

University of Houston System
Summary of New Academic Programs
Academic, Research and Student Success Committee
Thursday, August 20, 2026

Component	Program	Proposed Implementation Date	Purpose	Comments
UHCL	BAAS Geographic Information Science and Cartography	Spring 2026	The University of Houston-Clear Lake requests approval to establish a 120-credit-hour Bachelor of Applied Arts and Sciences in Geographic Information Science and Cartography. The four-year, interdisciplinary hybrid program will prepare students to collect, analyze, manage, and visualize spatial data using industry-standard GIS technologies, with coursework in cartography, remote sensing, spatial analysis, data management, and geospatial programming. Texas demand is strong, with projected employment growth of 15.3% for Cartographers and Photogrammetrists and 13.5% for Surveying and Mapping Technicians. Greater Houston recorded 1,521 GIS-related job postings in the first half of 2024, primarily in energy, engineering consulting, and aerospace. The program will be the first of its kind in Texas in a hybrid format and is expected to generate revenue by its fourth year.	In-person/Hybrid
UH	PhD Engineering Data Science and AI	Spring 2026	The University of Houston requests approval to establish a 54-credit-hour Ph.D. in Engineering Data Science and AI, a four-year interdisciplinary program integrating engineering, data science, and artificial intelligence. Students will develop expertise in statistical modeling, machine learning, and data-driven decision-making applied to areas such as materials, energy, robotics, health, and cybersecurity. Workforce demand is strong, with projected national employment growth of 23% for Computer and Information Research Scientists and 35% for Data Scientists from 2022–2032, while Texas identifies AI and data-related careers as high-demand, high-wage occupations. The program is distinguished by its specific focus on engineering applications of data science and AI and is expected to generate revenue by its fifth year.	In-Person/Online

Executive Summary
Bachelor of Applied Arts & Sciences (BAAS) in Geographic Information Science and Cartography
University of Houston-Clear Lake

Congruence with System Goals and University Mission

The proposed BAAS in Geographic Information Science and Cartography promotes the UH System Goals of National Competitiveness, Student Success, and Community Advancement. The development of a Bachelor of Applied Arts and Sciences (BAAS) degree in GIS and Cartography at the University of Houston-Clear Lake (UHCL) addresses this need while aligning with the university's mission to offer career-relevant, interdisciplinary education that serves diverse student populations.

UHCL's mission includes providing a high-quality educational experience to a diverse student body, where students are trained and encouraged to think critically and are prepared to make meaningful contributions to their communities. The Core Values of the UHCL College of Human Sciences and Humanities are integrity, innovation, interdisciplinarity, and community. Aligned with these values, the proposed program will adhere to established, grounded standards by seeking accreditation and continuous evaluation to ensure relevance and success, generate new knowledge and encourage students to discover innovative solutions to problems, promote interdisciplinary approaches and collaboration in all areas of the curriculum, and will be community-focused at its core.

Included in the strategic plan of the College is the idea of "destination programs," in which students pursue admission to a program because of its quality and significance rather than simply proximity or convenience. Our proposed program is aligned with the System-level Success Indicator of preparing graduates who will change the world.

Program Description

The BAAS in Geographic Information Science and Cartography undergraduate degree leads to a broad array of career opportunities. Keeping with standard bachelor's degree requirements, the BAAS will require a total of 120 credit hours. The goal of the proposed BAAS in GIS and Cartography is to teach students to apply geospatial knowledge and skills to solving real-life problems. Toward this goal, the proposed program introduces students to the principles, tools, and applications of GIS. Students will learn to collect, manage, analyze, and visualize spatial data using industry-standard software such as ArcGIS. Core topics include cartography, remote sensing, spatial analysis, data management, and geospatial programming. Through hands-on labs and real-world projects, students will explore applications in urban planning, environmental science, public health, and business. The program emphasizes problem-solving and critical thinking, preparing students for careers in government, private industry, and nonprofit sectors, or for advanced study in geography, geospatial science, or related disciplines.

Student and Job Market Demand

There is strong and growing demand for a bachelor of applied arts and sciences degree in Geographic Information Science (GIS), both nationally and in Texas. A Hanover Research analysis (August 2024) found that while Texas conferrals in Geographic Information Science and Cartography declined slightly from 2018–2022, demand increased regionally and nationally—particularly in online programs. UHCL's proposed dual-format program (face-to-face and online) will be the first of its kind in Texas, creating an opportunity to establish a distinctive presence in the field.

Nationally, online conferrals in GIS grew at an annualized rate of 60.7 percent between 2018 and 2022, with Arizona State University responsible for more than half of that growth. Locally, Houston

Community College and Lone Star College offer Associate of Applied Science (AAS) degrees in GIS, and both institutions have expressed interest in guided transfer pathways.

The proposed Bachelor of Applied Arts and Sciences (BAAS) in Geographic Information Systems (GIS) is consistent with Texas legislative and Texas Higher Education Coordinating Board policies supporting applied baccalaureate education, workforce credential mobility, and seamless transfer pathways.

[Texas workforce policy](#) recognizes that many community-college students begin in career-technical programs rather than academic transfer programs. Programs of Study are intended to create multiple entry and exit points, including certificates, AAS degrees, and bachelor's completion pathways.

UHCL's program would provide a seamless bridge from AAS degrees to a BAAS, maximizing the value of prior technical coursework and serving non-traditional students—such as working adults, veterans, and career-changers—who seek advancement into supervisory and analytical roles.

Program Duplication

Institution	Degree Designation & Title	CIP Code
Texas State University	BS in GIS	45.0702
Stephen F. Austin University	BS in Geospatial Science	45.0702
Tarleton State University	BAAS in Geography and GIS	45.0702
Texas A&M University	BS in GIS and Technology	45.0702
Texas A&M University	BS in GIS	45.0702
Sam Houston State University	BS in Geography, Geospatial Information Sciences	45.0702
University of North Texas	BS in GIS and Computer Science	45.0702
University of Texas at Dallas	BS in Geospatial Information Science	45.0702
Texas A&M-Corpus Christi	BS in Geospatial Science	45.0702

While there are nine other GIS programs in Texas, there are none in the Houston-Galveston Area. Additionally, unlike Bachelor of Arts or Bachelor of Science GIS programs, the proposed BAAS in GIS will provide a degree-completion pathway for students holding Associate of Applied Science degrees in GIS and related technical fields. The only comparable program in Texas is at [Tarleton State University](#).

The BAAS degree model is specifically designed to maximize the applicability of workforce and technical education credits that traditionally do not fit within conventional BS/BA programs. Students will transfer Texas Core Curriculum coursework and an approved block of workforce-oriented technical credits into the BAAS, where those credits will satisfy the applied professional component of the degree. Technical coursework in areas such as GIS, surveying, environmental technology, computer information systems, engineering technology, and unmanned aircraft systems will be complemented by advanced upper-division geospatial coursework at UHCL.

This model recognizes the value of prior workforce education, minimizes credit loss, supports timely graduation, and expands access to bachelor's-level education for Texas community-college graduates.

Faculty Resources

Existing Faculty

Name	Department	Highest Degree Awarded & Year	Highest Degree Awarding Institution	Expected % Time in Degree Program
*Jeffrey Lash	Communication and Social-Cultural Sciences	PhD in Geography, 2001	Texas State University	100%

New Faculty Hires

Anticipated Date of Hire	Required Degree	Hiring Rank (e.g. Associate Professor)	Expected % Time
Fall 2029 start	Master's	Lecturer	100%

Dr. Jeff Lash (Ph.D., GISP) will provide leadership for the new program. At launch, the program will be supported by a network of experienced Houston-area GIS professionals serving as adjunct faculty, bringing current industry expertise, real-world applications, and workforce connections into the classroom to ensure students are well prepared for careers in the geospatial field. Adjuncts will teach a total of four courses a semester.

The program would be housed within the current office and classroom spaces of the UHCL campus, including the Student Services & Classroom Building and the Bayou Building.

State or National Need

Regional demand is reinforced by industry support. The Houston-Galveston Area Council has endorsed the program, citing the need for experts who can analyze and manage spatial data for urban planning, environmental management, economic development, and public health.

The labor market outlook for GIS professionals is robust. Hanover Research projects employment growth of 15.3 percent for Cartographers and Photogrammetrists and 13.5 percent for Surveying and Mapping Technicians in Texas over the next decade. In the Greater Houston area alone, there were 1,521 GIS-related job postings in the first half of 2024, with 72 percent requiring a bachelor's degree. Positions are concentrated in energy, engineering consulting, and aerospace contracting.

State data confirm that GIS graduates experience above-average demand: employment in the first year after graduation is 5 percent higher than the state average, 4 percent higher than the regional average, and 7 percent above peer institutions. On a global scale, the geospatial analytics market is projected to reach \$134.23 billion by 2028, growing at a compound annual rate of 12.1 percent, driven by AI applications, rapid urbanization, and government investment.

Taken together, these data demonstrate that UHCL's proposed GIS bachelor's program will meet both immediate workforce needs and long-term market growth, while positioning the university as a leader in an expanding field.

PRO FORMA for BAAS in GIS and Cartography

FY2028		15	Operating Years					
			Year 0	FY2028	FY2029	FY2030	FY2031	FY2032
Enrollments				Fall27	Fall28	Fall29	Fall30	Fall31
Cohort 1				15	13	11	11	-
Cohort 2					17	14	12	12
Cohort 3						20	17	15
Cohort 4							22	18
Cohort 5								25
Cohort 6								
Total				15	30	45	62	70
Expenses								
Faculty (9 month)	Salary	% effort	Year 0	FY2028	FY2029	FY2030	FY2031	FY2032
Dr. Jeff Lash (current Professor)	\$ 90,455.04	100%		90,455	92,264	94,109	95,992	97,911
New Lecturer	69,000	100%		-	-	69,000	70,380	71,788
Adjuncts (4 courses/semester at \$3,000/course)	30,000	80%		24,000	24,480	24,970	25,469	25,978
Position 4				-	-	-	-	-
Position 5				-	-	-	-	-
Position 6				-	-	-	-	-
Adjuncts				-	-	-	-	-
Subtotal	189,455	280%	-	114,455	116,744	188,079	191,841	195,677
Faculty FTE				1.8	1.8	2.8	2.8	2.8
Staff (12 month)								
No new staff required		0%		-	-	-	-	-
Position 2				-	-	-	-	-
Position 3				-	-	-	-	-
Position 4				-	-	-	-	-
Position 5				-	-	-	-	-
Position 6				-	-	-	-	-
Graduate Students				-	-	-	-	-
Subtotal	-	0%	-	-	-	-	-	-
Staff FTE				-	-	-	-	-
Total Salaries			-	114,455	116,744	188,079	191,841	195,677
Benefits @ 20.5%			-	23,463	23,933	38,556	39,327	40,114
Total Personnel			-	137,918	140,677	226,635	231,168	235,791
Non-Personnel								
Marketing/Recruiting			5,000	5,000	5,000	5,000	5,000	5,000
Scholarships & Tuition Assistantships			-	-	-	-	-	-
Annual maintenance & operations				7,000	7,000	7,000	7,000	7,000
Library and Information Technology			-	10,000	10,000	10,000	10,000	10,000
Accreditation			-	-	-	-	-	-
Facilities			-	-	-	-	-	-
Laboratory and other equipment			-	5,000	5,000	5,000	5,000	5,000
Other			-	-	-	-	-	-
Total Non-Personnel			5,000	27,000	27,000	27,000	27,000	27,000
Allocated to university operations	10%			9,942	19,884	32,361	43,628	51,897
Total Annual Expense			\$ 5,000	\$ 174,860	\$ 187,560	\$ 285,996	\$ 301,796	\$ 314,689
Revenue								
Formula Funding Generated				-	-	65,851	65,851	142,922
Statutory Tuition Applied to Formula				-	-	(40,500)	(40,500)	(87,900)
Subtotal: State General Revenue				-	-	25,351	25,351	55,022
UH Tuition and Fees				112,950	225,900	338,850	466,860	527,100
Allocated to set aside per student				(13,532)	(27,063)	(40,595)	(55,930)	(63,147)
Total Revenue from Enrollment				99,419	198,837	323,607	436,281	518,975
Philanthropy and other External Revenue				-	-	-	-	-
Net Revenue				99,419	198,837	323,607	436,281	518,975
Net Annual Gain/(Loss)			(5,000)	\$ (75,442)	\$ 11,277	\$ 37,611	\$ 134,485	\$ 204,286
Cumulative Gain/(Loss)			(5,000)	\$ (80,442)	\$ (69,165)	\$ (31,554)	\$ 102,931	\$ 307,217
Campus Signoff								
Daniel Chang, Program Director, Office of the Provost Signature:								
Vivianne Do, Executive Director, Office of the Provost Signature:								

DOCTOR OF PHILOSOPHY IN ENGINEERING DATA SCIENCE AND AI

UNIVERSITY OF HOUSTON

Congruence with System Goals and University Mission

The proposed Ph.D. in Engineering Data Science and AI aligns with the University of Houston (UH) System Goals and University Mission on student success, national competitiveness, and community advancement. By expanding the Cullen College of Engineering's successful M.S. in Engineering Data Science and AI into a rigorous doctoral degree program, it meets a critical, growing demand for high-level experts at the intersection of engineering and artificial intelligence.

As industrial sectors, particularly Houston's energy, manufacturing, aerospace, and biomedical clusters, rely increasingly on big data, predictive modeling, and machine learning, this program equips students to generate original scholarly research. The curriculum combines advanced, interdisciplinary coursework with hands-on access to the high-performance computing clusters and infrastructure of the Hewlett Packard Enterprise Data Science Institute, providing the theoretical depth and technical resources needed to train data-driven engineers.

The program will enhance UH's national research profile, attracting top-tier global faculty and doctoral talent while driving regional economic development and social mobility. By transforming a diverse local talent pool into researchers capable of solving complex engineering challenges in cybersecurity, materials science, robotics, and health, UH will solidify its position as a leader in interdisciplinary innovation and directly support the evolving workforce needs of the state and nation.

Program Description

The proposed Ph.D. program in Engineering Data Science and AI provides a rigorous, research-driven curriculum tailored to solve real-world physical and industrial problems at the intersection of engineering and artificial intelligence. The program requires approximately 60 semester credit hours (66 for B.S. to Ph.D. and 54 for M.S. to Ph.D.) of advanced coursework and independent research, providing students with both the theoretical depth and the operational time necessary to make substantive contributions to the discipline.

A central feature of the program is its deeply interdisciplinary structure, which integrates doctoral students and faculty from across all major engineering departments, including chemical, mechanical, industrial, biomedical, civil, and electrical engineering. Rather than focusing solely on applied technical skills, the program trains students to develop novel methodologies in predictive modeling, machine learning, and data-driven decision-making.

To facilitate this high-level computational research, the program directly leverages the infrastructure of the Hewlett Packard Enterprise Data Science Institute at UH, ensuring students have continuous access to state-of-the-art high-performance computing clusters. Admission to this four-year program is highly selective, targeting exceptional external candidates alongside internal graduates from UH's M.S. program. This comprehensive preparation equips graduates to lead in elite research environments and meet the growing regional and national demand for highly specialized AI and data science experts.

DOCTOR OF PHILOSOPHY IN ENGINEERING DATA SCIENCE AND AI

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Student and Job Market Demand

There is clear evidence of student demand for a dedicated Ph.D. program in Engineering Data Science and AI. A growing number of students in UH's M.S. program are actively pursuing the thesis track to secure foundational research experience. However, these students face significant structural barriers when attempting to transition to doctoral studies. Without a dedicated program, they must enroll in traditional departmental programs where qualifying exams and required coursework do not align with their specialized training. To date, three students have been forced to navigate these barriers by transferring to separate departmental Ph.D. programs, and four current master's students are applying to other UH doctoral tracks for Fall 2026 due to the lack of a direct pathway. Furthermore, an informal survey indicates widespread faculty demand across the Cullen College of Engineering, as well as the Colleges of Pharmacy and Optometry, who are eager to recruit doctoral students with this specific interdisciplinary background.

There is strong evidence that the job market for Ph.D. graduates at the intersection of engineering and artificial intelligence is robust and expanding. According to the U.S. Bureau of Labor Statistics, employment for Computer and Information Research Scientists is projected to grow 23% from 2022 to 2032, while the demand for Data Scientists is projected to surge by 35% over the same period, both far exceeding the national average for all occupations. While general computer science and business analytics programs are growing, macro-industry studies project that AI will add trillions of dollars in global economic value by 2030, citing a persistent shortage of doctoral-level experts who can apply these methods to physical engineering domains as a major barrier to growth.

Program Duplication

While Lamar University, Texas A&M University, and Texas A&M University-Kingsville offer related Ph.D. programs, none replicate the specialized framework of the proposed degree. Their programs offer broad doctoral degrees in Engineering or Interdisciplinary Engineering that may contain isolated AI content, but the University of Houston's program is unique in its dedicated focus on the intersection of engineering data science and artificial intelligence.

Furthermore, the proposed program does not duplicate any existing doctoral pathways at UH. Unlike the university's current Ph.D. programs in Computer Engineering, Computer Science, or the Ph.D. in Statistics and Data Science, which primarily draw students from within their own disciplines, this proposed Ph.D. in Engineering Data Science and AI offers a distinctly interdisciplinary training model. It is structured specifically to attract doctoral candidates from across all engineering fields, including chemical, mechanical, biomedical, and industrial engineering. By providing foundational training in data science and AI while fostering a college-wide community of researchers applying these tools to domain-specific engineering problems, the program fills a critical, unaddressed curricular gap both institutionally and statewide.

Faculty Resources

A significant number of current tenured and tenure-track faculty in the Cullen College of

DOCTOR OF PHILOSOPHY IN ENGINEERING DATA SCIENCE AND AI UNIVERSITY OF HOUSTON

Engineering have a depth of expertise in data science and AI and its application to engineering disciplines. There are adjunct faculty and lecturers who teach many of the core and prescribed courses for the M.S. program. Thus, the proposed Ph.D. degree program can be launched with existing faculty resources within the Cullen College of Engineering. It is anticipated that future faculty hires with expertise in data science and AI will continue to enable the College to offer a richer palette of elective courses.

State or National Need

Employers are facing unique, high-wage workforce shortages at the regional and state levels. The Texas Workforce Commission explicitly identifies machine learning engineers, data engineers, and AI specialists as high-demand, high-wage occupations. In the Houston region, major employers including NASA, the Texas Medical Center, ExxonMobil, MD Anderson, Boeing, and Siemens increasingly require advanced AI-driven solutions for complex engineering systems in areas like predictive maintenance, robotics, energy transition, and materials design. Establishing this Ph.D. program will directly bridge this gap, preparing specialized graduates for high-demand roles as AI Research Scientists and Computational Engineers in both elite industry and academia.

PRO FORMA FOR PhD in Engineering Data Science and AI

FY2028			Operating Years					
			Year 0	FY2028	FY2029	FY2030	FY2031	FY2032
				Fall27	Fall28	Fall29	Fall30	Fall31
Enrollments	Cohort 1			5	5	5	5	
	Cohort 2				5	5	5	5
	Cohort 3					8	8	8
	Cohort 4						8	8
	Cohort 5						8	8
	Cohort 6							8
	Total			5	10	18	26	29
Expenses								
Faculty (9 month)	Salary	% effort	Year 0	FY2028	FY2029	FY2030	FY2031	FY2032
Saviz Saei	75,000	40%		30,000	30,600	31,212	31,836	32,473
Yashashree Kulkarni	171,668	10%		17,167	17,510	17,860	18,218	18,582
Vedhus Hoskere, Asst Professor	106,300	10%		10,630	10,843	11,059	11,281	11,506
Ying Ling, Professor	118,828	10%		11,883	12,120	12,363	12,610	12,862
Saurabh Prasad, Professor	154,016	10%		15,402	15,710	16,024	16,344	16,671
Tony Liao, Assoc Professor	122,684	10%		12,268	12,514	12,764	13,019	13,280
Chandra Mohan, Professor	276,988	10%		27,699	28,253	28,818	29,394	29,982
Adjuncts	40,000	40%	-	16,000	16,320	16,646	16,979	17,319
Subtotal	1,065,484	140%	-	141,048	143,869	146,747	149,682	152,675
Faculty FTE								
Staff (12 month)								
Position 1	44,000	20%		8,800	8,976	9,156	9,339	9,525
Position 2	50,000	10%		5,000	5,100	5,202	5,306	5,412
Position 3				-	-	-	-	-
Position 4				-	-	-	-	-
Position 5				-	-	-	-	-
Position 6				-	-	-	-	-
Graduate Students			-	-	-	-	-	-
Subtotal	94,000	30%	-	13,800	14,076	14,358	14,645	14,938
Staff FTE								
Total Salaries			-	154,848	157,945	161,104	164,326	167,613
Benefits @ 20.5%			-	31,744	32,379	33,026	33,687	34,361
Total Personnel			-	186,592	190,324	194,131	198,013	201,974
Non-Personnel								
Marketing/Recruiting				5,000	5,000	5,000	5,000	5,000
Scholarships & Tuition Assistantships				45,000	90,000	162,000	234,000	261,000
Annual maintenance & operations				10,000	10,000	10,000	10,000	10,000
Library and Information Technology				-	-	-	-	-
Accreditation				-	-	-	-	-
Facilities				-	-	-	-	-
Laboratory and other equipment				10,000	10,000	10,000	10,000	10,000
Other			-	-	-	-	-	-
Total Non-Personnel			-	70,000	115,000	187,000	259,000	286,000
Allocated to university operations	10%			2,951	5,903	27,684	32,406	61,473
Total Annual Expense			\$ -	\$ 259,544	\$ 311,227	\$ 408,815	\$ 489,420	\$ 549,446
Revenue								
Formula Funding Generated				-	-	178,097	178,097	463,052
Statutory Tuition Applied to Formula				-	-	(7,500)	(7,500)	(19,500)
Subtotal: State General Revenue				-	-	170,597	170,597	443,552
UH Tuition and Fees				32,100	64,200	115,560	166,920	186,180
Allocated to set aside per student				(2,587)	(5,174)	(9,313)	(13,452)	(15,004)
Total Revenue from Enrollment				29,513	59,026	276,844	324,065	614,727
Existing College Resources				186,592	190,324	194,131	198,013	201,974
Net Revenue				216,105	249,350	470,974	522,078	816,701
Net Annual Gain/(Loss)			-	\$ (43,438)	\$ (61,877)	\$ 62,159	\$ 32,658	\$ 267,254
Cumulative Gain/(Loss)			-	\$ (43,438)	\$ (105,315)	\$ (43,156)	\$ (10,497)	\$ 256,757
College Business Administrator Signature:						Date: _____		
Daniel Chang, Program Director, Office of the Provost Signature:						Date: _____		
Vivianne Do, Executive Director, Office of the Provost Signature:						Date: _____		