PURDUE UNIVERSITY
REQUEST FOR ADDITION, EXPIRATION,
OR REVISION OF AN UNDERGRADUATE COURSE
(10000-40000 LEVEL)

DEPARTMENT: MCET-195
EFFECTIVE SESSION: SPRING 2009

INSTRUCTIONS: Please check the items below which describe the purpose of this request.

- [ ] 1. New course with supporting documents
- [ ] 2. Add existing course offered at another campus
- [x] 3. Expiration of a course
- [ ] 4. Change in course number
- [ ] 5. Change in course title
- [ ] 6. Change in course credit type
- [ ] 7. Change in course attributes (department head signature only)
- [ ] 8. Change in instructional hours
- [ ] 9. Change in course description
- [ ] 10. Change in course requisites
- [ ] 11. Change in semesters offered (department head signature only)
- [ ] 12. Transfer from one department to another

PROPOSED:
Subject Abbreviation: ARET
Course Number: 223
Long Title: DIGITAL GRAPHICS FOR BUILT ENVIRONMENT II
Short Title: DIG GRAPH BLT ENVIR II

EXISTING:
Subject Abbreviation
Course Number

TERMS OFFERED
Check All That Apply:
- [x] Summer
- [x] Fall
- [x] Spring

CAMPUS(ES) INVOLVED
- Calumet
- Cont Ed
- N. Central
- Tech Statewide
- [x] Ft. Wayne
- [ ] Indianapolis
- W. Lafayette

CREDIT TYPE
1. Fixed Credit: Cr. Hrs.
2. Variable Credit Range: Minimum Cr. Hrs.
   (Check One) To      Or      Maximum Cr. Hrs.
3. Equivalent Credit: Yes No

COURSE ATTRIBUTES: Check All That Apply
1. Pass/Not Pass Only
2. Satisfactory/Unsatisfactory Only
3. Repeatable
4. Credit by Examination
5. Special Fees
6. Registration Approval Type
   - Department
   - Instructor
7. Variable Title
8. Honors
9. Full Time Privilege
10. Off Campus Experience

Schedule Type
- Lecture
- Recitation
- Presentation
- Laboratory
- Lab Prep
- Studio
- Distance
- Clinic
- Experiential
- Research
- Ind. Study
- Pract/Observ

Minutes Per Mtg.
Meetings Per Week
Weeks Offered
% of Credit Allocated

AN ADVANCED PRESENTATION OF DIGITAL GRAPHIC COMMUNICATION FOR THE ARCHITECTURAL, ENGINEERING, AND CONSTRUCTION (AEC) INDUSTRY.

Calumet Department Head ________________________________ Date 9/1/08
Calumet School Dean ________________________________ Date

Ft. Wayne Department Head ________________________________ Date
Ft. Wayne School Dean ________________________________ Date

Indianapolis Department Head ________________________________ Date
Indianapolis School Dean ________________________________ Date

North Central Department Head ________________________________ Date
North Central Chancellor ________________________________ Date

West Lafayette Department Head ________________________________ Date
West Lafayette College/School Dean ________________________________ Date

OFFICE OF THE REGISTRAR
From: Nancy Leinbach
To: Marshall, DJP
CC: Kowalenko, Sandra
Date: 9/25/2008 1:30 PM
Subject: New Course Number

Professor Marshall,
I checked with Purdue and course number ARET 223 has never been used for a Purdue course. Therefore, it is available at this time to be requested on a new course form (Purdue Form 40). These are available at http://www.ipfw.edu/vcaa/programs/curriculumdev.shtml.

Purdue no longer reserve course numbers because of their change to 5-digit course numbers at West Lafayette. For now, we will continue to request 3-digit numbers.

If I can be of further help, please let me know. I check for new course numbers and track courses in the approval process once they have been approved here at IPFW.

Nancy J. Leinbach, MPA, R.Ph.
Associate Registrar
Indiana University-Purdue University Fort Wayne
2101 E. Coliseum Boulevard
Fort Wayne IN 46805-1499
Kettler Hall 107
260-481-6097
fax: 260-481-6110

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SCHOOL OF ENGINEERING, TECHNOLOGY, AND COMPUTER SCIENCE (ETCS)
ASSEMBLY OF REPRESENTATIVES

ASSEMBLY OF REPRESENTATIVES DOCUMENT

Document No. ________
Date ____________

(Date sent forward)

To: Curriculum Committee
School of Engineering, Technology, and Computer Science

The Curriculum Committee for the Department of __________ M C E T
__________ submits the attached document entitled ______________ Revise Associate Degree Curriculum
Architecture Engineering Technology for your recommendation.

__________________ Chair

SEE ATTACHED TALLY

__________________

(Signature of all department committee members)

To: Assembly of Representatives

The Curriculum Committee of the School of Engineering, Technology, and Computer Science

__________ Recommends _________ Does not recommend

the approval of the attached document.

__________________ Chair

__________________

__________________

__________________

(Signature of all assembly committee members)

Assembly of Representatives Action

__________ Approved _________ Disapproved

__________________ Chair __________ Date

Dean, ETCS

__________ Approved _________ Disapproved

__________________ Dean __________ Date
Revised Associate Degree Curriculum
Architectural Engineering Technology

Background Information

The faculty of Architectural Engineering Technology recommends the following curriculum changes:

1. Remove ARET 282 – Environmental Equipment II from the ARET curriculum

   ABET accrediting policy does not require Design courses in the associates degree. This course is taught as a design course. With the retirement of the adjunct faculty member who has been teaching the course it seemed an appropriate time to get our curriculum in phase with our accrediting requirements.

2. Add ARET 223 – Digital Graphics for Built Environment II (new course) to the ARET curriculum and maintain the same number of credit hours.

   The ARET Advisory committee recently met and stressed the need for thorough training in CAD, AutoCAD specifically, since it is used ubiquitously in the profession. The ARET curriculum currently has only one such course, ARET 123, and the need for further CAD instruction is great. ARET 123 is to be renamed - Digital Graphics for Built Environment I

With these changes the curriculum more appropriately meets the TAC/ABET requirements for accreditation and the recommendations of our industrial advisory committee.

It is requested that the Assembly of Representatives approve the attached, effective Fall 2009 semester.
Substantiating Evidence

PROGRAM CRITERIA FOR
ARCHITECTURAL ENGINEERING TECHNOLOGY
AND SIMILARLY NAMED PROGRAMS
Lead Society: American Society of Civil Engineers

Applicability
These program criteria apply to engineering technology programs that include architectural and similar modifiers in their title.

Objective
An accreditable program in Architectural Engineering Technology will prepare graduates with the technical and managerial skills necessary to enter careers in the planning, design, construction, operation or maintenance of the built environment. Graduates of associate degree programs typically have strengths in their knowledge of the building, testing, operation, and maintenance of building systems with the ability to produce and utilize basic construction documents and perform basic analysis and design of systems components, whereas baccalaureate degree graduates are prepared to analyze and design systems, specify project methods and materials, perform cost estimates and analyses, and manage technical activities in support of architectural projects.

Outcomes
Associate degree programs must demonstrate that graduates are capable of:

a. employing concepts of architectural theory and design in a design environment;
b. utilizing modern instruments, methods and techniques to produce A/E documents and presentations;
c. conducting standardized field and laboratory testing on construction materials;
d. utilizing modern instruments and research techniques for site development and building layout;
e. determining forces and stresses in elementary structural systems;
f. estimating material quantities for technical projects;
g. calculating basic loads and demands in mechanical and electrical systems;
h. utilizing codes, contracts and specifications in design, construction and inspection activities; and
i. employing productivity software to solve technical problems;

Baccalaureate degree programs must demonstrate that graduates, in addition to the competencies above, are capable of:

a. creating, utilizing and presenting design, construction, and operations documents;
b. performing economic analyses and cost estimates related to design, construction, and maintenance of building systems in the architectural engineering technical specialties;
c. selecting appropriate materials and practices for building construction;
d. applying principles of construction law and ethics in architectural practice;
e. applying basic technical design concepts to the solution of architectural problems involving architectural history, theory and design; codes, contracts and specifications; electrical and mechanical systems, environmental control systems, plumbing and fire protection; site development; structures, material behavior, foundations; construction administration, planning and scheduling; and
f. performing standard analysis and design in at least one recognized technical specialty within architectural engineering technology that is appropriate to the goals of the program.
### SCHEDULE & SYLLABUS

**ARCHITECTURAL ENGINEERING TECHNOLOGY**

**SPRING 2008 -- Wed/Fri**

**ARET 223 – Digital Graphics for Built Environment II**
Professor Marshall – 221d ETCS Bldg – 260.481.6577 – marshall@ipfw.edu

<table>
<thead>
<tr>
<th>JAN</th>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>16</td>
<td></td>
<td>Syllabus and Schedule, Data collection, Equipment check</td>
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<tr>
<td>18</td>
<td></td>
<td>AutoCAD Basics review (Floor Plan Project)</td>
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<td>23</td>
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<td>Review of 3d AutoCAD Basics (Extrude Floor Plan Project)</td>
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<tr>
<td>25</td>
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<td>Understanding Rendering</td>
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<td>Rendering consultation and project</td>
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<td>6</td>
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<td>Views consultation and project</td>
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<td>13</td>
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<td>Animated Walk-thru</td>
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<td>15</td>
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<td>Walk thru consulting and project</td>
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<tr>
<td>20</td>
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<td>Rendering Interiors</td>
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<td>22</td>
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<td>Free Day – ALL projects up to and including Video review I MUST be handed in</td>
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<tr>
<td>23</td>
<td></td>
<td>Photoshop Essentials</td>
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<tr>
<td>27</td>
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<td>Essentials of Images and project</td>
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<td>Setting color consulting and project</td>
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<td>Tonal Correction</td>
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<td>12</td>
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<td>Correction consulting and project</td>
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<td>14</td>
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<td>19</td>
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<tr>
<td>21</td>
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<td>Line Art</td>
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<td>26</td>
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<td>Consulting on line art and projects</td>
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<td>28</td>
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<td>LAST DAY TO WITHDRAW - Image Capture</td>
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<tr>
<td>29</td>
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<td>Capture consultation and project</td>
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<td>Sketchup Introduction</td>
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<td>Modeling Setup</td>
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<td>Setup consultation and project</td>
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<td>11</td>
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<td>Viewing the Model</td>
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<td>16</td>
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<td>3d Warehouse</td>
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<td>Warehouse consultation and project</td>
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<td>Exporting Images</td>
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<td>23</td>
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<td>Image exporting consultation and project</td>
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<td>25</td>
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<td>Presentation Documents</td>
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<td>Document consultation and project</td>
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<tr>
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<td>Work on Projects</td>
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<td>3</td>
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<td>Work on Projects</td>
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<tr>
<td>8</td>
<td></td>
<td>Projects Submission Deadline – Thursday 5:00pm Finals Week</td>
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COURSE OUTLINE

Title and Course Number: ENVIRONMENTAL EQUIPMENT FOR BUILDINGS I
ARET 281

Credits and Contact Hours:
3 Credits
Classroom Lecture - 3 hours per week

Course Description:

Pre-requisites and Co-requisites:
An understanding of basic building design and construction methods and details.
Geometry, Algebra, and Trigonometry

Textbook:
Benjamin Stein & John S. Reynolds, Mechanical and Electrical Equipment for Buildings, 8th Edition (John Wiley and Sons, Inc.)

References:
NFPA Standards, UMC, UPC, NEC and Local Codes and Ordinances

Coordinator:
Mathew Kubik

Goals/ Objectives:
To introduce the students to the basic requirements of HVAC, plumbing, electrical and lighting system design, including preliminary calculations, code requirements, suitable materials and proper layout design and to insure an understanding of the system space requirements within the facility.

Course Topics and Hours Devoted to Each:

**TOPICS**                  **HOURS**
Introduction to Class       1.5 Class Hours
Energy Sources
Historical Use, Waste, Abuse & Shortages Energy
Use in Construction & Facility Operation
Future Trends
Thermal Comfort
- Age, Clothing, Ambient Conditions & Climates
Building Envelopes
Site & Resources
- Climates, Geographical Location, Solar, Sound, Barriers, Landscaping
Heat Flow
Heating & Cooling Calculations
- Construction / Heat Transfer, Solar Gain, Internal Loads, Latent Load
HVAC Systems
- Passive Heating & Cooling
- Direct Heating & Cooling
Water Distribution Design 3 Class Hours
- Bernoulli’s Equation, Water Consumption, Water Supply Distribution Piping Design, Fixture Selection
Waste System Design 3 Class Hours
Rain Water Piping Design, Water Collection, Waste Piping Design, Waste Treatment

MID-TERM EXAM 1.5 Class Hours

Principles of Electricity 3 Class Hours
Units & Terms, Circuit Types, Power Calculations, Electrical Demand

Electrical Wiring 3 Class Hours
Types and Sizes of Conductors
Types and Sizes of Conduits
Electrical Systems
Service Entrance, Standard Voltages, Switches, Circuit Protection

Electrical Wiring Design 6 Class Hours

Illumination 4.5 Class Hours
Physics of Lighting, General Illumination Levels, General vs. Task Lighting, Light Sources, Natural vs. Artificial Lighting, Lamp Types & Characteristics

Lighting System Design 3 Class Hours
Lighting System Analysis, Selection of Light Fixtures, Illumination Calculation Methods (Zonal Cavity Method and Point to Point Method)

Lighting Applications 3 Class Hours
Lighting Controls, Residential Lighting, Educational Facility Lighting, Commercial Facility Lighting, Exterior Lighting

FINAL EXAM 2 Class Hours

Computer Usage:
Calculations in this class (heat loss, heat gain, pipe sizing, pressure loss, etc.) are performed without computers to develop the students understanding of the methodology of the calculations.

Laboratory Projects:
None

Oral and Written Communication Requirements:
Oral class participation is expected. Calculations are assigned. No written assignments are required.

Calculus Usage:
None

Library Usage
None

Prepared By:
Joe Wilhelm
ARET 282
ENVIRONMENTAL EQUIPMENT FOR BUILDINGS II
SPRING 2008

Instructor: Joe Wilhelm
Home Phone: 260-347-8452
Office Phone: 260422-7994

Location / Time:
Lab - Tuesday 6:00 – 8:50 pm ET 241
Lecture - Thursday 7:00 – 8:50 pm ET 241

ASSIGNMENT DUE DATES:

Project No. 1 - Residence

<table>
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<tr>
<th>Date</th>
<th>Assignment</th>
<th>Reference</th>
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<tbody>
<tr>
<td>January 31</td>
<td>Plumbing System</td>
<td>Chapter 20 - 23</td>
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<tr>
<td>February 12</td>
<td>HVAC System</td>
<td>Chapter 4 - 10</td>
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<tr>
<td>February 19</td>
<td>Electrical System</td>
<td>Chapter 25 - 29</td>
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<tr>
<td>February 26</td>
<td>Utility Site Plan</td>
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Project No. 2 - Commercial Building

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<tr>
<th>Date</th>
<th>Assignment</th>
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<tr>
<td>March 27</td>
<td>Plumbing System</td>
<td>Chapter 20 - 23</td>
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<tr>
<td>April 10</td>
<td>HVAC System</td>
<td>Chapter 4 - 10</td>
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<tr>
<td>April 24</td>
<td>Lighting &amp; Electrical Power Systems</td>
<td>Chapter 11 – 16 &amp; 25 - 29</td>
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<tr>
<td>April 29</td>
<td>Fire Protection System &amp; Utility Site Plan</td>
<td>Chapter 3 &amp; 24</td>
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GRADING

Mid-term Exam 20% (Feb. 28, 2008)
Final Exam 20% (May 6, 2008 5:45 PM)
Project I 25%
Project II 25%
Attendance & Attitude 10%

Note
In an effort to conserve department funds and to extend the life of the large plotter, the use of the large plotter will be restricted. All preliminary plotting shall be done on the small paper printer (11" x 17"). Only the final plotting of submission drawings will be on 24" x 36" paper.

The assigned due dates are final. If you wait until the due date to plot, you may find that the system is backlogged and you can not meet the deadline. Also, the system does break down occasionally. These are not excuses for missing the deadline. Complete your drawings early and get the plotting completed before the deadline date so that if there is difficulty, you have time to recover.
### MCET Departmental Voting Tally Sheet

**Subject:** ARET CURRICULUM CHANGES

**Question:** ADD DROP ARET 282

---

Signatures or attached email responses shall constitute a valid vote.

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1. Albayari, Jihed</td>
<td>YES NO</td>
</tr>
<tr>
<td>2. Ding, Suining</td>
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</tr>
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<td>3. Dupen, Barry</td>
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<td>4. Franke, Bruce</td>
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<td>5. Kubik, Matthew</td>
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<tr>
<td>6. Leffers, Regina</td>
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<tr>
<td>7. Liang, &quot;Wilson&quot;</td>
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<tr>
<td>8. Marshall, DJ</td>
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<td>9. Narang, Ramesh</td>
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<tr>
<td>10. Nepal, Bimal</td>
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<tr>
<td>11. Pablo, Reynaldo</td>
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<td>12. Perry, Kenneth</td>
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<tr>
<td>13. Pugh, Al</td>
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<tr>
<td>14. Fruchey, Mike</td>
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</table>
To: ALL students currently in the ARET associate degree program

Date: October 13, 2008

You may have noticed that ARET 282 – Environmental Equipment for Buildings II is NOT being offered in the Spring 2009 semester. The reason is because it has been removed from the curriculum and will be replaced by ARET 223 – Digital Graphics for the Built Environment, which will be the required class for all students starting the program in the Spring 2009 semester.

For all of you students currently enrolled in the ARET program you will be allowed to substitute a technical elective such as:

CET 253 – Hydraulics and Drainage

CNET 290 – Experience in Construction

INTR 241 – Light and Color

VCD P273 -- Computer Art and Design I

Other courses can substitute with the approval of the ARET program chair (Prof. Marshall) and the department Chair (Prof. Albayyari). Please see me with any questions.

Professor Marshall

ARET program coordinator

221d ETCS Bldg – 481.6577

marshald@ipfw.edu