

### Engineering Session Notes

#### Disciplinary Sector Leaders

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Prior to the start of the session Elena Quiroz-Livanis (Special Assistant to the Commissioner and Director of Postsecondary Success Strategies) identified two questions/goals to help frame the meeting's direction.

1. What are the foundational courses for the Engineering Pathway?
2. At what point should a community college student transfer? Is it prior to earning the associate's?

The morning time block was consumed with the identification and discussion of the foundational courses. Foundational courses, in this discipline, should be thought of as non-engineering courses that a

student needs to master to be successful within any engineering (including computer science) discipline. Ideally these courses should be taken during the first 60 credits of a student’s plan of studies and thus should be part any engineering associate and/or bachelor's degree. Eleven courses and the specific credit requirements were identified. A strong consensus appeared to be held by all attendees.

Foundational Courses (39 credits)

- Calculus I (4 credits)
- Calculus II (4 credits)
- Calculus III (4 credits)
- Differential Equations (3 credits)
- Physics I + lab (Calculus-based - 4 credits)
- Physics II + lab (Calculus-based including electromagnetism – 4 credits)
- Chemistry I + lab or Biology I +Lab (4 credits)
- Two courses – English/Composition courses (6 credits)
- Two courses – Humanities/Fine Arts and Behavioral/Social Sciences (6 credits)

In the afternoon, the discussion turned to the engineering discipline specific skills and courses that should be acquired in the first 60 credits of a student’s plan of studies. An initial matrix was constructed for the following five disciplines: Chemical, Civil, Electrical (includes CS), Mechanical, and Biomedical. There was general agreement to the matrix’s intent and consensus that if the students were going to earn their associate degree prior to transfer, the remaining 21 credits should be focused on engineering electives.

	<b>Chemical</b>	<b>Civil</b>	<b>Electrical</b>	<b>Mechanical</b>	<b>Biomedical</b>
Computer based analysis skills	x	x	x	x	x
Programming skills	x	x	x	x	x
CAD (3D) skills	x	x (2 and 3D)	x	x (2 and 3D)	
Specialized math course	x	x	x	x	x
Statics	x	x		x	x
Strength of Materials		x		x	x
Dynamics		x		x	
Thermodynamics	x	x		x	
Materials Science		x		x	
Chemistry II or Biology II	x	x		x	x
Organic Chemistry I	x				x
Organic Chemistry II	x				x
Physics III				x	
Circuit Theory I and II	x		x	x	
Digital Logic			x		
Manufacturing				x	
Surveying		x			
Geomatics		x			

The afternoon discussion also addressed the question of when should a student transfer. In the meeting Elena stated that the Board of Higher Education is going to consider a motion to implement a statewide reverse transfer agreement. If this gets implemented it will allow community colleges to confer degrees to students who transferred to public four-year institutions prior to earning the associate's.

The topic morphed to a discussion regarding the developmental needs of many engineering students. For these students, the timeline to 4-year graduation might be five to six years.