



Civil and Industrial Engineering Type A Request



- Summary of Request
 - \$2 million to support addition of Civil and Industrial Engineering
 - Capital improvements
 - Laboratories
 - Equipment
 - Minimum of 1:1 match from state and community
 - 2017 Legislative Appropriations Request of \$2M for Civil and Industrial Engineering



TEXAS A&M UNIVERSITY CORPUS CHRISTI

OVERALL BUDGET FOR CIVIL & INDUSTRIAL ENGINEERING PROGRAMS			
Expense Type	Funding Sources	Civil	Industrial
Capital	University & Type A Funds	\$6,300,000	\$700,000
Program and Personnel	State	\$1,000,000	\$1,000,000
TOTAL		\$7,300,000	\$1,700,000

**Scholarship support will also be raised from private donors and the community.*

CAPITAL EXPENSES FOR CIVIL & INDUSTRIAL ENGINEERING	
Expense Item	Cost
Civil Engineering	
Materials Testing Lab Building	\$5,000,000
Materials Testing Lab Equipment	\$900,000
a) Axial/torsional test equipment	
b) Impact test equipment	
c) Grips and fixtures	
d) Environmental chamber	
e) Data acquisition, data processing, data storage, and data analysis software	
Structure Engineering Lab Equipment	\$400,000
a) Universal Test Machine with Vibration Actuators (e.g., MTS Universal Test Machine, actuators)	
b) Structural modal analysis (e.g., piezo-electric sensors, data acquisition)	
c) Data acquisition, data processing, data storage, and data analysis software (including FFT analysis)	
TOTAL	\$6,300,000
Industrial Engineering	
Immersive Evaluation Lab	\$400,000
a) Six-wall high-resolution virtual reality facility	
b) Software for immersive evaluation	
Cognitive Systems & Human Performance Lab	\$300,000
a) IR equipment	
b) Eye trackers	
c) Vehicle simulators for evaluation of human performance of driver-driverless cars, unmanned aircraft systems	
TOTAL	\$700,000



- Need for Engineering Graduates
 - TX Workforce Commission Projections indicate a current and future need for civil and industrial engineers
 - Multi-billion investments in the region
 - Port of Corpus Christi expansion
 - Corpus Christi Army Depot reliance on IE
 - Student demand
 - ME over 400 students
 - EE over 100 students
 - Anticipate more than 120 students in CE within 5 years and more than 100 students in IE within 5 years



PROJECTED JOBS FOR CIVIL & INDUSTRIAL ENGINEERING 2016-2020						
	2016 Jobs		2020 Jobs		% Change	
	Corpus Christi MSA	Coastal Bend WDA	Corpus Christi MSA	Coastal Bend WDA	Corpus Christi MSA	Coastal Bend WDA
Civil	297	362	335	412	13%	14%
Industrial	68	99	78	117	15%	18%
Chemical	386	395	408	418	6%	6%
Mechanical	204	265	230	306	13%	15%

**Workforce analysis provided by Workforce Solutions of the Coastal Bend*



- Progression Plan for Engineering at TAMU-CC
 - Regional Engineering Education Planning Committee developed recommendations for coordinated expansion of engineering programs at TAMU-CC, TAMUK, and TAMIU
 - TAMU-CC expansion into CE and IE follows that plan
 - CE and IE next in Fall 2017
 - Workforce demand for IE in next 5-10 years
 - Support of autonomous vehicle and unmanned systems programs
 - Chemical Engineering planned for Fall 2020
 - Lab space for chemical engineering opens in 2019



- Impact

- Type A funds \$2M for Mechanical and Electrical Engineering matched by \$7M from State and Community
 - 81 Mechanical Engineering graduates to date
 - Over 500 students in ME and EE combined
 - \$15.9M in direct economic impact
- Economic impact of Civil Engineering \$5,054,600
- Economic impact of Industrial Engineering \$4,378,000
- ROI = 631% (ROI ratio of 6.31)



- Return on Investment

- Assuming \$1M from the Type A Fund for each program, the proposed one-time \$2M in Type A funds will generate a permanent return on investment up to 6.31 (or 631%) annually from Year 5 onward.
- Civil Engineering

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Annual ROI	0.26	0.35	0.46	0.56	6.30	6.30	6.30	6.30	6.30	6.30
Cumulative ROI	0.26	0.61	1.07	1.63	7.93	14.24	20.54	26.85	33.15	39.45

- Industrial Engineering

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Annual ROI	0.43	0.50	0.59	0.68	6.31	6.31	6.31	6.31	6.31	6.31
Cumulative ROI	0.43	0.93	1.51	2.19	8.50	14.81	21.12	27.43	33.73	40.04