science Technology**

The Materials Science Technology certificate is designed to prepare students for a career as technicians in the expanding field of Materials Science. Coursework offered provides the student with an overview of manufacturing processes and experience in areas such as microscopy and microstructures, mechanical behavior, and materials selection. Upon completion, the student will be prepared to join the workforce in a variable size organization and/or elect to pursue additional technology training.

#### **e. Certificate in Network Administration**

This degree program is designed to teach students the skills to install and maintain a networked environment. It covers foundation skills in the area of basic system administration and basic network administration. Students learn about such concepts as network servers and workstations, network organizations, data administration, hardware and software installation, and the integration of multiple platform environments.

#### **f. Certificate in Office Communications and Technology**

The Certificate in Office Communications and Technology covers the skills required for effective administrative support. The program is designed for students seeking positions as administrative assistants, office assistants, and secretaries in technical/scientific government or private business office environments.

#### **g. Certificate in Technical Support**

A person with a certificate in Technical Support will be able to provide customers or in-house personnel with support in all areas relating to the installation, maintenance, and updating of a personal computer. This individual will have some expertise with the Microsoft Office products, be able to install new software, build a basic computer from the box, install basic hardware components and do minor hardware repairs. This individual will also have a basic knowledge of how a network is built and operates.

#### **h. Certificate in Web Technologies**

The Certificate in Web Technologies prepares students to design and develop Web sites. The kinds of websites students will learn to design and develop include a range from relatively simple websites that provide information, to complex, large-scale websites that provide information, and interactive websites that allow users to perform transactions. Students will learn the fundamental tools of web design and development: HTML (Hypertext Markup Language), CSS (Cascading Style Sheets), JavaScript, and DHTML (Dynamic HTML). Building on the basic core technologies and techniques of web development, the Web Technologies Web Design Concentration highlights classic design principles. The students will learn how color, fonts, white space, and other design principles can enhance their web site along with advanced techniques using multimedia, graphics, and digital photography. They will learn the techniques of information architecture and the principles of web usability. They will integrate these tools, techniques, and principles in the design and development of complex websites in a course on creating a web portfolio. Upon graduation, they will be prepared to work in web design companies,

in small businesses and institutions as the sole web designer and developer, or in large businesses and institutions as part of a team of web designers and developers.

**4. Employability certificates designed to provide students the option to gain expertise in a focused, marketable skill set; can be completed in one semester.**

**a. Windows System Administration Employability Certificate**

The *Windows System Administration Employability Certificate* provides individuals with prior technician-level computing skills with the additional skills set required to administer a LAN sized server-client network, supporting all users with software/hardware services, and insuring a secure environment.

**b. UNIX/Linux System Administration Employability Certificate**

The *UNIX/Linux System Administration* award of completion provides individuals with prior technician-level computing skills with the additional skills set required to administer a LAN sized server-client network running UNIX/Linux that supports multiple users.

**c. Office Administration Employability Certificate**

The *Office Administration Employability Certificate* provides individuals with prior introductory computer use skills the additional skills required to facilitate a busy office. In particular, this individual will become experienced in spreadsheets, desktop publishing, customer service skills, and database management.

**d. Graphic Designer Employability Certificate**

The *Graphic Designer Employability Certificate* provides individuals with prior technician-level computing skills the additional skill set required to create and manipulate bitmap and vector digital images, create video animations for the web, and design layouts for print and web pages.

**e. Photoshop Specialist Employability Certificate**

The *Photoshop Specialist Employability Certificate* provides individuals with prior computer use skills the additional skills required to create and manipulate digital images in Photoshop. In particular, this individual will become experienced in all aspects of Adobe Photoshop.

**f. Web Developer Employability Certificate**

The *Web Developer Employability Certificate* provides individuals with prior technician-level computing skills with the additional skill set required to build dynamic database-driven web pages and sites. Web topics include a basic understanding of Web Servers, Javascript and DHTML, XML, Architecture of web sites, and web forms with an emphasis on PHP or PERL.

**g. Web Designer Employability Certificate**

The Web Designer Employability Certificate provides individuals with prior technician-level computing skills with the additional skill set required to design, develop, and implement static web pages. Web topics include a basic understanding of web page planning, HTML code, Web editors, graphics, animation, and web design and functionality. Students will also gain some familiarity with either Photoshop or Illustrator.

**5. Campus Clubs**

- a. **Math Club:** open to all students interested in mathematics
- b. **Phi Theta Kappa:** Honor Society open to students with qualifying GPA including STEM students

**Relevant Program Advisors and Faculty:**

Advisors: Jackie La New  
Jill Gonzales  
Pat Boyer  
Yohanna Wiuff  
Kathryn Vigil

What is the average number of students transferring to 4-year STEM programs per year? **69**

What is the average number of STEM transfer students enrolling each year? **93**

**Institution's Contributions to/Potential for Meeting New Mexico AMP Goals:**

Our greatest potential is our access to a highly educated and trained scientists and engineers at LANL who frequently serve as adjunct faculty in our STEM programs.