



# Engineering Program Overview

# Overview

- Curriculum Offered
  - Associate of Science in Engineering
  - Career Studies Certificate in Engineering Technology
  - Career Studies Certificate in Industrial Maintenance Technology
- Presentation Order
  - Mission and constraints
  - Programs
  - Future Plans and Community Involvement

# Engineering Mission

- Graduating engineering students will have the skills to either continue on to a four year engineering curriculum or enter the job market with capabilities that are needed in Industry or government.
- Several degree paths will be available to students for an Associate of Science in Engineering (ASE), an Associate of Applied Science in Engineering (AASE) or for Certificates and Career Studies Certificates in Engineering.
  - The ASE curriculum prepares students to enter a four year institution at the Junior year level
  - The AASE is the accumulation of certificates and associated classes tailored for technical specialization and to individual student needs.
  - Engineering Certificates and Career Study Certificates are specialized areas of study that emphasize focused content such as surveying, drafting, industrial electricity, electronics, machining and manufacturing, information technology, mechanical systems, integrated mechanical-electrical systems, and green energy technology systems.
- **Students will have access to these curricula throughout the Germanna service area via on-line and video telecom multimedia systems that currently exist at all campuses.**

# GCC Service Region

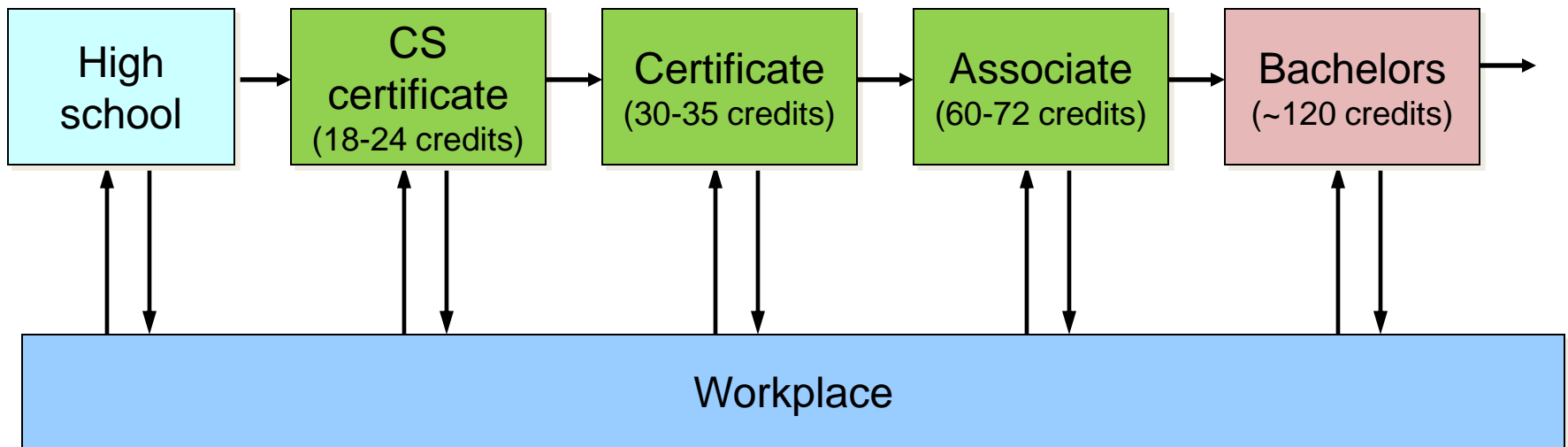


**How do we effectively service this large of an area?**

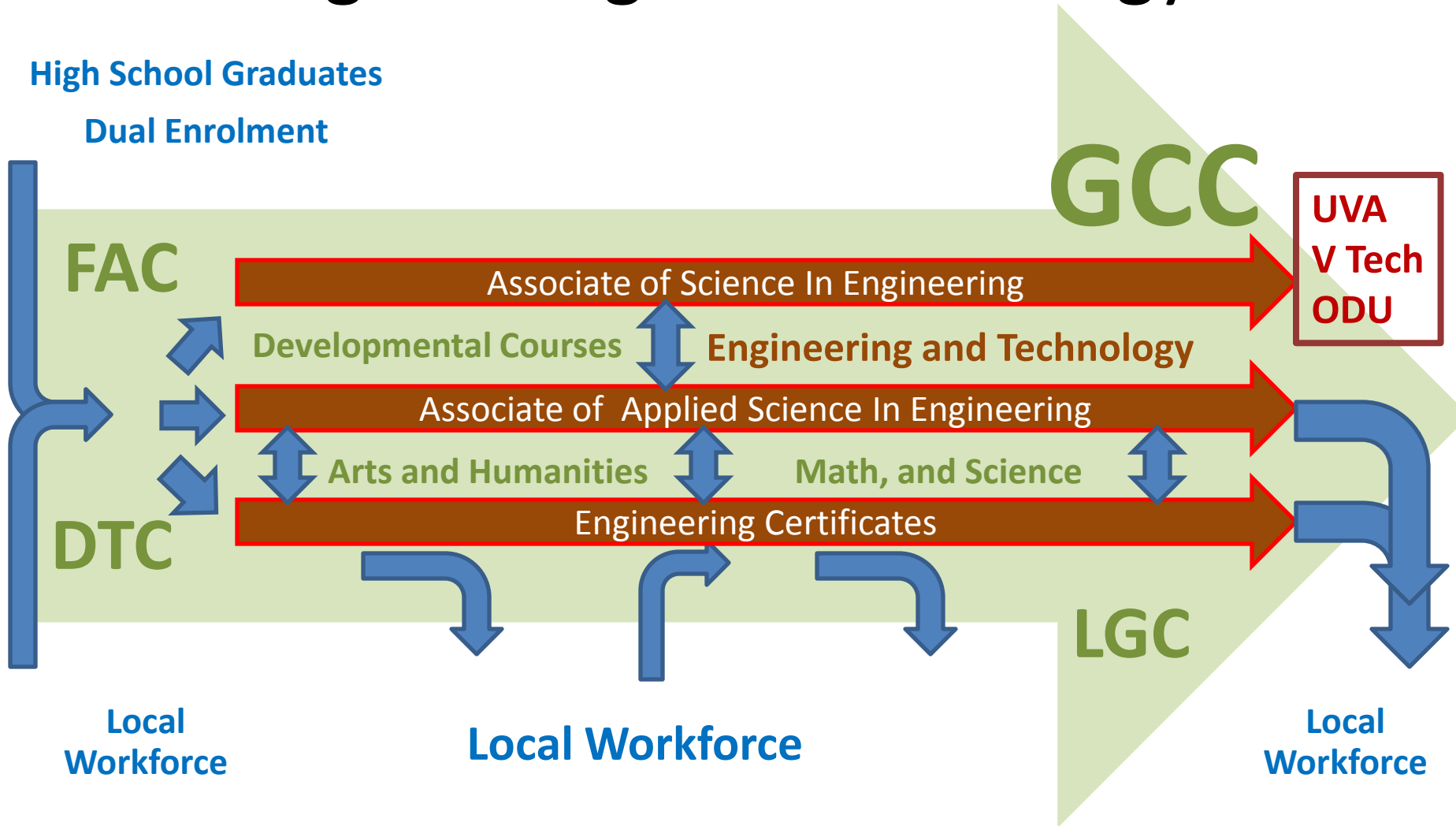
**The answer is to have a distributed learning environment**

# Career Progression

- Maintain pathway for students to follow with progressive exit and entry routes



# The Big Picture For Germanna Engineering and Technology



# Why We Need AS & AAS Engr. At GCC

- Data from the SIS system reveals a real local need.
  - Local Residents are commuting to other Community Colleges

County	ASE NOVA		ASE PVCC		ASE JSRCC	Total AS Engr.		AAS NOVA	AAS JSRCC	AAS Total
	2007-08	2008	2007-08	2008	2008	2007-08	2008	2008	2008	2008
Caroline	0	0	1	0	4	1	4	0	2	2
Culpeper	5	4	0	1	0	5	5	0	0	0
King George	0	1	0	0	2	0	3	1	0	1
Madison	0	0	4	5	0	4	5	0	0	0
Orange	1	0	3	7	0	4	7	0	0	0
Spotsylvania	3	4	1	0	3	4	7	2	2	4
Stafford	26	33	1	0	0	27	33	12	1	13
Fredericksburg	2	1	0	0	1	2	2	0	0	0
<b>Totals</b>	<b>37</b>	<b>43</b>	<b>10</b>	<b>13</b>	<b>10</b>	<b>47</b>	<b>66</b>	<b>15</b>	<b>5</b>	<b>20</b>

**CURRENT NEED WOULD FILL NEW CLASSES**

# Program Statistics

- Career Studies Certificate Engineering Technology Program
  - Current Enrolment – 23
  - Total Enrolment (3 Years) -- 79
  - Graduates
    - 2006-2007 – 4
    - 2007-2008 – 6
    - 2008 -2009 – 3
- Career Studies Certificate Industrial Maintenance Program
  - Current Enrolment -- 16
  - Graduates -- 1
- Associate of Science In Engineering
  - Current Enrolment -- 40

# CSC Engineering Technology Program

**The Engineering Technology program is designed to prepare students for entry-level positions in Engineering such as:**

- Engineering Technician
- Surveyors
- CAD Operation, drafters
- Project planners

## **Program Objectives:**

- Provide guidance for professional practice standards in the engineering technician field
- Expose students to instruction by experienced professionals, and the use of state-of-the-art equipment and computer programs in the engineering fields.
- Provide students with instruction and guidance, whether in-class or with off-site visits by local, practicing industry professionals.
- Provide students with information about the availability to further their interests in Engineering technology

# CSC Engineering Technology Program

Class	Name	Credits
CAD-151	Engineering Drawing Fundamentals I	3
CAD-201	Computer Aided Drafting I	3
CAD-202	Computer Aided Drafting II	3
CIV-171	Surveying I	3
ENG-111	College Composition I	3
MTH-115	Technical Mathematics I	3
<b>Total Credits</b>		<b>18</b>

Class	Semester	Day(s)	Time(s)
CIV 171	Spring	Wednesdays	7-9:45pm
DRF 151	Fall	Thursdays	7-9:45pm
DRF 201	Spring	Mondays	7-9:45pm
DRF 202	Fall	Mondays	7-9:45pm
MTH 115	Fall	Tuesdays	7-9:45pm
ENG 111	All	Multiple offerings – see class schedule	

# Industrial Maintenance

**This Program is designed to meet the need for trained industrial maintenance technicians. It is designed for those who wish to work as maintenance employees or those who have just been hired as maintenance employees. It may also assist current employees with upgrading the skills necessary to support and maintain high-technology equipment. Upon completion of the program, students will be prepared for work as:**

- Industrial Maintenance Technicians
- Industrial Process Technicians
- Engineering Technicians

# CSC Industrial Maintenance

Class	Name	Credits
<b><i>First Semester</i></b>		
SAF-126	Principles of Industrial Safety	3
ELE-133	Practical Electricity 1	3
MAC-131	Machine Lab	3
MEC-161	Basic Fluid Mechanics-Hydraulics/Pneumatics	3
<b><i>Total Semester</i></b>		<b>12</b>
<b><i>Second Semester</i></b>		
ELE-156	Electrical Control Systems	3
MAC-132	Machine Lab II	3
MEC-162	Applied Hydraulics, Pneumatics & Hydrostatics	3
ELE-223	Programmable Logic Controller Systems	3
<b><i>Total Semester</i></b>		<b>12</b>
<b><u>Total Curriculum Credits</u></b>		<b><u>24</u></b>

# Associate of Science in Engineering

- 70 Credit Hours Required
  - 20 Credits of Engineering
  - 50 Credits of Arts and Sciences
- 22 Classes for Program
  - 7 Engineering Classes
  - 15 Arts and Sciences Classes
- Transfer Agreements in Place with UVA, VA-Tech and ODU
  - Eligible for Junior Year Standing
- 2-4 Year Program Depending on Student Placement and Progress
- Full Time Engineering Faculty Supplemented by Adjunct Faculty and cooperative agreements with other community and state colleges.
- Tailored Program for Student Needs and Goals
  - Electrical, Mechanical, Civil Engineering Variations are Allowed
  - Classes may be taken locally or elsewhere and transferred to GCC
- Partner with UVA “Produced in VA” Program
  - Seamless Transfer
  - Distributed Learning Environment

# Full Time Two Year Schedule

## First Year

### Fall

CHM 111 Chem I	4
EGR 120 Intro To EGR	2
ENG 111 English I	3
MTH 173 Calculus I	5
SDV 100	1
HUM/ HIS/ LIT Elective	3
<b>Total Credits</b>	<b>18</b>

### Spring

PHY 241 University Phys I	4
EGR 110 Egr. Graphics	3
EGR 126 Progr. for EGR	3
ENG 112 English II	3
MTH 174 Calculus II	5
<b>Total Credits</b>	<b>18</b>

## Second year

### Fall

PHY 242 University Phys II	4
EGR 248 Thermodynamics	3
MTH 277 Vector Calculus	4
EGR 140 Statics	3
Social Science Elective	3
<b>Total Credits</b>	<b>17</b>

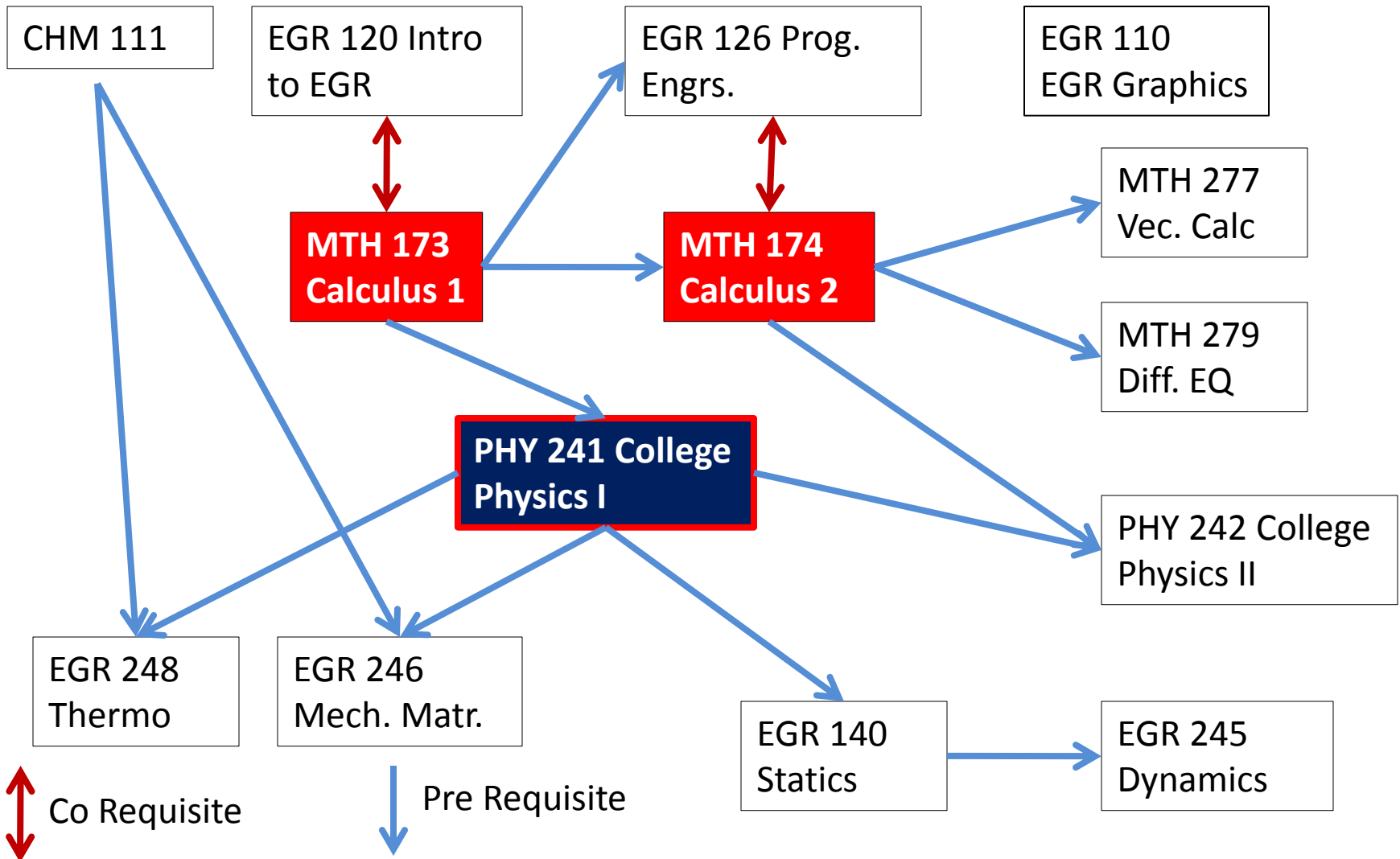
### Spring

EGR 246 Mech of Materials	3
HUM/ HIS/ LIT Elective	3
MTH 279 Ord. Diff Eqns	4
EGR 245 Dynamics	3
HLT/PED Health or Physical Education	1
Social Science Elective	3
<b>Total Credits</b>	<b>17</b>

# Modified 2 and 3 Year Schedule

Classes	EGR 120	EGR 126	EGR 110	MTH 173	MTH 174	PHY 241	PHY 242	EGR 140	EGR 245	EGR 248	EGR 246	MTH 277	MTH 279	CHM 111	SDV 101	HUM	Sco Sci	ENG	Phy Ed	Cred/Sem
<b>2 year (Normal)</b>																				
Fall 2009	2			5										4	1	3		3		18
Spring 2010		3	3		5	4												3		18
Sumer 2010																				0
Fall 2010							4	3		3		4					3			17
Spring 2011									3		3		4			3	3		1	17
Summer 2011																				0
<b>Total Credits</b>	2	3	3	5	5	4	4	3	3	3	3	4	4	4	1	6	6	6	1	<b>70</b>
<b>2 year Alternate</b>																				
Fall 2009	2			5										4	1			3		15
Spring 2010		3	3		5													3		14
Sumer 2010						4											3			7
Fall 2010							4	3		3		4								14
Spring 2011									3		3		4			3			1	14
Summer 2011																3	3			6
<b>Total Credits</b>	2	3	3	5	5	4	4	3	3	3	3	4	4	4	1	6	6	6	1	<b>70</b>
<b>3 Year Program for Working Students</b>																				
Fall 2009	2			5											1					8
Spring 2010		3			5															8
Summer 2010			3			4														7
Fall 2010							4					4								8
Spring 2011													4					3		7
Summer 2011														4				3		7
Fall 2011								3		3						3				9
Spring 2012									3		3						3			9
Summer 2012																3	3		1	7
<b>Total Credits</b>	2	3	3	5	5	4	4	3	3	3	3	4	4	4	1	6	6	6	1	<b>70</b>

# Path to AS Engineering



# ASE Program Development Schedule

Task	Date
GCC Advisory Committee	6/3/08
Survey Distribution	10/1/08
Survey Results	10/15/08
Devel. Pkg. for GCC Curriculum Committee	10/28/08
Germanna Curriculum Committee Approval	11/7/08
Germanna College Council Approval	11/21/08
GCC Presidents Council Approval	12/15/08
GCC Board Approval	1/15/09
Send Proposal to VCCS AS&R	1/29/09
State Board For Community Colleges	3/19/09
State Council of Higher Education for Virginia	<b>7/14/09</b>
SACS Approval to Start Program (Expected)	<b>July 09</b>

# ASE How Much Will It Cost Per Year

## **Germanda**

- Tuition 17 Credits/Semester  
– \$3,000
- Room (Live at home)
- Board (Eat at home)
- Books and Supplies \$ 1200

## **Four Year College**

- Tuition 17 Credits/Semester  
– \$9,500
- Room \$ 4,100
- Board \$ 3,600
- Books and Supplies \$ 1200

**Net savings over 2 years at GCC would be between \$13,000 and \$27,000**

# AS Engineering Future Plans

- Make Adjustments to Curriculum for Other Engineering Fields
  - Electrical Engineering
  - Civil Engineering
  - Computer Science Engineering
  - Chemical Engineering
  - Aero/Astro/Systems Engineering
- Provide Better Transfer Opportunities to Other 4-Year Institutions
- Cooperate and Collaborate With Other Community Colleges to Offer Joint Classes

# Planning for the Future

# Green Tech Program

- Germanna held a Green Technology Conference in May
  - Over 90 People attended
  - Several Vendors from Solar voltaic/Thermal and wind generation systems participated
  - VCCS supports expansion
  - Governor's office supported with presentation
- Next Steps
  - Green Technology Center Based out of Germanna
  - Need Ideas for industry and community support
  - Workforce or Credit Expansion??

# New FAC-3 Building Requirements

- New Architect Chosen June 2009
- Discussion
  - Lab Design
  - Classroom Design
- Green Building as Classroom

# Fundraising

- Student Support
  - First Semester AS Engineering
    - \$2,000 per student for computer and SW
    - \$1,500 Tuition per Semester
    - \$600 Books and Supplies
    - \$4,100 Total first semester cost
- Institutional Needs
  - Lab Build-out (\$250,000) 2009-2013
  - Additional Instructors (\$200,000/Yr) by 2013
  - Instructor Equipment/Training
    - Tablet PCs and Software 4 x \$2,000 = \$8,000 Needed Now
    - Conferences and Training \$10,000 per year
  - Instructional Software \$20,000 per year

# Student Sponsorship Tasks

- Local Business Support
  - Financial
  - Internship
  - Mentoring
  - Final Year Project sponsor for UVA BS EGR Science Degree
    - Students Remain in the Local Area for 4 Years