

## Measuring the Resource Impact of the Proposed Revision to the General Education Requirement

### SUMMARY

The Office of Resource Management and Planning (ORMP) was asked to estimate the potential resource implications of the proposed revision to the current General Education (GE) program. To understand possible resource implications, estimated student need (i.e., capacity needed) was compared to student course taking for 2006-07 (i.e., course demand) based on a provisional mapping of existing courses to each element of the proposed core literacies. These comparisons resulted in estimates of net “surplus” for those literacies where capacity needed exceeds student demand, and “gaps” where capacity needed is less than demand. At the aggregate level of analysis, only one literacy was found to have a gap and it is relatively small. However, without a specific plan regarding how this gap would be addressed (e.g., creating a new course, altering existing courses, etc) it is not possible to estimate this cost.

A subsequent and more detailed analysis of the proposed intensive writing literacy revealed the potential need for both additional TAs and instructors. The cost of additional TAs needed to support writing intensive sections in or outside of the each major could be as much as \$2 million. In addition, the current writing intensive literacy proposal is very likely to increase the need for instructors (ladder rank and/or temporary) for some majors and departments. The total impact of all of these costs will vary widely across majors and departments.

### BACKGROUND

In the February 13, 2007 draft of the proposed revision, the new GE requirement is described in part as follows:

*The GE requirement has two components: Topical Breadth and Core Literacies. The GE requirement is defined in terms of units, not courses. The units of every course at Davis (with very few exceptions) are assigned to one of the three Topical Breadth Areas or are certified as interdisciplinary.*

This analysis focuses on the four Core Literacies as follows:

Core Literacies Component – 35 units

A) Literacy with Words and Images, 20 units

1) English Composition	8
2) Writing-intensive coursework in the student's major	3
3) Additional writing-intensive coursework in the student's major or additional writing-intensive (including composition) coursework outside the student's major	3
4) Oral skills coursework or additional writing-intensive coursework within or outside the student's major	3
5) Visual literacy coursework	3

B) Civic and Cultural Literacy, 9 units

1) American Cultures, Governance, and History	6
2) World Cultures	3

C) Quantitative Literacy, 3 units

D) Scientific Literacy, 3 units

In a preliminary analysis (Attachment I), ORMP estimated the number of sections and TAs needed (i.e. capacity) to meet each new core literacy component except for English composition. This analysis compared estimates of need with enrollment data for the specific courses in each literacy with the goal of identifying course or instructor capacity or “gaps” for each core literacy. Gaps are defined as a need for more seats in courses assigned to a given literacy than the number of seats used during the last academic year. Conversely, to the extent that seats assigned exceed the actual number of seats used in the prior year, a surplus exists. Initial estimates prepared by ORMP estimated that each core literacy requirement would produce a need for 2,068 GE seats per term. Using the course lists prepared for each literacy by Academic Senate workgroups last summer (Attachment II), actual enrollment histories were examined for the courses in each literacy and literacy gap estimates were made both in terms of courses and student credit hours (see Attachment III for more details on how gaps were estimated).

**PART I. AGGREGATE LEVEL ANALYSIS.**

Comparing course capacity needed to support each of the literacy elements with actual course taking in 2006-07 reveals a somewhat surprising result of no significant gaps. Table I below demonstrates that, 2006-07 enrollments in courses provisionally assigned to each core literacy were greater than the estimated number of seats needed to meet GE demand. In some cases, the “excess” seems large, such as for Writing-Intensive course work but these differences must be interpreted with care (more discussion follows later in this analysis). Nonetheless, this aggregate level of analysis shows that the new GE proposal would not produce the need for additional resources (e.g., additional class sections, TA’s, etc) and current course offerings could presumably meet the demand produced by the new requirements.

Table I: Surplus-Gap Analysis Using Student Enrollment

Primary Literacy Elements	Required Units	Est. of Seats Needed per Year*	2006-07 Actual FWS Enrl	Estimated Enrl Surplus (Gap)
Writing-intensive coursework	6	12,408	52,353	39,945
Oral Skills coursework	3	6,204	11,330	5,126
Visual Literacy coursework	3	6,204	32,590	26,386
American Cultures, Governance & History	6	12,408	15,311	2,903
World Cultures	3	6,204	8,283	2,079
Quantitative Literacy	3	6,204	10,815	4,611
Scientific Literacy	3	6,204	22,052	15,848
Totals	27	55,836	152,734	96,898

Since the proposed requirements are based on the number of units instead of the number of courses, a second gap analysis was performed using student credit hours (SCH) instead of enrollments. The results are similar to the enrollment gap analysis in Table I except in the area of the American Cultures, Governance and History core literacy where a relatively small gap was found.

Table II: Surplus-Gap Analysis using Student Credit Hours (SCH)

Primary Literacy Elements	Required Units	Est. of SCH Needed per Year	2006-07 Actual FWS SCH	Estimated Surplus (Gap)
Writing-intensive coursework	6	74,448	198,148	123,700
Oral Skills coursework	3	18,612	50,191	31,579
Visual Literacy coursework	3	18,612	119,815	101,203
American Cultures, Governance & History	6	74,448	62,432	(12,016)
World Cultures	3	18,612	33,073	14,461
Quantitative Literacy	3	18,612	42,915	24,303
Scientific Literacy	3	18,612	90,860	72,248
Totals	27	241,956	597,434	355,478

The SCH core literacy gap in courses in American Cultures, Governance and History has to do with the relationship between the unit value of existing courses and the six units required under this literacy. In the previous analysis (Attachment I), the ORMP assumed that most of the courses that fulfill literacy requirements would have unit values of 3; therefore, for American Cultures, Governance and History, this meant that students would take two three unit classes to fulfill this requirement. However, the majority of the actual courses that have been identified as

fulfilling this literacy have a unit value of four. Consequently, many students take one of the four-unit qualifying courses for this literacy and fall short of the six units needed to meet this requirement. The gap in this area could result in the need for additional resources, but it is difficult to make any reasonable estimate of these costs.

## **PART II. A CLOSER LOOK AT THE WRITING-INTENSIVE CORE LITERACY REQUIREMENTS**

**Teaching Assistants.** The Writing Intensive (WI) core literacy is the area where the resource impacts may be quite significant. While the surplus-gap analysis results displayed in Tables I and II show that GE need is more than covered by current course offerings, these results can be misleading. The uncertainty is tied to the legitimacy of assuming that the courses meet the core literacy requirement as they are currently configured. (Note: the determination of whether a course would fulfill the requirement or not was made based on a review of course descriptions in the catalog by the Academic Senate workgroups.) However, if these courses need to be altered in order to fulfill this element of GE requirement – for example, the need to offer smaller (i.e., more) sections – ORMP would conclude that there will likely be increased costs because of the need for more teaching assistants (TAs).

Looking strictly at the possibility of needing more TAs, the initial analysis estimated that the two WI components [i.e., writing intensive course work (in the major) and additional writing intensive course work (in or outside the major)] could require approximately 80 TAs per term. This rough estimate was made independent of the actual TA resources currently utilized. As context, the average TA usage per quarter in 2006-07 was 537 FTE, so an additional 80 TAs (40 FTE) would be a 7% increase.

However, without additional information on how the WI literacy component will affect workload in each course listed, it is very difficult to make a meaningful estimate of additional TA costs. For this reason, given the information currently available, it is most appropriate to view the additional costs associated with TA's beyond the amount currently spent for TA's in WI qualifying courses as a range: at the low end a relative modest amount of additional resources would be needed because existing TAs would in fact absorb the bulk of the additional workload; at the high end of the range one could assume existing TA's could not absorb any additional work and costs could be as high as \$2 million. Currently, a full-time TA (0.5 FTE) is paid \$15,600 and receives fee remission and other benefits valued at approximately \$9,000 per year for a total cost of about \$24,600 per TA per year; therefore 80+ additional TAs would cost approximately \$2 million a year.

**Instructors.** As evidenced above, both writing intensive requirements are likely to produce new TA resource needs. But the requirement for WI coursework in the major may produce additional resource demands. Specifically, a review of the list of courses that fulfill the WI requirement reveal that there are some subject areas that do not have courses (i.e., there are some majors that currently do not have qualifying WI coursework available). In these cases, new courses or modifications to courses may be needed.

For example, the ORMP analyzed a major that does not currently have any courses that meet the within major WI requirement for each college or division. The potential added instructional costs of meeting this WI requirement for this sample of majors using lecturers is provided in Table III. However, some of this demand might also be met by changing the courses taught by ladder faculty.

**Table III: Estimating the Instructional Costs for a Sample of Majors that Currently Do Not Have a Qualifying Writing Intensive Course within the Major**

	2006-07 Majors	Seats required/yr (major / by 4)	Number of Sections needed (max size 25)	Lecturer Cost <sup>1</sup>
CA&ES: Viticulture and Enology	96	24	1	\$7,500
CBS: Microbiology	169	42	2	\$15,000
COE: Biomedical Engineering	199	50	2	\$15,000
HArCS: Medieval & Early Modern Studies	10	3	1	\$7,500
MPS: Chemistry	273	68	3	\$22,500
DSS: International Relations	581	145	6	\$45,000

A similar instructional need is likely to exist among majors that have qualifying courses where current enrollments do not meet the estimated need (i.e., insufficient capacity). To analyze the impact of the within major writing intensive requirement on these majors, the ORMP examined a several large majors in DSS: (1) Communication which had 535 first majors last year, and (2) Economics which had 894. Last year, the courses listed as meeting the WI requirement in Communications and Economics had total enrollments of 38 and 30 respectively. A gap analysis of these two subjects shows that 4 additional sections of Communications and 8 additional sections of Economics may be needed each year in order to provide the necessary WI coursework in these majors. The instructor cost associated with these additional classes is as follows:

**Table IV: Estimating the Instructional Costs for Two Majors that Currently Do Not Have a Sufficient Enrollment in Their Qualifying Writing Intensive Courses within the Major**

	2006-07 Majors	Seats required per year (major divided by 4)	2006-07 Enrollment	Enrollment Gap	# of Sections needed (max size 25)	Lecturer Cost
Communications	535	134	38	96	4	\$30,000
Economics	894	224	30	194	8	\$60,000

Lecturer costs, if needed, would be in addition to estimated TA costs presented earlier in this paper. The impact on Economics is made even more severe if Managerial Economics is included. Almost 800 more additional students in this major (200 seats more seats needed per year) would be added without making any significant changes to the 2006-07 enrollment.

<sup>1</sup> The lecturer cost estimate is made based on a per class cost calculation of \$7,500; this figure takes into consideration salary, benefits, and the assumption that a full-time lecturer is paid to teach 7 classes.

## CONCLUSIONS

The results presented in this analysis are heavily influenced by a number of assumptions that may or may not be reasonable. However, these assumptions and the course information made available by the Academic Senate workgroup provide the basis to conclude the following:

- 1) In the aggregate, current course offerings are sufficient to meet the enrollment demands produced by the new GE requirements for all literacies except for American Cultures, Governance and History. Whether the relatively small gap noted in this case results in additional resource demands cannot be determined at this time.
- 2) The specificity of the Writing Intensive coursework requirements in the major and outside the major will require additional resources for TAs and instructors. Additional TA costs could be as high as \$2 million annually or could be much less if workload for existing TAs is modified. The total cost of additional instructors cannot be determined without more information about the level of ladder-faculty participation directed at providing some of the new courses or sections. In any case, it is clear that the impact of the additional costs associated with implementing the writing intensive requirements will vary widely among majors and departments.
- 3) For these reasons, the timing for the implementation of the new proposal could influence costs. For example, a longer implementation time period could allow for adaptation of existing courses and instructor models that could mitigate cost increases.

## Attachments

Attachment 1: Initial ORMP Analysis of the Resource Impact of the Proposed Revision to the General Education Requirement, September 2007

Attachment 2: Lists of courses that meet the proposed core literacies, prepared by the Academic Senate Workgroups (Note that courses which meet more than one core literacy requirement are treated proportionally; i.e. if a course with an enrollment of 20 meets two literacies, this course is counted as a .5 in each literacy with enrollments of 10.)

Attachment 3: Additional tables supporting ORMP's estimates of current demand for core literacy courses

Ref: M/AY08/AY08-10 GE Cost Estimate/GE V6 100807.doc