ABSTRACT

In collaboration with Institutional Research, Assessment and Policy Studies (IRAPS) within the Office of Planning and Budget, a subcommittee of the Committees on Educational Policy (CEP) and Planning and Budget (CPB) have defined 29 metrics nominally associated with impaction of degree programs. These metrics have been used to perform quantitative assessment of the presence of impaction on the UCSC campus, both in comparison between the various campus programs as well as with similar programs across the UC system. Outcomes for the 29 metrics were combined to produce five different numerical indices, each making use of a different scheme for weighting the various quantitative metrics. Ten candidate programs were included in the study (Art, Art and Design: Games and Playable Media, Film and Digital Media, Computer Science, Technology and Information Management, Business Management Economics, Psychology, Sociology, MCD Biology, and Philosophy), along with five programs, one from each division, not generally considered to be impacted (Electrical Engineering, Physics, Anthropology, History, and History of Art and Visual Culture). Based on responses from the candidate departments with respect to the depth of the advising staff, as well as UCUES results, student-to-advising ratios were calculated and contextualized. Metrics were also formed that allowed for the assessment of the correlation between the abundance of teaching resources and graduation rates. Finally, a Principal Component Analysis was performed to explore the leading indicators of impaction. The intent of the study was to initiate and inform a dialog that would allow for a more nuanced assessment of impaction on our campus, in hopes of contributing to a consensus of actions to be taken, in view of the campus’s overall mission as well as the unique ethos of each impacted department.
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Introduction

Over the course of time, economic and cultural trends cause shifts in the distribution of student interest among the diverse academic areas that comprise the curricular spectrum of American universities. Combined with a general trend toward disinvestment in American higher education, this can lead to, over a relatively short time period, the development of enrollments in specific academic programs that overburden the resources of the sponsoring department, threatening both the ability of the program to provide a “UC quality” education for its students, as well as the productivity and working environment of the program’s faculty and staff.

Those serving on Senate committees find themselves exposed to, formally or incidentally, points of view about the overall health and trajectory of the campus’ educational enterprise that are informed by a relatively comprehensive array of its disciplinary areas. In the past few years, those serving on these committees have experienced a growing sense of concern that there are programs on campus that, as a result of these forces, have reached a state of “impaction”: having more students than can be accommodated by the program and its home department, given conventional and reasonable expectations for the allocation of the program’s and sponsoring department’s faculty and staff resources.

For its part, the campus administration also recognized the possibility that a number of the campus’ programs were inclining toward impaction. As a result, the office of the Vice Provost for Academic Affairs (VPAA), with significant input from the Senate, developed a procedure for self-selected programs to apply for and receive formal recognition as impacted programs [1], and to then propose and receive approval for remedies that are vetted by both the VPAA and Senate. To date, a single program has been granted impacted status: after significant review, the Bachelor of Science in Computer Science was granted impacted status. At the time, it wasn’t considered feasible to redress the Computer Science program’s impacted state via the allocation of sufficient FTE resources, and as a result, the program has been allowed to cap the number of majors that it is required to accept into its program. The specific nature and methodology of imposing that cap is under continual review by the program, administration and Senate, as is its effect upon access to the program by underrepresented groups [2,3].

However, there is a growing acknowledgement that the procedure for applying for and receiving an impacted designation is very demanding, and places an undue burden on potentially impacted programs, which are arguably already bearing a disproportionate responsibility for the education of the campus’ student body. From this perspective, it seems more consistent with the general ethos of the campus that the responsibility of identifying and addressing impaction would lie with the campus as a whole (administration plus Senate) rather than with any given program or host department. In addition, from a pragmatic standpoint, burdensome formal procedures for addressing impaction can (and probably already have) led to actions that circumvent the formal process, leading to a weaker engagement of the campus, and creating a greater likelihood that more ad-hoc remedies will be imposed that are not completely aligned with campus aspirations, particular in the area of diversity and inclusion.

It is with this in mind that the Committees on Education Policy (CEP) and Planning and Budget (CPB) initiated, beginning in academic year 2018-2019, a project making use of institutional data to develop and evaluate indicators of programmatic impaction on the UCSC campus, that would require little input from or burden upon individual programs and departments. This report represents an initial set of outcomes of that study. Rather than a definitive statement of which programs should be designated as impacted, it is intended as a method of shedding light, with some degree of objectivity, on the question of impaction, with the hopes of sparking a broader, more in-depth discussion that would only then clarify and justify a set of actions to address impaction on our campus. A discussion of the nature of those actions lies beyond the
scope of this report. It should also be pointed out that this study doesn’t attempt to capture workload associated with graduate-level instruction and advising, which can vary greatly from department to department.

**Participants and Process**

After a discussion between CEP chair Onuttom Narayan (Physics) and CPB chair Bruce Schumm (Physics), in which it was decided to pursue the initiative, a joint subcommittee of the two committees was formed. In addition to Narayan and Schumm, the subcommittee included David Helmbold (CPB; Computer Science and Engineering) and Megan Thomas (CEP; Politics). Professor Thomas rotated off CEP for 2019-2020, and was replaced by Douglas Bonnet (CEP; Psychology) for the 2019-2020 academic year. The Principal Component Analysis was performed on the collected metrics by CPB Vice-Chair Matthew Clapham.

At the outset, the subcommittee approached Vice Chancellor for Planning and Budget (VCPB) Delaney with a request for institutional support, which was immediately granted, allowing for the collaboration with the Institutional Research, Assessment and Policy Studies (IRAPS) group. In addition to IRAPS group members Fernald, Truong, Kupsch and Mojaverian, who contributed throughout the project, initial project-shaping discussions were joined by VCPB Delaney, Vice Provost for Academic Affairs (VPAA) Lee and Vice Provost and Dean of Undergraduate Education (VPDUE) Hughey. Together, this larger group proposed a list of candidate programs to study, and a candidate list of largely quantitative “impaction metrics” that were readily available to the IRAPS group, including both internally collected data as well as selected results from the system-wide UC Undergraduate Educational Experience Survey (UCUES). The latter were particularly valuable, in that they allowed (for most of the candidate programs) for comparisons between UCSC and its sister campuses, based on the Classification of Instructional Programs (CIP) designation developed by the National Center for Education Statistics [4].

Comments on the resulting proposal for impaction metrics and candidate programs were solicited from key members of the campus community, including the academic deans, student leaders, Vice Provost of Student Success Jaye Padgett, and Associate Vice Chancellor for Student Achievement and Equity Innovation Pablo Reguerin. The academic deans were requested to share the proposal with all the chairs in their division. Feedback from this group was incorporated into the proposal, and a final set of candidate programs and metrics was devised. In the course of viewing the metrics for the candidate programs, it was felt that a set of five “benchmark” programs, one from each division, that were not suspected of being at or near impacted status, should also be included in the study. Table 1 shows the resulting list of studied programs in both the candidate and benchmark categories.

A total of 34 impaction metrics have been explored, and are listed in Appendix A. With the help of Guadalupe Soto, a recent recipient of a Bachelor of Arts degree in Politics who was hired as a summer intern by the Academic Senate Office, most of these metrics have been incorporated in graphical visualizations. These visualizations are displayed in Appendices C – N. In addition, the majority of the metrics (the 29 metrics lending themselves to quantification) have been used to develop two types of “impaction indices”, each index being a number between 0 and 1 which is intended to correlate with the degree of impaction of the program under evaluation.

The first type of index (“internal” indices) made use of all 29 quantifiable metrics and were intended to provide comparisons between programs (candidate and benchmark) on our campus. For these indices, the 29 metrics were subdivided into a set of 8 impaction metric categories, relating to class size, availability of faculty contact and feedback, student-to-faculty ratios, availability of advising, availability of courses, opportunities for individual mentoring by faculty, graduation rates, and climate and diversity; the
assignment of impaction matric category to the 29 internal-index metrics is enumerated in Appendix A. Several different internal indices were developed, making use of different choices of weighting of the metrics among and within categories (see the Impaction Indices section below).

The second type of index (“comparative” indices) made use of the nine UCUES results for which system-wide results were available. This type of index was used to compare a given program on our campus to comparable programs on the other eight general-purpose campuses. Two of the candidate programs (Games and Playable Media in Arts and Technology and Information Management in Engineering) didn’t share a CIP code with other UC programs, and so were not included in studies involving comparative indices.

<table>
<thead>
<tr>
<th>Division</th>
<th>Candidate Programs</th>
<th>Benchmark Programs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arts</td>
<td>Art</td>
<td>History of Art and Visual Culture</td>
</tr>
<tr>
<td></td>
<td>Film and Digital Media</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Games and Playable Media (*)</td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td>Computer Science</td>
<td>Electrical Engineering</td>
</tr>
<tr>
<td></td>
<td>Technology &amp; Information Mgmt (*)</td>
<td></td>
</tr>
<tr>
<td>Humanities</td>
<td>Philosophy</td>
<td>History</td>
</tr>
<tr>
<td>Phys &amp; Bio Sciences</td>
<td>MCD Biology</td>
<td>Physics</td>
</tr>
<tr>
<td>Social Sciences</td>
<td>Economics (Business and Management)</td>
<td>Anthropology</td>
</tr>
<tr>
<td></td>
<td>Psychology</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sociology</td>
<td></td>
</tr>
</tbody>
</table>

Table 1: List of candidate and benchmark programs. Asterisked (*) programs have no counterpart programs within the UC system, as classified by the CIP designation.

**Impaction Index Algorithms and Results**

Two separate excel spreadsheets (one each for internal and relative metrics), available upon request, were used to record the derived impaction metric quantities and encode the algorithm used to determine the indices. For each included metric, a score was calculated by dividing the value of the metric by the maximum value across the 10 candidate programs. The various indices were calculated as combinations of these scores. Because it is possible for one of the non-candidate programs to have a value higher than the maximum of those for the candidate programs, this score can be negative. This came into play a bit for the comparative indices.

**Internal Indices**

Several different internal indices were defined, as follows. A table of weights for each metric, for the several different schemes, is provided in Appendix B.

*Index A Nominal Weights:* For the first of the internal indices, the values of the 29 metrics shown in Appendix A were added together for each candidate and benchmark program. Each of the 29 indices was
given an identical weight of one. For each program, the sum of the impaction metric values was divided by the maximum possible sum of 29, yielding an index value that lies between 0 and 1.

**Index B Weight by Category:** For this second internal index, each of the eight categories was given a total weight of one. This was achieved by giving each metric within a given category an equal fractional weight which was just one divided by the number of metrics in the category, so that the sum of weights within the category was one. The resulting sum over all metrics was then divided by eight so that again the index lay between 0 and 1.

**Index C De-Weight Discretionary Categories:** For certain categories of metrics, it is possible for beleaguered programs and departments to perform well (get low impaction scores) by having an ethos that delivers above and beyond expectations. One might be concerned that, to the extent a designation of impaction is a benefit (not all programs may see it this way!), such departments are being penalized for hard work and effective management. To explore the sensitivity of internal impaction indices to this concern, the weights of metrics in the following categories were reduced by 50% relative to their Index B weights: availability of faculty contact and feedback, availability of advising, opportunities for individual mentoring by faculty, graduation rates, and climate and diversity. The resulting index score was divided by \((3\times1.0) + (5\times0.5) = 5.5\) to produce a normalized index between 0 and 1.

**Index D Course-Based Metrics Only:** For this weighting scheme, only the following metrics were considered. These are the metrics associated with course size and quality. Each of the metrics within this category was given equal weight. The course-based metrics are: UCUES results on course availability and small-class access, class sized, student-to-faculty ratios, length of waitlists, ladder-rank faculty contribution to classroom instruction, and final-year class size.

**Index E Enrichment-Based Metrics Only:** For this weighting scheme, only the handful of metrics relating to individual contact, and especially mentoring/one-on-one instruction, are considered. Research/creative activity and independent study participation are given the highest weight.

Results for these three internal impaction indices are displayed for the 10 candidate programs (blue) and five benchmark programs (red) in Figures 1-5.

**Comparative Indices**

Comparative indices between programs and their administering division and, more importantly, similar programs at the other eight general-purpose UC campuses, made use of UCUES data. For divisional comparisons only, data on the number of visits to advisers within the past year, asked only for the UCSC UCUES survey, was included. As mentioned above, there were no matching CIP codes for TIM and Games and Playable Media at other campuses, and so system-wide comparisons couldn’t be made.

The results of the divisional and system-wide comparisons are shown in Figures 6 and 7. Each color represents the value of a numerical metric devised from each UCUES response; the numerical definition of each of the UCUES metric can be found in Appendix A. For the divisional comparison, the program under study has been removed from the contributions to the divisional quantities. The value of each metric has been scaled to the maximum (most indicative of impaction) for the ten programs to produce a value between 0 and 1 for each metric. The bars show the stacked values of these scaled metrics; the higher the bar, the more likely the given program is impacted.

In certain cases the stack extends below 0. This happens when one or more metrics in the given comparison (divisional or system-wide) is smaller than that for any of the ten candidate programs, leading to a negative score in one of the comparator metrics.
Indices Results

The following seven figures show the results for the internal and comparative indices described above.

**Internal Index A: Nominal Weights**

![Weighted Impaction Index](chart.png)

Figure 1: Impaction index for the 10 candidate (blue) and 5 benchmark programs (red), for Internal Index A (nominal weights).
Internal Index B: Weight by Category

Figure 2: Impaction index for the 10 candidate (blue) and 5 benchmark (red) programs, for Internal Index B (weights by category).

Internal Index C: De-weight Discretionary Categories

Figure 3: Impaction index for the 10 candidate (blue) and 5 benchmark (red) programs, for Internal Index C (de-weight discretionary categories).
**Internal Index D: Course-Based Metrics Only**

![Weighted Impaction Index](image)

Figure 4: Impaction index for the 10 candidate (blue) and 5 benchmark (red) programs, for Internal Index D (course-based metrics only).

**Internal Index E: Enrichment Based Metrics Only**

![Weighted Impaction Index](image)

Figure 5: Impaction index for the 10 candidate (blue) and 5 benchmark (red) programs, for Internal Index E (enrichment-based metrics only).
Divisional Comparisons (First Six of Ten)

Figure 6(a): Divisional comparisons for six of the ten candidate programs. For all comparisons, column 1 is the program and column 2 the comparator. The program under study has been removed from the contributions to the divisional quantities. Note that the vertical scale varies from plot to plot.
Divisional Comparisons (Remaining Four of Ten)

Figure 6(b): Divisional comparisons for the remaining four candidate programs. For all comparisons, column 1 is the program and column 2 the comparator. The program under study has been removed from the contributions to the divisional quantities. Note that the vertical scale varies from plot to plot.
Systemwide Comparisons (First Four of Eight)

Figure 7(a): Systemwide comparisons for four candidate programs. For all comparisons, column 1 is the program and column 2 the comparator. Note that the vertical scale varies from plot to plot.
Systemwide Comparisons (Remaining Four of Eight)

Figure 7(b): Systemwide comparisons for the remaining four candidate programs. For all comparisons, column 1 is the program and column 2 the comparator. Note that the vertical scale varies from plot to plot. The UC-wide MCD Bio stack extends below 0 because one of the comparison metrics is smaller than that for any of the ten candidate programs, leading to a negative score in that metric.
Observations and Discussion

Single-valued numerical indices, by their nature, suppress any subtlety or nuance contained within a broader body of qualitative and quantitative measures of any social phenomenon. Nonetheless, it can be informative, as a starting point for a deeper and more nuanced discussion, to view such impaction indices, which allow for well-defined rankings and comparisons between programs.

More or less independently of the chosen weighting scheme, five of the ten candidate programs score consistently higher than other candidate programs and, for the most part, the five benchmark programs: Computer Science, Technology and Information Management, (Business Management) Economics, Psychology, and MCD Biology.

The one exception is the fifth, enrichment-based weighting scheme, for which Psychology does not exhibit as high an index as the other four of these programs. Numerically, this can be traced to good performance (remember that good performance lowers the impaction score) in “direct” measures of enrichment: engagement in research, fraction taking an independent study class, and the overall sense of satisfaction with enrichment from the UCUES survey, which all contribute significantly lower values to the enrichment-based index than they do for the other four programs that have high values of the first four indices. Looking a little further into this result, Appendix E shows the UCUES enrichment metric comparisons between programs and their UC counterparts, which contains one objective (fraction of students engaging in research) and one subjective (rates of satisfaction with enrichment) measure. Psychology outperforms both its host division and its comparator programs within the UC system in terms of the objective measure (rates of participation), but somewhat underperforms both in terms of the subjective measure (satisfaction). The reason for this disparity is not clear, and may warrant further discussion. Also, for this metric, Electrical Engineering, a benchmark program, exhibits an index approaching that of the highest metric, Computer Science. Upon closer examination, it is seen that Electrical Engineering is performing poorly (leading to a higher impaction index) in the majority of enrichment metrics, including percentage of students with at least one faculty contact, satisfaction with advising by faculty, satisfaction with enrichment, participation in research, and engagement of independent study. The cause for this condition may, again, warrant further discussion.

For the second and third weighting schemes, Philosophy reaches the lower level of this lead-five band, but upon closer examination, this appears to be associated with a particularly high level of dissatisfaction with the climate for diversity and inclusion, as indicated by the UCUES survey results. It’s not clear that this negative sense arises from a lack of resources within the department.

Of the candidate programs, Computer Science consistently and notably rises above all other studied programs in its overall degree of impaction. In addition, its comparative scores (from the UCUES survey results) are significantly above that of the division, and even more so above that of its eight UC comparators. Of the remaining four programs that consistently score higher than other candidate programs, MCD Biology also rises very noticeably above its UC comparators. Psychology does as well, although to a lesser extent than Computer Science or MCD Biology. Philosophy also rises above its UC comparators, although if the question on campus climate is removed, it is very similar to the other eight campuses.

Although not within the original intent of the study, one could ask whether impaction indices shed any light on the overall status of an entire division. Candidate divisions include the Baskin School of Engineering, whose enrollments have been growing rapidly, and the Division of Social Sciences, which awards the most Bachelor’s degrees of the five divisions, and has argued that it has been particularly fiscally distressed in recent years. To this end, Figure 7 shows a comparison of UCUES results between the program, host
division, and similar programs at other UC campuses, for the two programs (Computer Science and Psychology) thought to be the most heavily impacted within each of the two divisions, and potentially across the UC system as well. It is seen that the overall comparative impaction index for the Baskin School of Engineering, while lower than that for the Computer Science program, is significantly larger than that for the UC-average Computer Science program. If it assumed that Computer Science tends to be more impacted than average engineering programs across the system, this might suggest that the School of Engineering is broadly impacted. For the case of Social Sciences, however, the overall divisional index is less than that of psychology programs on other campuses.

Figure 7: Relative impaction indices for Computer Science and Psychology. Of the three stacks, the left-most is that for the candidate UCSC program, the middle for the UCSC division hosting the candidate program, and the right-most the combined results for the other eight campuses for the equivalent program. Note that the two plots have differing vertical scales.

Another thing that caught the eye of the members of the Impaction Subcommittee was the ratio of students to program-level advisers in several of the programs. These ratios are shown in Appendix C, Figure C1, and are reproduced below in Figure 7. Of the five programs that score consistently highest in the various impaction indices, four of them count approximately one adviser per 500 declared majors, and close to 800 when proposed majors are also considered. The fifth program that has a consistently high impaction metric, MCD Biology, has approximately 250 declared majors per adviser, and approximately 450 overall majors per adviser, including undeclared majors. It’s difficult to imagine how students can be effectively advised with such limited access to advising.

Tellingly, the UCUES survey results displayed in Appendix D allow a comparative assessment of advising satisfaction with divisional and system-wide norms. The Computer Science and TIM programs share five undergraduate advisers, who operate across the entire School of Engineering. Assuming that attitudes towards advising are fairly similar for Computer Science and TIM students, satisfaction with access to both faculty and program advisers for these students is somewhat worse than that for their UC counterparts. For Economics and Psychology, while perhaps somewhat worse than divisional norms, satisfaction with faculty and program-level advising is roughly commensurate with UC-wide comparators. Satisfaction with faculty and program-level advising among MCD biology students is somewhat lower than for both divisional and UC-wide comparators. However, overall, while there does seem to be some stress associated with access to advising that might argue for more resources in specific cases, despite the apparently large student-to-
adviser (and student-to-faculty) ratios in the candidate departments, the advising function doesn’t appear to be falling apart at the seams. This surprised the subcommittee members a bit, and further discussion of advising resources maybe warranted.

![Majors per Advisor](chart.png)

**Figure 8**: Ratio of majors to program-level advisors for the ten candidate programs.

Another question of interest to the subcommittee was that of the possible correlation between impaction – more specifically, the relative unavailability of instructional resources – and graduation rates. To explore this question, two impaction metrics were taken as indicators of the inadequacy of instructional resources within a program: upper division class sizes and the ratio of majors to Senate faculty within the program. Six metrics were taken as indicators of graduation rates, three each for native and transfer students: average time to degree, and the fraction of students not graduating within four (two) and six (four) years for native (transfer) students in the program. As with the impaction index study discussed above, a score, nominally within the range \([0,1]\), was formed for each of these eight metrics by dividing each program’s metric by the maximum of that for any candidate program. Then, the two resource scores were averaged to form the independent variable of the correlation study, and the six graduate-rate scores were averaged to form the dependent variable. Figure 9 shows the resulting correlation plot for the ten candidate and five benchmark programs. Because graduation rates are worse for some benchmark programs than for any of the ten candidate programs, the independent variable is greater than one in two cases. There is no visible evidence of correlation between the unavailability of instructional resources and graduation rates, as explored in this manner. However, it is possible that impacted programs have modified requirements (this possibility is currently under exploration by CEP), or that they frequently approve alternatives to help mitigate the effects of course unavailability. Graduation rates are also affected by the complexity of programs and capstone requirements, which varies widely.
Figure 9: Scatter plot of the graduation rate score (vertical axis) versus unavailability of instruction (horizontal axis) for the ten candidate (blue) and five benchmark (red) programs.

**Principal Component Analysis**

Principal Component Analysis (PCA) is a statistical methodology that determines the combinations of the various inputs to a quantitative analysis that most effectively represent differences between objects characterized by those inputs. In this case, the “objects” are the fifteen (ten candidate and five comparator) programs in the study, and the “inputs” are the quantitative impaction metrics that compose the indices discussed above.

The PCA is displayed in Figure 10. The values of the discriminator PC1 (PC2) are the value of the linear combination of metrics that best (second-best) separates the fifteen programs from one another. The projections of the colored bars on the PC1 or PC2 axis show the relative weight given to each of the 29 impactions metrics in forming the associated discriminator. If the projection is negative, the given metric is anti-correlated with impaction for the given discriminator. The bars are color-coded according to which of the eight impaction categories (see Appendix A) that the given metric lies within. The weights can also be found tabulated in Appendix B.

Consistent with the impaction index results, Computer Science is seen to be most separated from the other 14 programs, exhibiting the largest value of PC1. Psychology, Sociology, Computer Science and Economics had the largest values of PC2. By design, PC1 provides the greatest discrimination between programs, with no one metric standing out as the dominant source of its discrimination power. The metrics contributing most to PC1 (having the greatest projection on the horizontal axis) tend to fall into the advising, class size, mentoring, and student-to-faculty workload categories. A similar trend, with the exception of mentoring metrics, is seen for PC2. The metric associated with diversity and inclusion is negatively correlated with both the PC1 and PC2 discriminators.
Figure 10: Principal Component Analysis of the 29 impaction metrics that are used to form the impaction indices for the fifteen studied programs. PC1 (PC2) is the value of the linear combination of metrics that best (second-best) separates the fifteen programs from one another. The projections of the colored bars on the PC1 or PC2 axis show the relative weight given to each of the 29 impaction metrics in forming the associated discriminator (note that impaction metric 21 is not used, so the maximum label is 30). The weights are also tabulated in Appendix B.

Summary

In collaboration with Institutional Research, Assessment and Policy Studies (IRAPS) within the Office of Planning and Budget, a subcommittee of the Committees on Educational Policy and Planning and Budget have defined 29 metrics nominally associated with impaction of degree programs. These metrics make use of institutional data readily available on our campus, as well as results from the system-wide UC Undergraduate Experience (UCUES) Survey. These metrics have been used to perform quantitative assessment of the presence of impaction on the UCSC campus, both in comparison between the various campus programs as well as with similar programs across the UC system.

Outcomes for the 29 metrics were combined to produce five different numerical indices, each making use of a different scheme for weighting the various quantitative metrics. By constructing these differing combinations of the 29 numeric metrics, the degree of confidence in conclusions drawn from the indices could be assessed. Ten candidate programs were included in the study (Art, Art and Design: Games and Playable Media, Film and Digital Media, Computer Science, Technology and Information Management, Business Management Economics, Psychology, Sociology, MCD Biology, and Philosophy), along with five programs, one from each division, not generally considered to be impacted (Electrical Engineering,
Physics, Anthropology, History, and History of Art and Visual Culture). In addition to the five internal numerical impaction indices, used to compare between programs on our campus, the UCUES results were used to develop an external index that allowed for the comparison of each candidate program, with the exception of Games and Playable Media and Technology and Information Management, with similar programs across the UC system.

Several other associated studies were performed. Based on responses from the candidate departments with respect to the depth of the advising staff, as well as UCUES results, student-to-advising ratios were calculated and contextualized. Metrics were also formed that allowed for the assessment of the correlation between the abundance of teaching resources and graduation rates.

The scope of the study did not include the development of specific recommendations of actions to be taken to remediate impaction, or even the identification of impacted programs. Instead, the intent of the study was to initiate and inform a dialog that would allow for a more nuanced assessment of impaction on our campus, in hopes of contributing to a consensus of actions to be taken, in view of the campus’s overall mission as well as the unique ethos of each impacted department.


Appendix A: List of Impaction Metrics
Below is the list of studies impaction metrics. Metrics with a letter (category) designation other than “X” were made use of in the development of the “impaction index” score. A list of the eight impaction metric categories (A-G) follows the list of individual metrics. The more description following the colon specifies how each metric was used in the quantitative impaction index, if the given metric was indeed made use of in the index.

01 (A) Small-class access (UCUES): Percent of dissatisfied/very dissatisfied
02 (A) LD class size distributions: Average LD class size
03 (A) UD class size distributions: Average UD class size
04 (B) Senate faculty per major: Declared major per permanent faculty FTE
05 (B) Payroll faculty per student FTE: Student FTE (UG plus grad) per faculty payroll FTE
06 (C) Course availability (UCUES): Percent of dissatisfied/very dissatisfied
07 (C) Size of waitlists (LD): Average at closure, from charts
08 (C) Size of waitlists (UD): Average at closure, from charts
09 (D) Native student 4 yr completion rates: Incompletion percentage, in any major
10 (D) Native student 6 yr completion rates: Incompletion percentage, in any major
11 (D) Transfer student 2 yr completion rates: Incompletion percentage, in any major
12 (D) Transfer student 4 yr completion rates: Incompletion percentage, in any major
13 (D) Native student time to degree: Average over 2008-2012 entering classes
14 (D) Transfer student time to degree: Average over 2010-2014 entering classes
15 (E) Faculty contacts (UCUES): Percent of students with no faculty contacts
16 (E) Feedback on work (UCUES): Percent that never or rarely receive prompt feedback
17 (E) UD Major FTE taught by ladder rank: Percent not taught by Senate faculty
18 (E) LD Major FTE taught by ladder rank: Percent not taught by Senate faculty
19 (F) Satisfied with advising (UCUES; 1): Percent (very) dissatisfied with advising by Faculty
20 (F) Satisfied with advising (UCUES; 2): Percent (very) dissatisfied with advising by Department
21 (X) Satisfied with advising (UCUES; 3): Discarded (divisional, and so not reflective of impaction)
22 (F) #majors per adviser: Majors are declared plus proposed
23 (G) Satisfaction w/ enrichment (UCUES): Percent (very) dissatisfied with availability of enrichment opportunities
24 (G) Fraction in research w/ faculty (UCUES): Find maximum of the sum of positive outcomes (assisted research + assisted project + conducted own research); then record for each program the quantity (maximum – sum)
25 (A) Final year class size profile: For all UD classes taken by majors (not just in their major department) in their final year in 2018-2019, fraction with enrollments of 60 or more
26 (G) Final year independent study fraction: Fraction of students in their final year in 2018-19 that did not take an independent study class

27 (A) Capstone class size distribution: Mean size of capstone class

28 (H) Campus climate (UCUES): Percent (very) dissatisfied with climate for diversity & inclusion in major

29 (F) Met with faculty adviser: Percent not meeting with faculty adviser in past year

30 (F) Met with department adviser: Percent not meeting with department adviser in past year

31 (X) Met with college adviser: Discarded (divisional, and so not reflective of impaction)

32 (X) Major requirements comparison with UC comparators (Riverside, Davis, Santa Barbara)

33 (X) Trends in major demand (declared)

34 (X) Trends in major demand (proposed)

**Impaction Metric Categories**

A Class Size  
B Student-to-faculty ratio  
C Course availability  
D Graduation rates  
E Faculty contact and feedback  
F Advising  
G Individual mentoring  
H Climate and diversity  
X No category (not used in numerical indices)
Appendix B: Weighting Schemes
<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>A NOMINAL</th>
<th>B CATEGORIES HAVE EQUAL WEIGHT</th>
<th>C WEIGHTING DESIGNED TO NOT PENALIZE OUTPERFORMING PROGRAMS</th>
<th>D COURSE-BASED METRICS ONLY</th>
<th>E ENRICHMENT METRICS ONLY</th>
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<th>PC2</th>
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Table B1: Weighting schemes made use of to calculate the various internal impaction indices and for the Principle Component Analysis.
Appendix C: Majors per Adviser and Lower Division Instructional Fraction
Figure C1: Majors per adviser for candidate programs.

Figure C2: Fraction of undergraduate instructional workload that is Lower Division. For reference, this fraction is 78% for Physics and 87% for Math.
Appendix D: UCUES Survey Results Relating to Advising
F&DM Advising Satisfaction

Computer Science Advising Satisfaction
Appendix E: UCUES Survey Results Related to Enrichment
Left: Fraction not engaged (blue) and engaged (orange) in research/creative activity. Right: fraction dissatisfied or very dissatisfied (blue), neutral (orange), and satisfied or very satisfied (gray) with enrichment opportunities.

Left: Fraction not engaged (blue) and engaged (orange) in research/creative activity. Right: fraction dissatisfied or very dissatisfied (blue), neutral (orange), and satisfied or very satisfied (gray) with enrichment opportunities.
Left: Fraction not engaged (blue) and engaged (orange) in research/creative activity. Right: fraction dissatisfied or very dissatisfied (blue), neutral (orange), and satisfied or very satisfied (gray) with enrichment opportunities.

Left: Fraction not engaged (blue) and engaged (orange) in research/creative activity. Right: fraction dissatisfied or very dissatisfied (blue), neutral (orange), and satisfied or very satisfied (gray) with enrichment opportunities.
Left: Fraction not engaged (blue) and engaged (orange) in research/creative activity. Right: fraction dissatisfied or very dissatisfied (blue), neutral (orange), and satisfied or very satisfied (gray) with enrichment opportunities.

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Left: Fraction not engaged (blue) and engaged (orange) in research/creative activity. Right: fraction dissatisfied or very dissatisfied (blue), neutral (orange), and satisfied or very satisfied (gray) with enrichment opportunities.

Left: Fraction not engaged (blue) and engaged (orange) in research/creative activity. Right: fraction dissatisfied or very dissatisfied (blue), neutral (orange), and satisfied or very satisfied (gray) with enrichment opportunities.
Appendix F: Enrichment: Capstone Class Enrollment and Independent Study Participation
Average Capstone Class Sizes

ART

190A required of all

190B if no exhibition or individual portfolio
GAMES AND PLAYABLE MEDIA

ARTG-170

COMPUTER SCIENCE

Basically any upper division
MCD BIOLOGY

Capstone is research (how assessed?) or any UD lab; here is average lab class size

ECONOMICS

Sections of 100A, averaged

Sections of 100B, averaged

Sections of 131 averaged
FILM AND DIGITAL MEDIA

FILM-194 averaged over sections


FILM-196 averaged over sections

PHILOSOPHY

PHIL-190 averaged over sections

PSYCHOLOGY

PSYC 119A-Z, 139A-Z, 159A-Z, 179A-Z, all averaged together
SOCIOLOGY

SOCY-196; *but changing over to senior seminar now*


![Graph showing average class size from 2009/2010 to 2018/2019](image-url)
TECHNOLOGY AND INFORMATION MANAGEMENT

TIM-105


TIM-125


TIM-158

Senior Year Class Sizes and Fraction of Majors Taking Independent Study

Availability of Enrichment Opportunities

Percentage of graduates who took an independent study class by graduation year

Class Level
Multiple values

Class Department (Line Graph Only)
Art

Average number of Lower Division & Upper Division classes taken in final year by class size

Number of Lower Division & Upper Division classes taken in final year by graduation year

Art
### Availability of Enrichment Opportunities

#### Graduation Cohort
- 2016-17
- 2017-18
- 2018-19

#### Select Major
- Art & Des. Games & P M

#### Percentage of graduates who took an independent study class

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<th>Division</th>
<th>Campus</th>
</tr>
</thead>
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<td>0%</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>20%</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>40%</td>
<td></td>
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<tr>
<td>60%</td>
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<tr>
<td>100%</td>
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#### Percentage of graduates who took an independent study class by graduation year

- 2016-17
- 2017-18
- 2018-19

#### Average number of Lower Division & Upper Division classes taken in final year by class size

<table>
<thead>
<tr>
<th>Class Level</th>
<th>Class Department (Line Graph Only)</th>
<th>Art</th>
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<tbody>
<tr>
<td>Multiples</td>
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#### Number of Lower Division & Upper Division classes taken in final year by graduation year

- 2016-17
- 2017-18

- Major Avg. Classes in Last Year
- Major Avg. Class Size <=100
- Major Avg. Class Size <=200
- Major Avg. Class Size <=60
- Major Avg. Class Size >200

- Division Avg. Class Size <=30
- Division Avg. Class Size <=60
- Division Avg. Class Size <=100
- Division Avg. Class Size <=200
- Division Avg. Class Size > 200
- Campus Avg. Class Size <=30
- Campus Avg. Class Size <=60
- Campus Avg. Class Size <=100
- Campus Avg. Class Size <=200
- Campus Avg. Class Size > 200
Film & Digital Media

Availability of Enrichment Opportunities

Percentage of graduates who took an independent study class by graduation year:

- Major
- Division
- Campus

Average number of Lower Division & Upper Division classes taken in final year by class size:

- Major Avg.: Class Size <= 30
- Division Avg.: Class Size <= 30
- Campus Avg.: Class Size <= 30
- Major Avg.: Class Size > 60
- Division Avg.: Class Size > 60
- Campus Avg.: Class Size > 60

Number of Lower Division & Upper Division classes taken in final year by graduation year:

- Major Avg. Class Size <= 100
- Major Avg. Class Size <= 80
- Major Avg. Class Size > 200

51
Availability of Enrichment Opportunities

Percentage of graduates who took an independent study class by graduation year

- Major
- Division
- Campus

Average number of Lower Division & Upper Division classes taken in final year by class size

- Major Avg. Class Size <= 30
- Division Avg. Class Size <= 30
- Campus Avg. Class Size <= 30
- Major Avg. Class Size <= 60
- Division Avg. Class Size <= 60
- Campus Avg. Class Size <= 60
- Major Avg. Class Size <= 100
- Division Avg. Class Size <= 100
- Campus Avg. Class Size <= 100
- Major Avg. Class Size <= 200
- Division Avg. Class Size <= 200
- Campus Avg. Class Size <= 200
- Major Avg. Class Size > 200
- Division Avg. Class Size > 200
- Campus Avg. Class Size > 200

Number of Lower Division & Upper Division classes taken in final year by graduation year

- Major Avg. Classes in Last Year
- Major Avg. Class Size <= 100
- Major Avg. Class Size <= 30
- Major Avg. Class Size <= 200
- Major Avg. Class Size <= 60
Availability of Enrichment Opportunities

Percentage of graduates who took an independent study class by graduation year

Percentage of graduates who took an independent study class

Class Level Multiple values
Class Department (Line Graph Only)
Technology Management

Average number of Lower Division & Upper Division classes taken in final year by class size

Number of Lower Division & Upper Division classes taken in final year by graduation year
Availability of Enrichment Opportunities

Percentage of graduates who took an independent study class by graduation year

Percentage of graduates who took an independent study class by graduation year

Average number of Lower Division & Upper Division classes taken in final year by class size

Number of Lower Division & Upper Division classes taken in final year by graduation year
Sociology

Availability of Enrichment Opportunities

Percentage of graduates who took an independent study class

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<th>Major</th>
<th>Division</th>
<th>Campus</th>
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</thead>
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<tr>
<td>100%</td>
<td>80%</td>
<td>60%</td>
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</table>

Percentage of graduates who took an independent study class by graduation year

Class Level
- Multiple values

Class Department (Line Graph Only)
- Sociology

Average number of Lower Division & Upper Division classes taken in final year by class size

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Number of Lower Division & Upper Division classes taken in final year by graduation year

- Major Avg. Classes in Last Year
- Major Avg. Class Size <=30
- Major Avg. Class Size <=100
- Major Avg. Class Size <=200
- Major Avg. Class Size <=60
- Major Avg. Class Size >200
Availability of Enrichment Opportunities

Percentage of graduates who took an independent study class by graduation year

Percentage of graduates who took an independent study class

Class Level
Multiple values

Class Department (Line Graph Only)
Psychology

Number of Lower Division & Upper Division classes taken in final year by graduation year

Average number of Lower Division & Upper Division classes taken in final year by class size

56
Availability of Enrichment Opportunities

Select Major
- Business Mgmt Economics

Class Level
- Multiple values

Class Department (Line Graph Only)
- Economics

Percentage of graduates who took an independent study class by graduation year

Average number of Lower Division & Upper Division classes taken in final year by class size

Number of Lower Division & Upper Division classes taken in final year by graduation year
Availability of Enrichment Opportunities

Graduation Cohort
- 2016-17
- 2017-18
- 2018-19

Select Major
- Molecular Cell & Dev Biology

Percentage of graduates who took an independent study class

- Major
- Division
- Campus

Percentage of graduates who took an independent study class by graduation year

Class level
- Multiple values
- Molecular Cell, & Dev Biology

Average number of Lower Division & Upper Division classes taken in final year by class size

Number of Lower Division & Upper Division classes taken in final year by graduation year

- Major Avg. Class Size <= 30
- Division Avg. Class Size <= 30
- Campus Avg. Class Size <= 30
- Major Avg. Class Size <= 60
- Division Avg. Class Size <= 60
- Campus Avg. Class Size <= 60
- Major Avg. Class Size <= 100
- Division Avg. Class Size <= 100
- Campus Avg. Class Size <= 100
- Major Avg. Class Size <= 200
- Division Avg. Class Size <= 200
- Campus Avg. Class Size <= 200
- Major Avg. Class Size > 200
- Division Avg. Class Size > 200
- Campus Avg. Class Size > 200

- Major Avg. Class Size <= 100
- Major Avg. Class Size <= 30
- Major Avg. Class Size <= 200
- Major Avg. Class Size >= 60
- Major Avg. Class Size > 200
Appendix G: Graduation Statistics
Average Time to Degree

NOTE: GAME AND DESIGN BASED ON JUST ONE COHORT, WITH ONLY 5 STUDENTS

FROSH Average Time to Degree

2012 Average Elapsed Years | 2008-2012 Average Elapsed Years.

NOTE: GAME AND DESIGN BASED ON JUST ONE COHORT, WITH ONLY 2 STUDENTS

Transfer Average Time to Degree

2014 Average Elapsed Years | 2010-2014 Average Elapsed Years.
Completion Rates for Native Students

NOTE: ART GAMES AND PLAYABLE MEDIA NOT AVAILABLE; USE AVERAGE AS A PROXY FOR IMPACTION SCORE

**Art**

**Film and Digital Media**
Philosophy

MCD Bio

[Bar charts showing distribution of students by year and major, with categories for In proposed major, In another major, and Did not Grad]
Completion Rates for Transfer Students

NOTE: ART GAMES AND PLAYABLE MEDIA NOT AVAILABLE; USE AVERAGE AS A PROXY FOR IMPACTION SCORE

**ART**

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<td>2 yr</td>
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<tr>
<td>2 yr</td>
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**Film & Digital Media**

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<tr>
<td>2 yr</td>
<td>In another major</td>
<td>0.00%</td>
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<tr>
<td>2 yr</td>
<td>Did not Grad</td>
<td>0.00%</td>
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</table>
Philosophy

BSN Economics
MCD Biology

- In proposed major
- In another major
- Did not Grad

Bar chart showing percentages for different years and divisions in MCD Biology.
Appendix H: UCUES Results on Class Size, Course Availability and Campus Climate
UCUES: Class Size, Availability of courses, Campus Climate.

KEY

Each group of three represents one of three UCUES survey questions
For each group the first bar represents UCSC, second bar represents Division, and the third bar represents other UC’s.

Q1: How satisfied are you with the access to small classes?
Q2: How satisfied are you with the availability of courses needed for graduation?
Q3: Overall, I feel comfortable with the campus climate for diversity and inclusion in my major.
Appendix I: Class Sizes and Trends
LOWER DIVISION CLASS SIZES (From IRAPS dashboard)

MCD Bio

Class Size Distribution for 2018-19

1:20
- Department
- Division
- Campus

21-30
- Department
- Division
- Campus

31-50
- Department
- Division
- Campus

51-100
- Department
- Division
- Campus

101+
- Department
- Division
- Campus

Average Class Size from 2009/2010 - 2018/2019

0% 20% 40% 60% 80% 100%

Comp Sci

Class Size Distribution for 2018-19

1:20
- Department
- Division
- Campus

21-30
- Department
- Division
- Campus

31-50
- Department
- Division
- Campus

51-100
- Department
- Division
- Campus

101+
- Department
- Division
- Campus

Average Class Size from 2009/2010 - 2018/2019

0% 20% 40% 60% 80% 100%
Art

Class Size Distribution for 2018-19

<table>
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<td>101+</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Average Class Size from 2009/2010 - 2018/2019

Games & Playable Media [Arts General]

Class Size Distribution for 2018-19

<table>
<thead>
<tr>
<th>Class Size</th>
<th>Department</th>
<th>Division</th>
<th>Campus</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21-30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31-50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>51-100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>101+</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Average Class Size from 2009/2010 - 2018/2019
UPPER DIVISION CLASS SIZES (From IRAPS dashboard)

MCD Bio

Class Size Distribution for 2018-19

- 1-20
- 21-30
- 31-50
- 51-100
- 101+

Average Class Size from 2009/2010 - 2018/2019

Comp Sci

Class Size Distribution for 2018-19

- 1-20
- 21-30
- 31-50
- 51-100
- 101+

Average Class Size from 2009/2010 - 2018/2019
Art

Games & Playable Media [Arts General]
Appendix J: Class Waitlist Size
Appendix K: UCUES Results on Exposure to Faculty
The first three bars represent the UCUES: “Faculty Providing prompt feedback and useful feedback on student work.”

- Orange bar represents “never/rarely”
- Yellow bar represents “occasionally/somewhat often”
- Green bar represents “often/ very often”

The second set of three bars represents: “How many Professors do you know well enough to ask for a letter of recommendation?”

- Orange bar represents “0”
- Yellow bar represents “1 or 2”
- Green bar represents “3 or 4 more”

Art
Arts: Games and Playable Media

Film & Digital Media
**Psychology**

![Psychology Chart]

**Philosophy**

![Philosophy Chart]
Appendix L: Instructor Type Distributions
## Art Lower Division

### Distribution of Undergraduate Enrollments by Faculty Type

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Division</th>
<th>Course Level</th>
<th>Faculty Type</th>
<th>Split by</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-19</td>
<td>Arts Division</td>
<td>Lower Division</td>
<td>All</td>
<td>65.32%</td>
</tr>
</tbody>
</table>

## Art Upper Division

### Distribution of Undergraduate Enrollments by Faculty Type

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Division</th>
<th>Course Level</th>
<th>Faculty Type</th>
<th>Split by</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-19</td>
<td>Arts Division</td>
<td>Upper Division</td>
<td>All</td>
<td>33.33%</td>
</tr>
</tbody>
</table>
### Film & Digital Media Lower Division

**Distribution of Undergraduate Enrollments by Faculty Type**

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Division</th>
<th>Split</th>
<th>Faculty Type</th>
<th>Senate Faculty</th>
<th>Unit 18 Lecturers</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-19</td>
<td>Arts Division</td>
<td>All</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Senate Faculty</td>
<td>54.15%</td>
<td>45.85%</td>
</tr>
</tbody>
</table>

### Film & Digital Media Upper Division

**Distribution of Undergraduate Enrollments by Faculty Type**

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Division</th>
<th>Split</th>
<th>Faculty Type</th>
<th>Senate Faculty</th>
<th>Unit 18 Lecturers</th>
<th>Academic Student Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-19</td>
<td>Arts Division</td>
<td>All</td>
<td></td>
<td>25.53%</td>
<td>50.50%</td>
<td>24.47%</td>
</tr>
</tbody>
</table>
### Arts General Lower Division

#### Distribution of Undergraduate Enrollments by Faculty Type

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Division</th>
<th>Course Level</th>
<th>Course Type</th>
<th>Split</th>
<th>Faculty Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-19</td>
<td>Arts Division</td>
<td>Lower Division</td>
<td>All</td>
<td>All</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Faculty Type

<table>
<thead>
<tr>
<th></th>
<th>Senate Faculty</th>
<th>All Other Faculty</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-19</td>
<td>73.42%</td>
<td>26.58%</td>
</tr>
</tbody>
</table>

### Arts General Upper Division

#### Distribution of Undergraduate Enrollments by Faculty Type

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Division</th>
<th>Course Level</th>
<th>Course Type</th>
<th>Split</th>
<th>Faculty Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-19</td>
<td>Arts Division</td>
<td>Upper Division</td>
<td>All</td>
<td>All</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Faculty Type

<table>
<thead>
<tr>
<th></th>
<th>Senate Faculty</th>
<th>Unit 18 Lecturers</th>
<th>All Other Faculty</th>
<th>Academic Student Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-19</td>
<td>73.42%</td>
<td>1.27%</td>
<td>26.58%</td>
<td>5.04%</td>
</tr>
</tbody>
</table>
## Computer Science Lower Division

### Distribution of Undergraduate Enrollments by Faculty Type

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Division</th>
<th>Course Level</th>
<th>Course Type</th>
<th>Split by</th>
<th>Faculty Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-19</td>
<td>Baskin School of Engineering</td>
<td>Lower Division</td>
<td>All</td>
<td>All</td>
<td>Senate Faculty</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Unit 18 Lecturers</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>All Other Faculty</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Academic Student Employees</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Division</th>
<th>Course Level</th>
<th>Course Type</th>
<th>Split by</th>
<th>Faculty Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-19</td>
<td>Baskin School of Engineering</td>
<td>All</td>
<td>All</td>
<td>All</td>
<td>Senate Faculty</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Unit 18 Lecturers</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>All Other Faculty</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Academic Student Employees</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Faculty Type</th>
<th>Senate Faculty</th>
<th>Unit 18 Lecturers</th>
<th>All Other Faculty</th>
<th>Academic Student Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-19</td>
<td>14.38%</td>
<td>31.25%</td>
<td>0.37%</td>
<td>0.02%</td>
</tr>
</tbody>
</table>

## Computer Science Upper Division

### Distribution of Undergraduate Enrollments by Faculty Type

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Division</th>
<th>Course Level</th>
<th>Course Type</th>
<th>Split by</th>
<th>Faculty Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-19</td>
<td>Baskin School of Engineering</td>
<td>Upper Division</td>
<td>All</td>
<td>All</td>
<td>Senate Faculty</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Unit 18 Lecturers</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>All Other Faculty</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Academic Student Employees</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Division</th>
<th>Course Level</th>
<th>Course Type</th>
<th>Split by</th>
<th>Faculty Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-19</td>
<td>Baskin School of Engineering</td>
<td>All</td>
<td>All</td>
<td>All</td>
<td>Senate Faculty</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Unit 18 Lecturers</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>All Other Faculty</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Academic Student Employees</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Faculty Type</th>
<th>Senate Faculty</th>
<th>Unit 18 Lecturers</th>
<th>All Other Faculty</th>
<th>Academic Student Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-19</td>
<td>23.62%</td>
<td>43.19%</td>
<td>0.02%</td>
<td>0.02%</td>
</tr>
</tbody>
</table>
### Technology and Info Management Lower Division

**Distribution of Undergraduate Enrollments by Faculty Type**

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Division</th>
<th>Faculty Type</th>
<th>Split</th>
<th>Course Level</th>
<th>Course Type</th>
<th>Course Section</th>
<th>Faculty Type</th>
<th>Split</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-19</td>
<td>Bascom School of Engineering</td>
<td>Senate Faculty</td>
<td>51.00%</td>
<td>Lower Division</td>
<td>All</td>
<td>All</td>
<td>Unit 1B Lecturers</td>
<td>49.00%</td>
</tr>
</tbody>
</table>

### Technology and Info Management Upper Division

**Distribution of Undergraduate Enrollments by Faculty Type**

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Division</th>
<th>Faculty Type</th>
<th>Split</th>
<th>Course Level</th>
<th>Course Type</th>
<th>Course Section</th>
<th>Faculty Type</th>
<th>Split</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-19</td>
<td>Bascom School of Engineering</td>
<td>Senate Faculty</td>
<td>100.00%</td>
<td>Upper Division</td>
<td>All</td>
<td>All</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Sociology Lower Division

#### Distribution of Undergraduate Enrollments by Faculty Type

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Division</th>
<th>Course Level</th>
<th>Course Type</th>
<th>Faculty Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-19</td>
<td>Social Sciences Division</td>
<td>Lower Division</td>
<td>All</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Faculty Type</th>
<th>Senate Faculty</th>
<th>Unit 18 Lecturers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Split by</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>72.99%</td>
<td>27.01%</td>
</tr>
</tbody>
</table>

### Sociology Upper Division

#### Distribution of Undergraduate Enrollments by Faculty Type

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Division</th>
<th>Course Level</th>
<th>Course Type</th>
<th>Faculty Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-19</td>
<td>Social Sciences Division</td>
<td>Upper Division</td>
<td>All</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Faculty Type</th>
<th>Senate Faculty</th>
<th>Unit 18 Lecturers</th>
<th>All Other Faculty</th>
<th>Academic Student Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Split by</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>55.55%</td>
<td>41.29%</td>
<td>3.00%</td>
<td>0.12%</td>
</tr>
</tbody>
</table>
### Philosophy Lower Division

#### Distribution of Undergraduate Enrollments by Faculty Type

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Division</th>
<th>Split</th>
<th>Faculty Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-19</td>
<td>Humanities Division</td>
<td>All</td>
<td>Senate Faculty: 22.54%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Unit 18 Lecturers: 31.59%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Academic Student Employees: 46.77%</td>
</tr>
</tbody>
</table>

### Philosophy Upper Division

#### Distribution of Undergraduate Enrollments by Faculty Type

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Division</th>
<th>Split</th>
<th>Faculty Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-19</td>
<td>Humanities Division</td>
<td>All</td>
<td>Senate Faculty: 75.99%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Unit 18 Lecturers: 22.60%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Academic Student Employees: 6.41%</td>
</tr>
</tbody>
</table>
### Economics Lower Division

**Distribution of Undergraduate Enrollments by Faculty Type**

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Division</th>
<th>Course Level</th>
<th>Course Type</th>
<th>Split by</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-19</td>
<td>Social Sciences Division</td>
<td>Lower Division</td>
<td>All</td>
<td>All</td>
</tr>
<tr>
<td></td>
<td>Course</td>
<td>All</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Course Section</td>
<td>All</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Faculty Type</th>
<th>Senate Faculty</th>
<th>Unit 18 Lecturers</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-19</td>
<td>93.72%</td>
<td>40.28%</td>
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</table>

### Economics Upper Division

**Distribution of Undergraduate Enrollments by Faculty Type**

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Division</th>
<th>Course Level</th>
<th>Course Type</th>
<th>Split by</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-19</td>
<td>Social Sciences Division</td>
<td>Upper Division</td>
<td>All</td>
<td>All</td>
</tr>
<tr>
<td></td>
<td>Course</td>
<td>All</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Course Section</td>
<td>All</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Faculty Type</th>
<th>Senate Faculty</th>
<th>Unit 18 Lecturers</th>
<th>All Other Faculty</th>
<th>Academic Student Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-19</td>
<td>47.83%</td>
<td>52.16%</td>
<td>1.04%</td>
<td>0.00%</td>
</tr>
</tbody>
</table>
### Psychology Lower Division

**Distribution of Undergraduate Enrollments by Faculty Type**

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Division</th>
<th>Course Level</th>
<th>Course Type</th>
<th>Faculty Type</th>
<th>Split by</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-19</td>
<td>Social Sciences Division</td>
<td>Lower Division</td>
<td>All</td>
<td>Senate Faculty</td>
<td>All</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Division</th>
<th>Course Level</th>
<th>Course Type</th>
<th>Faculty Type</th>
<th>Split by</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-19</td>
<td>Social Sciences Division</td>
<td>All</td>
<td>All</td>
<td>Unit 1B Lecturers</td>
<td>All</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Faculty Type</th>
<th>Senate Faculty</th>
<th>Unit 1B Lecturers</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-19</td>
<td>61.66%</td>
<td>38.34%</td>
</tr>
</tbody>
</table>

### Psychology Upper Division

**Distribution of Undergraduate Enrollments by Faculty Type**

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Division</th>
<th>Course Level</th>
<th>Course Type</th>
<th>Faculty Type</th>
<th>Split by</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-19</td>
<td>Social Sciences Division</td>
<td>Upper Division</td>
<td>All</td>
<td>Senate Faculty</td>
<td>All</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Division</th>
<th>Course Level</th>
<th>Course Type</th>
<th>Faculty Type</th>
<th>Split by</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-19</td>
<td>Social Sciences Division</td>
<td>All</td>
<td>All</td>
<td>Unit 1B Lecturers</td>
<td>All</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Faculty Type</th>
<th>Senate Faculty</th>
<th>Unit 1B Lecturers</th>
<th>All Other Faculty</th>
<th>Academic Student Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-19</td>
<td>17.09%</td>
<td>38.59%</td>
<td>25.0%</td>
<td>12.34%</td>
</tr>
</tbody>
</table>
### MCD Biology Lower Division

Distribution of Undergraduate Enrollments by Faculty Type

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Division</th>
<th>Course Level</th>
<th>Course Type</th>
<th>Split by</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-19</td>
<td>Physical and Bio Sciences Div</td>
<td>Lower Division</td>
<td>All</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Faculty Type</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senate Faculty</td>
<td>47.37%</td>
</tr>
<tr>
<td>Unit 1B Lecturers</td>
<td>52.63%</td>
</tr>
<tr>
<td>Academic Student Employees</td>
<td>0.00%</td>
</tr>
</tbody>
</table>

### MCD Biology Upper Division

Distribution of Undergraduate Enrollments by Faculty Type

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Division</th>
<th>Course Level</th>
<th>Course Type</th>
<th>Split by</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-19</td>
<td>Physical and Bio Sciences Div</td>
<td>Upper Division</td>
<td>All</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Faculty Type</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senate Faculty</td>
<td>41.86%</td>
</tr>
<tr>
<td>Unit 1B Lecturers</td>
<td>37.46%</td>
</tr>
<tr>
<td>All Other Faculty</td>
<td>1.00%</td>
</tr>
<tr>
<td>Academic Student Employees</td>
<td>0.00%</td>
</tr>
</tbody>
</table>
Appendix M: Faculty Workload

Latest data is for 2017-2018

<table>
<thead>
<tr>
<th>Program</th>
<th>Major per Permanent Faculty FTE</th>
<th>Student FTE per Faculty Payroll FTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Art</td>
<td>24.2 (12.3)</td>
<td>25.0 (25.2)</td>
</tr>
<tr>
<td>Games &amp; Playable Media (Art General)</td>
<td>34.5 &amp; rising (12.3)</td>
<td>20.5 (25.2)</td>
</tr>
<tr>
<td>Computer Science</td>
<td>54.7 (25.8)</td>
<td>52.2 (37.2)</td>
</tr>
<tr>
<td>Economics (all majors)</td>
<td>39.6 (27.2)</td>
<td>37.5 (28.4)</td>
</tr>
<tr>
<td>Film &amp; Digital Media</td>
<td>17.3 (12.3)</td>
<td>23.6 (25.2)</td>
</tr>
<tr>
<td>MCD Biology</td>
<td>45.5 (17.5)</td>
<td>27.3 (28.5)</td>
</tr>
<tr>
<td>Philosophy</td>
<td>11.7 (9.8)</td>
<td>32.1 (16.0)</td>
</tr>
<tr>
<td>Psychology</td>
<td>42.9 (27.2)</td>
<td>36.6 (28.4)</td>
</tr>
<tr>
<td>Sociology</td>
<td>30.9 (27.2)</td>
<td>33.8 (28.4)</td>
</tr>
<tr>
<td>TIM</td>
<td>32.1 (25.8)</td>
<td>28.0 (37.2)</td>
</tr>
</tbody>
</table>

Numbers in parentheses are for the division as a whole
Appendix N: Trends in Major Demand
Computer Science Proposed

Major Demand Trends: Undergraduate 3-Quarter Average Major Headcount

Computer Science
Proposed

Admit Type
- Other/Unknown
- Transfer
- Freshman

Comparison Lines
- BSSE Division
- Campus

Major Demand Trends: Undergraduate 3-Quarter Average Major Headcount

Computer Science Declared

Admit Type
- Other/Unknown
- Transfer
- Freshman

Comparison Lines
- BSSE Division
- Campus

121
Art Proposed

Major Demand Trends: Undergraduate 3-Quarter Average Major Headcount

Art Proposed

Art Declared

Major Demand Trends: Undergraduate 3-Quarter Average Major Headcount
Games and Playable Media Proposed

Major Demand Trends: Undergraduate 3-Quarter Average Major Headcount

Games and Playable Media Declared

Major Demand Trends: Undergraduate 3-Quarter Average Major Headcount
Film and Digital Media Proposed

### Major Demand Trends: Undergraduate 3-Quarter Average Major Headcount

<table>
<thead>
<tr>
<th>Select Program</th>
<th>Major Type</th>
<th>Major Level</th>
<th>EOP Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Film and Digital Media</td>
<td>Proposed</td>
<td>All</td>
<td>All</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Admit Type</th>
<th>Comparison Lines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other/Unknown</td>
<td>Arts Division</td>
</tr>
<tr>
<td>Transfer</td>
<td>Campus</td>
</tr>
<tr>
<td>First-Time Freshman</td>
<td></td>
</tr>
</tbody>
</table>

Film and Digital Media Declared

### Major Demand Trends: Undergraduate 3-Quarter Average Major Headcount

<table>
<thead>
<tr>
<th>Select Program</th>
<th>Major Type</th>
<th>Major Level</th>
<th>EOP Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Film and Digital Media</td>
<td>Declared</td>
<td>All</td>
<td>All</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Admit Type</th>
<th>Comparison Lines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other/Unknown</td>
<td>Arts Division</td>
</tr>
<tr>
<td>Transfer</td>
<td>Campus</td>
</tr>
<tr>
<td>First-Time Freshman</td>
<td></td>
</tr>
</tbody>
</table>
Business Management Economics Proposed

Major Demand Trends: Undergraduate 3-Quarter Average Major Headcount

Select Program: Business Management Economics
Major Type: Proposed
Major Level: All
EOP Status: All

Admit Type
- Other/Unknown
- Transfer
- First-Time Freshman

Comparison Lines
- SS Division
- Campus

Business Management Economics Declared

Major Demand Trends: Undergraduate 3-Quarter Average Major Headcount

Select Program: Business Mgmt Economics
Major Type: Declared
Major Level: All
EOP Status: All

Admit Type
- Other/Unknown
- Transfer
- First-Time Freshman

Comparison Lines
- SS Division
- Campus
## Psychology Proposed

### Major Demand Trends: Undergraduate 3-Quarter Average Major Headcount

<table>
<thead>
<tr>
<th>Select Program</th>
<th>Major Type</th>
<th>Major Level</th>
<th>EOP Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychology</td>
<td>Proposed</td>
<td>All</td>
<td>All</td>
</tr>
</tbody>
</table>

Admit Type:
- Other/Unknown
- Transfer
- First-Time Freshman

Comparison Lines:
- SS Division
- Campus

![Graph showing major demand trends](image)

## Psychology Declared

### Major Demand Trends: Undergraduate 3-Quarter Average Major Headcount

<table>
<thead>
<tr>
<th>Select Program</th>
<th>Major Type</th>
<th>Major Level</th>
<th>EOP Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychology</td>
<td>Declared</td>
<td>All</td>
<td>All</td>
</tr>
</tbody>
</table>

Admit Type:
- Other/Unknown
- Transfer
- First-Time Freshman

Comparison Lines:
- SS Division
- Campus

![Graph showing major demand trends](image)
Philosophy Proposed

Major Demand Trends: Undergraduate 3-Quarter Average Major Headcount

Select Program
Philosophy

Major Type
Proposed

Major Level
All

EOP Status
All

Admit Type
- Other/Unknown
- Transfer
- First-Time Freshmen

Comparison Lines
- HUM Division
- Campus

Philosophy Declared

Major Demand Trends: Undergraduate 3-Quarter Average Major Headcount

Select Program
Philosophy

Major Type
Declared

Major Level
All

EOP Status
All

Admit Type
- Other/Unknown
- Transfer
- First-Time Freshmen

Comparison Lines
- HUM Division
- Campus
MCD Biology Proposed

Major Demand Trends: Undergraduate 3-Quarter Average Major Headcount

MCD Biology Declared

Major Demand Trends: Undergraduate 3-Quarter Average Major Headcount
Technology and Info Management Proposed

Major Demand Trends: Undergraduate 3-Quarter Average Major Headcount

Select Program
Technology & Info Mgmt

<table>
<thead>
<tr>
<th>Major Type</th>
<th>Major Level</th>
<th>EOP Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposed</td>
<td>All</td>
<td>All</td>
</tr>
</tbody>
</table>

Admit Type
- Other/Unknown
- Transfer
- First-Time Freshman

Comparison Lines
- BSOE Division
- Campus

Technology and Info Management Declared

Major Demand Trends: Undergraduate 3-Quarter Average Major Headcount

Select Program
Technology & Info Mgmt

<table>
<thead>
<tr>
<th>Major Type</th>
<th>Major Level</th>
<th>EOP Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Declared</td>
<td>All</td>
<td>All</td>
</tr>
</tbody>
</table>

Admit Type
- Other/Unknown
- Transfer
- First-Time Freshman

Comparison Lines
- BSOE Division
- Campus