Major Highlights

Program Dashboard

Credit Hour Trends

Degree Trends

Occupational Projections

Sun Set proposal

CRC Recommendations

Follow up

To: Sally Hanna, Dean
Highland Lakes

From: Martin A. Orlowski, Director
Office of Assessment & Effectiveness

Date: November 9, 2006

Subject: Pre-Engineering Program

Per your request I've prepared the attached documents pertaining to the Pre-Engineering program. These documents include:

- 2005-06 Program Dashboard
- EGR Credit Hour Trends (1981-02 to 2004-05)
- EGR Degree Trends (1987-88 to 2004-05)
- Occupational Projections in Engineering Related Fields (2005 – 2015)

I offer the following analysis and observations based on these reports:

- During 2005-06 the Pre-Engineering program had a Program Dashboard composite score of 7.48 placing it 94th out of 103 curriculum offerings. This low ranking has prevailed over the past several years.
- Notably, three of the seven program dashboard measures were at or below established benchmarks (red zone). There is a lack of student demand in relation to the number of sections offered and seats available. Furthermore, EGR courses have a relatively high withdrawal rate e.g. exceeding the college-wide average for the past three consecutive years. This may suggest a need to review current pre-requisites and the potential of developing necessary student support services.
- Meanwhile, one measure (percent of minority students) exceeded the established benchmark.
- Enrollment in EGR courses peaked during academic year 1996-97. Since then, credit hours have fallen by nearly fifty percent.
- During 2005-06 credit hours generated in EGR courses placed it as the 75th largest curriculum out of 103 distinct areas at OCC.
- Over the five year period 2000-01 to 2004-05, 43 students graduated from the Pre-Engineering program.
- Among all programs which grant an Associates Degree, Pre-Engineering ranked 33rd largest at OCC during 2004-05 (8 degrees).

- Generally, occupational projections within a variety of engineering related fields have a positive outlook over the next ten years in Southeast Michigan. Potential employment opportunities are expected to result from both real job growth as well as from the need to replace current workers. This applies to both upper level as well as "technician" occupations.

There are a number of direct and indirect as well as internal and external factors impacting the viability of the Pre-Engineering program. These include:

- Current economic conditions
- Competition from other post-secondary institutions
- Student/community awareness of curricular offerings
- Packaging of the current program
- Methods and location of course offerings
- Focus and content of the curriculum in relation to occupational and advanced degree requirements, etc.

If you would like to discuss the information presented in these reports or would like to pursue additional avenues as outlined above, please feel free to contact me at 3882.

pc: Steve Reif, Interim Vice-Chancellor
Gordon May, President, Highland Lakes

Attachments:
2005-06 Program Dashboard Report
Credit Hour Trends
Degree Trends
Occupational Projections and SOC Descriptions (2005 – 2015)

Fact Sheet
Syed Hussain

Hired as Pre-Engineering Instructor Fall 1990 on an annual contract .
College wide appointment

91-92 Second annual contract

Summer 91 Supplement K for Program Development

Short .5 hours Spring 91

Fall 91 3 ICHs release for program review

92-93 Probationary contract awarded

Spring 92 short .5 ICH

93-94 Probationary contract awarded

Spring 93 Short .5 ICH

94-95 Continuing contract

Spring 94 short .5 ICH

Spring 95 short .5 ICH

Note often classes allowed to go with less than 15 students to "grow" program.
See note on loadsheets for Spring '96, Winter 98

Workforce Dev. Courses used to make load Fall 98, F99, W00, Sp01,

Spring 99 3 ICH release time to modify Eng 204 lab experiments and manual

Spring 00 short 1 ICH

W01 short 1ICH

W01 4 ICH release to coordinate curriculum review process for Eng. , need to make base load.

Spring 01 short base load

W 05 less than 15 students allowed to go to make load.

S05 less than 15 students/offered 1X per year

F05 short I ICH for load

W06 short 2 ICH for load

SI06 short 3 ICH for load

F06 short 2 ICH for load class allowed to go with low enrollment.

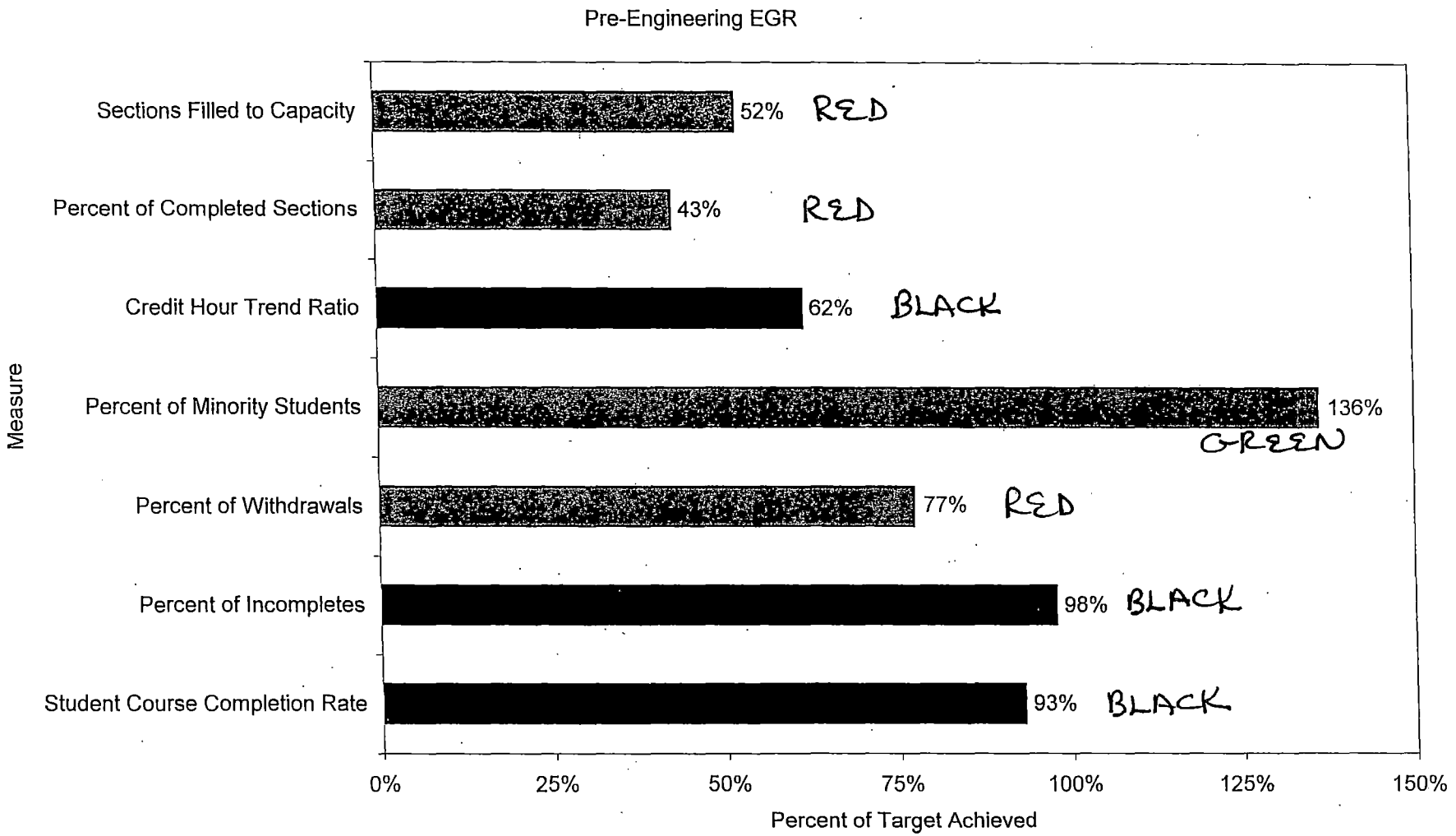
Oakland Community College
Program Dashboard Report
2005-06

Pre-Engineering EGR
Dashboard Score: 7.48

Measures	Current Score	Benchmarks: Trouble Score	Benchmarks: Target	Percent of Target Achieved	Weight	Weighted Score
Sections Filled to Capacity	47.0%	75.0%	90.0%	52.2%	18.0%	0.94
Percent of Completed Sections	38.5%	75.0%	90.0%	42.8%	14.2%	0.61
Credit Hour Trend Ratio	0.77	0.71	1.25	61.6%	15.3%	0.94
Percent of Minority Students	25.6%	16.9%	18.8%	136.2%	6.1%	0.83
Percent of Withdrawals	22.7%	15.0%	0.0%	77.3%	12.0%	0.93
Percent of Incompletes	2.3%	3.0%	0.0%	97.7%	7.9%	0.77
Student Course Completion Rate	69.7%	60.0%	75.0%	92.9%	26.5%	2.46

Source: Office of Assessment and Effectiveness
Updated On: 11/9/2006

Oakland Community College
Percent of Target Achieved
2005-06



Source: Office of Assessment and Effectiveness
Updated On: 11/9/2006

Program Dashboard
Detail Report

Prefix EGR
Title Pre-Engineering

	Program			College Wide
	2005-06	**2004-05**	**2003-04**	**2005-06**
Sections Filled to Capacity	47.0%	45.3%	48.6%	83.2%
Percent of Completed Sections	38.5%	60.9%	88.9%	86.6%
Headcount Trend Ratio	0.79	0.86	1.06	1.02
Credit Hour Trend Ratio	0.77	0.87	1.06	1.02
Percent of Minority Students	25.6%	31.2%	27.1%	27.9%
Percent of Withdrawals	22.7%	25.7%	35.1%	17.8%
Percent of Incompletes	2.3%	0.0%	0.6%	1.6%
Student Course Completion Rate	69.7%	72.1%	36.4%	68.2%
Dashboard Score	7.48	8.14	7.36	

Sections Filled to Capacity

Prefix EGR

Prefix Title Pre-Engineering

	2005-06	2004-05	2003-04
Total Students	133	136	244
Total Capacity	283	300	502
Sections Filled To Capacity	47.0%	45.3%	48.6%

Definition:

The percent of all available seats which are filled on the terms official census date. Time Frame: Academic Year (Summer II, Fall, Winter, Summer I). Data Source: One-tenth-day of each term.

Methodology:

Total number of sections (credit courses only) that are filled to their designated capacity e.g. allocated seats divided by the total number of available seats in all sections throughout the academic year (July 1 through June 30). In other words, how many sections are filled to their capacity on the sections 1/10 day out of all sections? Include sections that are more than filled / overflowing in calculation.

One-Tenth Day data shows the capacity filled numbers at approximately 3 weeks after the Fall and Winter terms begin; and 1 week after the Summer I and II terms begin. This data will not provide additional enrollment data if the sections begin after the one-tenth day.

While a section may only have a few students enrolled in it the college is able to designate some sections as 'full' so that they are not cancelled (per OCCFA Master Agreement). Therefore some disciplines may show low fill capacity rates, and the college never cancelled the sections or condense the students into fewer sections offering the same course.

Percent of Completed Sections

Prefix EGR

Prefix Title Pre-Engineering

	2005-06	2004-05	2003-04
Active Sections	10	14	16
Cancelled Sections	16	9	2
Total Sections	26	23	18
Percent of Completed Sections	38.5%	60.9%	88.9%

Definition:

Of all offered sections, the percent of sections that are completed (not cancelled). Time Frame: Academic Year (Summer II, Fall, Winter, Summer I). Data Source: End of session, after grades are posted.

Methodology:

Annually, the total number of offered credit sections that are completed. Formula = number of completed credit sections divided by the total number of offered credit sections. In other words, the percent of these sections that are not cancelled.

Headcount Trend Ratio

Prefix EGR

Prefix Title Pre-Engineering

	2005-06	2004-05	2003-04
Headcount Year 1	279	253	201
Headcount Year 2	244	279	253
Headcount Year 3	145	244	279
Headcount Year 4	136	145	244
Headcount Period 1	223	259	244
Headcount Period 2	175	223	259
Headcount Ratio	0.79	0.86	1.06

Definition:

Trend in student headcount based on a three year rolling average. Time Frame: Academic Year (Summer II, Fall, Winter, Summer I). Data Source: One-tenth-day of each term. (Note: this measure is not used in the calculation of the Program Dashboard score since it parallels trends depicted in Credit Hours.)

Methodology:

In order to establish a meaningful enrollment statistic which applies to large as well as small disciplines/programs a "ratio" was calculated based on a three year rolling average of student headcount.

The formula used to calculate this measure involves three simple steps:

a. Year 1 + Year 2 + Year 3 / 3 = Period 1
b. Year 2 + Year 3 + Year 4 / 3 = Period 2
c. Period 2 / Period 1 = Ratio

If the ratio is greater than "1" this means there has been an enrollment increase. On the other hand, if the ratio is less than "1" this translates into an enrollment decline. The larger the number the larger the enrollment increase. Likewise, the lower the number the greater the enrollment decline.

Credit Hour Trend Ratio

Prefix EGR

Prefix Title Pre-Engineering

	2005-06	2004-05	2003-04
Credit Hour Year 1	939	830	668
Credit Hour Year 2	806	939	830
Credit Hour Year 3	491	806	939
Credit Hour Year 4	429	491	806
Credit Hour Period 1	745	858	812
Credit Hour Period 2	575	745	858
Credit Hour Ratio	0.77	0.87	1.06

Definition:

Trend in student credit hours based on a three year rolling average. Time Frame: Academic Year (Summer II, Fall, Winter, Summer I). Data Source: One-tenth-day of each term.

Methodology:

In order to establish a meaningful enrollment statistic which applies to large as well as small disciplines/programs a "ratio" was calculated based on a three year rolling average of student credit hours.

The formula used to calculate this measure involves three simple steps:

a. Year 1 + Year 2 + Year 3 / 3 = Period 1
b. Year 2 + Year 3 + Year 4 / 3 = Period 2
c. Period 2 / Period 1 = Ratio

If the ratio is greater than "1" this means there has been an enrollment increase. On the other hand, if the ratio is less than "1" this translates into an enrollment decline. The larger the number the larger the enrollment increase. Likewise, the lower the number the greater the enrollment decline.

Percent of Minority Students

Prefix EGR

Prefix Title Pre-Engineering

	2005-06	2004-05	2003-04
Minority Students	31	34	52
Total Students	121	109	192
Percent of Minority Students	25.6%	31.2%	27.1%

Definition:

The percent of students who are minority. Minority status is self-reported by the student and includes: African American, Asian, Hispanic, Native American Indian and Other. Time Frame: Academic Year (Summer II, Fall, Winter, Summer I). Data Source: One-tenth-day of each term.

Methodology:

Percentages are based on those students enrolled on the terms official census date (one tenth day) and excludes missing data.

Percent of Withdrawals

Prefix EGR

Prefix Title Pre-Engineering

	2005-06	2004-05	2003-04
Total Withdrawals	30	35	54
Total Grades	132	136	154
Percent of Withdrawals	22.7%	25.7%	35.1%

Definition:

The percent of students who withdraw from their course after the term begins. Time Frame: Academic Year (Summer II, Fall, Winter, Summer I). Data Source: End of session files, after grades are posted.

Methodology:

Percent of withdrawals is derived by dividing the total number of student initiated withdrawals by the total number of grades and marks awarded throughout the academic year. The Withdrawal-Passing (WP), and Withdrawal-Failing (WF) are considered Withdrawals (W). Meanwhile, calculations exclude: Audit (AU), Not Attended (N), and Not Reported (NR).

Percent of Incompletes

Prefix EGR

Prefix Title Pre-Engineering

	2005-06	2004-05	2003-04
Total Incompletes	3	0	1
Total Grades	132	136	154
Percent of Incompletes	2.3%	0.0%	0.6%

Definition:

The percent of students who receive an incomplete in their course. Time Frame: Academic Year (Summer II, Fall, Winter, Summer I). Data Source: End of session files, after grades are posted.

Methodology:

Percent of incompletes is derived by dividing the total number of incompletes by the total number of grades and marks awarded throughout the academic year. The Continuous Progress (CP) grade is considered an Incomplete (I). Meanwhile, calculations exclude: Audit (AU), Not Attended (N), and Not Reported (NR).

Student Course Completion Rate

Prefix EGR

Prefix Title Pre-Engineering

	2005-06	2004-05	2003-04
Successful Grades	92	98	56
Total Student Grades	132	136	154
Student Course Completion Rate	69.7%	72.1%	36.4%

Definition:

The percent of students who successfully complete a course with a grade of "C" or higher. Time Frame: Academic Year (Summer II, Fall, Winter, Summer I). Data Source: End of session files, after grades are posted.

Methodology:

Student success rates are based on end of session data after all grades have been posted. Data includes grades from the entire academic year (Summer II, Fall, Winter, and Summer I). The following grades/marks are excluded from the calculation: Audit (AU), Not Attended (N) and Not Reported (NR).

Engineering Related Occupations (2005 - 2015)

SOC Detail Group

SOC Code	Name	Base Year	Five Year	Ten Year	New Jobs	Rplmnt Jobs	% New Jobs	% Rplmnt	% New & Rplmnt	Earnings
15-1031	Computer Software Engineers, Applications	6,324	7,712	8,839	2,515	613	40.0%	10.0%	49.0%	$73,320
15-1032	Computer Software Engineers, Systems Software	2,769	3,166	3,537	769	269	28.0%	10.0%	37.0%	$71,698
17-2011	Aerospace Engineers	190	175	164	-26	46	-14.0%	24.0%	11.0%	$105,518
17-2021	Agricultural Engineers	62	54	49	-13	20	-20.0%	32.0%	12.0%	$110,510
17-2031	Biomedical Engineers	80	77	76	10	14	-5.0%	17.0%	12.0%	$109,491
17-2041	Chemical Engineers	436	465	491	55	125	12.0%	29.0%	41.0%	$71,157
17-2051	Civil Engineers	4,218	3,898	3,676	-543	648	-13.0%	15.0%	3.0%	$69,326
17-2061	Computer Hardware Engineers	624	624	637	13	103	2.0%	17.0%	19.0%	$77,438
17-2071	Electrical Engineers	4,306	4,306	4,321	15	820	0.0%	19.0%	19.0%	$76,690
17-2072	Electronics Engineers, Except Computer	1,494	1,450	1,440	-54	290	-4.0%	19.0%	16.0%	$78,146
17-2081	Environmental Engineers	1,261	1,371	1,439	178	204	14.0%	16.0%	30.0%	$72,155
17-2111	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors	379	397	406	27	90	7.0%	24.0%	31.0%	$74,152
17-2112	Industrial Engineers	9,609	10,759	11,514	1,905	2,349	20.0%	24.0%	44.0%	$74,963
17-2121	Marine Engineers and Naval Architects	197	176	163	-34	89	-17.0%	45.0%	28.0%	$86,237
17-2131	Materials Engineers	485	514	533	48	126	10.0%	26.0%	36.0%	$71,906
17-2141	Mechanical Engineers	12,304	12,698	12,988	684	3,332	6.0%	27.0%	33.0%	$80,787

Source: OCC, Office of Assessment & Effectivenes (CCSP)

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SOC Code	Name	Base Year	Five Year	Ten Year	New Jobs	Rplmnt Jobs	% New Jobs	% Rplm nt	% New & Rplmnt	Earnings
17-2151	Mining and Geological Engineers, Including Mining Safety Engineers	197	186	182	-15	57	-8.0%	29.0%	21.0%	$71,011
17-2161	Nuclear Engineers	325	317	307	-18	96	-5.0%	30.0%	24.0%	$167,253
17-2171	Petroleum Engineers	126	121	129	10	39	2.0%	31.0%	33.0%	$48,630
17-2199	Engineers, All Other	6,266	7,403	7,998	1,732	1,182	28.0%	19.0%	47.0%	$87,651
17-3021	Aerospace Engineering and Operations Technicians	351	346	327	-24	71	-7.0%	20.0%	13.0%	$62,587
17-3022	Civil Engineering Technicians	913	907	896	-16	183	-2.0%	20.0%	18.0%	$46,696
17-3023	Electrical and Electronic Engineering Technicians	2,881	2,946	2,995	114	591	4.0%	21.0%	24.0%	$53,976
17-3024	Electro-Mechanical Technicians	225	226	226	10	46	1.0%	20.0%	21.0%	$51,314
17-3025	Environmental Engineering Technicians	785	928	999	214	161	27.0%	21.0%	48.0%	$52,874
17-3026	Industrial Engineering Technicians	2,482	2,579	2,624	141	523	6.0%	21.0%	27.0%	$68,203
17-3027	Mechanical Engineering Technicians	1,209	1,251	1,263	53	249	4.0%	21.0%	25.0%	$52,458
17-3029	Engineering Technicians, Except Drafters, All Other	3,302	3,830	4,098	796	781	24.0%	24.0%	48.0%	$57,928
Totals:		63,800	68,882	72,317	8,546	13,117				

Source: OCC, Office of Assessment & Effectivenes (CCSP)

PRE-ENGINEERING (EGR) PROGRAM
COURSE DATA BY SEMESTER 1990-2006
16-YEAR TIME PERIOD

		FALL 1990					WINTER 1991						SPRING 1991					
Course	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.
Highland Lakes																		
EGR 110																		
EGR 182																		
EGR 200	HL 057	37	11	30%		1	HL 839	37	15	41%			HL 504	37	27	73%		
EGR 200	HL 836	37	13	35%		1												
EGR 202	HL 837	37	25	68%			HL 840	37	16	43%			HL 505	39	39	100%		
EGR 203							HL 841	37	12	32%								
EGR 204	HL 838	27	22	81%									HL 506	27	13	48%		
EGR 230																		
Totals		**138**	**70**	**50%**		**2**		**111**	**44**	**39%**				**103**	**79**	**76%**		

% Cap. = Percent Capacity
P.B. = Piggy Backed

Highlighted courses: These courses were allowed to go with **less** than the requisite number of 15.
P.B.: These courses were piggy backed meaning they were combined because of low numbers in order to justify letting them go.

PRE-ENGINEERING (EGR) PROGRAM
COURSE DATA BY SEMESTER 1990-2006

		FALL 1991					WINTER 1992						SPRING 1992					
Course	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.
Highland Lakes																		
EGR 110																		
EGR 182																		
EGR 200	HL 848	37	20	54%			HL 644	37	23	62%			HL 507	37	32	86%		
EGR 200																		
EGR 202	HL 252	37	11	30%		1	HL 645	37	27	73%			HL 427	37	10	27%	1	
EGR 202	HL 849	37	15	41%		1							HL 508	37	15	41%		
EGR 203							HL 646	37	19	51%								
EGR 204	HL 850	27	12	44%									HL 509	27	11	41%	1	
EGR 230																		
Totals		**138**	**58**	**42%**		**2**		**111**	**69**	**62%**				**138**	**68**	**49%**	**2**	

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PRE-ENGINEERING (EGR) PROGRAM
COURSE DATA BY SEMESTER 1990-2006

		FALL 1992					WINTER 1993						SPRING 1993					
Course	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.
Highland Lakes																		
EGR 110	HL 069	27	11	41%		1												
EGR 182							HL 647	27	11	41%								
EGR 200	HL 647	37	23	62%			HL 648	37	19	51%			HL 511	37	17	46%		
EGR 200																		
EGR 202	HL 648	37	25	68%			HL 649	39	37				HL 512	37	36	97%		
EGR 203							HL 650	37	23	62%								
EGR 204													HL 513	27	21	78%		
EGR 230	HL 649	27	7	35%		1												
Totals		**128**	**66**	**51%**		**2**		**140**	**90**	**64%**				**101**	**74**	**73%**		

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PRE-ENGINEERING (EGR) PROGRAM
COURSE DATA BY SEMESTER 1990-2006

		FALL 1993					WINTER 1994						SPRING 1994					
Course	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.
Highland Lakes																		
EGR 110	HL 653	27	24	89%														
EGR 182							HL 655	27	24	89%			HL 511	27	9	33%		1
EGR 200	HL 654	37	21	57%			HL 656	37	27	73%			HL 509	37	24	64%		
EGR 200																		
EGR 202	HL 655	37	21	57%			HL 657	37	34	92%			HL 510	37	29	78%		
EGR 203							HL 203	37	14	38%								
EGR 204													HL 524	27	9	33%		1
EGR 230	HL 656	27	10	37%														
Totals		**128**	**76**	**59%**				**138**	**99**	**71%**				**128**	**71**	**55%**		**2**

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Highlighted courses: These courses were allowed to go with **less** than the requisite number of 15.
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PRE-ENGINEERING (EGR) PROGRAM
COURSE DATA BY SEMESTER 1990-2006

		FALL 1994					WINTER 1995						SPRING 1995					
Course	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.
Highland Lakes																		
EGR 110	HL 948	27	26	96%														
EGR 182							HL 938	28	28	100%			HL 404	27	7	26%		1
EGR 200	HL 947	37	19	51%			HL 937	37	25	68%			HL 508	37	13	35%		
EGR 200																		
EGR 202	HL 946	37	18	49%			HL 936	37	36	97%			HL 509	37	21	57%		
EGR 203							HL 935	37	5	14%								
EGR 204													HL 510	27	6	22%		1
EGR 230	HL 945	27	9	33%														
Totals		**128**	**82**	**64%**				**139**	**94**	**67%**				**128**	**47**	**36%**		**2**

% Cap. = Percent Capacity
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Highlighted courses: These courses were allowed to go with **less** than the requisite number of 15.
P.B.: These courses were piggy backed meaning they were combined because of low numbers in order to justify letting them go.

PRE-ENGINEERING (EGR) PROGRAM
COURSE DATA BY SEMESTER 1990-2006

		FALL 1995					WINTER 1996						SPRING 1996					
Course	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.
Highland Lakes																		
EGR 110	HL 858	27	25	93%														
EGR 182							HL 852	27	25	93%			HL 403	27	0	0%	Yes	
EGR 200	HL 859	37	15	41%									HL 352	37	10	27%		
EGR 200							HL 853	37	17	50%								
EGR 202	HL 860	37	29	78%			HL 854	37	34	92%			HL 086	37	18	49%		
EGR 202													HL 353	37	28	76%		
EGR 203							HL 855	37	14	38%								
EGR 204																		
EGR 230	HL 861	27	14	52%														
Totals		**128**	**83**	**64%**				**138**	**90**	**65%**				**138**	**56**	**40%**	**1**	

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P.B. = Piggy Backed

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PRE-ENGINEERING (EGR) PROGRAM
COURSE DATA BY SEMESTER 1990-2006

		FALL 1996					WINTER 1997						SPRING 1997					
Course	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.
Highland Lakes																		
EGR 110	HL 089	27	23	85%														
EGR 182							HL 809	27	17	63%								
EGR 200	HL 090	37	13	35%			HL 810	37	16	43%			HL 114	37	11	30%		
EGR 200																		
EGR 202	HL 856	37	23	62%			HL 222	37	13	35%			HL 115	37	29	78%		
EGR 202							HL 811	37	36	97%								
EGR 203							HL 812	37	6	16%								
EGR 204	HL 857	27	9	33%														
EGR 230	HL 858	27	5	19%														
Totals		**155**	**73**	**47%**				**175**	**88**	**50%**				**74**	**40**	**54%**		

% Cap. = Percent Capacity
P.B. = Piggy Backed

Highlighted courses: These courses were allowed to go with **less** than the requisite number of 15.
P.B.: These courses were piggy backed meaning they were combined because of low numbers in order to justify letting them go.

25

PRE-ENGINEERING (EGR) PROGRAM
COURSE DATA BY SEMESTER 1990-2006

		FALL 1997					WINTER 1998						SPRING 1998					
Course	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.
Highland Lakes																		
EGR 110	HL 075	27	21	78%			HL 666	27	27	100%								
EGR 182													HL 440	27	3	11%		
EGR 200	HL 951	37	12	32%			HL 618	37	5	14%	Yes		HL 153	37	7	19%	Yes	
EGR 200																		
EGR 202	HL 950	37	17	50%			HL 619	37	19	51%			HL 154	37	23	62%		
EGR 202							HL 667	27	5	19%								
EGR 203							HL 620	37	5	14%	Yes		HL 176	37	1	02%	Yes	
EGR 204	HL 949	27	5	19%	Yes													
EGR 230	HL 948	27	12	44%														
Totals		**155**	**67**	**43%**	**1**			**165**	**61**	**36%**	**2**			**138**	**34**	**24%**	**2**	

% Cap. = Percent Capacity
P.B. = Piggy Backed

Highlighted courses: These courses were allowed to go with **less** than the requisite number of 15.
P.B.: These courses were piggy backed meaning they were combined because of low numbers in order to justify letting them go.

35

PRE-ENGINEERING (EGR) PROGRAM
COURSE DATA BY SEMESTER 1990-2006

		FALL 1998					WINTER 1999						SPRING 1999					
Course	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.
Highland Lakes																		
EGR 110	HL 054	27	27	100%			HL 057	27	27	100%								
EGR 182																		
EGR 200	HL 501	37	5	14%									HL 116	37	4	11%	Yes	
EGR 200																		
EGR 202	HL Q56	37	17	50%			HL 505	37	13	35%			HL 156	37	19	51%		
EGR 202							HL Q59	37	4	11%								
EGR 203	HL 055	27	2	7%	Yes								HL P17	37	1	03%	Yes	
EGR 204							HL 507	27	16	59%								
EGR 230	HL 058	27	26	96%														
Totals		**155**	**77**	**49%**	**1**			**128**	**60**	**46%**				**111**	**24**	**21%**	**2**	

% Cap. = Percent Capacity
P.B. = Piggy Backed

Highlighted courses: These courses were allowed to go with **less** than the requisite number of 15.
P.B.: These courses were piggy backed meaning they were combined because of low numbers in order to justify letting them go.

2

PRE-ENGINEERING (EGR) PROGRAM
COURSE DATA BY SEMESTER 1990-2006

		FALL 1999					WINTER 2000						SPRING 2000					
Course	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.
Highland Lakes																		
EGR 110	HL 039	28	27	96%			HL 519	27	14	52%			HL Q42	27	6	22%	Yes	
EGR 182																		
EGR 200	HL 211	37	1	3%									HL Q43	37	10	27%		1
EGR 200																		
EGR 202	HL Q40	37	11	30%			HL 520	37	25	68%			HL Q44	37	10	27%		1
EGR 202							HL 613	37	0	0%								
EGR 203	HL 594	37	0	0	Yes		HL 594	37	5	14%								
EGR 204													HL Q45	27	5	19%		1
EGR 230	HL 041	27	10	37%			HL 612	27	5	19%	Yes							
Totals		**166**	**49**	**29%**	**1**			**165**	**49**	**29%**	**1**			**128**	**31**	**24%**	**1**	**3**

% Cap. = Percent Capacity
P.B. = Piggy Backed

Highlighted courses: These courses were allowed to go with **less** than the requisite number of 15.
P.B.: These courses were piggy backed meaning they were combined because of low numbers in order to justify letting them go.

PRE-ENGINEERING (EGR) PROGRAM
COURSE DATA BY SEMESTER 1990-2006

		FALL 2000					WINTER 2001 *						SPRING 2001 *					
Course	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.
Highland Lakes																		
EGR 110	HL 509	27	20	74%									HL Q35	27	3	11%	Yes	
EGR 182																		
EGR 200																		
EGR 200																		
EGR 202	HL 510	37	6	16%	Yes		HL 619	37	11	30%		1	HL Q36	27	6	22%		1
EGR 203							HL 620	37	6	16%		1	HL Q37	27	5	19%		1
EGR 204																		
EGR 230	HL 511	27	8	30%														
Totals		**91**	**28**	**30%**	**1**			**74**	**17**	**22%**		**2**		**81**	**11**	**13%**		**2**

*** Data is Incomplete**

% Cap. = Percent Capacity
P.B. = Piggy Backed

Highlighted courses: These courses were allowed to go with **less** than the requisite number of 15.
P.B.: These courses were piggy backed meaning they were combined because of low numbers in order to justify letting them go.

PRE-ENGINEERING (EGR) PROGRAM
COURSE DATA BY SEMESTER 1990-2006

		FALL 2001 *					WINTER 2002 *						SPRING 2002 *					
Course	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.
Highland Lakes																		
EGR 1100																		
EGR 1820																		
EGR 2000							HL 710	37	6	16%		1						
EGR 2000																		
EGR 2020	HL 114	37	8	22%		1							HL Q03	37	19	51%		
EGR 2030							HL 711	37	6	16%		1						
EGR 2040													HL Q04	27	10	37%		
EGR 2300	HL 115	27	5	19%		1												
TOTAL		**64**	**13**	**20%**		**2**		**74**	**12**	**16%**		**2**		**64**	**29**	**45%**		

*** Data Is Incomplete**

% Cap. = Percent Capacity
P.B. = Piggy Backed

Highlighted courses: These courses were allowed to go with **less** than the requisite number of 15.
P.B.: These courses were piggy backed meaning they were combined because of low numbers in order to justify letting them go.

PRE-ENGINEERING (EGR) PROGRAM
COURSE DATA BY SEMESTER 1990-2006

		FALL 2002					WINTER 2003						SPRING 2003					
Course	Section	Avail Seats	Taken Seats	% Cap	Canc	PB	Section	Avail Seats	Taken Seats	% Cap	Canc	PB	Section	Avail Seats	Taken Seats	% Cap	Canc	PB
Highland Lakes																		
EGR 1100	H1515	27	15	56%		1	H1503	27	14	52%			H0801	27	8	30%		1
EGR 1820																		
EGR 2000																		
EGR 2000																		
EGR 2020	H1516	37	19	51%			H1502	37	11	30%			H1303	37	9	24%		1
EGR 2030							H1501	37	13	35%								
EGR 2040													H1304	27	11	41%		
EGR 2300	H1517	27	6	22%		1												
Totals		**91**	**40**	**43%**		**2**		**101**	**38**	**37%**				**91**	**28**	**30%**		**2**
Auburn Hills																		
EGR 1100																		
EGR 1820							A1501	27	22	81%								
EGR 2000	A1501	37	13	35%														
EGR 2000																		
EGR 2020																		
EGR 2030																		
EGR 2040																		
EGR 2300																		
Totals		**37**	**13**	**35%**				**27**	**22**	**81%**								
Orchard Ridge																		
EGR 1100	O1501	27	20	74%			O1501	27	23	85%			O8110	27	11	41%		
EGR 1820	O1510	27	26	96%			O1510	27	0		Yes							
EGR 2000							O1510	37	14	38%			O1301	37	13	35%		
EGR 2000																		
EGR 2020																		
EGR 2030																		
EGR 2040																		
EGR 2300																		
Totals		**54**	**46**	**85%**				**91**	**37**	**40%**	**1**			**64**	**24**	**37%**		
Grand Totals		**182**	**99**	**54%**		**2**		**219**	**97**	**44%**	**1**			**155**	**52**	**33%**		**2**

For notes on highlighted courses and P.B. see page _____

PRE-ENGINEERING (EGR) PROGRAM
COURSE DATA BY SEMESTER 1990-2006

		FALL 2003					WINTER 2004						SPRING 2004					
Course	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.
Highland Lakes																		
EGR 1100	H1501	27	13	48%			H1501	27	18	67%			H8101	27	6	22%		1
EGR 1820																		
EGR 2000																		
EGR 2000																		
EGR 2020	H1502	37	7	19%		1	H1502	37	10	27%		1	H1301	37	19	51%		
EGR 2030							H1503	37	6	16%		1	H1303	27	0	0%	Yes	
EGR 2040													H1302	27	6	22%		1
EGR 2300	H1503	27	11	41%		1												
Totals		**91**	**31**	**34%**		**2**		**101**	**34**	**33%**		**2**		**118**	**31**	**26%**	**1**	**2**
Auburn Hills																		
EGR 1100																		
EGR 1820							A1501	27	15	56%								
EGR 2000	A1501	37	12	32%														
EGR 2000																		
EGR 2020																		
EGR 2030																		
EGR 2040																		
EGR 2300																		
Totals		**37**	**12**	**32%**				**27**	**15**	**56%**								
Orchard Ridge																		
EGR 1100	O1501	27	17	63%			O1500	27	16	59%			O8101	27	0	0%	Yes	
EGR 1820	O1510	27	14	52%														
EGR 2000							O1501	37	15	41%			O1301	37	17	46%		
EGR 2000																		
EGR 2020																		
EGR 2030																		
EGR 2040																		
EGR 2300																		
Totals		**54**	**31**	**57%**				**64**	**31**	**48%**				**64**	**17**	**26%**	**1**	
Grand Totals		**182**	**74**	**40%**		**2**		**192**	**80**	**41%**		**2**		**182**	**48**	**26%**	**2**	**2**

For notes on highlighted courses and P.B. see page _____

PRE-ENGINEERING (EGR) PROGRAM
COURSE DATA BY SEMESTER 1990-2006

		FALL 2004					WINTER 2005						SPRING 2005					
Course	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.
Highland Lakes																		
EGR 1100	H1503	27	8	30%			H1501	27	6	22%		1	H8101	27	0	0%	Yes	
EGR 1820																		
EGR 2000																		
EGR 2000																		
EGR 2020							H1502	27	6	22%		1	H1301	37	12	32%		
EGR 2030							H1503	37	0	%	Yes							
EGR 2040													H1302	27	7	26%		
EGR 2300	H1501	27	0	0%	Yes													
Totals		**54**	**8**	**14%**	**1**			**91**	**12**	**13%**	**1**	**2**		**91**	**19**	**20%**	**1**	
Auburn Hills																		
EGR 1100																		
EGR 1820							A1501	27	13	48%								
EGR 2000	A1501	37	0	0%	Yes													
EGR 2000																		
EGR 2020																		
EGR 2030																		
EGR 2040																		
EGR 2300																		
Totals		**37**	**0**	**0%**	**1**			**27**	**13**	**48%**								
Orchard Ridge																		
EGR 1100	O1500	27	17	63%			O1500	27	16	59%			O8100	27	0	0%	Yes	
EGR 1820	O1500	27	18	67%														
EGR 2000							O1500	37	14	38%			O1300	37	0	0%	Yes	
EGR 2000																		
EGR 2020																		
EGR 2030																		
EGR 2040																		
EGR 2300																		
Totals		**54**	**35**	**64%**	**1**			**64**	**30**	**46%**				**64**	**0**	**0%**	**2**	
Grand Totals		**145**	**43**	**29%**	**3**			**182**	**55**	**30%**	**1**	**2**		**155**	**19**	**12%**	**3**	

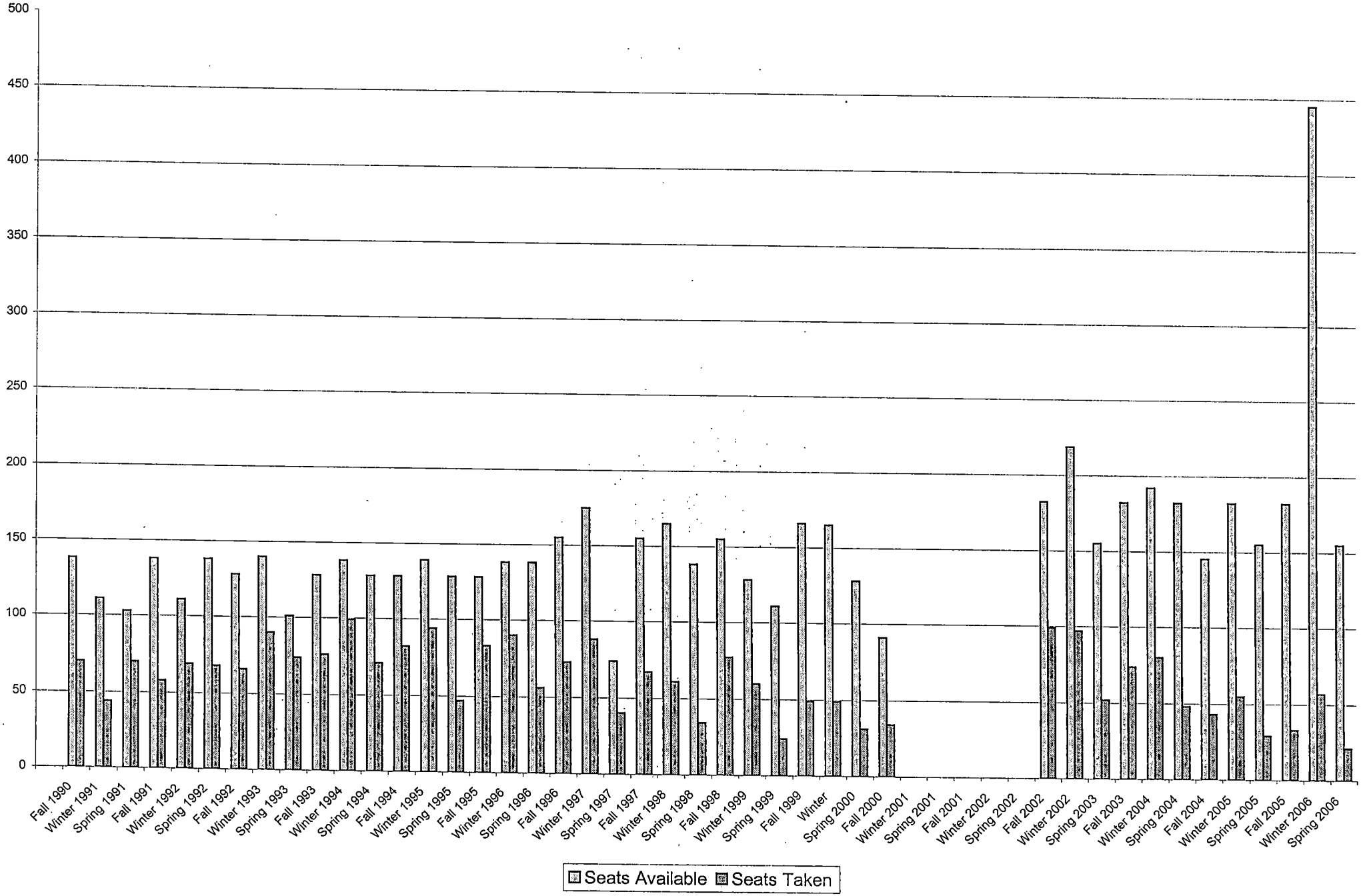
For notes on highlighted courses and P.B. see page _____

PRE-ENGINEERING (EGR) PROGRAM
COURSE DATE BY SEMESTER 1990-2006

		FALL 2005					WINTER 2006						SPRING 2006					
Course	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.	Section	Avail Seats	Taken Seats	% Cap	Canc	P.B.
Highland Lakes																		
EGR 1100							H1501	27	0	0%	Yes		H8101	27	0	0%	Yes	
EGR 1000							H1504	27	11	41%		2						
EGR 1820							H1502	27	0	0%	Yes							
EGR 2000																		
EGR 2000																		
EGR 2020							H1505	37	9	24%		2	H1300	37	11	30%		1
EGR 2030							H1503	37	0	0%	Yes							
EGR 2040													H1300	27	0	0%	Yes	
EGR 2300							H1506	27	0	0%	Yes							
Totals								**182**	**20**	**10%**	**4**	**2**		**91**	**11**	**12%**	**2**	**1**
Auburn Hills																		
EGR 1100	A1501	27	13	48%			A1501	27	0	0%	Yes							
EGR 1000							A1501	27	11	41%		1						
EGR 1820							A1820	27	0	0%	Yes							
EGR 2000	A1502	37	8	21%		1	A1501	37	7	19%		1						
EGR 2000																		
EGR 2020	A1503	37	0	0%	Yes		A1503	37	0	0%	Yes							
EGR 2030																		
EGR 2040	A1504	27	0	0%	Yes													
EGR 2300							A1504	27	0	0%	Yes							
Totals		**128**	**21**	**16%**	**2**	**1**		**182**	**18**	**9%**	**4**	**2**						
Orchard Ridge																		
EGR 1100	O1500	27	12	44%		1	O1501	27	0	0%	Yes		O8100	27	0	0%	Yes	
EGR 1820	O1500	27	0	0%	Yes		O1501	27	0	0%	Yes							
EGR 1820							O1500	27	19	70%								
EGR 2000													O1300	37	10	27%		1
EGR 2000																		
EGR 2020																		
EGR 2030																		
EGR 2040																		
EGR 1100																		
Totals		**54**	**12**	**22%**	**1**	**1**		**81**	**19**	**23%**	**2**			**64**	**10**	**15%**	**1**	**1**
Grand Totals		**182**	**33**	**18%**	**3**	**2**		**445**	**57**	**12%**	**10**	**4**		**155**	**21**	**13%**	**3**	**2**

For notes on highlighted courses and P.B. see page _____

Pre-Engineering Course Data 1990-2006



PRE-ENGINEERING (EGR) PROGRAM
NUMBER OF TOTAL REGISTRANTS AND WITHDRAWALS

FALL 1990-2006

16-YEAR TIME PERIOD

COURSE	TOTAL REGISTRANTS	TOTAL WITHDRAWALS	% WITHDRAWALS
EGR 1100	924	247	26%
EGR 1820	543	108	19%
EGR 2000	1514	458	30%
EGR 2020	1325	243	18%
EGR 2030	374	71	18%
EGR 2040	469	112	23%
EGR 2300	154	39	25%

Annual Degrees Awarded
Pre-Engineering (EGR.PRE.ASC)

Year	Graduates
2004-05	8
2003-04	10
2002-03	5
2001-02	10
2000-01	10
1999-00	16
1998-99	17
1997-98	7
1996-97	10
1995-96	9
1994-95	8
1993-94	13
1992-93	11
1991-92	16
1990-91	8
1989-90	11
1988-89	16
1987-88	9
Total	194

Program Dashboard
Detail Report

Prefix EGR
Title Pre-Engineering

	Program	College Wide
Average Section Size	15.3	23.3
Sections Filled to Capacity	48.6%	88.4%
Percent of Completed Sections	88.9%	89.1%
Headcount Trend Ratio	1.06	1.04
Credit Hour Trend Ratio	1.06	1.03
Percent of Minority Students	27.1%	27.1%
Percent of Withdrawals	35.1%	16.5%
Percent of Incompletes	0.6%	1.6%
Student Course Completion Rate	36.4%	64.8%

Average Section Size

Prefix EGR
Prefix Title Pre-Engineering

Total Students	244
Number of Sections	16
Average Section Size	15.3

Definition:
Average number of students per section. Time Frame: Academic Year (Summer II, Fall, Winter, Summer I). Data Source: One-Tenth-Day of each term.

Methodology:
Total duplicated student headcount divided by total capacity of all sections over an academic year. Currently (2003-04 data) does not take into account the differences between "A" and "B" sections.

Sections Filled to Capacity

Prefix EGR
Prefix Title Pre-Engineering

Total Students	244
Total Capacity	502
Sections Filled To Capacity	48.6%

Definition:
The percent of all available seats which are filled on the terms official census date. Time Frame: Academic Year (Summer II, Fall, Winter, Summer I). Data Source: One-tenth-day of each term.

Methodology:
Total number of sections (credit courses only) that are filled to their designated capacity e.g. allocated seats divided by the total number of available seats in all sections throughout the academic year (July 1 through June 30). In other words, how many sections are filled to their capacity on the sections 1/10 day out of all sections? Include sections that are more than filled / overflowing in calculation.

One-Tenth Day data shows the capacity filled numbers at approximately 3 weeks after the Fall and Winter terms begin; and 1 week after the Summer I and II terms begin. This data will not provide additional enrollment data if the sections begin after the one-tenth day.

While a section may only have a few students enrolled in it the college is able to designate some sections as 'full' so that they are not cancelled (per OCCFA Master Agreement). Therefore some disciplines may show low fill capacity rates, and the college never cancelled the sections or condense the students into fewer sections offering the same course.

Percent of Completed Sections

Prefix EGR
Prefix Title Pre-Engineering

Active Sections	16
Cancelled Sections	2
Total Sections	18
Percent of Completed Sections	88.9%

Definition:
Of all offered sections, the percent of sections that are completed (not cancelled). Time Frame: Academic Year (Summer II, Fall, Winter, Summer I). Data Source: End of session, after grades are posted.

Methodology:
Annually, the total number of offered credit sections that are completed. Formula = number of completed credit sections divided by the total number of offered credit sections. In other words, the percent of these sections that are not cancelled.

Headcount Trend Ratio

Prefix EGR
Prefix Title Pre-Engineering

Headcount Year 1	201
Headcount Year 2	253
Headcount Year 3	279
Headcount Year 4	244
Headcount Period 1	244
Headcount Period 2	259
Headcount Ratio	1.06

Definition:
Trend in student headcount based on a three year rolling average. Time Frame: Academic Year (Summer II, Fall, Winter, Summer I). Data Source: One-tenth-day of each term.

Methodology:
In order to establish a meaningful enrollment statistic which applies to large as well as small disciplines/programs a "ratio" was calculated based on a three year rolling average of student headcount.

The formula used to calculate this measure involves three simple steps:

a. Year 1 + Year 2 + Year 3 / 3 = Period 1
b. Year 2 + Year 3 + Year 4 / 3 = Period 2
c. Period 2 / Period 1 = Ratio

If the ratio is greater than "1" this means there has been an enrollment increase. On the other hand, if the ratio is less than "1" this translates into an enrollment decline. The larger the number the larger the enrollment increase. Likewise, the lower the number the greater the enrollment decline.

Credit Hour Trend Ratio

Prefix EGR
Prefix Title Pre-Engineering

Credit Hour Year 1	668
Credit Hour Year 2	830
Credit Hour Year 3	939
Credit Hour Year 4	806
Credit Hour Period 1	812
Credit Hour Period 2	858
Credit Hour Ratio	1.06

Definition:
Trend in student credit hours based on a three year rolling average. Time Frame: Academic Year (Summer II, Fall, Winter, Summer I). Data Source: One-tenth-day of each term.

Methodology:
In order to establish a meaningful enrollment statistic which applies to large as well as small disciplines/programs a "ratio" was calculated based on a three year rolling average of student credit hours.

The formula used to calculate this measure involves three simple steps:

a. Year 1 + Year 2 + Year 3 / 3 = Period 1
b. Year 2 + Year 3 + Year 4 / 3 = Period 2
c. Period 2 / Period 1 = Ratio

If the ratio is greater than "1" this means there has been an enrollment increase. On the other hand, if the ratio is less than "1" this translates into an enrollment decline. The larger the number the larger the enrollment increase. Likewise, the lower the number the greater the enrollment decline.

Percent of Minority Students

Prefix EGR
Prefix Title Pre-Engineering

Minority Students	52
Total Students	192
Percent of Minority Students	27.1%

Definition:
The percent of students who are minority. Minority status is self-reported by the student and includes: African American, Asian, Hispanic, Native American Indian and Other. Time Frame: Academic Year (Summer II, Fall, Winter, Summer I). Data Source: One-tenth-day of each term.

Methodology:
Percentages are based on those students enrolled on the terms official census date (one tenth day) and excludes missing data.

Percent of Withdrawals

Prefix EGR
Prefix Title Pre-Engineering

Total Withdrawals	54
Total Grades	154
Percent of Withdrawals	35.1%

Definition:
The percent of students who withdraw from their course after the term begins. Time Frame: Academic Year (Summer II, Fall, Winter, Summer I). Data Source: End of session files, after grades are posted.

Methodology:
Percent of withdrawals is derived by dividing the total number of student initiated withdrawals by the total number of grades and marks awarded throughout the academic year. The Withdrawal-Passing (WP), and Withdrawal-Failing (WF) are considered Withdrawals (W). Meanwhile, calculations exclude: Audit (AU), Not Attended (N), and Not Reported (NR).

Percent of Incompletes

Prefix EGR
Prefix Title Pre-Engineering

Total Incompletes	1
Total Grades	154
Percent of Incompletes	0.6%

Definition:
The percent of students who receive an incomplete in their course. Time Frame: Academic Year (Summer II, Fall, Winter, Summer I). Data Source: End of session files, after grades are posted.

Methodology:
Percent of incompletes is derived by dividing the total number of incompletes by the total number of grades and marks awarded throughout the academic year. The Continuous Progress (CP) grade is considered an Incomplete (I). Meanwhile, calculations exclude: Audit (AU), Not Attended (N), and Not Reported (NR).

Student Course Completion Rate

Prefix EGR
Prefix Title Pre-Engineering

Successful Grades	56
Total Student Grades	154
Student Course Completion Rate	36.4%

Definition:
The percent of students who successfully complete a course with a grade of "C" or higher. Time Frame: Academic Year (Summer II, Fall, Winter, Summer I). Data Source: End of session files, after grades are posted.

Methodology:
Student success rates are based on end of session data after all grades have been posted. Data includes grades from the entire academic year (Summer II, Fall, Winter, and Summer I). The following grades/marks are excluded from the calculation: Audit (AU), Not Attended (N) and Not Reported (NR).

Annual Credit Hours

Pre-Engineering (EGR)

Year	Credit Hours
2004-05	462
2003-04	534
2002-03	929
2001-02	804
2000-01	789
1999-00	665
1998-99	926
1997-98	925
1996-97	1,046
1995-96	843
1994-95	895
1993-94	899
1992-93	928
1991-92	742
1990-91	763
1989-90	474
1988-89	626
1987-88	545
1986-87	498
1985-86	
1984-85	440
1983-84	561
1982-83	235
1981-82	166

Annual Degrees Awarded
Pre-Engineering (EGR.PRE.ASC)

Year	Graduates
2004-05	8
2003-04	10
2002-03	5
2001-02	10
2000-01	10
1999-00	16
1998-99	17
1997-98	7
1996-97	10
1995-96	9
1994-95	8
1993-94	13
1992-93	11
1991-92	16
1990-91	8
1989-90	11
1988-89	16
1987-88	9
Total	194

Engineering Related Occupations (2006 - 2011)

SOC Detail Group

SOC Code	Name	Base Year	Five Year	New Jobs	Rplmnt Jobs	% New Jobs	% Rplmnt	% New & Rplmnt	Earnings Average	Earnings Median
15-1031	Computer Software Engineers, Applications	8,081	9,542	1,461	400	18.1%	4.9%	23.0%	$33.68	$32.30
15-1032	Computer Software Engineers, Systems Software	4,039	4,530	491	200	12.2%	4.9%	17.1%	$32.53	$31.79
17-2011	Aerospace Engineers	126	106	-20	16	-15.9%	12.7%	-3.2%	$44.82	$35.67
17-2021	Agricultural Engineers	297	251	-46	49	-15.5%	16.5%	1.0%	$24.60	$21.72
17-2031	Biomedical Engineers	326	282	-44	28	-13.5%	8.6%	-4.9%	$25.56	$22.89
17-2041	Chemical Engineers	524	543	19	78	3.6%	14.9%	18.5%	$31.82	$30.67
17-2051	Civil Engineers	3,332	3,083	-249	266	-7.5%	8.0%	0.5%	$27.96	$25.19
17-2061	Computer Hardware Engineers	662	655	-7	55	-1.1%	8.4%	7.3%	$35.95	$34.13
17-2071	Electrical Engineers	4,743	4,687	-56	466	-1.2%	9.8%	8.6%	$34.85	$34.10
17-2072	Electronics Engineers, Except Computer	1,807	1,742	-65	178	-3.6%	9.9%	6.3%	$32.27	$31.50
17-2081	Environmental Engineers	1,315	1,398	83	112	6.3%	8.5%	14.8%	$35.94	$36.28
17-2111	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors	320	328	8	39	2.5%	12.2%	14.7%	$33.55	$31.96
17-2112	Industrial Engineers	12,087	13,771	1,684	1,463	13.9%	12.1%	26.0%	$35.51	$35.31
17-2121	Marine Engineers and Naval Architects	153	136	-17	36	-11.1%	23.5%	12.4%	$41.13	$33.12

Source: OCC, Office of Assessment & Effectiveness (CCSP)

SOC Code	Name	Base Year	Five Year	New Jobs	Rplmnt Jobs	% New Jobs	% Rplmnt	% New & Rplmnt	Earnings Average	Earnings Median
17-2131	Materials Engineers	549	567	18	72	3.3%	13.1%	16.4%	$34.56	$33.91
17-2141	Mechanical Engineers	13,376	13,981	605	1,829	4.5%	13.7%	18.2%	$34.08	$33.73
17-2151	Mining and Geological Engineers, Including Mining Safety Engineers	62	57	-5	9	-8.1%	14.6%	6.5%	$30.39	$28.31
17-2161	Nuclear Engineers	426	371	-55	64	-12.9%	15.0%	2.1%	$46.40	$43.84
17-2171	Petroleum Engineers	104	100	-4	17	-3.8%	16.3%	12.5%	$24.71	$21.55
17-2199	Engineers, All Other	3,176	3,651	475	302	15.0%	9.5%	24.5%	$41.76	$41.48
17-3021	Aerospace Engineering and Operations Technicians	69	63	-6	7	-8.7%	10.1%	1.4%	$25.74	$24.21
17-3022	Civil Engineering Technicians	1,003	988	-15	105	-1.5%	10.5%	9.0%	$20.03	$19.03
17-3023	Electrical and Electronic Engineering Technicians	2,693	2,732	39	282	1.4%	10.5%	11.9%	$26.47	$24.60
17-3024	Electro-Mechanical Technicians	178	173	-5	19	-2.8%	10.7%	7.9%	$21.13	$20.74
17-3025	Environmental Engineering Technicians	460	519	59	48	12.8%	10.5%	23.3%	$23.92	$22.51
17-3026	Industrial Engineering Technicians	3,550	3,717	167	372	4.7%	10.5%	15.2%	$28.88	$26.80
17-3027	Mechanical Engineering Technicians	1,464	1,508	44	153	3.0%	10.5%	13.5%	$23.88	$22.49
17-3029	Engineering Technicians, Except Drafters, All Other	2,027	2,313	286	244	14.1%	12.0%	26.1%	$29.13	$29.14
Totals:		66,949	71,794	4,845	6,909					

Source: OCC, Office of Assessment & Effectiveness (CCSP)

Engineering Related Occupations

SOC Detail Definitions

SOC Code 15-1031

Name Computer Software Engineers, Applications

Definition

Develop, create, and modify general computer applications software or specialized utility programs. Analyze user needs and develop software solutions. Design software or customize software for client use with the aim of optimizing operational efficiency. May analyze and design databases within an application area, working individually or coordinating database development as part of a team. Exclude "Computer Hardware Engineers" (17-2061).

Examples

Applications Developer, Programmer Analyst, Software Designer

SOC Code 15-1032

Name Computer Software Engineers, Systems Software

Definition

Research, design, develop, and test operating systems-level software, compilers, and network distribution software for medical, industrial, military, communications, aerospace, business, scientific, and general computing applications. Set operational specifications and formulate and analyze software requirements. Apply principles and techniques of computer science, engineering, and mathematical analysis.

Examples

EDP Systems Engineers

Source: OCC, Office of Assessment & Effectivenes (CCSP)

Engineering Related Occupations

SOC Detail Definitions

SOC Code 17-2011

Name Aerospace Engineers

Definition

Perform a variety of engineering work in designing, constructing, and testing aircraft, missiles, and spacecraft. May conduct basic and applied research to evaluate adaptability of materials and equipment to aircraft design and manufacture. May recommend improvements in testing equipment and techniques.

Examples

Aerodynamicist, Flight Test Engineer, Aeronautical Engineer

SOC Code 17-2021

Name Agricultural Engineers

Definition

Apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products.

Examples

Farm Equipment Engineer, Agricultural Research Engineer

Source: OCC, Office of Assessment & Effectivenes (CCSP)

Engineering Related Occupations

SOC Detail Definitions

SOC Code 17-2031

Name Biomedical Engineers

Definition

Apply knowledge of engineering, biology, and biomechanical principles to the design, development, and evaluation of biological and health systems and products, such as artificial organs, prostheses, instrumentation, medical information systems, and heath management and care delivery systems.

Examples

Orthopedic Designer

SOC Code 17-2041

Name Chemical Engineers

Definition

Design chemical plant equipment and devise processes for manufacturing chemicals and products, such as gasoline, synthetic rubber, plastics, detergents, cement, paper, and pulp, by applying principles and technology of chemistry, physics, and engineering.

Examples

Absorption and Adsorption Engineer, Explosives Engineer, Fuels Engineer

Engineering Related Occupations

SOC Detail Definitions

SOC Code 17-2051

Name Civil Engineers

Definition

Perform engineering duties in planning, designing, and overseeing construction and maintenance of building structures, and facilities, such as roads, railroads, airports, bridges, harbors, channels, dams, irrigation projects, pipelines, power plants, water and sewage systems, and waste disposal units. Include architectural, structural, traffic, ocean, and geo-technical engineers. Exclude "Hydrologists" (19-2043).

Examples

Bridge Engineer, Construction Engineer, Concrete Engineer

SOC Code 17-2061

Name Computer Hardware Engineers

Definition

Research, design, develop, and test computer or computer-related equipment for commercial, industrial, military, or scientific use. May supervise the manufacturing and installation of computer or computer-related equipment and components. Exclude "Computer Software Engineers, Applications" (15-1031) and "Computer Software Engineers, Systems Software" (15-1032).

Examples

Source: OCC, Office of Assessment & Effectivenes (CCSP)

Engineering Related Occupations

SOC Detail Definitions

SOC Code 17-2071

Name Electrical Engineers

Definition

Design, develop, test, or supervise the manufacturing and installation of electrical equipment, components, or systems for commercial, industrial, military, or scientific use. Exclude "Computer Hardware Engineers" (17-2061).

Examples

Power Distribution Engineer, Illuminating Engineer, Relay Engineer

SOC Code 17-2072

Name Electronics Engineers, Except Computer

Definition

Research, design, develop, and test electronic components and systems for commercial, industrial, military, or scientific use utilizing knowledge of electronic theory and materials properties. Design electronic circuits and components for use in fields such as telecommunications, aerospace guidance and propulsion control, acoustics, or instruments and controls. Exclude "Computer Hardware Engineers" (17-2061).

Examples

Communications Engineer, Circuit Design Engineer, Guidance and Control Systems Engineer

SOC Code 17-2081

Name Environmental Engineers

Definition

Design, plan, or perform engineering duties in the prevention, control, and remediation of environmental health hazards utilizing various engineering disciplines. Work may include waste treatment, site remediation, or pollution control technology.

Examples

Soil Engineer, Industrial Hygiene Engineer, Pollution Control Engineer

Source: OCC, Office of Assessment & Effectivenes (CCSP)

Engineering Related Occupations

SOC Detail Definitions

SOC Code 17-2111

Name Health and Safety Engineers, Except Mining Safety Engineers and Inspectors

Definition

Promote worksite or product safety by applying knowledge of industrial processes, mechanics, chemistry, psychology, and industrial health and safety laws. Include industrial product safety engineers.

Examples

Fire-Protection Engineer, Industrial Health Engineer Product Safety Engineer

SOC Code 17-2112

Name Industrial Engineers

Definition

Design, develop, test, and evaluate integrated systems for managing industrial production processes including human work factors, quality control, inventory control, logistics and material flow, cost analysis, and production coordination. Exclude "Health and Safety Engineers, Except Mining Safety Engineers and Inspectors" (17-2111).

Examples

Packaging Engineer, Time Study Engineer, Plant Engineer

SOC Code 17-2121

Name Marine Engineers and Naval Architects

Definition

Design, develop, and evaluate the operation of marine vessels, ship machinery, and related equipment, such as power supply and propulsion systems.

Examples

Marine Architect, Port Engineer, Ship Surveyor

Source: OCC, Office of Assessment & Effectivenes (CCSP)

Engineering Related Occupations

SOC Detail Definitions

SOC Code 17-2131

Name Materials Engineers

Definition

Evaluate materials and develop machinery and processes to manufacture materials for use in products that must meet specialized design and performance specifications. Develop new uses for known materials. Include those working with composite materials or specializing in one type of material, such as graphite, metal and metal alloys, ceramics and glass, plastics and polymers, and naturally occurring materials. Include metallurgists and metallurgical engineers, ceramic engineers, and welding engineers.

Examples

Ceramic Engineer, Corrosion Engineer, Metallurgical Engineer

SOC Code 17-2141

Name Mechanical Engineers

Definition

Perform engineering duties in planning and designing tools, engines, machines, and other mechanically functioning equipment. Oversee installation, operation, maintenance, and repair of such equipment as centralized heat, gas, water, and steam systems.

Examples

Combustion Engineer, Plant Equipment Engineer, Hydraulic Engineer

Engineering Related Occupations

SOC Detail Definitions

SOC Code 17-2151

Name Mining and Geological Engineers, Including Mining Safety Engineers

Definition

Determine the location and plan the extraction of coal, metallic ores, nonmetallic minerals, and building materials, such as stone and gravel. Work involves conducting preliminary surveys of deposits or undeveloped mines and planning their development; examining deposits or mines to determine whether they can be worked at a profit; making geological and topographical surveys; evolving methods of mining best suited to character, type, and size of deposits; and supervising mining operations.

Examples

Exploration Engineer, Mineral Engineer, Mine Equipment Design Engineer

SOC Code 17-2161

Name Nuclear Engineers

Definition

Conduct research on nuclear engineering problems or apply principles and theory of nuclear science to problems concerned with release, control, and utilization of nuclear energy and nuclear waste disposal.

Examples

Atomic Process Engineer, Radiation Engineer, Reactor Engineer

Source: OCC, Office of Assessment & Effectivenes (CCSP)

Engineering Related Occupations

SOC Detail Definitions

SOC Code 17-2171

Name Petroleum Engineers

Definition

Devise methods to improve oil and gas well production and determine the need for new or modified tool designs. Oversee drilling and offer technical advice to achieve economical and satisfactory progress.

Examples

Drilling Engineer, Natural Gas Engineer, Oil Well Surveying Engineer

SOC Code 17-2199

Name Engineers, All Other

Definition

All engineers not listed separately.

Examples

Optical Engineer, Salvage Engineer, Ordnance Engineer

SOC Code 17-3021

Name Aerospace Engineering and Operations Technicians

Definition

Operate, install, calibrate, and maintain integrated computer/communications systems consoles, simulators, and other data acquisition, test, and measurement instruments and equipment to launch, track, position, and evaluate air and space vehicles. May record and interpret test data.

Examples

Wind Tunnel Technician, Flight Data Technician, Altitude Chamber Technician

Source: OCC, Office of Assessment & Effectivenes (CCSP)

Engineering Related Occupations

SOC Detail Definitions

SOC Code 17-3022

Name Civil Engineering Technicians

Definition

Apply theory and principles of civil engineering in planning, designing, and overseeing construction and maintenance of structures and facilities under the direction of engineering staff or physical scientists.

Examples

Highway Technician

SOC Code 17-3023

Name Electrical and Electronic Engineering Technicians

Definition

Apply electrical and electronic theory and related knowledge, usually under the direction of engineering staff, to design, build, repair, calibrate, and modify electrical components, circuitry, controls, and machinery for subsequent evaluation and use by engineering staff in making engineering design decisions. Exclude "Broadcast Technicians" (27-4012).

Examples

Calibration Laboratory Technician, Semiconductor Development Technician, Instrumentation Technician

Source: OCC, Office of Assessment & Effectivenes (CCSP)

SOC Code 17-3024

Name Electro-Mechanical Technicians

Definition

Operate, test, and maintain unmanned, automated, servo-mechanical, or electromechanical equipment. May operate unmanned submarines, aircraft, or other equipment at worksites, such as oil rigs, deep ocean exploration, or hazardous waste removal. May assist engineers in testing and designing robotics equipment.

Examples

SOC Code 17-3025

Name Environmental Engineering Technicians

Definition

Apply theory and principles of environmental engineering to modify, test, and operate equipment and devices used in the prevention, control, and remediation of environmental pollution, including waste treatment and site remediation. May assist in the development of environmental pollution remediation devices under direction of engineer.

Examples

Air Analysis Technician, Soil Technician

Engineering Related Occupations

SOC Detail Definitions

SOC Code 17-3026

Name Industrial Engineering Technicians

Definition

Apply engineering theory and principles to problems of industrial layout or manufacturing production, usually under the direction of engineering staff. May study and record time, motion, method, and speed involved in performance of production, maintenance, clerical, and other worker operations for such purposes as establishing standard production rates or improving efficiency.

Examples

Methods Study Analyst, Quality Control Technician, Time Study Analyst

SOC Code 17-3027

Name Mechanical Engineering Technicians

Definition

Apply theory and principles of mechanical engineering to modify, develop, and test machinery and equipment under direction of engineering staff or physical scientists.

Examples

Heat Transfer Technician, Optomechanical Technician, Tool Analyst

SOC Code 17-3029

Name Engineering Technicians, Except Drafters, All Other

Definition

All engineering technicians, except drafters, not listed separately.

Examples

Laser Specialist, Metallurgical Technician, Material Stress Tester

POSITION PAPER

HIGHLAND LAKES
PROPOSAL TO SUNSET THE PRE-ENGINEERING PROGRAM
NOVEMBER 2006/REVISED DECEMBER 2006

Background:

In 1981 the physics discipline proposed the creation of the Pre-Engineering Program to serve as a first-step transition experience for students to transfer to four-year institutions in engineering. The program was designed around the classic theoretical model for engineering education. A faculty member was hired and the program was launched. The program has always been designated as a transfer program, not an occupational program.

Since that time there have been many changes in the transfer relationship between OCC and the major engineering transfer institutions, such as Kettering University and Lawrence Technological University. These four-year institutions are now primarily interested in students taking fundamentals classes in science, math and general studies at the two-year schools and then enrolling for the engineering courses at their universities. In fact, most of the students from OCC whom we are aware of who have transferred to four-year institutions as of late intending to major in some area of engineering have been students in the science and technical programs, not Pre-Engineering.

As a transfer program, Pre-Engineering is becoming less desirable than a science fundamentals program that prepares students to transfer to four-year institutions in a variety of disciplines, such as chemistry, physics, math, biology and engineering of all sorts. Additionally, a science fundamentals program would offer students a greater opportunity for transfer to four-year institutions given the reasons discussed above.

Today, most engineering programs do not focus on engineering courses until the third, fourth, and, in some cases, fifth years of the undergraduate experience. In short, four-year institutions prefer students with strong fundamentals education in science and math who have the preparation to take the upper level engineering courses offered at the four-year institutions.

The Pre-Engineering Program currently is housed at the Highland Lakes Campus. The most suitable location for the program is the Auburn Hills Campus, but neither the Science Department nor the Technology Department there is willing to accept the existing program.

Analysis of Data:

Perhaps of greatest concern is the falling enrollment in the program. Since the fall of 2004, the full-time faculty member in the program has been unable to make his program teaching load in five semesters. In 1991-1992 the program generated 1032 SCHs, but in 2001-2002 only 320 SCHs were attributable to Pre-Engineering. In the previous two decades, less than 200 students received an associate degree in Pre-Engineering. This is perhaps the most problematic piece of information. At a time when industry needs for engineers were significant, this program should have been one of the most popular at OCC with strong enrollments and graduates. This was not the case. When examining enrollment data for the program, it becomes very clear that the students who do register for the program, register only for the beginning courses. The second-year courses are not making.

At my request, Martin Orlowski, Director of the Office of Assessment and Effectiveness, prepared an assortment of pertinent documents pertaining to the Pre-Engineering Program. The data and an analysis are presented on pages 4-16. Also included in this information on pages 17 and 18 are documents showing the number of projected jobs in engineering related fields in Southeast Michigan from 2005-2015. The outlook is positive.

Following the data and analysis from the Office of Assessment and Effectiveness is data collected about the actual courses offered in Pre-Engineering from 1990-2006 on pages 19-34. The first set of data shows what actually occurred when courses in Pre-Engineering were allowed to run. Often, the courses did not meet the minimum (15) for the course to run, but exceptions were made. In other instances, courses were piggybacked in order to run. Piggybacking means that courses are combined in order for the instructor to make his/her teaching load, but the instructor is only paid for one section not two. So, when sections run, they are counted as two single sections implying that the enrollment was healthy when, in fact, that is not the case.

The next set of data on page 35 is a graphical representation of the actual seats available and the seats taken in Pre-Engineering between 1990-2006. What you see is a program in steady decline.

On page 36 registrants and withdrawals in Pre-Engineering over a 16-year period are shown. It is evident that the number of students enrolled in the upper level classes is small in comparison to the beginning level classes. The "bulge" in student registrations in EGR 2000 and EGR 2020 might be explained by guest students.

The final document on page 37 shows the annual degrees awarded in Pre-Engineering. From 1987-2005 there was a total of 194 Pre-Engineering degrees awarded.

Conclusions:

The Pre-Engineering Program at Oakland Community College has suffered declining enrollment for the last several years. The major four-year engineering transfer institutions are now primarily interested in students taking fundamentals classes in science, mathematics, and general studies at two-year colleges before enrolling in the engineering courses (during the third, fourth, and fifth years) at their respective universities. The programs at the four-year institutions focus on pure engineering, while the community college focus has shifted to engineering technology. While the outlook for engineering positions is positive, the number of students retained in the program continues to fall. Given the regional need for engineers and students' interest in engineering, there is a clear disconnect between what should be an attractive program, and the existing enrollment and graduates in the Pre-Engineering Program at OCC. Due to low student enrollment in the past two years, the program has been unable to offer enough classes/students to support one full-time faculty member. The recommended solution is to sunset the current Pre-Engineering Program as it is designed and determine a new direction.

OAKLAND
COMMUNITY
COLLEGE

CRC Pre-Engineering Review
CRC Committee Reviewed per request of Dean Sally Hanna
May 18, 2007

Recommendations:

- **CRC supports the sun-setting of the Pre-Engineering Program (PRE.ASC)**
- **The Associates in Science Degree will better serve students with higher level math and science requirements**
- **Consider taking to Curriculum Committee an ASC with a Engineering Transfer Option focusing on higher level Math, Chemistry and Physics versus an ASC for those that might be going into the Biological Science which may not need as high a Math requirement, more Biological sciences and Chemistry**
- **Look at other schools that have Engineering and OCC transfer guides to determine what we need to teach for the ASC Engineering Transfer Option**
- **Recommend a Release Time posting to study the feasibly of the Transfer Option and take the new program through the Program Planning Study and then to the Curriculum Committee.**