

K-State 2025 Strategic Action and Alignment Plan College or Major Unit: College of Engineering

Department: Computing and Information Sciences

1. What are your Department's mission and vision and how does your organization contribute to achieving the University's and your College's/Major Unit's vision for K-State 2025?

The mission of CIS at K-State is four-fold:

- Conducting world class, high quality basic and applied research that contributes to the body of knowledge in computer science, software engineering, information technology and related interdisciplinary areas.
- 2. Educating tomorrow's leaders in computing professions at the BS, Masters and PhD level.
- 3. Educating students and faculty at K-State with computing tools and knowledge to become highly competitive in the information rich world, and engaging them to strengthen the impact of computation in other disciplines.
- 4. Conducting Outreach programs to enhance K-12 STEM education, promote economic development and societal impacts of computing.
- 2. What are your Department's key strategic activities and outcomes?
- 3. Identify [in brackets] which of your Department's strategic outcomes are directly linked to your College's/Major Unit's outcomes. (If your Department or similar unit is not in a College or Major Unit, skip this question.)

Theme 1: Conducting world class, high quality basic and applied research that contributes to the body of knowledge in computer science, software engineering, information technology and related interdisciplinary areas.

	Key Activities		Short Term (2013 - 2015) Key Outcomes		Intermediate (2016 - 2020) Key Outcomes		Long Term (2021 - 2025) Key Outcomes	
Wha	at we plan to do	What we expect to happen		What we expect to happen		What we expect to happen		
1.	Promote and publicize high-quality scholarly work of faculty	A.	chairs and professorships from	A.	chairs and professorships to 5	A.	chairs and professorships to 6	
2.	3 1		1 to 3 [ENT3C]		[ENT3C]		[ENT3C]	
	programs with international impact	В.	Increase research expenditure	B.	Increase research expenditure	B.	Increase research expenditure	
3.	Recruit and retain high-quality		from \$2.3M to \$4M [ENT3E]		to \$4.5M [ENT3E]	1	to \$5M [ENT3E]	
	faculty and maintain high level of Espirit de Corps	C.	Increase number of projects that include industrial	C.	Increase number of projects that include industrial	C.	Increase number of projects that include industrial	
4.	extramural funding from a diverse		participation from 3 per year to 5 per year [None]		participation to 7 per year [None]		participation to 8 per year [None]	
	collection funding sources	D.	Increase number of projects	D.	Increase number of projects	D.	Maintain number of projects	
5.	Develop and support multidisciplinary activities and		funded by industry from 4 per year to 5 per year [None]		funded by industry to 6 per year [None]		funded by industry at 6 per year [None]	
	centers	E.	Increase number of faculty	E.	Increase number of faculty	E.	Increase number of faculty	
6.	Enhance scholarly activities by faculty		visits to industry/national labs from 10 per year to 15 per year		visits to industry/national labs to 18 per year [None]		visits to industry/national labs to 20 per year [None]	
7.	Provide opportunities to graduate students for professional		[None]					

development 8. Provide opportunities to engage undergraduate students in research		Increase number of technology transfer activities to 5 per year [None]	F.	Increase number of technology transfer activities to 7 per year [None]	F.	Increase number of technology transfer activities to 8 per year [None]
	G.	Increase number of media recognitions (new releases, interviews, etc.) to 6 per year [None]	G.	Increase number of media recognitions to 8 per year [None]	G.	Maintain number of media recognitions at 8 per year [None]
	H.	Increase number of on- campus faculty awards to 2 per year [None]	H.	Maintain number of on-campus faculty awards at 2 per year [None]	H.	Maintain number of on-campus faculty awards at 2 per year [None]
	I.	Increase faculty awards with national/international exposure to 1 per year [None]	l.	Maintain faculty awards with national/international exposure to 1 per year [None]	I.	Maintain faculty awards with national/international exposure to 1 per year [None]
	J.	Increase in number of positions in conference committees and panels from 30 per year to 35 per year [ENT3B]	J.	Increase number of positions in conference committees and panels from to 40 per year [ENT3B]	J.	Maintain number of positions in conference committees and panels to 40 per year [ENT3B]
	K.	Increase number of faculty fellows to 2 [ENT3B]	K.	Increase number of faculty fellows to 3 [ENT3B]	K.	Maintain number of faculty fellows to 3 [ENT3B]
	L.	Increase number of meeting/event organization activities from 8 to 10 per year [ENT3B]	L.	Maintain number of meeting/event organization activities 10 per year [ENT3B]	L.	Maintain number of meeting/event organization activities 10 per year [ENT3B]
	M.	Increase number of refereed publications from 38 to 45 per year [ENT3A]	M.	Increase number of refereed publications to 50 per year [ENT3A]	M.	Increase number of refereed publications to 55 per year [ENT3A]
	N.	Increase number of graduate students with fellowship support to 5 per year [ENT3F]	N.	Increase number of graduate students with fellowship support to 6 per year [ENT3F]	N.	Increase number of graduate students with fellowship support to 8 per year [ENT3F]
	0.	Increase number of visits by graduate students to industry and academic partners to 10 per year [None]	0.	Increase number of visits by graduate students to industry and academic partners to 13 per year [None]	0.	Increase number of visits by graduate students to industry and academic partners to 15 per year [None]
		Increase number of graduate research internships to 5 per year [ENT5D]		Increase number of graduate research internships to 8 per year [ENT5D]	P.	Increase number of graduate research internships to 10 per year [ENT5D]
	Q.	Increase number of faculty working in multidisciplinary areas to 8 [ENT3G]	Q.	Increase number of faculty working in multidisciplinary areas to 9 [ENT3G]	Q.	Increase number of faculty working in multidisciplinary areas to 10 [ENT3G]

Theme 2: Educating tomorrow's leaders in computing professions at the BS, Masters and PhD level.

Key Activities	Short Term (2013 - 2015) Key Outcomes	Intermediate (2016 - 2020) Key Outcomes	Long Term (2021 - 2025) Key Outcomes	
What we plan to do	What we expect to happen	What we expect to happen	What we expect to happen	
Graduate Studies 1. Recruit PhD students	A. Increase percentage of MS students doing the MS Thesis option from 30% to 40% [None]	A. Increase percentage of MS students doing the MS Thesis option to 60% [None]	A. Increase percentage of MS students doing the MS Thesis option to 75% [None]	
 Encourage MS students to do a thesis option Developing funding for student travel to conferences 	B. Increase number of MS/MSE students attending conferences/workshops from 2 to 5 per year.[None]	B. Increase number of MS/MSE students attending conferences/workshops to 7 per year [None]	B. Increase number of MS/MSE students attending conferences/workshops to 10 per year [None]	
 4. Encourage student presentation of research within or outside the department 5. Encourage students authorship of 	C. Increase number of occurrences of MS/MSE students as authors of papers from 8 to 10 per year [None]	C. Increase number of occurrences of MS/MSE students as authors of papers to 15 per year [None]	C. Increase number of occurrences of MS/MSE students as authors of papers to 18 per year [None]	
publications 6. Develop support for PhD students	D. Increase number of PhD students from 31 to 36 [ENT3D]	D. Increase number of PhD students to 45 [ENT3D]	D. Increase number of PhD students to 55 [ENT3D]	
7. Consider joint BS/MS program that is research oriented.	E. Increase number of PhD graduates to 4 per year [ENT3D]	E. Increase number of PhD graduates to 6 per year [ENT3D]	E. Increase number of PhD graduates to 8 per year [ENT3D]	
	F. Increase number of occurrences of PhD students as authors of papers from 15 to 20 per year [None]	F. Increase number of occurrences of PhD students as authors of papers to 25 per year [None]	F. Increase number of occurrences of PhD students as authors of papers to 30 per year [None]	
	G. Increase number of PhD students attending conferences/workshops from 11 to 15 per year [None]	G. Increase number of PhD students attending conferences/workshops to 20 per year [None]	G. Increase number of PhD students attending conferences/workshops to 25 per year [None]	
	H. Increase percentage of fully funded PhD students to 90% [None]	H. Increase percentage of fully funded PhD students to 95% [None]	H. Increase percentage of fully funded PhD students to 100% [None]	
Undergraduate Studies 1. Develop programs to retain students with emphasis on students who are high-performing and/or from underrepresented	A. Increase number of incoming freshmen per year with high school GPA at least 3.6 and ACT composite score of at least 29 from 11 to 18 [ENT1A]	A. Increase number of incoming freshmen per year with high school GPA at least 3.6 and ACT composite score of at least 29 to 22 [ENT1A]	A. Increase number of incoming freshmen per year with high school GPA at least 3.6 and ACT composite score of at least 29 to 25 [ENT1A]	
groups. 2. Develop comprehensive advising programs and strengthen	Increase number of undergraduate students in the CS program from 204 to 250. [ENT1B]	B. Increase number of undergraduate students in the CS program to 260 [ENT1B]	B. Increase number of undergraduate students in the CS program to 270 [ENT1B]	
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collaboration with the College advising system.	students in the IS program from 36 to 50 [ENT1B]	undergraduate students in the IS program to 65 [ENT1B]	undergraduate students in the IS program to 80 [ENT1B]
Conduct workshops for high school teachers to provide them with training on integrating	D. Increase number of BS graduates from 28 per year to 35 per year [ENT1E]	D. Increase number of BS graduates to 40 per year [ENT1E]	D. Increase number of BS graduates to 45 per year [ENT1E].
computing into their teaching.Develop programs that expose middle school students to	E. Increase Freshman-sophomore retention from 54% to 57% [ENT1G]	E. Increase Freshman- sophomore retention to 60% [ENT1G]	E. Increase Freshman-sophomore retention to 63% [ENT1G]
computer science principles. 5. Expand recruitment of high-quality	F. Increase number of female students from 15 to 20 [ENT1D]	F. Increase number of female students to 25 [ENT1D]	F. Increase number of female students to 30 [ENT1D]
students. 6. Provide opportunities for	G. Improve 6-year graduation rates from 19% to 23% [ENT1F]	G. Improve 6-year graduation rates to 26% [ENT1F]	G. Improve 6-year graduation rates to 30% [ENT1F]
undergraduate research. 7. Continue to align our curricula with evolving trends in the	Increasing number of advising meetings per students from 1.3 to 2 per year [None]	H. Increasing number of advising meetings per students to 2.5 per year [None]	H. Increasing number of advising meetings per students to 3 per year [None]
computational field. 8. Adapt our teaching strategies to reflect current educational best practices.	Increase number of participant- hours in K-12 workshops to 1000 per year [None]	I. Increase number of participant- hours in K-12 workshops to 1200 per year [None]	Increase number of participant- hours in K-12 workshops to 1250 per year [None]
	Increase number of student interactions in K-12 outreach per year to 350 [None]	J. Increase number of student interactions in K-12 outreach per year to 400 [None]	J. Increase number of student interactions in K-12 outreach per year to 450 [None]
	K. Increase number of funded students involved in undergraduate research from 11 to 13 per year [ENT1H]	K. Increase number of funded students involved in undergraduate research to 15 per year [ENT1H]	K. Increase number of funded students involved in undergraduate research to 17 per year [ENT1H]
	L. Increase number of students with internships to 50 per year. [ENT5D]	L. Increase number of students with internships to 60 per year [ENT5D]	L. Increase number of students with internships to 70 per year [ENT5D]

Theme 3: Educating students and faculty at K-State with computing tools and knowledge to become highly competitive in the information rich world, and engaging them to strengthen the impact of computation in other disciplines.

	Key Activities	Short Term (2013 - 2015) Key Outcomes	Intermediate (2016 - 2020) Key Outcomes	Long Term (2021 - 2025) Key Outcomes
Wha	t we plan to do	What we expect to happen	What we expect to happen	What we expect to happen
1.	Provide state of the art education in information technology literacy to K-State community. Provide support for high-performance computing	Increase enrollment in introductory information technology course from 1800 student credit hours per year to 1900 student credit hours per year [None]	A. Increase enrollment in introductory information technology course to 2000 student credit hours per year [None]	Increase enrollment in introductory information technology course to 2100 student credit hours per year [None]
	computational research to K-State research community.	Develop new courses (at least two) on information security [None]	B. Continue to offer courses on information security [None]	B. Continue to offer courses on information security [None]

3. Educate and train a sophisticated C. Increase the number of users of C. Well established high C. Well established high performance computing infrastructure to support Beocat high performance workforce in computational performance computing computing cluster from 180 to 300 computational research at K-State infrastructure to support science [None] [None] computational research at K-State with steady number of users [None]

Theme 4: Conducting Outreach programs to enhance K-12 STEM education, promote economic development and societal impacts of computing.

Key Activities		Short Term (2013 - 2015) Key Outcomes		Intermediate (2016 - 2020) Key Outcomes		Long Term (2021 - 2025) Key Outcomes			
What v	ve plan to do	What we expect to happen		What	What we expect to happen		What we expect to happen		
1.	Increase our advertisement of the MSE program, both to alumni and		Increase distance education enrollment from 5 to 10 [None]	A.	Increase distance education enrollment to 20 [None]	A.	Increase distance education enrollment to 30 [None]		
2.	target companies within the Midwest region. Work with Kansas State	В.	Increase number of projects emphasizing K-12 education from 1 to 3 [None]	В.	Maintain number of projects emphasizing K-12 education to 3 [None]	B.	Maintain number of projects emphasizing K-12 education to 3 [None]		
	University recruiting offices in China, India, and Vietnam to advertise the MSE distance program internationally.	C.	Increase number of participant- hours in K-12 workshops to 1000 per year [None]	C.	Increase number of participant- hours in K-12 workshops to 1200 per year [None]	C.	Increase number of participant- hours in K-12 workshops to 1250 per year [None]		
3.	Investigate a combined BS/MSE program that would allow students to complete the MSE program online after graduating with their BS with a reduced number of hours	D.	Increase number of student interactions in K-12 outreach per year to 350 [None]	D.	Increase number of student interactions in K-12 outreach per year to 400 [None]	D.	Increase number of student interactions in K-12 outreach per year to 450 [None]		
4.	Encourage the integration of CS Principles across K-12 curriculum in the state of Kansas								
5.	Conduct workshops for in-service K-12 teachers to provide them with training on integrating computer science principles into their teaching.								

4a. What resources and/or opportunities exist for your Department to achieve its vision and outcomes?

The major resources for the CIS Department are its faculty and staff. The department has the following to help achieve our objectives:

- Well established research programs
- Excellent student advising system
- · Comprehensive curriculum for undergraduate and graduate education
- 4b. What resources and/or opportunities are needed for your Department to achieve its vision and outcomes?

To achieve our goals, the CIS Department will need the following:

- Additional faculty lines (5 lines)
- Funds to attract and support graduate students
- Funds to attract and retain high quality faculty
- 5. How do you propose to acquire the resources needed for your Department to accomplish its vision and outcomes?

We plan to acquire these resources as follows:

- Request central administration for faculty lines
- Request college for scholarship support for graduate students
- Acquire extramural funds to expand research programs
- Leverage UEIA funds to improve undergraduate curriculum
- 6. How does your plan link to the K-State 2025 University Benchmark Metrics, Common Elements, and Thematic Goals, Outcomes, and Metrics? (See below)

6. Departmental Links to K-State 2025 University Benchmark Metrics, Common Elements, and Thematic Goals, Outcomes, and Metrics

Links to Benchmark Metrics

- B-1 Total research and development expenditures
- B-2 Endowment pool
- B-4 Number of faculty awards
- B-5 Number of doctorates granted annually
- B-6 Freshman-to-sophomore retention rate
- B-7 Six-year graduation rate
- B-8 Percent of undergraduate students involved in research

Links to Common Elements

- CE-1 Communications and Marketing
- CE-3 Diversity
- CE-5 Funding
- CE-6 International
- CE-8 Technology

Links to 2025 Thematic Goals and Metrics	Links to Short Term Outcomes	Links to Intermediate Outcomes	Links to Long Term Outcomes
	(2011 – 2015)	(2016 – 2020)	(2021 – 2025)
T1 - Research, Scholarly and Creative Activities, and Discovery (RSCAD) Theme 1 Metrics: T1-1 - # of interdisciplinary research projects, institutes, and centers T1-2 - Total sponsored extramural funding expenditures T1-3 - # of juried, adjudicated, or externally vetted performances, shows and designs T1-4 - # of refereed scholarly publications per academic year and allocated faculty member T1-5 - Total international research and development expenditures	T1-A - Increased intellectual and financial capital to support RSCAD T1-B - More clusters/centers of collaborative RSCAD focus T1-C - Increased funding for investigator-based research, research centers, and graduate training grants T1-E - Competitive compensation and support available to GRAs, GTAs, and GAs T1-F - Enhanced and systematic approach for UG research T1-G - Successful recruitment, retention, evaluation, compensation, and rewards strategies in place to support RSCAD needs T1-H - Enhanced visibility and appreciation for research, discovery, and scholarly and creative activities	T1-I - Intellectual and financial capital in place for expanded RSCAD efforts T1-J - Greater proportion of nationally and internationally recognized awardwinning faculty in RSCAD programs T1-K - Nationally and internationally recognized research centers T1-M - Increased participation by undergraduates in expanded opportunities in research	T1-N - Fifty nationally recognized K-State researchers, a high proportion of which are members of their national academies T1-O - Extramural funding competitive with our benchmark institutions T1-P - Research and development expenditures competitive with benchmark institutions

	Links to University Thematic	Goals, Outcomes, and Metrics	
Links to 2025 Thematic Goals and Metrics	Links to Short Term Outcomes (2011 – 2015)	Links to Intermediate Outcomes (2016 – 2020)	Links to Long Term Outcomes (2021 – 2025)
T2 - Undergraduate Educational Experience (UEE) Theme 2 Metrics: T2-2 - # and % of undergraduate students completing an experiential learning experience T2-6 - % of undergraduate enrollment by demographic group T2-7 - Student satisfaction and utilization rates	T2-A - Excellent, customized academic advising and services available to all students to support their success and degree completion T2-C - Increased participation by undergraduates in expanded opportunities for meaningful research T2-D - Successful integration of undergraduate education and meaningful research is standard practice T2-E - Effective evaluation practices that recognize and reward teaching, advising, and life-long learning/professional development T2-G - Successful recruitment and retention strategies that address our entire student population T2-H - Improved six-year graduation rates and retention ratios	T2-J - Excellent reputation for high quality teaching and advising that prepares students for their professional, community, social, and personal lives T2-K - Superior and diverse faculty recognized for teaching excellence T2-M - Increased undergraduate contributions in the creation of scholarship through research T2-N - Ongoing improvement of sixyear graduation rates and retention ratios	T2-O - An undergraduate educational experience recognized as one of the best among the nation's Top 50 Public Research Universities T2-Q - Freshman to Sophomore retention ratios comparable to benchmark institutions T2-R - Six-Year graduation rates comparable to benchmark institutions
T3 - Graduate Scholarly Experience Theme 3 Metrics:	T3-A - Competitive compensation and support available for GRAs, GTAs, and GAs	T3-I - Increased participation by our graduate students in unique high level learning and experiential training	T3-N - National and international reputation for outstanding graduates with demonstrable career success
T3-1 - # and % of graduate students with assistantships, endowed scholarships, and fellowships	T3-D - Outstanding mentoring for our graduate students	T3-J - Expanded reputation for outstanding graduates with the critical skill sets needed to excel in their	T3-O - World-class reputation as a preferred destination for outstanding graduate students
T3-2 - Total funds awarded for graduate assistantships, endowed scholarships, and fellowships	T3-E - Expectation of excellence for the graduate scholarly experience T3-F - Increased capacity to secure	T3-K - Increased funding for graduate research and teaching	T3-P - Stable funding for graduate research and teaching competitive with benchmark institutions
T3-4 - # of private/public sector partnerships supporting graduate experiential training opportunities	funding for graduate research and teaching	T3-L - Increased number of nationally and internationally recognized award-	T3-Q - Doctorates Awarded comparable with benchmark
T3-5 - # of graduate students	T3-H - Expanded partnerships with	winning graduate faculty	institutions

	Links to University Thematic Goals, Outcomes, and Metrics					
Links to 2025 Thematic Goals and Metrics	Links to Short Term Outcomes (2011 – 2015)	Links to Intermediate Outcomes (2016 – 2020)	Links to Long Term Outcomes (2021 – 2025)			
participating in a unique high level learning and experiential training	industry and government to provide high level learning and experiential	T3-M - Increased number of				
T3-6 - # of graduate terminal degrees awarded	training opportunities for graduate students	Doctorates Awarded				
T3-7 - Total graduate students enrolled by demographic group and degree type						
T4 - Engagement, Extension, Outreach and Service	T4-C - Increased recognition of our services as a source of expertise, information, and tools for disciplines worldwide	T4-J - Increased number of graduate students involved in Engagement	T4-O - Nationally and internationally recognized as leaders in Engagement on a global scale			
Theme 4 Metrics:	T4 5 1					
T4-2 - Total extramural-funded expenditures for Engagement initiatives at the local, state, national, and international level	T4-E - Increased extramural funding for Engagement initiatives at the local, state, national, and international level					
T4-3 - # of partnerships by sector and geographic boundary supporting collaborative research, education, and engagement	T4-F - Recognition as leaders in Engagement within our state and nation					
T4-5 - # of participants involved in community-based research and outreach projects	T4-G - Enhanced visibility and appreciation for Engagement and its interconnectedness with research and education within our university community					
T5 - Faculty and Staff	T5-A - Total compensation competitive with aspirant university	T5-E - Total compensation competitive with aspirant university	T5-H - Talented and high performing diverse workforce recognized for			
Theme 5 Metrics:	and regional employers for faculty and staff in high priority areas	and regional employers for all employees	excellence and award-winning faculty and researchers			
T5-1 - # of national and international faculty awards	T5-D - Effective evaluation	T5-F - Faculty and staff current with	T5-I - Stable funding available for			
T5-2 - # and % of faculty with endowed chairs, professorships, and fellowships	processes that result in accountable faculty and staff with a clear understanding of their job	developments in their fields and the skills needed to achieve excellence in performing their jobs	recruitment and retention of top leve faculty and staff			
T5-3 - Competitive compensation packages for faculty and staff	expectations and how they contribute to the University's mission	T5-G - Successful recruitment and retention of a talented and high	T5-J - Optimal number of faculty and staff comparable with our benchmarl institutions			
T5-4 - # and % of faculty and staff participating in international experiences State 2025 Strategic Action and Alignment Plan for		performing, diverse workforce				

Links to 2025 Thematic Goals and Metrics	Links to Short Term Outcomes (2011 – 2015)	Links to Intermediate Outcomes (2016 – 2020)	Links to Long Term Outcomes (2021 – 2025)
T5-5 - % of tenure/tenure-track faculty by demographic group			
Theme 6 Metrics: T6-1 - # and % of technology enabled classrooms	T6-C - Robust and reliable information technology ensuring business continuity and consistent with the achievement of the highest quality levels of support for research, instruction, student services, and administration	T6-D - Adequate office space for all K-State employees equipped to support their work and productivity T6-E - Enhanced campus community experience and collaborative learning and working environments promoted by facilities that support multidisciplinary work and integrated interaction between students, faculty, researchers, staff, and administrators	T6-G - High quality, technology enabled, flexible and adaptable classroom space appropriate to the evolving needs of the learning environment and readily available to K-State faculty and students T6-H - High-quality research laboratories and specialty spaces that enhance research and scholarl activities T6-I - Well-maintained buildings, utilities, IT infrastructure, and grounds consistent with the expectations and image of a highly ranked land grant research and teaching institution