



Greening a Curriculum

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Background – AACC

- Established in 1961
- Located in Arnold, MD (*near Annapolis*)
- 54,970 credit and noncredit students
- 8,432 FTE



Background – ACH Department

- Program **Mission**
- Program **Options**
 - Architecture
 - Interior Design
 - Construction Management
 - Landscape Design
- **Enrollment**
 - 125 Annual FTE
 - 300+ Students/Semester



Background – Sustainable Design



- **Impact** of building on environment
- Building industry **statistics**
 - **65.2%** of total U.S. electricity consumption
 - **30%** of total U.S. greenhouse gas emissions
 - **136 million tons** of construction and demolition waste in the U.S.
 - **12%** of potable water in the U.S.
 - **40%** (3 billion tons annually) of raw materials use globally
- Question: Amount of **waste** the **construction** of an **average** home creates?

Environment in *Jeopardy!*



And the Question is...

- **How much water does the average home in the US use each day?**
(within 50 gallons)

The average home
consumes **300**
🔊 gallons of water



And the Question is...

- **What is the percentage of carbon dioxide that is generated by buildings in the US?**

(within 5%)

Buildings create
38% of the carbon
💡 dioxide emitted



And the Question is...

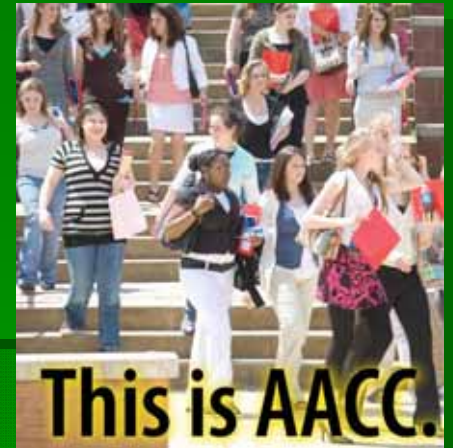
- **How many new residential buildings are built each year?**

(within 1,000)

1.8 Million new residential buildings are built each year

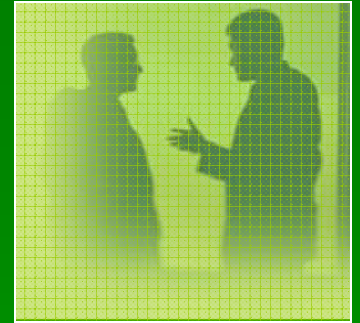


Challenge



- College **Vision Statement**
 - *Anne Arundel Community College is a premier learning community whose students and graduates are among the best-prepared citizens and workers of the world*
- How does the Architecture and Interior Design Department **respond**?

Response



- Created **separate** Advisory Committees
- Membership
 - Current students and former graduates
 - Employers
 - University partners
 - Secondary partners
- Meet annually
 - Review curriculum and respond to recommendations

Recommendation

- Infuse sustainable design in **all three** options
 - University and employers
- Base curriculum on **national standard**
 - USGBC LEED



LEEDTM
LEADERSHIP IN ENERGY & ENVIRONMENTAL DESIGN

Response

- Train faculty
- Develop partnerships
 - Professional
 - Industry
 - Governmental
- Pick a pilot course
- Expand to other courses
- Expand to other options



Pilot Course



- ACH 212 – Architectural Design 4
 - Final design studio for architecture majors
 - Serves as the **capstone course**
- Invited **industry professionals**
- Partnered with the state's **Department of Natural Resources**
- Was awarded **grant**

Sustainable/Green Design Grant

- Models of designs illustrating green building concepts
- Designs complied with LEED industry standards (Silver or above)
- Nine teams of two students
- Models had to be educational by explaining the green features



Sustainable/Green Design Grant

- Designs were judged by **outside jury** of professionals and government officials



Sustainable/Green Design Grant

- The Winning Design



- Tags explain the sustainable features

Sustainable/Green Design Grant

- Model was displayed around the **state**
 - Home Shows
 - Government Buildings
 - Libraries
 - Malls
- On permanent display at county **permit center**



Next Steps



- Project made permanent part of ACH 212
- Looked at key courses to cover sustainable design
 - Required course in all options
- ACH 242 – Mechanical Electrical Systems

| ARCHITECTURE OPTION ARCHITECTURE/INTERIOR DESIGN CODE AAS.ACH.ARCH AAS Degree 2007-2008 | | | | |
|--|--|--|--|--|
| Credit Hours | First Year | | Second Year | |
| | Semester 1 | Semester 2 | Semester 3 | Semester 4 |
| Architecture 39 | *ACH 111 (4) Architectural Design 1 | ACH 112 (3) Architectural Design 2 | ACH 211 (3) Architectural Design 3 | ACH 212 (3) Architectural Design 4 Spring Semesters Only |
| Computer Science 3-4 | | | | ACH 220 (3) Construction Estimating for Design Spring Semesters Only |
| CAD 6 | | | | |
| English 6 | | | | |
| Health 3 | *ACH 121 (4) Architectural Material and Methods 1 | ACH 122 (3) Architectural Material and Methods 2 | ACH 240 (3) Construction Documentation | ACH 230 (3) Cost Estimating for Design Spring Semesters Only |
| Mathematics 4 | | | | |
| Science 4 | | | | |
| Soc/Beh/Div/Req 3 | | | | |
| Minimum 66 | CSI 112 (4) or CSI 113 (3) | ACH 245 (3) Computer Applications for Design | ACH 221 (3) Professional Practices Fall Semesters Only | PHY 111 (4) Fundamentals of Physics 1 |
| For more information, call the School of Business, Computing and Technical Studies Anne Arundel Community College 410.777.2442 | ACH 221 (3) History of Western Architecture 1 | ACH 222 (3) History of Western Architecture 2 | ACH 242 (3) Environmental Systems for Design Fall Semesters Only | SOC 111 (3) Intro to Sociology |
| | ENG 111 (3) Composition and Intro to Literature 1 | ENG 112 (3) Composition and Intro to Literature 2 | MAT 121 or MAT 151 or MAT 191 (4) | *ACH or ENT (3-4) Computer-Aided Design Elective |
| | | HEA (3) Approved Health Gen. Ed. Reqmt. | | |
| | 17-18 | 18 | 16 | 17-18 |

*ACH 111 and ACH 121 must be taken concurrently.
*ACH 250, ACH 255, ACH 256, ACH 287, ENT 242, ENT 243, ENT 249, ENT 250
Please refer to current college catalog for specific graduation requirements.

| CONSTRUCTION MANAGEMENT OPTION ARCHITECTURE/INTERIOR DESIGN CODE AAS.ACH.CSTN-MGMT AAS Degree 2007-2008 | | | | |
|--|--|--|--|--|
| Credit Hours | First Year | | Second Year | |
| | Semester 1 | Semester 2 | Semester 3 | Semester 4 |
| Architecture 26 | *ACH 111 (4) Architectural Design 1 | BPA 142 (3) Principles of Management | ACH 216 (3) Construction Management Fall Semesters Only | ACH 218 (3) Construction Operations Spring Semesters Only |
| Business 9 | | | | |
| Computer Science 6-7 | | | | |
| CAD 3 | | | | |
| English 9 | | | | |
| Health 3 | *ACH 121 (4) Architectural Material and Methods 1 | ACH 122 (3) Architectural Material and Methods 2 | ACH 219 (3) Construction Contract Administration | ACH 220 (3) Cost Estimating for Design Spring Semesters Only |
| Mathematics 4 | | | | |
| Physics 4 | | | | |
| Soc/Beh/Div/Req 3 | | | | |
| Minimum 66 | CSI 112 (4) or CSI 113 (3) | BPA 253 (3) Business Law 1 | ACH 242 (3) Environmental Systems for Design Fall Semesters Only | CSI 116 (3) Introduction to Project Management |
| For more information, call the School of Business, Computing and Technical Studies Anne Arundel Community College 410.777.2442 | ENG 111 (3) Composition and Intro to Literature 1 | ENG 112 (3) Composition and Intro to Literature 2 | BPA 162 (3) Business Communications | ECO 116 (3) Inside the Global Economy |
| | HEA (3) Approved Health Gen. Ed. Reqmt. | ACH 245 (3) Computer Applications for Design | MAT 121 or MAT 151 or MAT 191 (4) | PHY 111 (4) Fundamentals of Physics |
| | | COM 111 (3) Fundamentals of Oral Communication | | |
| | 17-18 | 15-18 | 16 | 16 |

*ACH 111 and ACH 121 must be taken concurrently.
*ACH 250, ACH 255, ACH 256, ACH 287, ENT 242, ENT 243, ENT 249, ENT 250
Please refer to current college catalog for specific graduation requirements.

| INTERIOR DESIGN OPTION ARCHITECTURE/INTERIOR DESIGN CODE AAS.ACH.INT-DSGN AAS Degree 2007-2008 | | | | |
|--|--|--|--|--|
| Credit Hours | First Year | | Second Year | |
| | Semester 1 | Semester 2 | Semester 3 | Semester 4 |
| Architecture 24 | ACH 101 (4) Introduction to Interior Design | ACH 102 (4) Interior Design 2 | ACH 201 (3) History of Interior Design Design Fall Semesters Only | ACH 202 (3) Space Planning Spring Semesters Only |
| Art 6 | | | | |
| Computer Science 3-4 | | | | |
| CAD 6 | | | | |
| English 6 | | | | |
| Health 3 | *ACH 111 (4) Architectural Design 1 | ACH 112 (3) Architectural Design 2 | ACH 245 (3) Computer Applications for Design | *ACH or ENT (3) Computer-Aided Design Elective |
| Mathematics 4 | | | | |
| Physics 3 | | | | |
| Soc/Beh/Div/Req 3 | | | | |
| Minimum 66 | *ACH 121 (4) Architectural Material and Methods 1 | ACH 244 (3) Interior Construction Drafting Spring Semesters Only | ACH 242 (3) Environmental Systems for Design Fall Semesters Only | PHY 120 (3) Sound and Light |
| For more information, call the School of Business, Computing and Technical Studies Anne Arundel Community College 410.777.2442 | ART 103 (3) Color | CSI 112 (4) or CSI 113 (3) | ACH 104 (3) Material and Methods for Interior Design 1 Fall Semesters Only | ART 100 (3) Fundamentals of Design |
| | ENG 111 (3) Composition and Intro to Literature 1 | ENG 112 (3) Composition and Intro to Literature 2 | MAT 121 or MAT 151 or MAT 191 (4) | HEA (3) Approved Health Gen. Ed. Reqmt. |
| | | | | SOC 111 (3) Intro to Sociology |
| | 18 | 16-17 | 16 | 18 |

*ACH 111 and ACH 121 must be taken concurrently.
*ACH 250, ACH 255, ACH 256, ACH 287, ENT 242, ENT 243, ENT 249, ENT 250
Please refer to current college catalog for specific graduation requirements.

Course Revision – ACH 242

- **Outdated** name and curriculum
- Researched **partner university** programs
- Changed name
 - “Mechanical and Electrical Systems” to
 - **“Environmental Systems for Design”**
- Completely revised outline to include the **LEED system**
- Recruited **LEED AP** (accredited professional) instructor

Course Revision – ACH 242

- Main Changes

| Old Outline | New Outline |
|--|---|
| <p>Main Topics:</p> <ul style="list-style-type: none"><input type="checkbox"/> Plumbing<input type="checkbox"/> Fire Suppression<input type="checkbox"/> Acoustics<input type="checkbox"/> Electricity<input type="checkbox"/> Lighting<input type="checkbox"/> HVAC | <p>Main Topics:</p> <ul style="list-style-type: none"><input type="checkbox"/> Introduction and Overview<input type="checkbox"/> Sustainable Sites<input type="checkbox"/> Water Efficiency<input type="checkbox"/> Energy and Atmosphere<input type="checkbox"/> Materials and Resources<input type="checkbox"/> Indoor Environmental Quality<input type="checkbox"/> Acoustics<input type="checkbox"/> Electricity<input type="checkbox"/> Fire Protection |

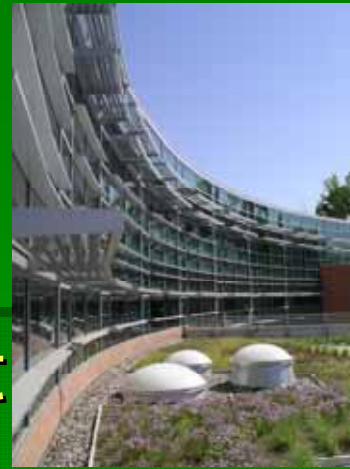
Facilities

- Center for Applied Learning and Technology
- 97,631 Square feet
- Home for college's **high technology** programs
 - Architecture and Interior Design
 - Computer Science/Information Systems
 - Engineering
- Designed to be a **learning tool**
- Designed under **LEED Certified** rating



Facilities

- Oriented on **east-west** axis
- Accommodates **existing grades**
- Continues **natural** amphitheatre
- **Native** vegetation
- **Sun shades** on south facing glass



Facilities

- Natural daylighting
 - Atrium
 - Clerestories and skylights
 - Internal glass for borrowed light
- Indirect lighting/reflective surfaces
 - Lights switched by independent banks
- Light sensors



Facilities

- Vegetated roof
- High efficiency boilers A/C units
- Automatic HVAC controls
- Automatic plumbing controls
- Recycled materials and finishes
 - Cork flooring



Next Steps

- Infusing sustainable design into **key courses** in other options
 - **Interior Design**
 - Studio Courses
 - Material and Methods Courses
 - New course in advanced certificate
 - **Construction Management**
 - Construction Management
 - Construction Administration
- Introduce in all **entry courses**



Recommendations

- Use Advisory Committees
- Partner with experts
- Provide training
- Pick pilot course/project
- Include as part of “gateway course”
- Infuse into specialized and entry courses
- Use actual examples



 Anne Arundel Community College

Architecture and Interior Design



***Our Students
are the
Successes of
Tomorrow***

www.aacc.edu/architecture