

Chemistry proposal for replacement hire for Nivaldo Tro's Position

Chemistry would like to replace Niva with a full time faculty member with subdisciplinary expertise in theoretical chemistry. The replacement of Niva with a theoretical chemist would allow us to fill a lacuna in our current disciplinary expertise with a faculty member whose expertise matches our current research and teaching needs and with research space needs that could be accommodated within scope of our facilities on the 2nd floor of the Whittier sciences building. We anticipate that the replacement hire would contribute an active research program involving undergraduates and producing outputs in the form of publications and successful grants. The courses taught by the replacement hire would replace seventeen units of current load as outlined in Appendix I and allow us to assume seven units of load that could be used to redress a number of issues in our current program, including two identified the ACS Committee on Professional Training in their assessment of our program. However, even with the addition of seven additional units of load the issues involved are thorny and the department is unsure about how to best proceed. The more promising options are outlined in Appendix II and briefly explained below. Right now our preference would be to try some form of options 1 or 2 with the remaining options serving as a fallback position.

Options 1 & 2 reflect attempts of varying seriousness to use the additional load as an effort to meet American Chemical Society requirements for accreditation. The replacement of Niva by a research active faculty member would bring us closer to meeting the current requirements for an ACS-certified department. With this hire the only remaining issue to be addressed which may require resourcing¹ is maintenance support for the department's instrument holdings – perhaps the most serious stumbling block identified in the ACS committee on professional training's 2016 assessment of our department. The department notes that the most clear and cost effective way to meet this requirement is to provide the support through part-time load assigned either within IT or the physical plant (for whom we would provide training and technical support as needed). However, a lower cost but less certain option is to assign all or part of the seven units of excess load to one faculty member as load credit for instrument support. With this option in place, the department considers it possible, but far from certain, to successfully argue to the ACS that this arrangement best meets our needs and reflects the current capabilities of the department. It may be that the ACS committee on professional training views this form or level of support as inadequate; however in that case we can simply rescind the instrument support load (with this document as proof of our intention to do so) and replace the instrument support load with added course offerings, as outlined in options 4 -6 of appendix II.

In Option 1 One unit of the additional load credit would be assigned to a faculty member who would be the instructor of record for the CHM 198 course and who would be responsible for seeing that student researchers complete the written report on their work mandated by the American Chemical Society.

¹ Specifically, we need to address two issues we were unable to fully resolve before Michael and Kristi left for sabbatical at the end of the Spring of 2017. The first is that we need to require summer and academic year research students produce a summative report on their work. The second is that we need to offer an additional class yearly that clearly meets the ACS requirements for an advanced course. This could be done simply by adding one unit of credit to our advanced analytical chemistry class and rescheduling the class so as to follow the course's catalogue description, something we currently do not do. Of these only the latter change has load implications, in this case of a single credit which we could pay for either by reducing the load credit assigned for instrument support in options 1-2, through a reshuffling of classes to bring one faculty member who teaches 23 units of load to 24 units, or by simply taking it as an overload.

Although we have a strong tradition of both student-faculty research and teaching students to write high quality lab reports we have been unable to meet this requirement due to inconsistent faculty supervision, limited by the weak link of overburdened faculty experiencing this as “one more thing” they need to get to. Assigning load credit for this work will provide a mechanism for students and departmental faculty to be held accountable and for students to receive more organized and consistent guidance in their research training experience. The remaining six units of credit would be use to meet another major issue identified in the committee’s report, the need for instrument support, by using all six units as credit for instrument support, divided equitably among the existing faculty, who currently spend many many hours each year performing routine maintenance and fixing instruments in need of repair (as well as writing grants for new instruments).²

Option 2 is identical to option one but reduces the load credit for instrument support from 6 to 3 units and uses the remaining three units to addresses an abnormality in our existing physical chemistry II lab course. Currently the course adopts the highly unorthodox practice of serving two separate lecture courses. In this option the physical chemistry lab course would be split into an introductory physical chemistry lab course and a physical chemistry II lab course, corresponding to different lecture courses currently served by that lab. In our opinion this option provides a viable case for accreditation, albeit one not as strong as that in option 1.

Option 3 is identical to option one but addresses an anomaly in our existing advanced inorganic course so that all courses considered foundational by the American chemical society have a laboratory component. Since the latter course is taught in alternating years it would either allow for an additional three units of instrument support credit to be assigned in alternating years, with the understanding this would be used for the completion of routine maintenance and the preparation of an instrumentation grant either to a foundation or under the NSF’s major research instrumentation program. In our opinion this option provides a viable case for accreditation, albeit one not as strong as those in options 1 or 2.

Option 4 is identical to option one in terms of providing a unit of CHM-198 load credit but foregoes yearly instrument support credit to addresses the issues in both our physical chemistry II and advanced inorganic chemistry offerings so that it would only be possible to offer three units of instrument support credit in alternating years. In our opinion this option probably still precludes ACS accreditation, although this might be corrected by adjuncting a single section of general chemistry lab in alternating years and using the released load credit to provide instrument support.

Option 5 reflects our desire to better meet the needs of the ~15% of students in our general chemistry course who lack the math preparation needed to succeed in general chemistry.³ In this option the unit

² And here we might also add that if the instrument support load includes grant writing responsibilities then it might be reasonable to partly assign the indirect costs of instrument grants to offset the load assigned to instrument support, albeit we would hope this assignment be in proportion to the actual effort expended and occur only after adequate overhead-derived resources have been assigned to fulfilling grant-mandated instrument maintenance responsibilities.

³ The last time chemistry assessed the correlation between Math SAT scores and performance in general chemistry no student with an SAT score of less than 500 obtained a score higher than 60% on the first CHM-005 exam while every student with an SAT score of greater than 600 obtained an exam score of 80% or higher. Approximately 15% of students are in the former category.

of CHM-198 load credit is retained, the instrument support load of option one is reduced to a token two units, and the remaining four units of load is allocated to CHM 1, the introductory chemistry course intended as general chemistry preparation that is currently in the catalogue. The CHM 1 course would offer students who score less than a 550 on the Math SAT a chance to succeed in chemistry at Westmont and, pending biology department approval, take BIO 5 in the Spring of their Freshman year. However, this arrangement would not allow these students to immediately complete the regular general chemistry sequence and push completion of these students' organic and biochemistry sequences into their junior and senior years. Thus we offer a more attractive option for these students in the form of...

Option 6 is similar to option five but takes things further in removing all research and instrument support in favor of adding an off-sequence general chemistry course taught by the replacement hire along with an off-sequence laboratory course taught by either existing faculty or an adjunct. This is by far the most expensive option in terms of time, effort, and money. Not only would it require us to at least temporarily forego the programmatic enhancements outlined in options 1-4 and the varying degrees of consequent ACS accreditation viability they would entail, this option would require us to adjunct additional load hours beyond those provided by the replacement hire. Specifically, even after implementing such austerity measures as no longer offering the EPS GE-serving CHM 4 course and replacing existing general chemistry labs with an off-sequence lab (and the possibility of doing this is highly doubtful) we would still need to adjunct at least three units of load. Moreover, we would need to staff high-setup cost and high-footprint off-sequence general chemistry laboratory courses in the same space as our regular general chemistry sequence. Nevertheless we offer this option in the spirit of our having noted with concern an increasing numbers of inadequately-prepared first year advisees leaving the college in recent years and in recognition of the fact that low student retention has financial implications and US News and World Report ranking implications for the college as a whole. Thus we mention this possibility in order to point out that a replacement hire could be employed to allow us to offer a retention-configured general chemistry sequence in the event this might best serve the present needs of the college. However, in recognition of the needs outlined in options 1-4, we hope that the considerable load entailed in offering such a sequence might be released towards the overall servicing of our major program if and when the general chemistry readiness of our admitted student population improves.

Appendix I: Courses that will be taught by chemistry adjuncts next year. These aren't necessarily the courses to be assumed by the replacement hire but they do represent the adjunct load the department will face in the absence of a replacement hire. The total units count comes to 21, although since the PHS 114 course technically falls within the purview of physics it is perhaps better to think of our actual adjunct load as comprising 17 units and we will use that number throughout this proposal. The chemistry department acknowledges neither number equals 24 and that our replacement hire proposal seeks to redress other needs.

CHM	005-2	General Chemistry I	4	Staff
CHM	5H	General Chemistry I, honors	4	Staff
CHM	5L-4	General Chemistry Lab I	3	Staff
CHM	5L-5	General Chemistry lab I	2	Staff
CHM	006-2	General Chemistry II	4	Staff
PHS	114	Earth Science	4	Nishimura

Appendix II: Options for the proposed load assignments for the replacement hire.

Option 1 address the "staff" load of Appendix I and moves Chemistry towards American Chemical Society accreditation by adding one unit of CHM-198 responsibility and six units of instrument support to our departmental load.

CHM	005-1	General Chemistry I	4	Fall
CHM	005-2	General Chemistry I	4	Fall
CHM	5H	General Chemistry I, honors	4	Fall
CHM	006-2	General Chemistry II	4	Spring
CHM	131	Physical Chemistry II	4	Spring
CHM	133	Physical Chemistry II Lab	3	spring

Option 2 address the "staff" load of Appendix I; redresses one issue with our upper division offerings by splitting the existing physical chemistry II lab into separate courses (or at least sections) that service unique lecture courses; and moves Chemistry towards American Chemical Society accreditation by providing one unit of CHM-198 responsibility and three units of instrument support release in an attempt to satisfy the American Chemical Society's accreditation guidelines. Since the additional course would be assigned within the department this arrangement has the replacement hire teaching a full load identical to that in option 1.

Option 3 address the "staff" load of Appendix I; redresses two issues with our upper division offerings by splitting the existing physical chemistry II lab into separate courses (or at least sections) that service unique lecture courses and by adding a lab to the existing advanced inorganic chemistry class so that all courses considered foundational by the American chemical society have a laboratory component; and moves towards American Chemical Society accreditation by providing three units of instrument support release in an attempt to satisfy the American Chemical Society's accreditation guidelines. Since these courses would be assumed by existing faculty this arrangement has the replacement hire teaching a full load identical to that in option 1.

Option 4 address the "staff" load of Appendix I; redresses two issues with our upper division offerings by splitting the existing physical chemistry II lab into separate courses (or at least sections) that service unique lecture courses and by adding a lab to the existing advanced inorganic chemistry class so that all courses considered foundational by the American chemical society have a laboratory component; and

moves more deliberately Chemistry towards American Chemical Society accreditation by providing three units of instrument support release in alternating years in a dubious attempt to satisfy the American Chemical Society's accreditation guidelines that may necessitate adjunct load in alternating years. Since these courses would be assumed by existing faculty this arrangement has the replacement hire teaching a full load identical to that in option 1.

Option 5 address the "staff" load of Appendix I and attempts to meet the need of the ~15% of incoming students with Math SAT scores below 550 (none of whom score higher than a C in general chemistry) by offering the four unit introductory chemistry (CHM 1) course our department hasn't offered in many years.

CHM	1	Introductory Chemistry	4	Fall
CHM	005-1	General Chemistry I	4	Fall
CHM	005-2	General Chemistry I	4	Fall
CHM	006-2	General Chemistry II	4	Spring
CHM	131	Physical Chemistry II	4	Spring
CHM	133	Physical Chemistry II Lab	3	spring

Option 6 address the "staff" load of Appendix I and fully attempts to meet the need of the ~15% of incoming students with Math SAT scores that have not yet presaged success in general chemistry before. In this program we would offer the four unit introductory chemistry (CHM 1) course our department hasn't offered in many years along with an off-sequence general chemistry course. This option would require us to accommodate at least three units of load through a combination of adjuncts and overload.

CHM	1	Introductory Chemistry	4	fall
CHM	005-1	General Chemistry I	4	fall
CHM	6	General Chemistry II	4	fall
CHM	5	General Chemistry I	4	spring
CHM	131	Physical Chemistry II	4	spring
CHM	133	Physical Chemistry II Lab	3	spring