

# Engineering Residential Initiative and Cornerstone Engineering

Tom Wolff  
College Faculty Meeting  
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# Vision

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- ... connect freshmen to seniors,
- ... freshmen to early team project experiences,
- ... students to the profession,
- ... and all to a “sense of place.”

# Components

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As a significant step beyond the current ROSES program, it might include

- dedicated student housing,
- on-site project-based freshman engineering experiences,
- classrooms,
- offices for faculty, staff and advisors,
- computing and shop facilities,
- study lounges,
- tutoring help rooms, and
- space for student organizations.

# Residents

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- Engineering freshmen would be strongly encouraged to live in the same hall
- Sophomores are expected to remain in significant numbers.
- Juniors and seniors who leave the residence hall would still gravitate there as a meeting place.
- Seniors would be hired as instructional aides to mentor freshman teams.

# Synergy

Combine

- an **early engineering program** (increasingly common at top engineering schools)
- with a **residential living-learning program** (for which MSU is already renowned)

...to strongly improve both MSU's ability to recruit against top engineering schools and our ability to graduate engineers with the skills now demanded by the profession.

These include a combination of technical, teamwork, social and communications skills as described in the "**Engineer of 2020**" initiatives.

# Planning Team

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- Brad Marks, BAE
- Neeraj Buch, CEE
- Daina Briedis, ChEMS
- Greg Wierzba, ECE
- Jon Sticklen, CSE
- Tim Hinds, ME
- Tom Wolff, UGS
- Les Leone AES / UGS
- Sean Fochtman, ROSES / UGS
- Wendy Booth, UGS statistical analyst
- Cindy Helman, MSU Res Life



# Program Goals

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- Value-Added Goal (Overarching)
  - Prepare engineers who
    - graduate with “added value” over mainstream engineering graduates, and
    - are talented “individuals,” beyond a specific curriculum skill set.

# Program Goals

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- Learning Goals

- Engage students in their learning, through cross-disciplinary teamwork
- Develop strong disciplinary problem solvers, grounded in math, science and computational modeling
- Develop understanding of the profession, including ethics
- Develop communications skills



# Program Goals

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- Engagement Goals
  - Hands on experiences
  - Student / Faculty interaction
  - Engagement in research or inquiry
  - Meaningful co-curricular experiences connected to academics
  - Strong sense of community

# Program Goals

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- Pedagogy Goals (faculty and staff)
  - Encourage, emphasize and undertake pedagogical research
  - Implement the findings in the program

# Draft Curriculum

## Early Engineering First Draft -- Sample Programs for discussion – Draft 2

### First Year – Start in Math 132

Fall	Credits	Spring	Credits
ISS 2xx	4	WRA 1XX	4
CEM 141/151	4	MTH 133	4
CEM 161	1	<b>EGR 103 Modeling</b>	<b>3 (1-3)</b>
<b>EGR 101 Project</b>	<b>3 (1-4)</b>	<b>Intro course in discipline</b> or Bioscience	<b>3/4</b>
<b>EGR 102 Engineering Profession (fall)</b>	<b>1</b>		
MTH 132	3		
<b>Total</b>	<b>16</b>	<b>Total</b>	<b>14/15</b>

Admissible to college at end of first year if we eliminate requirement for PHY 183

### Second Year – Starting in Math 132

Fall	Credits	Spring	Credits
IAH 20x	4	MTH 235	3
MTH 234	4	PHY 184	4
PHY 183	4	Course in discipline or <b>elective</b>	3 / 4
Course in discipline or elective	3/4	Bioscience or course in discipline	3 / 4
			<b>Va</b>
<b>Total</b>	<b>15/16</b>	<b>Total</b>	<b>16/Va</b>