Information Literacy Portfolio for Curriculum Mapping

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Abstract

A portfolio of information literacy (IL) assignments was created for undergraduate engineering students. The portfolio, which includes 29 assignments shaped by the ACRL Framework for Information Literacy for Higher Education, was designed in conjunction with the creation of a curriculum map covering all of the College of Engineering's undergraduate programs. The goal of this ongoing project is to provide opportunities for students to engage in short, thoughtful experiences with IL at strategic points throughout their time as undergraduates. To accomplish this, the following steps were taken: (1) Syllabi from 300 courses were analyzed to determine potential for compatibility with IL instruction, (2) sequences of required courses for each of the 10 undergraduate engineering programs were visualized to facilitate scaffolding of IL instruction, (3) a list of discrete IL concepts and skills were derived from the ACRL Framework, (4) assignments were designed to introduce students to each of those concepts and help them develop each of those skills, (5) assignments were matched to high potential courses identified during the curriculum mapping process. The next step is to collaborate with engineering faculty to refine the portfolio and work toward the adoption of these assignments as part of a holistic program. The assignments and supplementary materials are available online for other librarians to use and adapt.

Introduction

The University of North Carolina at Charlotte (UNCC) is a 4-year public R2 doctoral university that serves 23,400 undergraduate students. Of those students, 3,100 are pursuing bachelor of science degrees in civil engineering, computer engineering, electrical engineering, mechanical engineering, systems engineering, engineering technology, and construction management from the William States Lee College of Engineering (COE).

In all of COE's undergraduate programs, formal library instruction is generally limited to an optional workshop that first-year students may attend for extra credit. Approximately 78% of eligible students participate in this workshop during which they receive a basic introduction to library resources in the context of an assignment focused on career planning. In addition to this annual workshop, interested professors may contact the engineering librarian directly to request library instruction sessions. These individual requests from professors, which generate a few sessions each semester, are usually spurred by concerns regarding the sufficiency of students' research skills or disappointment in the quality of citations in student work.

Undergraduate engineering students may also participate in library instruction sessions in elective courses offered outside of COE. However, these sessions often address information literacy (IL) concepts through a discipline-specific lens and students may struggle to translate the skills and knowledge gained from these sessions to an engineering context.

The lack of authenticity, scaffolding, and consistency that characterize the few structured encounters undergraduate engineering students have with the library and IL instruction is far from ideal. A newly created summer fellowship program for library and information science

students offered an opportunity for the engineering librarian to explore a potential solution to this problem by developing a portfolio of IL assignments to be deployed in accordance with insights gained from creating a detailed curriculum map.

Literature review

The literature exploring faculty perceptions of IL and factors affecting collaborations between faculty and librarians is quite abundant.[1] Much of this research examines these matters in multidisciplinary or discipline-agnostic contexts rather than in the specific context of undergraduate engineering programs. However, several of these broader studies do offer a view of how these issues play out in engineering programs. McGuinness conducted semi-structured interviews with faculty from sociology and civil engineering departments to gain a better understanding of impediments to collaboration between faculty and librarians.[2] The results of these interviews suggest that many faculty from both disciplines believe students develop IL skills regardless of the absence of formal IL structures and that a strong determinant of students' IL competency is individual motivation.[3] These perceptions understandably serve to undermine faculty motivation to collaborate with librarians.

Among other factors influencing collaboration between faculty and librarians, the desire to support students' academic and professional success as well as a belief in the usefulness of modelling effective teamwork both serve as driving motivations. Meanwhile, "organizational culture, professional practice, and interpersonal characteristics" stand out as major barriers standing in the way of such collaborations.[4] One tool that can be used to overcome, or at least mitigate, some of these impediments is curriculum mapping. In the context of academic libraries, curriculum mapping is an exercise to understand learning outcomes in a course of study and identify where to strategically position IL concepts.[5] As Brasley explains in an article on various models of librarian-faculty collaboration, curriculum mapping "is a particularly beneficial approach for information literacy development, as both classroom faculty and librarians then possess mutual understanding of its placement and timing within the department's curriculum."[6]

The process of curriculum mapping involves "systematically analyzing the content or focus of the courses in a curriculum" which may include reviewing syllabi, course assignments, academic plans of study, departmental strategic plans, among others.[7] In this way, curriculum mapping has much in common with syllabi review as a method for understanding students' educational trajectories. Despite the different terminology, the motivations for undertaking a course syllabi review project and the methods such a project calls for are quite similar to motivations and methods involved in curriculum mapping.[8] However, a notable distinction between the two types of projects is their endpoints. Curriculum mapping uses conclusions drawn from analyzing syllabi to generate a visual tool that can facilitate effective scaffolding of educational activities.

COE curriculum mapping

In order to identify strategic points in the COE curricula to target for increased IL instruction, syllabi for all 300 undergraduate courses were analyzed. The syllabi are written in accordance with a template that requires instructors to complete several standard sections. The primary sections considered in the syllabi review were course goals, course outcomes, and grading

information. Sections on design content and computer usage also offered some occasional insight into the potential for successful integration of IL instruction. Based on the content of these sections, each syllabus was assigned a rating of "yes", "maybe", or "no" to indicate the likelihood that students in the course would be expected to engage in critical thinking while using information from sources beyond standard course materials. Additionally, courses required for any of the undergraduate engineering programs were noted as such.

Of the 300 syllabi reviewed, 14 were determined to definitely contain opportunities for IL instruction and 60 were determined to potentially contain opportunities for IL instruction. Figure 1 shows the distribution of high, medium, and low/no potential syllabi by department. Many of the 207 courses marked as having no potential for IL instruction are primarily focused on teaching technical content and skills through assignments that do not require the use of information beyond standard course materials.

The remaining 19 syllabi did not provide enough information to determine potential for IL instruction. Further inquiry via outreach to COE faculty and program coordinators will be needed to gain a clearer understanding of these courses and to verify the conclusions drawn about courses with more robust syllabi. These outreach efforts will also include discussions with instructors responsible for interpreting and teaching from syllabi they did not design. These conversations hopefully will shed light on how courses may diverge from written syllabi in practice. See Appendix 3 for a more detailed view of the syllabi analysis.

Department	Syllabi Reviewed	Likelihood of Compatibility with IL Instruction			
		High	Medium	Low/No	Insufficient information
College of Engineering	9	2 (22.2%)	6 (66.7%)	1 (11.1%)	0
Civil and Environmental Engineering	56	4 (7.1%)	13 (23.2%)	35 (62.5%)	4 (7.1%)
Electrical and Computer Engineering	50	1 (2%)	5 (10%)	44 (88%)	0
Engineering Technology and Construction Management	129	7 (5.5%)	31 (24%)	88 (68.2%)	3 (2.3%)
Mechanical Engineering and Engineering Science	49	0	2 (4.1%)	35 (71.4%)	12 (24.5%)
Systems Engineering and Engineering Management	7	0	3 (42.9%)	4 (57.1%)	0
TOTAL	300	14 (4.7%)	60 (20%)	207 (69%)	19 (6.3%)

Figure 1. Distribution of course syllabi with high, medium, or low/no potential for compatibility with IL instruction across departments.

The information gathered through the syllabi review was used in conjunction with Academic Plan of Study documents for all COE undergraduate programs to generate a map of required courses with potential for IL instruction. The map illustrates the required course sequences for each of the degree programs and concentration tracks open to undergraduate students. Of the 34 distinct courses that appear on the map, 6 were determined to have a high likelihood of compatibility with IL instruction, and 23 were determined to have a medium likelihood of compatibility with IL instruction. After IL assignments were designed, the map was annotated to indicate which assignments would likely fit well with each of those courses. This visualization of students' academic paths illustrates the intended pacing, repetition, and scaffolding of IL instruction across COE curricula. See Appendix 4 for the annotated map.

Concept and skill identification and classification

A list of discrete concepts and skills for IL was produced based on the ACRL Framework for Information Literacy for Higher Education (ACRL Framework). Each of the six frames (Authority Is Constructed and Contextual, Information Creation as a Process, Information Has Value, Research as Inquiry, Scholarship as Conversation, and Searching as Strategic Exploration) was used to generate six to eight related concepts or skills.

The decision to define specific concepts and skills rather than working directly with the ACRL Framework's knowledge practices and dispositions was influenced by two key considerations. First, many of the knowledge practices and dispositions are too complex to be distilled into a single assignment. Second, much of the language in the ACRL Framework would likely be perceived as library jargon by the engineering faculty who will be deciding whether or not to use the assignments.

In order to devise a means for organizing the assignments that would be perceived as logical by someone entirely unfamiliar with the ACRL Framework, the concepts and skills were arranged in an order mirroring a generic research process defined by the following steps:

1. Understanding information need
2. Selecting a topic
3. Strategic searching
4. Evaluating and selecting sources
5. Evaluating and analyzing sources
6. Synthesizing and organizing information
7. Crediting and contributing

In order to facilitate a scaffolded approach, the concepts and skills were also rated based on complexity. This rating was used to indicate the need for repetition. Higher complexity ratings translate to more frequent repetition intended to provide students with more opportunities to engage with and eventually master complex ideas. Repetition called for the creation of multiple assignments for each of the more complex concepts and skills as well as assignments with built-in variations. See Appendix 1 for the full list of concepts and skills with connections to generic research process steps and complexity ratings.

Assignment design and operationalization

Following the identification and classification of IL concepts and skills described in the previous section, relevant assignments were designed. Each assignment was intended to address one of the identified concepts or skills. Additionally, as discussed in the previous section, some concepts and skills require multiple assignments or assignments with elements that could be easily replaced to create variation.

A template was used to ensure that the information about each assignment was sufficiently structured. In addition to providing consistency across the portfolio, the use of a standardized template also generated controlled descriptions of every assignment. These controlled descriptions facilitated the creation of a spreadsheet enabling users to easily filter or search for assignments by any of the template fields. The template included the following pieces of information:

- Learning outcome (the concept or skill generated from the ACRL Framework)
- Activity description (summary of what students will be asked to do and the ideas they will be expected to engage with)
- Content (directions and contextual information for the assignment)
- Method (information about how students will complete the assignment (e.g., how external readings will be accessed, how work will be submitted, etc.)
- Related tutorial (additional instructional content students will need to view to complete the assignment)
- Expected amount of time required
    - for a student to complete the assignment
    - for the librarian to provide feedback on a student's work
- Feedback rubric (defined expectations with criteria specifically tailored to the assignment for three levels of accomplishment: beginning, developing, exemplary)[9]

See Appendix 2 for an example of an assignment designed using the template.

The assignments and supplementary materials are available online (under a Creative Commons Attribution-NonCommercial-ShareAlike license) for other librarians to use and adapt. They can be accessed here: https://sites.google.com/a/uncc.edu/undergrad-engineering-il/.

The assignments were operationalized using Canvas, the university's learning management system (LMS). The decision to use Canvas rather than an external platform was informed by several benefits it provides. First, students will receive direct and private feedback, and faculty will be able to quickly determine whether students have completed assignments. Second, students' progress through the IL assignments can be tracked across their entire academic career. This allows students to demonstrate to professors that they have completed particular assignments in previous courses, and it will facilitate the design of longitudinal studies of student cohorts in collaboration with UNCC's Office of Institutional Research. Finally, because students regularly use Canvas for coursework, they are already familiar with the platform, so they can focus on the content of the assignments rather than learning a new interface.

Promoting the portfolio

While concerns about including too much library jargon were addressed to some degree by distilling the ACRL Framework into discrete concepts and skills and by organizing assignments around a generic research process, the decision was made to further mitigate this issue by grouping the assignments into thematic categories for the purpose of explaining and promoting the portfolio to engineering faculty. These assignment categories are:

- Search skills, topic selection
- Critical evaluation of information (formats, authority)
- Organize information
- Citations, Intellectual Property
- Students as creators of information
- Scholarly conversation (+ publishing)

These categories are intended to help students and faculty, as well as librarians, to better understand the scope of the portfolio and see how the assignments fit together in service of the overarching goals of the program. A handout will be created to provide engineering faculty with an at-a-glance overview of the categories and assignments to help them choose appropriate assignments for their students. See Appendix 5 for the list of assignments grouped by thematic category.

Future steps

This project is an ongoing process with several major steps that are either currently underway or will be soon. As discussed in the previous section, promoting the portfolio to engineering faculty is of the utmost importance. Without faculty endorsement, students will be unlikely to complete any of the IL assignments. Outreach to the key faculty members and program administrators in COE will be used to refine the portfolio. The assignments were intentionally designed to be flexible and easily modified so that this feedback can be incorporated. As the portfolio is revised, improved, and supplemented, the groundwork will also be laid for encouraging the adoption of these assignments as part of a holistic program.

Conversations with COE faculty and administrators will focus on the potential benefits to student success as seen in the quality of individual student work as well as more objective measures like retention and graduation rates. Another point that will be highlighted is the minimal burden placed on the instructors. Finally, it will be important to emphasize that the assignments in the portfolio will be most effective if students are exposed to them regularly throughout their academic careers.

Another future step that will be critical to the success of this project is assessment. Several methods for short-term and long-term assessment are currently being considered. These include tracking a cohort of students over their time at the university, qualitative interviews with individual students or focus groups with several students, and coding student submissions. Assessment will be carried out and reported on over the next few years.

References

[1] Franklin, K. Y. (2013). *Faculty/Librarian Interprofessional Collaboration and Information Literacy in Higher Education*. PhD diss., Claremont Graduate University.

[2] McGuinness, C. (2006). "What Faculty Think–Exploring the Barriers to Information Literacy Development in Undergraduate Education." *The Journal of Academic Librarianship* 32, no. 6: 573-82.

[3] McGuinness, 576-7.

[4] Franklin, 4.

[5] Buchanan, H., Webb, K. K., Harris Houk, A., and Tingelstad, C. (2015). "Curriculum Mapping in Academic Libraries." *New Review of Academic Librarianship* 21, no. 1: 94–111. doi: 10.1080/13614533.2014.1001413.

[6] Brasley, S. S. (2008). "Effective Librarian and Discipline Faculty Collaboration Models for Integrating Information Literacy into the Fabric of an Academic Institution." *New Directions for Teaching and Learning*, no. 114: 71-88. doi: 10.1002/tl.318.

[7] Bullard, K., and Holden, D. (2006). "Hitting a Moving Target: Curriculum Mapping, Information Literacy and Academe." Paper presented at the LOEX Conference Meeting, University of Maryland, College Park, May 2006. http://commons.emich.edu/loexconf2006/29.

[8] Dinkelman, A. L. (2010). "Using Course Syllabi to Assess Research Expectations of Biology Majors: Implications for Further Development of Information Literacy Skills in the Curriculum." *Issues in Science and Technology Librarianship*, 60. doi: 10.5062/F49Z92TJ.

[9] Oakleaf, M. (2009). "Using Rubrics to Assess Information Literacy: An Examination of Methodology and Interrater Reliability." *Journal of the American Society for Information Science & Technology*, *60*(5): 969-83. doi: 10.1002/asi.21030

APPENDIX 1: IL Concepts and skills derived from the ACRL Framework

Concepts and Skills	Generic Research Process Step	Complexity Rating
Frame: Authority is Constructed and Contextual		
Ideas evolve, are shared through social connections, and sources will develop over time into varied products	0	1
Authoritative content isn't always formal, and doesn't always use the same type of sources	3	2
Define types of authority	4	1
Standard or classic authoritative texts as example, but people who still challenge these	4	1
Use tools to filter authority, recognize limitations of these tools to confirm credibility	4	2
You create intellectual property, which comes with responsibilities	7	1
Frame: Information Creation as a Process		
Define traditional and emerging processes and dissemination in this discipline	0	2
Define own process with an understanding of how choices impact audience and message	1	2
Match process with need	1	3
Define different information creation processes Acknowledge the capabilities and constraints of said processes	4	1
Information package types influence reader perceptions (especially in context)	4	2
Define implications of static or dynamic formats	4	2
Transfer knowledge of capabilities and constraints to new types of information (in context)	7	2
Frame: Information has Value		
Understand how and why people can be underrepresented within these systems of publication	0	1
Understands that Google tracks their info and personalized their search content (not just Google)	3	1
Understand that IP is a social construct that varies by culture (including academia)	7	1
Define characteristics and purposes of copyright, fair use, open access, and public domain	7	1

Give credit to original ideas through appropriate attribution and citation	7	2
Decide where and how their information is published	7	2
Make informed choices about publishing online knowing what companies can do with it	7	2
Frame: Research as Inquiry		
Identify research questions (topic) by acknowledging gaps and conflicting information	1	3
Identify appropriate scope for the topic	2	2
Break down questions into simplest form	2	3
Decide research method based on need	3	2
Evaluate information gathered, determine completeness	5	2
Synthesize a combination of sources coherently	6	1
Organize info in meaningful way	6	2
Frame: Scholarship as Conversation		
Identify barriers to enter scholarly conversation at various levels	0	1
Understand scholarly works may not represent majority perspective in the field	0	2
Identify foundational and authoritative sources for disciplinary knowledge	1	1
Critically evaluate other contributions in participatory environment	5	1
Identify changes in scholarly perspective over time on a topic	5	1
Contribute to scholarship at appropriate level	7	1
Cite works of others in your own info product	7	2
Frame: Searching as Strategic Exploration		
Understand how information is organized	0	3
Determine scope of project	1	2
Manage search processes and results (search diary)	3	1
Identify potential producers of information on the topic	3	2
Use divergent (broad) and convergent (narrow) approaches in searching	3	2
Use variety of language types and when to use appropriately	3	2
Choose appropriate search tool based on need	3	3
Design and re-evaluate search strategies based on results	3	3

APPENDIX 2: Example of an assignment designed using the template

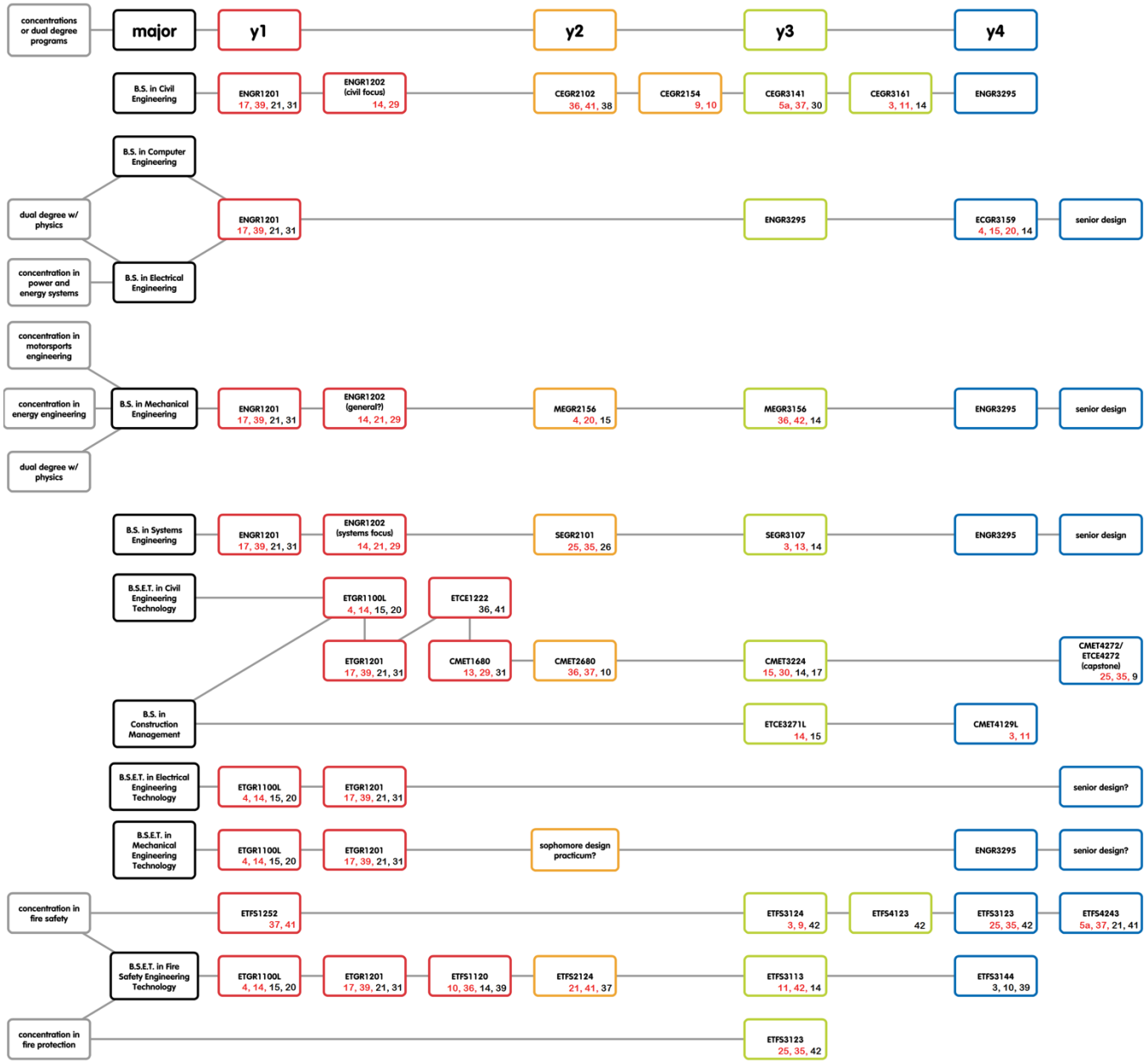
Assignment #	10			
Learning outcome	Information package types influence reader perceptions (especially in context)			
Activity description	Without knowledge of any publication details, students will compare two articles on related topics, created by the same author, published in different formats, and directed at different audiences. After writing a brief reflection on the similarities and differences between the two articles, they will be provided with publication details and asked to reflect on how information format affected their perceptions.			
Expectation	***Time to complete:***	25-30 minutes	***Time to grade:***	3-5 minutes
Content	Read and compare the following two articles on bridge design (article 1, article 2). Briefly describe the differences and similarities between the two articles as well as any points on which you think the authors are in disagreement. ****students submit brief compare/contrast responses**** David P. Billington is a structural engineering professor at Princeton. He co-authored article 1 which was published in 2007 in the *International Journal of Space Structures*. Billington also wrote article 2, an op-ed that appeared in the *New York Times* on August 18, 2007. With that information in mind, write 1-2 paragraphs reflecting on your reaction to learning that these articles were written by the same author. While reflecting, consider how the format of each of the articles affected your perceptions as a reader and why the author's tone or language may have varied from one article to the other.			
Method	Submission - two open-ended responses (submitting the first response will trigger the prompt for the second response)			
Related tutorial	N/A			
Evaluation rubric	***Beginning***	Student describes differences between articles and expresses preference for one regardless of context.		
	Developing	Student describes differences between articles and notes potential disagreements between authors.		
	Exemplary	Student describes differences between articles, notes potential disagreements between authors, and reflects on value of these articles in different contexts.		
Other notes	This assignment can be occasionally refreshed with pairs of articles from other authors			

Course Number	Course Name	Required Course?	Likelihood of IL Instruction Compatibility (1, 2, 3 - No, Maybe, Yes)	Explanation of Likelihood (for maybes and yeses)
COLLEGE OF ENGINEERING				
ENGR1201	Introduction to Engineering Practices and Principles I	yes	2	Goals - cultural awareness component may work well with social justice oriented IL outcomes
ENGR1202	Introduction to Engineering Practices and Principles II	yes	3	Goals - "Use library resources effectively for conducting research"
ENGR1202	Introduction to (Civil) Engineering II	yes	2	Goals - "be able to explain what Civil Engineers do, be able to explain the sub-disciplines within Civil Engineering, be able to design, build, and test a balsa wood bridge, and be able to prepare and present oral and written presentations on a balsa wood bridge project"
ENGR1202	Introduction to (Systems) Engineering II	yes	3	Goals/Course Outcomes - "Research skills using library resources" and "A good understanding of the importance of ethics and avoiding plagiarism"; Grading - term project will likely require a fair amount of research
ENGR1202	Introduction to (Electrical and Computer) Engineering II	yes	1	
ENGR3295	Multidisciplinary Professional Development	yes	2	Course Outcomes - "To identify and articulate global, societal and contemporary issues facing the engineering profession"
ENGR600	Engineering Freshman Learning Community Seminar		2	Course Outcomes - "Demonstrate an understanding of the academic support resources available to engineering students" (opportunity to introduce students to the library)
ETGR1201	Introduction to Engineering Technology	yes	2	Goals - cultural awareness component may work well with social justice oriented IL outcomes
UCOL1300	COE Academic Success Seminar		2	Goals - "Have a thorough understanding of the resources available to students at UNC Charlotte and how to access them" (opportunity to introduce students to the library)
CIVIL AND ENVIRONMENTAL ENGINEERING				
CEGR2101	Civil Engineering Drawing	yes	1	
CEGR2102	Engineering Economic Analysis	yes	2	Grading - depending on how much research is required for the course project
CEGR2104	Surveying and Site Design	yes	1	Goals - "collect, analyze, and utilize surveying data" (maybe IL related if they have to use pre-existing datasets, but the syllabus suggests that there's a fieldwork component, so probably not)
CEGR2154	Design Project Lab	yes	2	depends on the degree of research required for the various projects
CEGR3090	Construction Management		3	Design Content - "Students are required to prepare a report on the impact of federal labor laws, codes, and specifications on construction management"
CEGR3122	Structural Analysis	yes	1	
CEGR3141	Introduction to Environmental Engineering	yes	2	Grading - "Optional extra credit: Literature reviews, special projects"
CEGR3143	Hydraulics and Hydrology	yes	1	
CEGR3153	Transportation Laboratory	yes	1	
CEGR3155	Environmental Laboratory	yes	1	
CEGR3161	Transportation Engineering I	yes	2	Goals - "Students should... be able to present analysis of transportation problems from a societal and economic perspective" (maybe IL related depending on how much research is actually expected)
CEGR3201	Civil Engineering Systems and Design I	yes	1	
CEGR3202	Systems and Design II	yes	2	depends on how much research the semester-long project requires
CEGR3212	Computer Applications in Civil Engineering		?	syllabus only contains pre-reqs and university policies
CEGR3221	Structural Steel Design I	*	1	
CEGR3225	Reinforced Concrete Design I	*	1	
CEGR3232	Urban Engineering		3	Goals - "students should obtain credible knowledge of the global impacts of development in urban areas" (this course may also work well with social justice oriented IL assignments)
CEGR325[illegible]	Structu[illegible]aterials[illegible]oratory[illegible]	ye[illegible]	1	

For the full syllabi review, see https://sites.google.com/a/uncc.edu/undergrad-engineering-il/.

APPENDIX 4: Annotated curriculum map of undergraduate COE programs

The numbers listed in the below and to the right of course numbers indicate IL assignments that are likely matches for the course content.



APPENDIX 5: Assignments grouped by thematic category for promoting to COE faculty and program administrators

Topic/Category	Assignment #	Assignment Summary
Search skills, topic selection	6	Peer-review filter
	21	Develop research question based on free-write
	32	Update literature review
	35	Revise research topics
	36	Identify information producers for a given topic
	39	Develop and revise search terms
	41	Develop search queries, choose database or search engine
	42	Search diary
Critical evaluation of information (formats, authority)	1	Characteristics of scholarly authorities
	3	Formal and informal sources
	8	Comparison of pop science and original research articles
	9	Read and reflect on intersection of scholarship and social media
	10	Comparison of scholarly and popular formats
	11	Comparison of static and dynamic formats
	31	Evaluate contributions in participatory environment (Wikipedia)
Organize information	25	Evaluate completeness of information gathered
	26	Graphical representation of information gathered
	37	Convergent thinking (select sources), divergent thinking (concept map or outline showing connections between selected sources)
Citations, IP	14	How and when to cite sources
	15/16	IP and related concepts (fill-in-the-blank, multiple choice, reflection)
Students as creators of information	4	Share work with Creative Commons license
	13	Diagram and reflect on own information creation processes
	20	Read and reflect on privacy policies/ToS for online publishing
Scholarly conversation (+publishing)	5a	Citation map
	17	Read and reflect on underrepresentation in publishing
	29	Consider own place in the discipline's scholarly conversation
	30	Read and reflect on barriers to entering scholarly conversation
	33	Timeline of shifts in scholarly perspectives