



Center for Serve-Learn-Sustain

Annual Report 2016-2017

Table of Contents

<i>Overview, Highlights, Trends, Accomplishments</i>	<i>1</i>
Strengthening Structures & Approach	1
Strengthening Course and Program Offerings	3
Engaging Faculty	5
Strengthening and Developing New Partnerships	6
<i>Staff Highlights</i>	<i>7</i>
<i>Appendix</i>	<i>8</i>



Overview, Highlights, Trends, Accomplishments

AY 2016-17 was the Center for Serve-Learn-Sustain's second year in operation. With our basic program in place, we were able to make great strides in strengthening oversight structure and approach; improving our course and program offerings; engaging faculty; spreading awareness; and strengthening and developing new partnerships. Through partnerships with faculty, colleges, and schools across campus, we offered over 100 SLS and SLS-affiliated courses, preparing over 5,000 students in all six colleges to use the knowledge and skills they learn in Tech classrooms to "create sustainable communities." Through our co-curricular activities, including our popular year-long Environmental Justice Series, as well as other events and workshops offered by SLS and our partners, we additionally engaged over 500 students, as well as over 150 faculty, 60 staff, and 40 partners, in thinking in new ways about what it means to create sustainable communities – and trying out ideas in practice through real-world projects.

Other key accomplishments include: establishing a Strategic Advisory Council and articulating our Vision, Mission, and approach to sustainable communities education; supporting faculty in connecting their teaching and research to sustainable communities content and real-world projects and partnerships; leading the Equity Petal Work Group for the Georgia Tech Living Building; spearheading broad regional collaborations of diverse stakeholders around sustainable communities challenges, particularly as they relate to science and technology; and launching our assessment program, led by a new Academic Assessment Manager.



Fig. 1: Handbill for online tour created by students in English 1102

Even though we are still in our infancy, we are starting to see some significant outcomes in terms of student impact, related both to learning outcomes and career aspirations – and to make impact in communities, especially in the Atlanta region. Please read on to learn more about the accomplishments mentioned here – and a few more exciting ones that we wanted to make sure to share!

Strengthening Structures & Approach

Establishing SLS Strategic Advisory Council

In keeping with SLS' approach of convening partners to create and implement a collaborative direction, we established a new SLS Strategic Advisory Council comprising 24 faculty and staff from across the Institute (see Appendix). The Council is charged with providing guidance to SLS leadership related to strategy, development of curricular and co-curricular pathways, and fundraising. The Council meets twice a year, and SLS consults with members individually in between meetings, for general advice and to establish joint initiatives with members' schools or units. Two such initiatives include:

- *New partnerships with two Interdisciplinary Research Institutes* – the Strategic Energy Institute and The Institute for People and Technology – connecting research and teaching. With SEI, we plan to issue a joint funding call in Fall Semester 2017, for research and teaching related to sustainable energy, with a special focus on energy equity. With IPaT, we co-hosted a conference in June on data

and sustainable communities and have started plans to launch a joint Data for Sustainable Communities Action Group to facilitate research, teaching, and action around this topic.

- *Leading the Equity Petal Work Group for the Georgia Tech Living Building* - SLS has taken the lead on developing and advancing an equity approach to this major project, working closely with Administration and Finance and Capital Planning and Space Management. In Fall 2016, SLS Director Dr. Jennifer Hirsch assembled the Work Group, which comprises staff and faculty whose work relates to social equity and diversity. The group has facilitated a number of roundtable discussions and created recommendations for approaching equity in a deep manner, well beyond requirements issued by the International Living Futures Institute (ILFI), which runs the Living Building Challenge. Both ILFI and The Kendeda Fund, which provided the funding for the building, have told us that our equity work has the potential to set direction and raise the bar for the Living Building Challenge’s equity petal moving forward.

Articulating Vision, Mission, and Approach

Since we opened our doors in Fall 2015, we have been working with faculty and staff from all six colleges and units across campus to co-create our approach to sustainable communities education. Last year, together we developed our Big Ideas interactive tool, highlighting 50+ “Big Ideas” about sustainable communities that we teach at Tech—and they are now part of the course search function on our new website, which means that students can search for courses that teach the Big Ideas they are interested in learning.

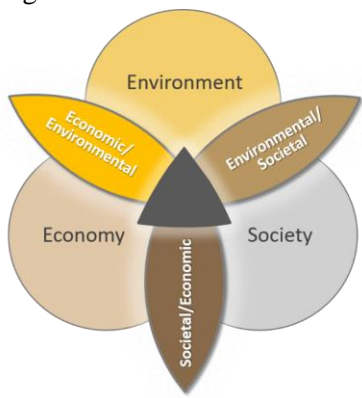


Fig. 2: What is sustainability?

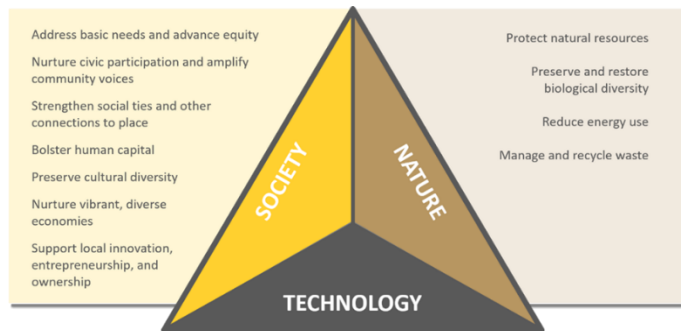


Fig. 3: How can technology support society and nature?

Building on that project, this year we finalized our Vision and Mission, emphasizing both our educational goal of training students to use their disciplinary expertise to engage in sustainable communities work as well as our broader goal of turning Georgia Tech into an internationally known expert on the role that technological institutes can play in advancing community sustainability. We also worked with a subset of faculty to articulate SLS’ approach to sustainable communities education, including how we define sustainability, how we define community engagement, and what we focus on as a center. We emphasize the following three points: (1) We approach sustainability as an integrated system, encompassing and linking society, economy, and environment (Fig. 2); (2) We focus especially on the society component, including social equity and community voice – to complement sustainability work being done in units across campus that focuses on economy, energy, and environment; (3) Because we are at a technological institute, we especially focus on the ways in which technology can support community-driven visions for change that benefit society and nature (Fig. 3). These newly articulated ideas and materials help us better support faculty in connecting their teaching and research to real-world projects and partnerships working to create sustainable communities.

Strengthening Course and Program Offerings

Expanding and Improving SLS Courses

This year, we focused heavily on putting in place a variety of course offerings for students, to ensure that eventually, students in every school will have opportunities to take courses related to SLS within their discipline. This year, we offered over 100 SLS and SLS-affiliated courses, including courses in every college and 29 out of 34 schools and, for the first time, summer courses, including study abroad. Our primary mechanisms for achieving this goal include: 1) our funding calls for projects related to student learning, 2) our college and school strategies program, through which colleges and schools receive SLS funds to support key courses and initiatives that advance their strategic goals and SLS' goals at the same time, and 3) our SLS Affiliation program, through which faculty request affiliation for a course and then work with SLS to incorporate additional sustainable communities-related content and/or SLS co-curricular programming and to assess SLS student learning outcomes. SLS supports affiliated courses and other projects related to student learning by marketing them to students, providing assistance with content, partnership, and project development, and providing funding. In AY2016-17, we gave out \$341,600 for course development and implementation, as well as other projects related to student learning.

SLS also offers Foundation courses – courses that provide students with a strong interdisciplinary foundation for addressing sustainable communities challenges. In 2015-16, we piloted two such courses – Sustainable Communities and Systems, and

Technology and Sustainable Community Development. In 2016-17, we received approval from the Institute Curriculum Committee for an SLS course code and also for these foundation courses themselves. Additionally, we developed criteria for making an existing course an SLS Foundation course, and expanded the designation to include two additional courses: Sustainability, Technology, and Society (Public Policy – to be taught again in Fall 2017 [see Fig. 4]) and Sustainable Urban Development (City and Regional Planning).

SLS Course Named One of the 6 "Interesting Classes Students Are Taking this Fall"



Sustainability, Technology, and Policy (PUBP 3600), taught by Emanuele Massetti, assistant professor, School of Public Policy, will provide a solid introduction to the concept of sustainable growth and development.

Fig. 4: SLS Foundation Course write up in OUE newsletter

Socio-technical Aspects of the course with human-centered problem definition

TEAM PROJECT: Low-cost dehumidifiers as a potential solution for reducing public health risks associated with mold and mildew in the **Proctor Creek watershed**. The water vapor removed from air in homes could potentially be reused for gardening; and dehumidifiers that utilize solar energy may not have a huge impact on energy bills. Alternative low-cost multi-purpose dehumidification approaches and designs are also encouraged.

Technical : Design Ideation, sketching, CAD, large scale assembly and collaborative design and team work.



Multi-home Dehumidifier



Low-cost Dehumidifier



Desiccant Dehumidifier



Dehumidifier with home garden



Osmotic Dehumidifier



Solar Dehumidifier

Social: Sustainable cities and communities

SLS framework in classroom

Engineering Education

- Traditionally engineering is viewed as a technical problem solving discipline.
- Engineer is identified as problem solver – not problem definer.
- For many students design means “design for Industry”
- University training in problem solving is primarily done using decontextualized text-book problems.
- One-size-fits-all approach

SLS-based Engineering Education

- Socio-technical problem solving (Enhance human capabilities, opportunities and resources. Decrease risks and harms)
- Engineers need to understand structural conditions (who suffers / who benefits).
- Listening to community – “design-for-community”
- Define design problems with context (Human-centered problem rewriting).
- Technology to transform society

Fig. 5: Raghu Pucha made an “SLS framework” based on SLS/ASEE workshops and redesigned ME1770, Intro to Engineering Graphics & Visualization, to focus on a real-world project

Our next step in terms of SLS curriculum is to develop pathways for students to engage in SLS-related learning and experiences throughout their time at Georgia Tech. Our plan for this is twofold: 1) to develop criteria for and pursue affiliation with SLS-related minors, such as Global Development, Sustainable Cities, Energy, Climate Change, and Social Justice, many of which we are already working with; and 2) to develop thematic “pathways” within SLS. In Spring 2017, we started developing one pathway – Innovating for Sustainable Communities – with a group of faculty fellows. In AY 2017-18, we plan to finalize and market this pathway, as well as another one called Civic Leadership, and then to launch both in Fall 2018. The proposed structure links courses and co-curricular activities, resulting in a complementary transcript – and will proceed as a pilot project of Georgia Tech’s Commission on Creating of Next in Education.

Assessing Student Learning Outcomes

Assessment activities formally began in Spring 2016 with the hiring of SLS’s Academic Assessment Manager, Dr. Carol Thurman. One of the first assessment tasks to get underway was the revision of the Student Learning Outcomes (SLOs). This was accomplished with the assistance of the SLS Assessment Working Group, comprising 11 staff and faculty from various colleges and units across campus (see Appendix). Two trainings for faculty also took place, focused on two key assessment tools: concept mapping and rubrics. Since one of the QEP goals is to increase students’ sustainability knowledge, it was important that our training efforts focused on equipping instructors with tools that can directly measure this goal. In addition to the trainings, we began work on a toolkit for instructors with useful instructional and assessment tools to support them in their practice. Furthermore, data collection efforts have begun in earnest with pre- and post-semester student surveys, student and instructor focus groups, rubric scoring of student artifacts, and instructor interviews. Although the primary focus of the assessment efforts to date has been on courses, SLS’ approach to student development connects in- and out-of-classroom learning; and our plans for AY 2017-18 and beyond include assessing the SLOs in terms of both curricular and co-curricular impact. More broadly, we are also making important connections with fellow researchers in the fields of sustainable education and service-learning/community engagement. Our cutting edge research will focus on developing a national assessment model that integrates sustainability and service-learning/community engagement. One tool that we plan to adopt is an innovative, narrative-based research methodology known as Sensemaker®, which enables the capture and analysis of a large quantity of stories in order to understand complex change; the output of SenseMaker® is statistical data backed up by explanatory narrative. We plan to offer a SenseMaker® training for faculty and staff in Fall 2017.

Co-curricular Programs

In addition to focusing on course expansion, we also put in place a wide variety of co-curricular offerings designed to complement course/curricular learning. We offered a year-long series of events around the theme of Environmental Justice, which was conceived as a series to compliment faculty teaching expertise (primarily technical) and provide a gateway for students into SLS. The series was successful in expanding student learning beyond, yet connected to, the classroom, with many events planned in coordination with courses or in response to course feedback. Events also featured 11 faculty sharing their research and teaching across disciplinary lines, as well as partners both on and off campus. In support of student engagement outside the classroom, SLS also launched a partnership program with 20 student organizations. Through this program, SLS supported student-sponsored events related to the theme of sustainable communities and assisted students in linking their projects with curricular offerings, as well as with making connections to external partners. Representatives from the student organizations served on the inaugural SLS Student Advisory Board, meeting to discuss future SLS initiatives and programming.

For the second year in a row, SLS also hosted a satellite conference in June as part of the NSF-funded Integrated Network for Social Sustainability (INSS). The theme of this year’s conference was “Smart,

Connected Communities,” and SLS partnered with Georgia Tech’s Institute for People and Technology (IPaT) and Civic Data Science program to host over 120 faculty, staff, students, and partners. The goal of this year’s conference was to discuss plans for working on Georgia Tech and Atlanta-based initiatives focused on data for sustainable communities that support collaboration among faculty, students, and partners to enhance and expand teaching, research, and action. In addition to student participation in INSS, SLS also sponsored students to attend a variety of sustainable communities-related local conferences and symposiums.

For the upcoming year, co-curricular programming will continue to remain an integral part of SLS offerings. Our event series will focus on the UN Sustainable Development Goals, in response to suggestions from members of our Student Advisory Board, and we will continue our focus on providing support for students to participate in a wide range of local activities that constitute experiential learning.

Engaging Faculty

To achieve our vision and mission, SLS is committed to supporting faculty in integrating sustainable communities and work with diverse partners into their courses and research. This past year, 156 faculty participated in three types of programs: 1) Fellows programs, 2) a Neighborhood Immersion Course Design Workshop, and 3) NSF Broader Impacts workshops.

SLS Fellows Programs: FEWS and Smart Cities

SLS Fellows programs this year focused on two themes aligned with NSF: Food, Energy, Water Systems (FEWS-Fall 2016) and Smart Cities, Connected Communities (Spring 2017). Combined, the programs comprised 60 faculty, staff, and graduate students, representing all six colleges and a number of offices, such as Facilities Management and CEISMC. Over the course of one semester, SLS sponsored gatherings with real-world partners, on and off campus, that provided fellows with opportunities to think in multi-disciplinary ways about new theoretical approaches to the theme and how it plays out in real-world situations. In addition to providing unusual opportunities for collaboration and exploration, the program has influenced participants’ courses as well as launched a number of ongoing research collaborations and new projects.

NSF Broader Impacts

SLS aims to become a go-to office for Broader Impacts projects included in NSF proposals. To start exploring our potential role as a Broader Impacts partner, we collaborated with the Center for Teaching and Learning (CTL), the Office of Sponsored Programs, College of Engineering faculty, CEISMC, and GTRI’s HBCU/MI Outreach Initiative to host two interactive NSF proposal writing workshops, drawing approximately 60 people. The workshops aimed to prepare faculty to work with our offices to develop competitive Broader Impacts plans for NSF research proposals that engage with our partners in meaningful ways that will facilitate translation of research into student and partner engagement for real-world impact. A number of faculty followed up with workshop facilitators to discuss specific collaborations. SLS plans to offer more workshops in the coming year, this time exploring specific examples of sustainable communities projects.

Neighborhood Immersion Course Design Workshop

We also sponsored our second course design workshop in April 2017, bringing together 25 faculty from all six colleges to learn how to integrate sustainable communities content and experiential learning into their courses. We expanded the workshop from one to 1.5 days to include a neighborhood bus excursion to the Buford Highway Corridor, through generous coordination from Modern Languages faculty member Juan Carlos Rodriguez. The workshop also included training in sustainable communities and backward

course design, as well as assessment and roundtable discussions with 26 community, nonprofit, municipal, and industry partners. Participants will receive stipends in Fall 2017 to use towards course development and implementation.

In AY 2017-18, in addition to continuing to offer a yearly course design workshop, we will also launch a Teaching Toolkit of lesson planning resources to help instructors integrate sustainability, community engagement, and service-learning into their courses. We will also offer short workshops each semester to introduce students, faculty, and staff to specific tools, such as Asset-based Community Development, Civic Design, and Equity & Sustainability.

Spreading Awareness

Awareness of our programming, both curricular and co-curricular, is critical to the growth and success of SLS. This year, we launched a new website with significant enhancements, including the ability for students and other users to search for SLS affiliated courses by college, school, Big Idea, and theme. Visitors to the site can also search for and view information on the wide range of partners, faculty, and staff who work with SLS, as well as use our interactive Big Ideas tool. We also focused on increasing our social media presence, and launched a weekly newsletter, as well as a weekly blog post, with entries written by faculty, staff, students, and partners, reflecting on a wide range of topics related to SLS.

Strengthening and Developing New Partnerships



Fig. 5: UN SDGs
www.un.org/sustainabledevelopment/sustainable-development-goals/

Partnerships are key to everything we do in SLS, and this year we spent significant effort working with faculty and capstone design coordinators to connect their courses to real-world work. This resulted in projects across all colleges, ranging from students collecting data from Proctor Creek and analyzing it in lab (CHEM1101), conducting research with corner store owners about selling fresh food (HTS3823), and redesigning access points to a park based on community input (CEE4090). We also made important strides establishing

collaborative structures to nurture connections with municipal, nonprofit, community, and industry partners. Building on the momentum of the INSS conference, this year we embarked on a joint initiative with Emory University’s Sustainable Initiatives Office and with Spelman College to apply to establish a Greater Atlanta United Nations University Regional Centre of Expertise on Education for Sustainable Development (RCE). RCEs commit to implementing the UN Sustainable Development Goals at the regional and local level. The RCE application process brought together over 200 stakeholders. With approval anticipated in January 2018, we expect that this new network will lead to unprecedented collaborative endeavors for our students, faculty, and staff, at the individual course and project level as well as through broad joint initiatives.

The RCE application includes letters of support from:
 Agnes Scott College (President)
 Atlanta Regional Commission (Executive Director)
 Captain Planet Foundation (Director, Strategic Partnerships)
 City of Atlanta (Mayor)
 Clark Atlanta University (Sustainability Coordinator)
 Corporate Volunteer Council (Executive Director)
 Emory University (President)
 Georgia State University (Dean, College of Arts and Sciences)
 Georgia Institute of Technology (Provost)
 Atlanta Student Sustainability Council (RCE Youth Network)
 Greenhouse Accelerator, Inc. (Executive Director)
 Kennesaw State University (Faculty Member)
 Morehouse College (Interim Provost)
 Ray C. Anderson Foundation (Executive Director)
 Saving Our Sons & Sisters International (Executive Director)
 Southface (President)
 Spelman College (President)
 United Nations Foundation (J. Rutherford Seydel, II)

Staff Highlights

Kristina Chatfield, Program & Operations Manager, received her Project Management Certificate through Georgia Tech Professional Education's certification program in April 2017. In addition, she received a promotion/reclassification to Program & Operations Manager, effective July 1, 2017. In her expanded role, she will take on broader strategic, operational, and management responsibilities, reflecting the overall growth of the Center.

Dr. Jennifer Hirsch, Director, was selected by Atlanta Mayor Kasim Reed to serve on the city's Resilience Steering Committee. The City of Atlanta was chosen by the Rockefeller Foundation as part of "100 Resilient Cities," a nonprofit organization dedicated to helping cities around the world build resilience to the economic, social, and physical challenges of the 21st century. This resilience work created opportunities for GT students—as well as faculty and staff—to apply their knowledge to a key initiative outside of the classroom and to learn from each other as well as the other government, community, nonprofit, and business leaders who were engaged.

Jamie Jones, Sr. Administrative Professional, served on the Georgia Tech Earth Day Committee for the second year in a row. This year's celebration marked the 20th anniversary of the annual Earth Day event on Tech's campus. As part of that anniversary, Jamie co-chaired a "Retrospective" committee focused on highlighting the past 20 years of Earth Day celebrations on campus. The Retrospective display included a timeline, photographs, and mementos from each year.

Dr. Carol Thurman, Academic Assessment Manager, joined the Center in October 2016, working 80% with SLS and the remaining 20% with Office of Academic Effectiveness. She came to us from the Office of the Vice Provost for Undergraduate Education, where she served as the Data and Assessment Coordinator. As SLS's Academic Assessment Manager, Carol's responsibilities include ensuring the implementation and execution of a sound assessment plan for SLS, Georgia Tech's Quality Enhancement Plan (QEP) and a key component of the Institute's 2015 SACSCOC reaffirmation of accreditation. Carol earned her Ph.D. in Research, Measurement, and Statistics from Georgia State University.

Student Assistants and Graduate Research Assistants

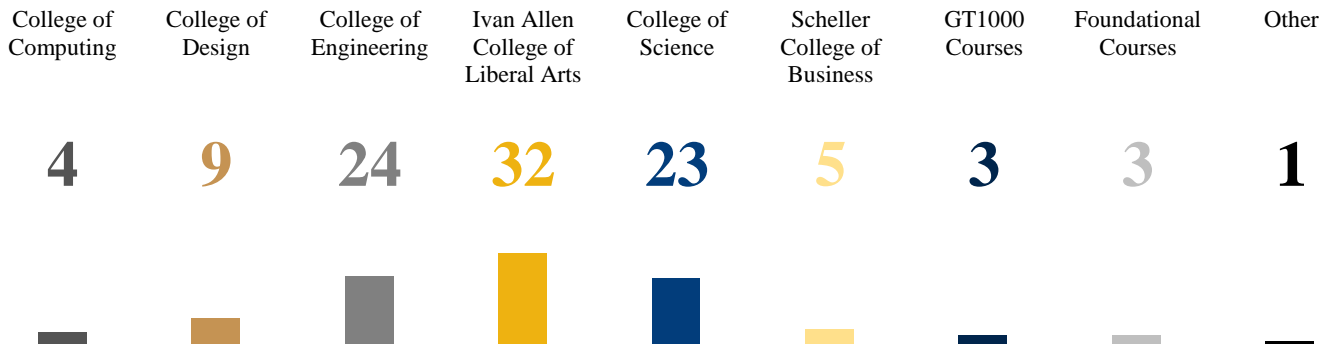
CSLS hired ten student workers, including nine undergraduates and a graduate research assistant (GRA) focused on visual design. Five of the undergraduate student assistants focused on the social media presence of the Center, developed the SLS weekly newsletter, developed and promoted student engagement opportunities, and assisted with events and administrative work. Four additional undergraduate students served as part of an SLS student photography pool, capturing SLS events as well as course programs and projects and partner events. Our visual design GRA focused on a branding strategy for SLS events and programs, expansion of the "BIG IDEAS" interactive tool, development of the SLS teaching toolkit, and the re-design and launch of the new SLS website. These students are a crucial part of our staff, and we plan to expand our student assistant program in the coming year.

Marion L. Brittain Postdoctoral Fellows

CSLS hired four Marion L. Brittain Postdoctoral Fellows to work with us this academic year. The Brittain Fellows Program at Georgia Tech offers an opportunity for emerging scholars to develop innovative teaching and scholarship in writing and communication in their role as faculty members. Our Brittain Fellows researched policies related to service learning and community engagement; developed written and multi-media teaching resources for SLS-affiliated courses; and assisted with SLS assessment. The Brittain Fellows have become an integral part of SLS and will continue to work with us in AY17-18.

Appendix

Faculty and Student Engagement

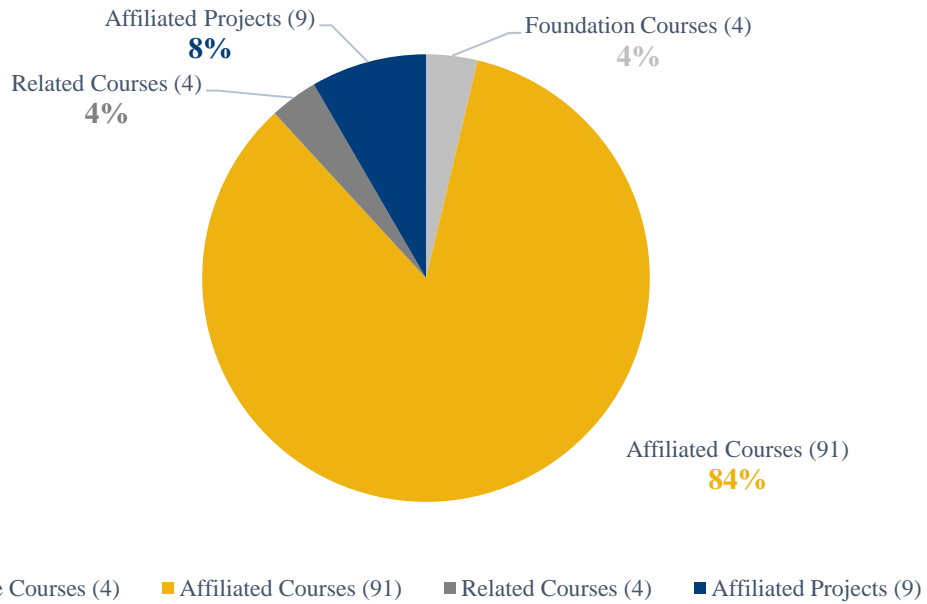


Total Faculty Teaching Courses¹ = **100**

Total Students in Courses²

5062

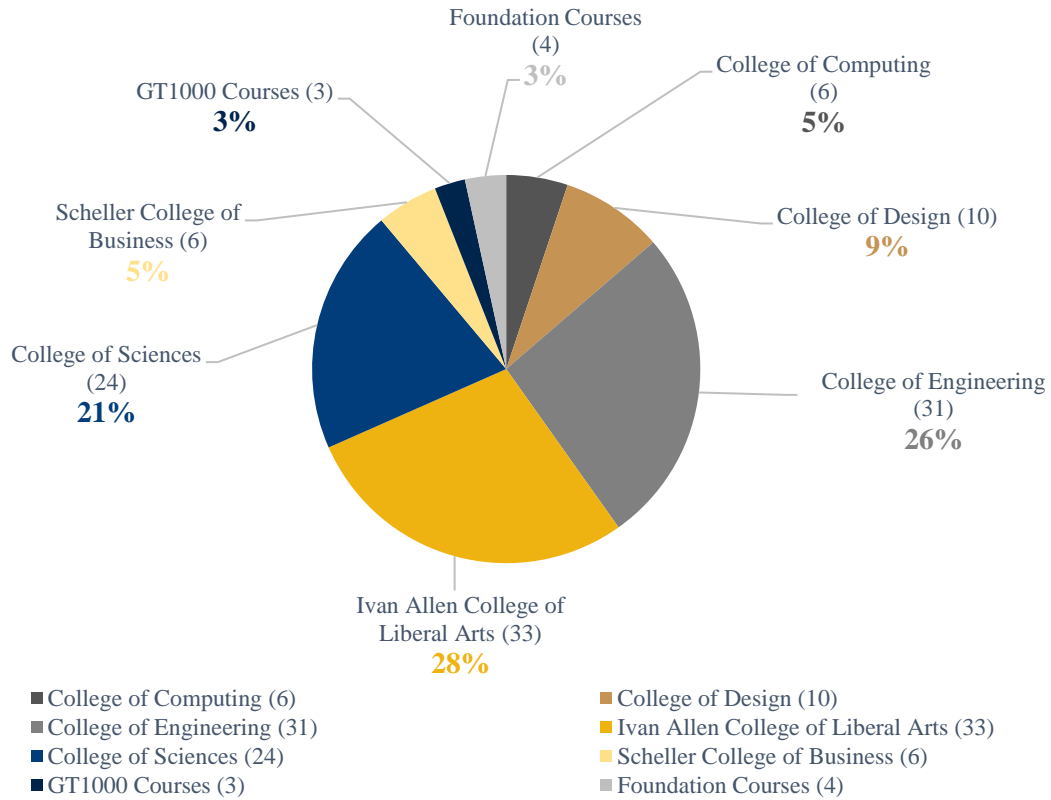
Number of Courses/Projects by Type



¹ Each faculty member is counted only once, even if they teach multiple courses

² Each individual student may be counted more than once if they take multiple courses

SLS Course Breakdown by College



*SLS Course Breakdown by School (117 Total)**

College of Computing	College of Design	College of Engineering	Ivan Allen College of Liberal Arts	College of Sciences	Scheller College of Business	Other Courses
Computer Science	6	Architecture 3	Aerospace 1	Economics 2	Biological Sciences 5	GT1000 Courses 3
Interactive Computing	-	Building Construction 1	Biomedical 1	History and Sociology 4	Chemistry and Biochemistry 4	Foundation Courses 4
Computational Science and Engineering	-	City & Regional Planning 3	Chemical & Biomolecular 3	Literature, Media, and Communication 14	Earth and Atmospheric Sciences 13	
		Industrial Design 3	Civil and Environmental 9	Modern Languages 4	Mathematics -	
		Music -	Electrical and Computer 4	Public Policy 6	Physics -	
			Industrial and Systems 3	International Affairs 3	Psychology 2	
			Materials Science 2			
			Mechanical 8			
6	10	31	33	24	6	7
5%	9%	26%	28%	21%	5%	6%

*Some courses are cross listed in multiple schools and therefore counted more than once for these numbers

SLS Strategic Advisory Council, January 2017 – June 2018

Name	Affiliation	Also Representing
Srinivas Aluru	School of Computational Science and Engineering	Institute for Data Engineering and Science
Yves Berthelot	International Initiatives	
Sandi Bramblett	Institutional Effectiveness	
Marilyn Brown	School of Public Policy	Brook Byers Institute for Sustainable Systems
Jonathan Clarke	Scheller College of Business	
Wayne Clough	President Emeritus	
David Collard	School of Chemistry & Biochemistry	College of Sciences
Bonnie Ferri	Graduate Education and Faculty Development	
Richard DeMillo	Center for 21 st Century Universities	
Archie Ervin	Institute Diversity	
Andrew Gerber	Georgia Tech Research Institute	
Charles Isbell	School of Interactive Computing	College of Computing
Larry Jacobs	School of Civil and Environmental Engineering	College of Engineering
Beth Mynatt	School of Interactive Computing	Institute for People and Technology
Nagela Nukuna	Student Government Association	
Matthew Realff	School of Chemical and Biomolecular Engineering	Strategic Energy Institute, Renewable Bioproducts Institute
Michelle Rinehart	College of Design	
Philip Spessard	Development	
John Stein	Student Life	
Monique Tavares	Office of the EVP of Research	
Bill Todd	Scheller College of Business	
John Tone	School of History and Sociology	Ivan Allen College of Liberal Arts
Howard Wertheimer	Capital Planning and Space Management	
JulieAnne Williamson	Administration and Finance	

SLS Assessment Working Group

Carol Thurman, SLS Academic Assessment Manager (Chair)

Meltem Alemdar, Associate Director, Center for Education Integrating Science, Mathematics, & Computing (CEISMC)

Cara D. Appel-Silbaugh, Associate Dean of Students, Division of Student Life

Jill Auerbach, Director, Office of Undergraduate Research ECE & Opportunity Research Scholars program

Jason Borenstein, Senior Academic Professional, Public Policy

Elijah Cameron, Director, Assessment and Quantitative Services, College of Computing

Julia M. Sonnenberg-Klein, Academic Program Manager II

Carol S. Sullivan, Faculty Teaching and Learning Specialist, Center for Teaching and Learning (CTL)

Cassandra Telenko, Assistant Professor, School of Mechanical Engineering

Brenda A. Woods, Director of Research and Assessment for Student Life

Ellen Zegura, SLS Co-Executive Director, Professor, School of Computer Science