

Guidelines for Submission of Courses for Organic Chemistry TAG Review

(November 2009)

The Organic Chemistry TAG requires the submission of a full year (two semesters or three quarters) of both the lecture and laboratory components of a science major's sophomore organic chemistry sequence. Only full year sequences can be approved.

Pre-requisite. It is essential that a **full year** (two semesters or three quarters) of a (TAG approved) General Chemistry sequence for science majors be included as a pre-requisite for any full year organic chemistry sequence submitted for consideration.

Who Should Write the Content for the TAG Submission? It is essential that the TAG document be written with the active involvement of the chemistry faculty who are actually teaching these courses. Submissions that receive "pending" or "rejected" designations often appear to have been prepared by administrators unfamiliar with the detailed content/approaches of the courses being submitted.

Should We Provide a Master Syllabus or a Working Syllabus? In situations where these courses have already been taught, *detailed recent working syllabi* should be included to show what is currently practiced in the courses rather than some idealized and sanitized version of what was intended when the courses were created.

The names/editions of the text(s) currently used should be included. Full details of the content covered should be provided (with titles of sections covered rather than simply chapter numbers, and assigned subsections listed in cases where the entire chapter is not covered). For laboratory courses, full titles of experiments performed should be provided rather than experiment numbers. Details of how the courses are evaluated should be included. While details of the dates of particular activities are not needed, some indication of the approximate number of class hours dedicated to each section of the course (chapter, experiment, etc) needs to be listed.

Please avoid sending submissions which include many pages of irrelevant (to the TAG review) material. Also, note that it is not useful to simply cut and paste language verbatim from the required learning outcomes in order to convince the review committee that certain outcomes are being met.

What About For Institutions With Approved Sequences Who Are Transitioning from Quarters to Semesters? For institutions transitioning to semesters from quarters, Organic Chemistry TAG submissions will necessarily be draft syllabi rather than actual syllabi from recent offerings of the courses. However, these draft syllabi should provide the level of detail of content and skills development expected in a working syllabus. The text(s) that will most likely be used in the first offerings of these courses should be listed. An estimate of the approximate number of class hours that will be dedicated to each section of the course (chapter, experiment, etc) needs to be provided. A cover letter can

address any important changes vis-à-vis the originally approved sequence. It is not necessary to answer all of the individual questions on the CEMS submission form.

Internal Consistency of Documentation. A common cause of “pending” designations for past submissions has been the submission of internally inconsistent materials. All materials submitted should be from the same year so that a seamless two semester/three quarter submission is provided that uses the same text and neither duplicates content nor omits content.

Resubmission of Sequences Previously Designated as Pending or Rejected. In cases where a submission is rejected or is designated as pending, it is **crucial** that the submitting institution carefully consider all the points raised by the TAG review panel and then **explicitly address each of these issues** in the resubmission. The onus is on the submitting institution to clearly delineate how they have addressed the concerns raised by the panel and how the new submission has been changed such that it now meets the requirements of the Organic Chemistry TAG. The largest frustrations for this panel are in dealing with resubmitted documents that were hastily resubmitted without carefully and explicitly addressing the concerns raised in the previous review. To this end, we strongly encourage the submitting institution to attach a cover page to their resubmission (written in close consultation with the faculty who teach these courses!) in which they explicitly address how all of the concerns raised in the prior review have been remedied, and delineate how their courses now meet the TAG learning outcomes.

Learning Outcomes/Content Coverage. The Organic Chemistry TAG requires the coverage of a broad range of topics that are found in all high quality sophomore organic chemistry sequences. The order in which these topics are covered is flexible and varies enormously between different institutions, depending on the nature of the textbook used and the preferences of the faculty. Thus, it is important that the submitted documentation clearly delineates exactly where each of the required content items is covered during the full year sequence. Simply listing the textbook chapter titles is insufficient – the CEMS entries should succinctly but explicitly explain where each topic is covered.

Common Problems with Delineation of Learning Outcomes/Content Coverage. The most common problems with Organic Chemistry TAG submissions are with the explicit communication of sufficient detail to show that the required learning outcomes are achieved in the following areas::

- 1) **Bonding:** the explicit delineation of what level of bonding theory is discussed and where – note that the discussion of the molecular orbital theory of bonding and coverage of hybridization (valence bond theory) is required;
- 2) **Spectroscopy:** it is important for the submission to explicitly detail which areas of spectroscopy are covered and where. Common pitfalls are to omit mention of ^{13}C NMR and/or mass spectrometry, both of which are required. It is expected that **all** areas of spectroscopy listed in the TAG document are dealt with in lecture. In addition, the laboratory course must involve students in **hands-on** use of IR spectroscopy; NMR spectral interpretation is also required in lab, although

- spectra may either be recorded by students or else standard spectra may be provided. Please explain where in the lab course students receive this exposure.
- 3) **Synthesis:** it is important to explicitly indicate (i) that students are required to design multi-step syntheses as part of the lecture course, and (ii) that students are required to perform multi-step synthesis in the laboratory portion of the course. Which multi-step synthesis(es) are performed in lab should be explicitly described.
 - 4) **Stereochemical Implications of Reactions:** it is important to point out the places in the courses where students are exposed to the stereochemical implications of various organic reactions.
 - 5) **Applications of Organic Chemistry in Society:** these applications are usually distributed throughout the lecture sequence; thus, it is necessary to succinctly indicate the major points at which these societal applications are embedded in the course.

Some topics may be covered partially in lecture and partially in lab. This is acceptable; in such cases, how this coverage is achieved should be explained in the CEMS responses.