

1 **FS 13/14-53/EX Program Impaction Biological Sciences Undergraduate Major,**
2 **Approval Of**
3

4 The Faculty Senate recommends approval of impaction for the Undergraduate Major in
5 Biological Sciences, effective Fall 2015, contingent upon approval at all subsequent levels of
6 review.
7

8 **Declaring Impaction – Dept. of Biological Sciences**
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10 We understand that impaction status is a drastic step to be taken only if all other options have
11 been exhausted. We have done everything possible to serve the demand for our program
12 (streamlining the major curriculum, instituting a pre-major, and micromanaging enrollment in
13 bottleneck courses), but simply cannot accommodate the number of students interested in
14 pursuing a degree in Biological Sciences. Of particular concern: we lack the resources to enable
15 students *who are likely to be successful in the major* to complete degrees in a timely manner.
16

17 To ease with the interpretation of this document, we are formatting it according to current
18 Faculty Senate Policy.
19

- 20 1. *Demand and capacity: Complete/include the table of information required for the*
21 *system-wide impaction application, listing program capacity and demand. Explain the*
22 *methodology to calculate each number. For example, capacity may be limited by physical*
23 *(or other) resources, class/ pedagogy delivery format (lab vs lecture/ discussion), faculty*
24 *workload, accrediting organization, and/or professional certification organizations.*
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26 **[Data table included as Attachment 1]**
27

28 **Student Capacity**
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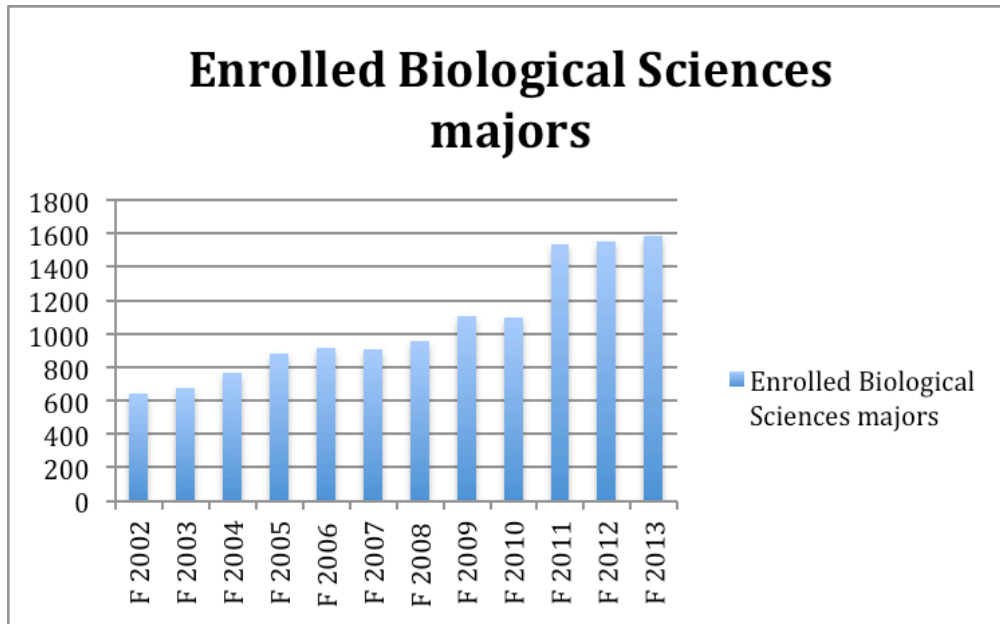
30 Our calculated capacity (matriculated majors) is 1,056 students (not including pre-majors). This
31 is based on the number we can serve in our required core courses (BIO 100 and 184). Our
32 current capacity in BIO 184 (the most restrictive course) is 176 students per semester, or
33 352/year. This class requires an equipped laboratory space, and is currently running at
34 capacity. Allowing a generous 3-year “window” during which that course may be taken
35 determines a maximum capacity of 1, 056 students. BIO 100 can accommodate a slightly higher
36 number (1, 156 over a two year period; it is designed to be the first upper division course taken
37 by majors). Our laboratories are continually cited by employers, professional programs, and
38 alumni as our most critical pedagogical tool. Programs requiring our courses as pre-requisites
39 require laboratory components to be attached, so removing them is not an option.
40

41 There are other capacity limitations related to factors that may be attenuated by other
42 University actions (see final page for details). These limitations include:
43

- 1 • Current infrastructure limitations. Limited access to large lecture rooms; old buildings
2 with small labs (directly limits capacity); overworked technical staff; limited space
3 available for new faculty offices/laboratories. As scholarly activity in science generally
4 requires lab space, we are limited in our ability to attract badly needed FT faculty.
- 5 • Number of full-time faculty. *Over the last five years, this number has reduced from 25 to*
6 *20, as the number of majors/pre-majors increased from 957 to almost 2000.* PT faculty
7 have been difficult to find for many courses, and they don't support the significant
8 extracurricular demands of the department (which include heavy loads of advising and
9 departmental service); increasing the number of PT faculty will not attenuate any of the
10 difficulties we currently face (and, we are already at 52% PT instruction).
- 11 • Enrollment capacity in other majors classes (BIO 1, BIO 121, BIO 131). BIO 1 is our most-
12 impacted class, with students already waiting 3-4 semesters to enroll; **this is primarily**
13 **due to transfer students who arrive without intro level course work completed (an**
14 **issue that impaction will allow us to address).** The noted upper division courses are
15 presently running at near-capacity and, like BIO 100 and 184, are limited by
16 infrastructure and technical support staff. Students often wait 2 semesters for these
17 courses, which are pre-requisite to several others within the major.
- 18 • FT faculty-to-student ratio within classes has increased 100% in the last 5 years. Due to
19 the nature of our service classes (e.g. foundational courses for students from HHS that
20 are pursuing health careers), our faculty members provide career advising to large
21 numbers of students outside of Biology, and the workload of engaging meaningfully
22 with this number of students every semester must be considered. We require intrusive
23 advising of all new majors/pre-majors (freshmen and transfer) and dedicate much of our
24 faculty time to both academic and career advising. It is a large component of our full
25 time faculty members' workload.

26
27 **Currently:** 1050 matriculated majors; 900 pre-majors. We expect an average of 200 students
28 per semester to enter under the current pre-major (based on pre-requisite course
29 enrollments/transfer). We graduate an average of 75 students/semester; thus, we will soon be
30 well beyond our capacity.

31
32 The number of enrolled Biological Sciences majors and pre-majors is shown below.
33 (NOTE: matriculated (declared) majors for the current semester is much higher – 1951. Thus,
34 ~400 of our declared students are not taking classes this semester. We cannot conclusively
35 determine the contributing factors, but anecdotal evidence from department advisors indicates
36 that students' inability to enroll in desired classes plays a substantial part in this number.)



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2. Considerations of alternatives to impaction: Describe and explain any other solutions which have been considered to mitigate overload or capacity problems, such as: reducing service course offerings not required in the program (e.g., courses servicing other programs, general education courses, elective courses), restricting access to program course offerings (e.g., by major code), re-organizing program offerings into more rigid schedules (e.g., use of cohorts), reducing required coursework in the program, discontinuing other programs/concentrations offered in the same unit, or gaining access to larger classrooms or laboratories.

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11 **We have considered and/or already tried the following:**

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- 1) **Pre-major implementation.** Upon our first majors' surge two years ago, we implemented a pre-major; however, it has had only a minor effect on the influx to the major. We plan to submit a program change proposal to make the pre-major more restrictive as an immediate change, but it has two shortcomings: a) it has a fixed standard rather than a flexible one, which we need to determine the appropriate cutoff; b) it does not address one of our primary issues – the influx of transfer students who have not completed introductory course work. Data from the last three orientations (summer 2012, 2013 and winter 2013) indicate that less than 10% complete the pre-major requirements prior to transfer. Transfer students add additional strain to our introductory courses, preventing native students from making progress.
 - 2) **Reorganization of curricular requirements.** Our research indicates that the curricular bottlenecks are in the core courses required by all concentrations. These bottleneck courses cannot expand due to infrastructure limitations and staffing (technical staff as well as faculty), so the problem is not related to the specialty concentrations.
 - 3) **Gaining access to other buildings/facilities.** The laboratory components of our courses are what make our graduates successful and competitive (as reported by both employers and alumni). However, laboratories cannot be run in most regular rooms. When they can be

1 (e.g. intro anatomy labs), we have already taken them to other buildings (e.g. El Dorado
2 Hall, soon to be torn down)

3
4 * We offer a great deal of required service courses for other programs on campus, and provide
5 the majority of GE courses in Area B2. Reducing offerings in areas of service or GE will not
6 address our bottleneck situation, as the rooms used by these classrooms will not be equipped in a
7 way that would allow them to serve the previously described bottleneck courses.

8
9 3. Admission process: All admission criteria must adhere to current university policy.
10 Describe all applicable admission criteria being proposed. Explain, for each, how and
11 why the individual criterion was selected and what data, if any, contributed to that
12 selection.

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14 **A. Prerequisite courses and or unit requirements**: List prerequisite coursework, any
15 minimum grade requirements for pre-requisite coursework and maximum number of
16 times a course can be repeated in the context of earning the minimum grade for
17 admissions consideration. List minimum prerequisite unit requirements.

18
19 Pre-requisite courses: BIO 1, BIO 2, CHEM 1A, ENG 1A, and STAT 1 (or their equivalents). Only
20 one of these courses may be in progress at the time of application. [NOTE: while we recognize
21 that this “in progress” aspect may complicate things, BIO 2 is an immediate pre-requisite for
22 several upper division courses; thus, for pedagogical reasons, we want to avoid a “gap”
23 semester.]

24
25 Minimum grade requirements for these courses: “C” or better in all courses

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27 Maximum number of times a course may be repeated in the context of earning the minimum
28 grade requirements: only two attempts will be accepted (students are allowed to repeat the
29 course only once).

30
31 Minimum pre-requisite unit requirements: None designated. The pre-requisite courses total
32 21 units and a minimum of two semesters due to course sequencing.

33
34 Additional requirement: Students transferring into CSUS from a community college must
35 complete all pre-requisite courses prior to transfer. [NOTE: we have investigated this
36 thoroughly; we have no other way to accomplish this except impactation]

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38 **B. Minimum grade requirements**: Overall GPA, GPA for prerequisite coursework, GPA
39 in minimum number of completed units, GPA in last stipulated number of completed
40 units.

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42 Overall GPA: None designated; however, students must be in good academic standing at the
43 time of application to the major.

1 Minimum GPA across pre-requisite courses: 2.3 (current pre-major minimum)

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3 GPA in minimum number of completed units: N/A

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5 GPA in last stipulated number of completed units: N/A

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7 **C. Other admissions considerations:** *List other criteria that will be used to evaluate*
8 *other skills and experiences e.g., past work experience, extra-curricular activities, second*
9 *languages, veteran status); List admission strategies that will be used to mitigate against*
10 *adverse impacts on diversity and access (e.g., first generation college status,*
11 *socioeconomic factors, historically disadvantaged status).*

12
13 Other criteria used to evaluate applicants: N/A

14
15 Strategies used to mitigate against adverse impacts on diversity and access: The Department
16 will continue to work closely with the College's Science Educational Equity (SEE) program (one
17 of our full-time faculty members serves as its co-Director), and will use additional data from OIR
18 to monitor the effects of impaction on these groups. The Department will also continue its
19 support of success strategies (e.g. peer-assisted learning, problem-based learning and small
20 group work in lecture settings) that have been shown to effectively improve the performance of
21 all students (but particularly URM students) in the science gateway courses that are included in
22 the pre-requisites. The Department will readdress this issue if it becomes apparent after
23 analyzing impaction data that there are adverse impacts on diversity and access. 7

24
25 **D. Admission decisions:** *Describe the ranking procedure that incorporates criteria from*
26 *A, B and C above; Describe the appeals process in the case of denied applicants.*

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28 Ranking procedure: All students meeting the course and grade requirements listed above will
29 be rank ordered according to pre-requisite GPA (not overall GPA). We will accept as many
30 students as we can accommodate up to the stated capacity. Due to the pedagogical necessity
31 of allowing at least one course to be in progress (as mentioned, BIO 2 is the immediate pre-
32 requisite for upper division course work), some students will initially receive conditional
33 acceptance into the major, which will be affirmed or denied after the posting of semester
34 grades.

35
36 Appeals process: The Department will allow an appeal process for students who were not
37 admitted into the program with the submission of additional, relevant information and
38 completion of an appeals form.

39
40 4. Monitoring impact on the campus community

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42 **A. Effect on other campus programs:** *List campus programs that may be affected and*
43 *the magnitude of that effect.*

1 The department most likely to be affected by this decision is Chemistry. Although concerned
2 about the steps that department may need to take if some students denied admittance to Bio
3 Sci pursue a degree in Chemistry, the Chemistry Chair has also expressed her understanding
4 that we have no other options, and is hopeful that this may actually help with some of the
5 chemistry bottlenecks (particularly at the lower-division level, as transfers will be required to
6 arrive with Chem 1A done). The Chair of KINS and Health Science has been involved in our early
7 discussions of impactation. She expressed concern over service courses – we intend to preserve
8 service courses as much as possible, as they are not our current bottlenecks (see page 1). In
9 total, we have consulted with the following departments: All NSM departments (Chemistry,
10 Physics and Astronomy, Geology, Geography, and Math & Statistics); KINS, Health Science, and
11 FACS.

12
13 Anecdotally, those already advised out of Biology (due to violation of the pre-major, a total of 8
14 students this semester and counting – as they are identified, they are advised by the Bio Dept
15 Chair) have gone into various departments all over campus – Child Development, Sociology,
16 Ethnic Studies, etc. Most are interested in the human side of health care.

17
18 *Describe the consultation process between the program seeking impactation, and other*
19 *programs and administration.*

20
21 The Chair of Chemistry has been quietly advised at every step as we have moved forward;
22 formal notification to all NSM Departments took place in late October. We consulted with the
23 following departments across campus when researching impactation options: Psychology, Health
24 Science, Criminal Justice, and Nursing. The Dean and Associate Dean of NSM have both been
25 consulted throughout, and are in support of this proposal. We have also consulted with the
26 Chairs of all other CSU Biology programs that are currently impacted (with the exception of
27 those where all programs are impacted, such as Cal Poly SLO).

28
29 *Describe changes in university wide resource allocation and how these will be managed*
30 *to ensure impactation does not distort the institutional commitment to the desired array*
31 *and balance of programs.*

32
33 We are presently operating at close to our proposed impactation number. We may require a
34 short-term increase in WTU/FTES to accommodate the immediate demand as the 900 pre-
35 majors make their way into the major, and then as we then slowly reduce to our capacity, but
36 this should continue to be in line with the number of students served.

37
38 ***B. Effect on students:*** *How will students who have been denied program admission be*
39 *advised and accommodated within the university; Outline how courses will be restricted*
40 *to accepted majors; How will impactation affect access and diversity within the program?*

41
42 Process for denied applicants: Students who are denied admittance to the major will be invited
43 to post-application workshops in which they will be advised with regard to academic
44 alternatives. We will also post all Applicant Pool Statistics on our departmental website.

1
2 [NOTE: All of the pre-requisite courses may count as GE; in fact, a student who completed
3 these classes but did not matriculate to the major would have Area B completed (i.e., classes
4 would not be wasted courses and will all count toward a degree at CSUS)]
5

6 Advising of “expressed interest” students: We propose to continue advising students
7 navigating the pre-requisite courses (two of which are taught by us); we are hopeful that NSAC
8 (Natural Sciences Advising Center) will continue to assist us in advising. This will also allow for a
9 smooth transition back to the regular pre-major when we are able to phase out of impactation.

10
11 The two bottleneck courses previously described (BIO 100 and BIO 184) are already restricted
12 to accepted majors via course change proposals that have been approved at all levels of the
13 University (this was accomplished within the last year and is related to our pre-major).
14

15 While it is unknown how access and diversity will be affected by impactation, we do have data
16 from our current BIO 2 courses (the group of students that should be at the precipice of
17 applying for the major). These data indicate that students who are Pell-grant eligible or are
18 URM-designated are NOT adversely affected by the suggested pre-requisite GPA ranking. In
19 fact, they are over-represented in the higher echelons of GPA. [complete data set is available
20 upon request].
21

22 *C. Outline the plan to monitor future enrollment trends, resource needs and*
23 *continuing effects of impactation on the campus community. This plan will be used to*
24 *justify consideration of subsequent applications for impactation.*
25

26 We plan to closely monitor enrollment demand in consultation with University administration
27 and the local community colleges, which have robust science programs. We are able to
28 measure course enrollments easily (they are mostly sequenced), and should be able to predict
29 the removal of impactation in a timely manner.
30

31 We will continue to consult with programs (e.g. Chemistry, KINS, etc.) that may be affected by
32 our impactation, and will in good faith attempt to communicate with transparency to all those
33 involved with our program (including students).
34
35

36 **ALTHOUGH THE CURRENT IMPACTION POLICY DOES NOT ASK DEPARTMENTS TO DISCUSS THE**
37 **FACTORS THAT WOULD ALLOW THEM TO COME OUT OF IMPACTION, THE NEWLY PROPOSED**
38 **POLICY DOES, SO WE ANSWER THIS BELOW.**
39

40 **Events that may allow us to come out of impactation:** The most immediate issue is a lack of
41 adequately equipped laboratory space. Like many on campus, we also need more full-time
42 faculty and additional technical staff, but the most critical aspect involves infrastructure (we
43 really need a new building!). We are constantly looking for space that could be transformed
44 into adequate laboratories. If we are able to locate some, equip it, and hire faculty and

1 technical support personnel, we will be able expand our capacity and possibly come out of
2 impaction. We sincerely hope this is what the future holds.

3

4 We have also put forth a proposal that would convert our support technician for the Genetics
5 area to a 12-month appointment (she is currently a 10/12). If approved, this will allow us to
6 offer BIO 184 (our most severe bottleneck) in the summer. However, as this would add fewer
7 than 100 students per year (depending on the enrollment of CSUS students; some of our
8 courses are highly populated by students from other universities), it is inadequate to solve the
9 overall issue at this time (and, it doesn't address the transfer readiness problem).

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11