# FROM 150 TO 120

## CURRICULUM REDESIGN TO THE EXTREME

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*PAPER ABSTRACT: For design educators, the challenge of rethinking a 5-year industrial design curriculum to fit within a 4-year envelope can be a formidable task. For every 'new learning outcome' to be added, and equal or greater number needed to be taken away. This story chronicles this 2- year process and offers a glimpse of what has emerged as the new curriculum at Syracuse University.*

*The first step for our faculty was to conduct a curriculum mapping exercise. This involved reviewing the current curriculum and mapping out the learning objectives, outcomes, and assessments for each existing course. The mapping exercise helped to prioritize courses that align with the overall goals and objectives of the program, uncovering gaps in essential knowledge and emerging skills.*

*Current perspectives on what should constitute an ID curriculum were evaluated and debated. In addition, industry experts, alumni, and current students were invited to lend their insights. Collectively, they provided valuable feedback on which courses are most relevant, useful, and essential in order to succeed in the field. This resulted in a top-to-bottom overhaul of the majority of our course offerings. As a result, what has emerged is a 4-stage curriculum with the following over-arching themes:*

*Year 1: Design Worlds Today*
*Year 2: Deep Dive: Industrial and Interaction Design*
*Year 3: Human and Environmental Contexts*
*Year 4: Speculative Futures and Professional Launch*

*Keywords: Curriculum, Redesign, Industrial Design, Design Education, Rethink*

## 1. INTRODUCTION

The industrial and interaction design (IID) program at Syracuse University is one of the oldest and most well-known programs of its kind. As a 150 credit BID degree positioned within a Tier One research university, the program spans a wide range of courses from traditional industrial design to UI/UX and design research skills. As a university-based program and in contrast to programs offered by art schools, many students elect to pursue a minor in areas such as Entrepreneurship, EEE, and Sustainability. Throughout its existence, the program and its faculty have worked to maintain a balance of theory and practice. This approach has allowed students to develop a critical perspective on the field while preparing them to meet the immediate challenges of the workplace at the time of graduation and beyond.

Though there are numerous outstanding qualities for the current 5-year program, there are a series of factors that have led the faculty to envision a new 4-year curriculum. First and foremost, given the competitive landscape and the spiraling cost of higher education, the vast majority of our peer institutions each offer a 4-year degree in Industrial Design. As a result, enrollment numbers within the industrial design program have in recent years gone down at a steady rate. Though the faculty believe the 5-year curriculum offers a comprehensive design education, parents are reluctant to rationalize the costs associated with a 5th year. In addition, within the School of Design, the ID program has been the only 5-year degree offered. Therefore, this change will bring the program in alignment with the other programs in the school of design such as Fashion Design, Interior Design, Communication Design, and Design Studies. This in turn will permit numerous IND classes with a DES prefix to non-ID majors which will further bolster our position within the school.

Beyond the School of Design, there is also the opportunity to explore various design minors across Syracuse University which we believe will be attractive to students from other colleges. Throughout its existence, the ID program has always been known for initiating a wide array of collaborative efforts to meet and enhance key learning objectives. Therefore, the proposed new curriculum should make these efforts easier to implement working with the College of Engineering, the School of Management, and the School of Architecture.

Due to changes in the professional landscape and expectations of skills of our graduates, the proposed curriculum will have a greater 'portfolio focus' and a laddering-up of the student's core skill sets. Given the strong desire by employers to hire graduates that have honed their skills through internships, these skills are introduced earlier in the new curriculum to enable students to pursue internships after completing the second year. The new curriculum also explores the idea of offering the ability to have a professional internship during the fall or spring semester in the 3rd year. This would give ID students yet another option in addition to attending the study abroad programs.

While changing from a 5-year to a 4-year BID degree, there is also an acknowledgement that numerous institutions have developed a range of masters and PhD offerings. Therefore, this curriculum includes the consideration of a 4 + 1 graduate offering which would align with the College of Engineering.

## 2. TRANSITION FROM 150 TO 120 CREDITS

To make this transition from 5 to 4 years and achieve the necessary reduction in credit hours, the newly formed curriculum committee sought a structure that increased the chance for success. The journal article "Facilitating program, faculty, and student transformation: A framework for curriculum redesign." (Fowler et al, 2015) provided a thorough roadmap. The first part of that roadmap suggested a questionnaire for the team with the title "Readiness for Change". (Holt et al., 2007; Jippes et al., 2013) Although some difficult issues were brought to the surface, the conversations that followed taking the questionnaire helped to determine the readiness for engaging in a curriculum redesign. It also

supported the faculty to identify "which areas might need attention in order to better prepare … for this effort."
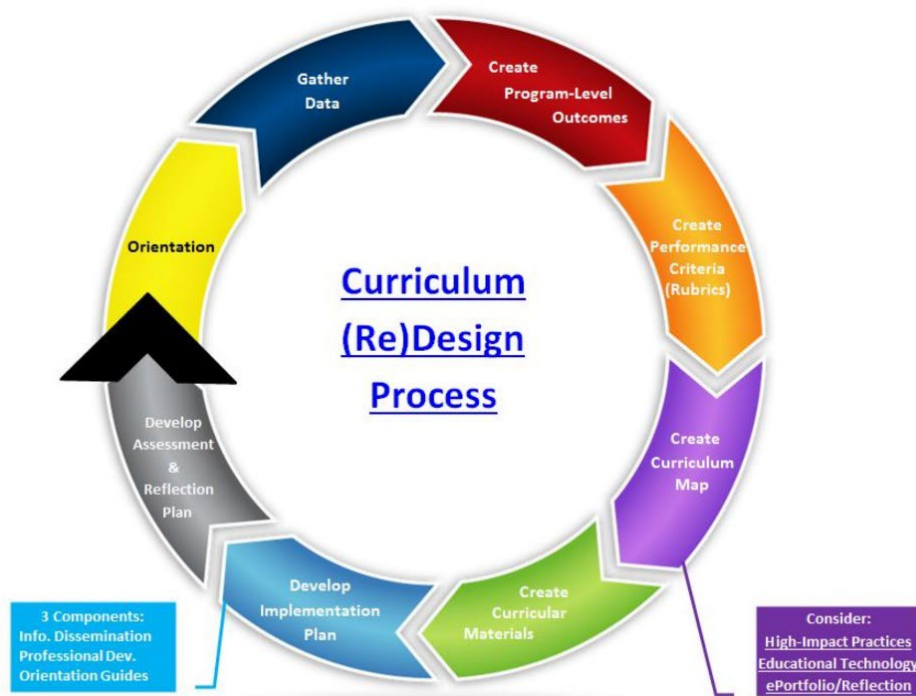


*Figure 1. Curriculum Roadmap (Fowler et al, 2015)*

Aware that the content in years 1 to 5 need to be compressed and certain that we did not want to lose the essence of the program, we analyzed the strengths and weaknesses of the current curriculum. What followed was the review of learning outcomes mapped on existing courses. The learning outcomes of the four core courses that were removed from the curriculum were integrated into revised courses of the new curriculum structure. Although a reduction in the number of electives was necessary, IID students are still able to pursue a minor. Double minoring or double majoring is unfortunately very difficult in a 120-credit hour structure. Multiple studio courses in the upper level enable our efforts for undergraduate research activities.

In improving the student experience in the first year, the faculty created 'Design Worlds' as a gateway course that introduces students to the wide array of professional paths available to industrial and interaction designers. This will address the concern that some students have expressed that they don't gain a solid understanding of the depth and breadth of the profession until they've completed various upper-level classes. Directly related to this, in order to place a greater emphasis on professional practice, this course will be segmented into a series of 1-credit courses that will begin in the 2nd year and will support the incremental improvement of the student's portfolio until graduation.

The learning outcomes of the industrial design principles courses from the second year have been integrated into first year experience courses DES 101, 102, 103 and IND 104) and a revised prototyping course in the second year. By the end of year 2, students have gained foundational knowledge in industrial and interaction design, ready to contribute during a summer internship in meaningful ways.

In addition to these integration efforts, we've elected to integrate aspects of our production processes classes into our systems classes. We believe this will allow for a greater understanding of how these processes exist within a larger context. We've also reduced the number of credits required to develop a 5th year thesis and, in its place, we will teach a one semester capstone class during the spring of the 4th year. Though this is a scaled-down offering, it will still allow the faculty to integrate with specialty fields.

## 3.  CURRICULUM THEMES

The faculty organized the new curriculum into a series of interconnected learning episodes. This thinking pertains to the curricular offerings taken concurrently during each semester, from one year to the next, and how the entire 4-year sequence is envisioned. As noted below, beginning with the first year, each year has an overarching theme. Therefore years 1 through 4 are depicted as follows:

YEAR 1 THEME: DESIGN WORLDS TODAY
Freshmen start the program with a broad introduction to the field.  Here students will research and examine a range of historic and contemporary practices. They learn foundational skills which provide a strong base from which they can build towards their chosen profession.

This broad introduction helps students and faculty evaluate the fit between the students' interests, developing skill sets, and the IID program. Students will meet with their advisor at the end of the year to discuss their progress.

YEAR 2 THEME: DEEP DIVE: INDUSTRIAL AND INTERACTION DESIGN
Students will gain mastery of foundational design skills and basic technologies in IID. These applied skills are grounded with a strong focus on theory and contexts of practice. A visiting designer series will be paramount to increase students' exposure and gain a greater understanding of their chosen field and the role of the designer. Skills demonstrated by the end of the 2nd year will prepare students for entry level internship opportunities.

At the end of Year 2, students will exhibit their work emphasizing their strengths and interests. Faculty and external experts will meet with each student to discuss their work and progress.  Students will be encouraged to follow a path that is a strong fit for their skills and interests. Students may also choose to pursue the Design Studies (BS) degree as an alternative.

YEAR 3 THEME: HUMAN AND ENVIRONMENTAL CONTEXTS
The third year focuses increasingly on human, product and environmental relationships. Students learn to approach their work from an emphatic and ethical lens. Students will continue to develop their skillset in industrial and interaction design.

Students will undergo a portfolio review at the end of the fall semester. This review will be used to help determine whether they can enroll in the 4 +1 program. There is an optional study abroad trip in the spring semester of 3rd year. Students can select the location to study abroad. This experience offers a strong and unique emphasis on ethnography and culture and complements the focus of Year 3.

YEAR 4 THEME: SPECULATIVE FUTURES AND PROFESSIONAL LAUNCH
Students engage with emerging ideas, issues, and technologies in the field. Courses emphasize creativity, critical thinking, and professional practices. There are industry partnerships and practical projects throughout Year 4.

All students complete a capstone project associated with an external collaboration (e.g. community or industry partnership) and show their work at the capstone exhibition.

## 4. CURRICULUM MAP

Most of the time spent on the redesign circled around the curriculum map and its associated course level learning outcomes. After several drafts, the committee discussed the take aways from the *White Book on the Future of Design Education* (Böninger et al., 2021) in relation to the new curriculum map and concluded that both hard- and soft-skills expectations in the 21st century are incorporated.

| | Design Worlds Today | | | | | | Deep dive: industrial and interaction design | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | year 1 | | | | | | year 2 | | | | |
| | | Fall | ch | | Spring | ch | | Fall | ch | | Spring | ch |
| IID Core | | | | ST IND 104 | Fundamentals of IID | 3 | ST IND 273 | Prototyping | 3 | ST IND 256 | Digital Twin I | 3 |
| | | | | | | | ST IND 271 | Sustainable Product Systems I | 3 | ST IND 278 | Designing Interaction | 3 |
| | | | | | | | ST IND 275 | Qualitative Observation and Analysis | 3 | ST IND 264 | Information Visualization | 3 |
| Core Total | | | 0 | | | 3 | | | 9 | | | 9 |
| Supporting Core | ST DES 101 | Digital Tools for Designers I | 3 | ST DES 102 | Digital Tools for Designers II | 3 | | | | | | |
| | ST DES 103 | Analog Design Tools | 3 | ST IND 132 | IID Visualization Techniques I | 3 | AC IND 201 | Portfolio and Self Presentation I | 1 | | | |
| | AC IND 128 | Design Worlds | 3 | | | | | | | | | |
| Supporting Total | | | 9 | | | 6 | | | 1 | | | 0 |
| Electives | | | | ST | AC / ST ELECT. | 3 | | AC / ST ELECT. | 3 | | AC / ST ELECT. | 3 |
| Elective Total | | | 0 | | | 3 | | | 3 | | | 3 |
| Academic requirements | WRT 105 | | 3 | | | | | | | WRT 205 | | 3 |
| | DES 100 | Freshmen Forum | 1 | | | | | | | | | |
| | FYS 101 | First-Year Seminar | 1 | | | | | | | | | |
| General Studies Total | | | 5 | | | 3 | | | 3 | | | 6 |
| Art history requirements | 113 | ART/ DES HIST. | 3 | 114 | ART/ DES HIST. | 3 | | ART/ DES HIST. | 3 | | | |
| Liberal Arts | | | 11 | | | 3 | | | 0 | | | 0 |
| Total | | | 17 | | | 15 | | | 16 | | | 15 |

*Figure 2. Curriculum Map Year 1&2 (Schneider, 2022)*

The first year is enriched with "Design Worlds", a course that introduces freshman to the wide world of design profession and highlights many different possible career paths. Furthermore, the fundamental industrial design skills with an emphasis on exploring the design intent through physical model making

and sketching are covered. The second year is a deep dive in hard skills with the goal for students to be able to secure an internship in the summer.

| Human and environmental contexts | | | | | | Speculative futures and professional launch | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| year 3 | | | Study Abroad (optional) | | | year 4 | | | | | |
| Fall | ch | | Spring | ch | | Fall | ch | | Spring | ch | ch total |
| ST IND 375 Human Factors for Designers | 3 | | | | | ST IND 475 Advanced Design Studio | 3 | ST IND 484 Capstone | 3 | | |
| ST IND 371 Sustainable Product Systems II | 3 | | | | | ST IND 471 Digital and Physical Intersections | 3 | AC IND 494 Philosophy and Ethics | 3 | | |
| ST IND 339 Semiotics: Messages and Interpretations | 3 | | | | | | | | | | |
| | 9 | | | 0 | | | 6 | | | 6 | 42 |
| | | AC IND 396 Advanced Research Methods | 3 | | | ST IND 447 Digital Twin II | 3 | | | | |
| AC IND 301 Portfolio and Self Presentation II | 1 | ST DES 304 Collaborative Design | 3 | | | AC IND 401 Portfolio and Self Presentation III | 1 | | | | |
| ST IND 337 IID Visualization Techniques II | 3 | | | | | AC DES 441 Capstone Research | 3 | | | | |
| | 4 | | | 6 | | | 7 | | | 0 | 33 |
| AC / ST ELECT. | 3 | AC / ST ELECT. | 3 | | | AC ELECT. | 3 | AC / ST ELECT. | 3 | | |
| | | AC ELECT. | 3 | | | | | AC ELECT. | 3 | | |
| | 3 | | | 6 | | | 3 | | | 6 | 27 |
| | | | | | | | | | | | 6 |
| | 3 | | | 6 | | | 3 | | | 6 | 35 |
| | | ART/ DES HIST. | 3 | | | | | | | | 12 |
| | 0 | | | 6 | | | 3 | | | 3 | 26 |
| | 16 | | | 15 | | | 16 | | | 12 | 122 |

*Figure 3. Curriculum Map Year 3&4 (Schneider, 2022)*

The open structure of the spring semester in the third year is a unique attempt to encourage students to study abroad or seek an internship to further refine soft and hard skills. More complex topics such as "Sustainable Product Systems II", which stimulate systems thinking are covered. The fourth year opens up the opportunity for industry collaborations and the exploration of the intersection of physical and digital user experiences. An individual capstone project and "Philosophy and Ethics" round out the undergraduate core education.

## 5. CONCLUSION

The curriculum redesign took two years. Within these two years aspects of design have shifted once again, for example the rapid evolution of artificial intelligence supported design. However, the faculty is confident that the details of the new curriculum outlined in this document retain the uniqueness of the current curriculum while addressing current design education needs. Curricula are designed to be a framework with adaptive components and require continuous fine-tuning. In the end, the most important criteria whether the redesign was successful will be the feedback on which design education experiences are most relevant, useful, and essential for future graduates in order to succeed in the field.

## 6. REFERENCES

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