CEFNS Student Success Plan

Revision History: Draft V2.0 Presented to CEFNS Chairs for their review on January 29, 2010, V3.0 to CEFNS chairs on February 18, 2010. Final version submitted to the Provost's office on Feb 26, 2010.

Introduction

The College of Engineering, Forestry and Natural Sciences has been, and continues to be, committed to offering and maintaining high-quality undergraduate programs and experiences. Examples of this tradition range from faculty who are noted nationally for their expertise and success in the classroom to the inclusion of undergraduates in research and design activities. The College's fourth goal in its strategic direction is to remain committed to the undergraduate educational experience, which is further articulated by this document. This Student Success plan is a set of four measurable goals and associated strategies and is data driven, whenever possible. For the purposes of economy and practicality, the plan relies on tools, techniques, and efforts that are already in place or will be in the near future.   The background notes section of each goal includes data summaries and information pertinent to the selected strategies.

Goal 1

Transform curriculum and processes for effectiveness and efficiencies. By the fall of 2011:
   a. Reduce the number of active undergraduate plans in the College by 25%, using the 2008-09 AY as the benchmark year.
   b. Reduce major requirements to 125 or fewer required units per progression plans. In the long-term and when possible, make progress towards reducing plans to 120 units.
   c. Reduce degree substitution/exception activity on a per department basis to no more than 10% per year.
   d. Increase program assessment activities to a 100% participation rate in NAU's Office of Academic Assessment (OAA) reporting structure.
   e. In accordance to the developing academic program dismissal policy, the College will adopt, with possible modifications, the academic integrity policy being developed by the ACC.

Goal 1 Background:

The following evidence is provided as benchmarking data or to support the merits of the various strategies and metrics.

- Prior to the start of the 2008-09 academic year, the College hosted 125 various undergraduate plans including extended majors, minors, certificates, BAILS, BSEDs, BAs, BS,BSE, BSIS, BAIS.

- Per the December 2009 letter to the Deans from the Provost, each College is encouraged to conduct reviews of "the configuration and design of academic programs including practices related to requirements. Smart curricula design that improves student learning and achievement will support the agendas of departments, schools, and programs. Well-designed curricula will create a foundation for us to be more successful in the pursuit of research, outreach, and other agendas." A current (fall 2009) sample of accredited engineering programs per Table 1, however, show that very few programs are able to achieve a 120 unit program and that a more realistic goal, without consideration to our growing current liberal studies and university requirements, is 125 units.

Table 1. Survey of the Number of Semester Units Required for Various Engineering Programs (http://profiles.asee.org/, fall 2009)

Engineering Programs At:	Unit Req'ts	Engineering Programs At:	Unit Req'ts
Arizona State University	120	Rowan University	128 - 131
Boise State University	128 - 132	San Jose State University	128 - 135
California Polytechnic Pomona*	129.3	University of Arizona	128
California Polytechnic SLO*	129.3	University of California Irvine*	126
Embry Riddle	128 - 129	University of Nevada Las Vegas	125 - 134
Montana Tech of U of Montana	136	University of Nevada Reno	126 - 133
Montana State University	128	University of New Mexico	132
New Mexico Inst. of Mining & Tech.	132	University of Texas El Paso	125 - 130
New Mexico State University	129 - 136	University of Utah	122 - 129
Oregon State University*	120	Utah State University	≥ 126
Rose-Hulman Institute of Technology*	125-129		

*Quarter system converted to an equivalent semester basis

Table 2. Degree Exceptions Entered from January 2009 to November 2009

Departments	Exceptions from 1/1/09 to 11/13/09	Students enrolled in majors as of 11-18-09	Exception Rate
Environmental Sci/Studies	171	280	61%
Construction Mgt	133	259	51%
Electrical Egr	84	186	45%
Forestry	112	276	41%
Geology	38	150	25%
Civil/Environmental Egr	106	448	24%
Biology	394	1922	20%
Mechanical Egr	87	490	18%
CS	39	214	18%
Chemistry	42	396	11%
Mathematics	25	251	10%
Physics/ Astronomy	17	328	5%
Total /Average	1248	5200	24%

- As shown in Table 2 for a recent eleven month period, the College recorded 1248 degree exceptions; amounting to over 624 hours of staff time. Not only do these exceptions incur staff costs, they are also predictive of complicated or out-of date curricula that confuse and delay students. In addition, some exceptions are the result of interdisciplinary degree programs that rely on courses in other colleges.
- Program assessment plans tied to explicit learning outcomes encourage the creation of a long-term culture of programmatic improvement tied to student success. The OAA's 2008-09 audit indicates that 79% of the College's degree programs have assessment plans, and 71% have submitted follow-up reports.

Goal 1 Strategies:

1. Each department shall establish programmatic assessment plans with measurable learning outcomes.
2. Each department shall set up an active outcomes assessment process and shall report upon their progress and results within the schedule specified by OAA.
3. Using the above strategies as guiding principles, each department shall:
   a. Indentify low enrolled programs (e.g. emphasis or focus areas, sub-plans, minors) and courses, and develop plans to modify or phase out.
   b. Review and reconsider the need for multiple degree paths. Reconfigure plans to accommodate the elimination of degree plans.
   c. Review prerequisite pathways to remove hidden required courses, maintain proper sequencing to facilitate progression, and reduce lengthy sequences of pre-requisite requirements that are not in-sync with progression plans.
   d. Review the degree substitution and exception practices of the program.
      i. Revise catalog text to reflect the current practices that are being accommodated by degree substitutions /exceptions.
      ii. Disallow those exceptions that erode the academic integrity of the program.
      iii. Work with other colleges to improve degree progress for interdisciplinary programs.

Goal 2

Improve the DFW rates by an average of an absolute 5% during the 2010-11 AY in the 100 and 200-level College's courses that have mean 25% or higher DFW rates.

Goal 2 Background Notes:

Recent data shows that there are 99 CEFNS courses with a running average over a five year period with a 20% or more DFW rate, and 54 courses with a 25% or more DFW rate. Per Table 3, of the 25% or higher DFW courses, twenty-nine are at the 100 level. However, student

participation in the Supplemental Instruction (SI) program shows a direct and positive impact on DFW performance. Per Table 4, a spring 2009 data summary for the CEFNS SI program shows that students who attend three or more SI sessions per course demonstrated a significant improvement in course grade performance: SI students accounted for, respectively, 5.4% and 11.1% more A's and B's; and a 15.9% reduction in DFW rates. The average course GPA for SI and non-SI from Table 4 was 2.71 and 2.31

Table 3. Courses with a Five-Year Average of 25% or Greater DFW Rates (AY 05 to AY 08)

Course	Mean (%)	Course	Mean (%)	Course	Mean (%)	Course	Mean (%)	Course	Mean (%)
AST 392	26.09	CENE 251	40.76	CS 315	33.90	EXS 190	31.39	MAT 137	29.86
BIO 100	31.99	CS 110	38.34	CS 396	45.13	FOR 211	26.23	MAT 226	27.47
BIO 171	29.19	CS 122	26.93	CS 413	34.78	GLG 101	25.54	MAT 238	26.70
BIO 181	32.30	CS 126	41.69	CS 421	28.30	GLG 115	32.14	MAT 239	32.85
BIO 182	27.73	CS 126R	47.71	CS 470	25.42	MAT 108	35.61	MAT 316	27.06
BIO 192	26.85	CS 136	31.57	CS 480	29.64	MAT 114	30.47	MAT 318	26.64
BIO 201	36.58	CS 199	40.00	EE 110	28.02	MAT 119	32.15	MAT 320W	30.96
BIO 350	33.17	CS 200	35.06	EE 188	36.09	MAT 125	38.87	PHY 263	26.30
BIO 401C	26.23	CS 212	27.23	EGR 251	28.69	MAT 131	34.79	STA 270	26.80
		CS 249	30.09	ENV 115	36.59	MAT 136	37.54	STA 473C	25.48

Table 4. Spring 2009 Grade Distribution in CEFNS Courses with and without Supplemental Instruction (on a per course basis)

Course Grade	SI Students*	Non-SI Students
A	25.27%	19.84%
B	35.36%	24.28%
C	25.95%	26.57%
D	7.05%	10.92%
F	4.70%	12.05%
W	1.67%	6.34%
DFW	13.42%	29.32%

*SI Students are those defined by attending three or more SI sessions.

Goal 2 Strategies:

1. Advocate for more course-linked academic support, including SI, in the high DFW rate courses.
2. Provide training on the SI program to all instructors teaching in the 25% or higher DFW courses that have SI assistance.

3. Create three centralized, accessible, and visible SI centers - science, math, and engineering/forestry – to encourage regular student participation.
4. Encourage programs and/or small groups of faculty consult with the NAU Student Success Team for expert guidance on improving student success rates in key courses. (Requests are made through Karen Pugliesi's office.)

Goal 3

Increase the in-college retention rates for first year and second year first time freshman (FTT) cohorts to, 64% and 50%, respectively for the 1998 – 2012 and 1998 – 2011 cohorts.

Goal 3 Background Notes:

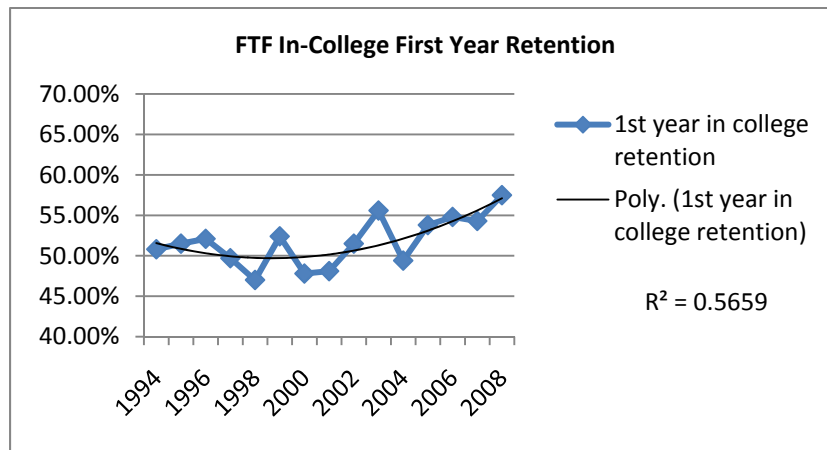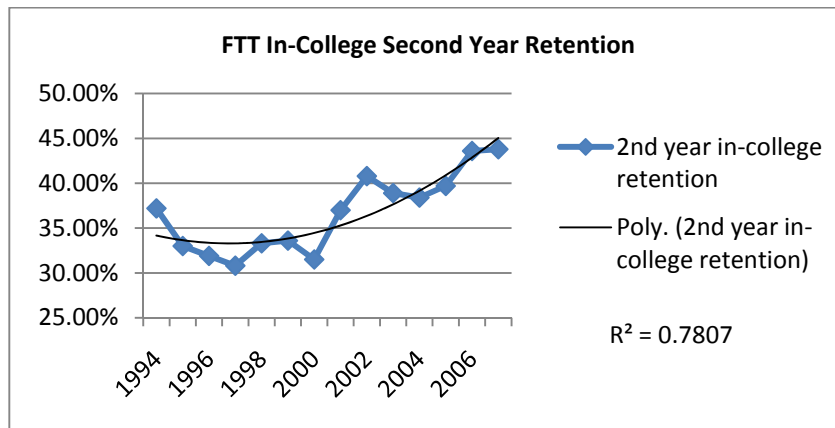Figure 1. First Year Retention First Time Freshman Cohorts in CEFNS

Figure 2. Second Year Retention First Time Freshman Cohorts in CEFNS

The College's ten-year running averages for FTT first and second year in-college retention data has been relatively stable at 51.8% and 36.7%, respectively. The recent trends per Figures 1 and

2 have been upward.   Beyond the second year, in-college average retention rates do not change dramatically as shown in Table 5; leading to the conclusion that improvements in first and second year retention rates also lead to increased graduation rates. It is probable that graduation rates will become an important university metric, similar to the role that the 21-day enrollment count played. A recent ABOR initiative is, in part, working to examine and create a new state funding formula for higher education that rewards student progress and degree completion[1]. Students who participated in the NAU's 2009 Sophomore Survey[2] rated, using a scale of 1-10 (1 = unimportant and 10=very important), the importance of various University services as related to their success and overall satisfaction. The top rated services for the University to provide was academic advising with an average score of 8.72. The literature on retention lists various other important strategies including: academic intervention, community building, financial assistance, and research or other hands-on activities.

Table 5. College Combined Retention-Graduation Averages for First Time Freshman Cohorts

1 Year Retention & Graduation		2 Year Retention & Graduation		3 Year Retention & Graduation		4 Year Retention & Graduation		5 Year Retention & Graduation		6 Year Retention & Graduation	
Cohorts	Aver.	Cohorts	Aver.	Cohorts	Aver.	Cohorts	Aver.	Cohorts	Aver.	Cohorts	Aver.
1994-2008	51.8%	1994-2007	36.7%	1994-2006	32.0%	1994-2005	29.6%	1994-2004	28.8%	1994-2003	28.5%

Goal 3 Strategies:

1. Encourage, at the department level, enhanced instructor participation in:
   a. Utilizing the Vista course shell tools and facilitate use by new instructors through training.
   b. Reporting meaningful mid-term grades in 100 and 200-level courses.
   c. Using the GPS system.
   d. Verifying compliance with pre-requisites during the first week of each semester and administratively withdrawing non-complying students.
2. Further strengthen the advising and students service functions by:
   a. Utilizing the e-Planning system as it comes on-line.
   b. Adding professional advising staff as needed to focus on special populations (e.g. international students, under-represented students in certain majors, athletes, probation students and students returning from suspension) and in academic areas with student growth significantly out-pacing capacity (e.g. biology, environmental studies and environmental sciences).

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[1] NAU's Community College Partnerships In Sync with Lumina Grant. Inside NAU. Hhttp://www4.nau.edu/insidenau/bumps/2009/11_25_09/luni.htmH. (date accessed 12/2/09)

[2] Office of Planning and Institutional Research, 2009 Sophomore Survey Report, Northern Arizona University, Hhttp://www4.nau.edu/pair/SurveysReport/SurveysReports.aspH (date accessed: 1/5/10).

   c. Continuing to support, at the department level, the freshman learning communities and student organizations.
   d. Creating an office, at the college level, for coordinating undergraduate research opportunities.
   e. Maintaining the engineering programs' commitment to design through coursework and project sponsorships.
   f. Encouraging participation by programs in the sponsorship of undergraduate research and facilitation of high-quality student internship opportunities.
   g. Maintaining staff support for career services, internships, scholarships, and multi-cultural programs.
   h. Accounting for, within SOE workload assignments at the department level, faculty member's efforts in advising student organizations, career and academic advising, recruiting, mentoring, etc.
   i. Clarifying the various roles of faculty and professional advisors.
3. Encourage the completion of degrees by students who have applied for graduation, but have not completed the last remaining requirements to graduate.
4. Grow college and department scholarship funds to increase the number of students receiving financial assistance via scholarships.

Goal 4

Focus attention on two or three degree programs and/or course offerings to pilot activities and efforts resulting in enhanced student success indicators. Show measurable increases in various student success indicators (as determined by programs) by 2011-2012 for the targeted programs. Strategies will be determined by targeted programs.