### Specific Courses for Engineering Careers- UMASS transfers (rev 4/9/13)

**Overall Notes:**
1. Charts below are set up to allow students to transfer with 2 years of classes, preserving pre-req needed to continue seamlessly as juniors; note however, sometimes the order of the classes is <> UMass’ order to allow more classes to be taken at GCC.
2. These specific courses are not needed for GCC Associates degree, but will be required for UMASS. Other Institutions will have similar but not identical requirements. See the program guide for your transfer institution and work with your advisor in selecting courses. UM courses require registration at UMass for that semester and are limited to 3 courses per semester.
3. EGR 107 or EGR 105 is accepted as Intro to Engineering for all except EE and CSE.
4. **Classes bolded** must be taken elsewhere while at GCC to start as a Junior after transfer to U-Mass.

#### Mechanical Engineering

**Fall - Freshman year**
- Calculus 1 (GCC MAT201)
- Engineering Orientation (EGR 105)
- Chemistry (CHE 111)

**Spring Freshman year**
- Calculus II (MAT202)
- Computer Programming (EGR 107)
- Statics (EGR 105)

**Fall - Sophomore year**
- English Comp 1 (ENG 101,103,105)
- English Comp 2 (ENG 112,114,116)
- Linear Algebra (MAT 205 or UM MAT235)
- Differential Equations (MAT 204 or UM MAT331)
- Discrete Structures (CIS 201 or UM MAT 455 or UM CMPSCI 250)

**Spring Sophomore year**
- Economics  (ECO 101 or 102)
- Systems Appreciation (UM ECE 197SA -1 cr--optional)
- Circuit Analysis and Design (UM ECE232)
- Probability & Stats (EGR 213, HCCMTH 245, or UM MIE273/CEE260)
- Circuits II (EGR212;HCC EGR223;UM ECE211)

**Fall - Sophomore year**
- Liberal Arts elective
- Data Structures (CIS 254 or UM ECE242)
- Multivariate Calculus (MAT 203)

**Spring Sophomore year**
- Liberal Arts elective
- Systems Appreciation( UM ECE 197SA -1 cr--optional)
- Discrete Structures (CIS 201 or UM MAT 455 or UM CMPSCI 250)

#### Electrical Engineering

**Fall - Freshman year**
- Physics with Calculus I ( PHY 111)
- Calculus 1 (MAT201)
- English Comp 1 (ENG 101,103,105)

**Spring Freshman year**
- Physics with Calculus II ( PHY 112)
- Calculus II (MAT202)
- Systems Appreciation( UM ECE 197SA -1 cr--optional)
- Statics (EGR 205 or UM MIE210 or UM CEE 240)

**Fall - Sophomore year**
- Engineering Graphics I (EGR 107)
- Linear Algebra (MAT 205 or UM MAT235)
- Statics (EGR 205 or UM MIE210 or UM CEE 240)

**Spring Sophomore year**
- Computer Programming (CIS 150, CIS251, CIS252, or UM MIE124)
- Differential Equations (MAT 204)
- Probability & Stats (EGR 213, HCCMTH 245, or UM MIE273/CEE260)

#### Computer Systems Engineering

**Fall - Freshman year**
- Physics with Calculus I ( PHY 111)
- Calculus 1 (MAT201)
- Engineering Comp 1 (ENG 101,103,105)

**Spring Freshman year**
- Physics with Calculus II ( PHY 112)
- Calculus II (MAT202)
- Systems Appreciation( UM ECE 197SA -1 cr--optional)
- Statics (EGR 205 or UM MIE210 or UM CEE 240)

**Fall - Sophomore year**
- Liberal Arts elective
- Data Structures (CIS 254 or UM ECE242)
- Multivariate Calculus (MAT 203)

**Spring Sophomore year**
- Liberal Arts elective
- Systems Appreciation( UM ECE 197SA -1 cr--optional)
- Discrete Structures (CIS 201 or UM MAT 455 or UM CMPSCI 250)

**Fall - Freshman year**
- Calculus 1 (MAT 202)
- Linear Algebra (MAT 205 or UM MAT235)
- Linear Algebra ( MAT  205 or UM MAT235)

**Spring Freshman year**
- Differential Equations (GCC MAT 204 or UM MAT331)
- Differential Equations (GCC MAT 204 or UM MAT331)
- Discrete Structures (CIS 201 or UM MAT 455 or UM CMPSCI 250)

**Fall - Freshman year**
- Engineering Graphics I (EGR 107)
- Linear Algebra (MAT 205 or UM MAT235)
- Linear Algebra (MAT 205 or UM MAT235)

**Spring Freshman year**
- Computer Programming (CIS 150, CIS251, CIS252, or UM MIE124)
- Differential Equations (MAT 204)
- Probability & Stats (EGR 213, HCCMTH 245, or UM MIE273/CEE260)

**Fall - Sophomore year**
- Calculus 2 (ENG 112,114,116)
- Linear Algebra (MAT 205 or UM MAT235)

**Spring Sophomore year**
- Calculus II (MAT 202)
- Systems Appreciation( UM ECE 197SA -1 cr--optional)
- Discrete Structures (CIS 201 or UM MAT 455 or UM CMPSCI 250)

**Fall - Sophomore year**
- Differential Equations (MAT 204)
- Probability & Stats (EGR 213, HCCMTH 245, or UM MIE273/CEE260)
- Circuits II (EGR212;HCC EGR223;UM ECE211)

**Spring Sophomore year**
- Liberal Arts elective
- Systems Appreciation (UM ECE 197SA -1 cr--optional)
- Discrete Structures (CIS 201 or UM MAT 455 or UM CMPSCI 250)

### ME Advising Notes:
MEs will be 1 class ahead of their UM counterparts; could leave out dynamics (OK w/ prereq).
If student has extra time, take a biological science (required for all), or linear algebra or chemistry II (which both count MIE electives).
EGR 107 does not count for ME at UMass.
Computer programming not used to fulfill MIE 124 requirement may or may not count as a tech elective depending on what else the student takes.

Note: GCC EGR206 students make up a 1 credit lab when they get to U-Mass to complete Strength of Mat’l. Material Science (UM MIE 201) is required before transfer only for students arriving at UM in Spring---otherwise the pre-reqs & offerings S/F at UM work out that this class does not need to be taken pre-transfer.

EGR209 or UM MIE 310 Dynamics is req’d for MEs but not to start as a Junior---should take if have opportunity...
**Chemical Engineering**

**Fall - Freshman year**
- Physics with Calculus I (PHY111)
- Chemistry (CHE112)
- Calculus I (MAT201)
- English Comp 1 (ENG 101,103,105)
- Engineering Orientation (EGR 105)
- Economics (ECO 101 or 102)

**Spring Freshman year**
- Chemistry II (CHE112)
- Calculus II (MAT 202)
- Physics II (PHY 112)
- Liberal Arts elective

**Fall - Sophomore year**
- Liberal Arts elective
- Multivariate Calculus (MAT 203)
- Organic Chem I (CHE 201 or UM CHEM261)
- English Comp 2 (ENG 112,114,116)
- Computers (CIS140, 150, 251, or 252)

**Spring Sophomore year**
- Organic Chem II (CHE 202 or UM CHEM262 and Lab 269)
- Math elective (MAT 204)
- Engineering Graphics (EGR 107)
- Biology (BIO 126 or UM BIO 100)(opt)

**CHE Advising Notes:**
- Professional Seminar (UM CHE 291A): 1 cr is generally done Fall sophomore year, but can wait until they’re at UM.
- Any 1 computer programming class is accepted as a CHE elective.

**Civil & Environmental Engineering**

**Fall - Freshman year**
- Physics with Calculus I (PHY111)
- Chemistry (CHE111)
- Calculus I (MAT201)
- English Comp 1 (ENG 101,103,105)
- Engineering Orientation (EGR 105)
- Microeconomics (ECO 102)

**Spring Freshman year**
- Chemistry II (CHE112)
- Calculus II (MAT 202)
- Physics with Calculus II (PHY 112)
- Statics (EGR 205 or UMCEE240)
- Biological Science (BIO 126 or any 4 credit Bio designation)(opt)

**Civil & Environmental Engineering**

**Fall - Sophomore year**
- Multivariate Calculus (MAT 203)
- Strength of Materials (EGR206/UMCEE 241)
- CIS 150 programming (CIS 251or252 also OK)
- Statics (EGR 205 or UM MIE210 or UM CEE240)

**Spring Sophomore year**
- Engineering Graphics I (EGR 107)
- Math elective (MAT 204)
- Liberal Arts elective
- Thermodynamics (EGR210; UM CEE 250; UM MIE 230; HCC EGR 250)

**CEE Advising Notes:**
- EGR 107 or computer programming is used as an elective for CEs (not both).
- UM soph take CEE 270 systems analysis, but GCC grads are req to take more social and tech electives that put them ahead of UM students and open slots for CEE 270 etc later. Does not delay progress.
- UM CEE 121 is spring only (and is a prereq only for UM Strength of Mat’l but not GCC’s Str of Mat’l). CEE 121 is the only class CE majors need to take at UM, and can wait until they transfer.
- Dynamics (EGR 209) counts as a “free elective” at UM Mass. Other classes would also count.
- Biological science is optional---can be taken anytime at UM.
- Prob/Stats EGR 213 is not a pre-req to be a junior, but it is a co-req for a Fall junior class (CE310)

**Industrial Engineering**

**Fall - Freshman year**
- Physics with Calculus I (PHY 111)
- Calculus I (MAT201)
- English Comp 1 (ENG 101,103,105)
- Engineering Orientation (EGR 105)
- CIS 150 programming (optional; see below)

**Spring Freshman year**
- Engineering Graphics I (EGR 107)
- Math elective (MAT 204)
- Liberal Arts elective
- Statics (EGR 205 or UM MIE210 or UM CEE240)

**IE Advising Notes:**
- IEs take Macro (not Micro) economics; offered F and S at GCC.
- Computer programming may be an elective for IEs at UM---depends what else is taken.
- EGR 107 is not an elective for IEs at UM.

**Fall - Sophomore year**
- Chemistry (CHE 111)
- Multivariate Calculus (MAT 203)
- Strength of Materials (EGR206/UM MIE211)(opt-see note)
- English Comp 2 (ENG 112,114,116)
- Linear Algebra (MAT 205)

**Spring Sophomore year**
- Engineering Graphics I (EGR 107)
- Math elective (MAT 204 or UM MATH 331)
- Computer programming (CIS 251 or 252 or UM MIE 124)(opt)
- Statics (EGR 205 or UM MIE210 or UM CEE240)
- Liberal Arts elective

**IE Advising Notes:**
- IEs take Macro (not Micro) economics; offered F and S at GCC.
- Computer programming may be an elective for IEs at UM---depends what else is taken.
- EGR 107 is not an elective for IEs at UM.
- CIS 150 computer programming is optional if the student has extensive programming experience.
- UM MIE 201 is fall only & needs to be taken only if student transfers in Spring to UM; otherwise prerequisites work.
- UM soph take MIE 353 engr econ, MIE 273 prob&stats, and MIE 460 human factors. This string is replaced by free elective (computer programming), differential eqs, and a social world elective so no time is lost; prerequisites OK.

**The process for GCC students taking courses at UMASS in Eng’g:**

1. Get a copy of instructor permission forms from your GCC engineering advisor.
2. Go to financial aid at GCC and get the consortium agreement and instructions.
3. For the instructor permission form, contact the instructor and ask permission to enter the class.
4. Get the form signed by the Instructor or an email confirming it's OK---be polite---call them "Professor__".
5. Go to UMASS - Continuing Ed Office (100 Venture Way In Hadley, not really on the UMASS campus) the day before classes start or the first day of classes, turn in the form signed or with a copy of the email giving permission, and sign up for the classes.

Note that you will be billed via your UMass email account---you get a UM email when you register.

6. Note that any UMASS math classes can be signed up directly with Continuing Ed - no instructor approval req,
unless the course is full, in which case, you will need instructor approval for overload.
7. Do not forget to get your consortium agreement signed/filled out according to instructions from financial aid