

# Hispanic-Serving Institutions Program Activity Budget Detail Form

**INSTRUCTIONS:** ALL applicants must complete and submit this form. You may copy or recreate this form, but do not amend or modify the required information or format. Upon completion, attach this document as a .doc, .rtf or .pdf into Part III of the "HSI Activity Budget Narrative Form" in the e-Application package.

<b>Activity Budget (To be completed for every activity for which funding is requested)</b>												
<b>1. Name of Institution:</b> California State University Bakersfield (lead institution), Bakersfield College (community college partner)		<b>2. Activity Title:</b> Increasing the Productivity of the Engineering Degree Pipeline in the High Needs Southern San Joaquin Valley: A Sound Cooperative Arrangement Project with Bakersfield College										
<b>3. Budget Categories By Year</b>		<b>First Year</b>		<b>Second Year</b>		<b>Third Year</b>		<b>Fourth Year</b>		<b>Fifth Year</b>		<b>Total Funds Requested</b>
Object Class	a. Personnel (Position Title)	% of Time	Funds Requested	% Of Time	Funds Requested	% Of Time	Funds Requested	% Of Time	Funds Requested	% Of Time	Funds Requested	Funds Requested
	Project Director	100%	\$85,000	100%	\$86,700	100%	\$88,434	100%	\$90,203	100%	\$92,007	\$442,343
	Engineering Coordinator	50%	\$42,500	50%	\$43,350	50%	\$44,217	50%	\$45,101	50%	\$46,003	\$221,172
	Project Assistant	100%	\$38,000	100%	\$38,760	100%	\$39,535	100%	\$40,326	100%	\$41,132	\$197,754
	Engr Student Support Services Specialist	50%	\$32,500	40%	\$26,520	30%	\$20,288	25%	\$17,245	25%	\$17,590	\$114,142
	Liberal Engr Curriculum Specialist	50%	\$38,500	40%	\$31,416	40%	\$32,044	25%	\$20,428	25%	\$20,837	\$143,225
	Engr Transfer/Articulation Advisor	50%	\$26,000	50%	\$26,520	50%	\$27,050	50%	\$27,591	50%	\$28,143	\$135,305
	Data Analysis Specialist/Researcher	50%	\$26,000	50%	\$26,520	50%	\$27,050	50%	\$27,591	50%	\$28,143	\$135,305
	<b>BC</b>											
	Partner Project Lead	15%	\$0	15%	\$0	15%	\$0	15%	\$0	15%	\$0	\$0
	Engineering Liaison	50%	\$30,000	50%	\$30,600	50%	\$31,212	50%	\$31,836	50%	\$32,473	\$156,121
	Faculty Release	10%	\$5,000	10%	\$5,100	10%	\$5,202	10%	\$5,306	10%	\$5,412	\$26,020
	<b>SUB-TOTAL</b>		\$323,500		\$315,486		\$315,033		\$305,628		\$311,740	\$1,571,387
	b. Fringe Benefits 30%		\$97,050		\$94,646		\$94,510		\$91,688		\$93,522	\$471,416
	c. Travel		\$9,000		\$9,000		\$9,000		\$9,000		\$9,000	\$45,000
	d. Equipment		\$0		\$165,867		\$159,081		\$149,336		\$152,424	\$626,708
	e. Supplies		\$185,446		\$29,986		\$33,357		\$43,147		\$30,241	\$322,177
	f. Contractual		\$0		\$0		\$0		\$0		\$0	\$0
	g. Construction		\$0		\$0		\$0		\$0		\$0	\$0
	h. Other (non-endowment)		\$35,000		\$35,000		\$39,000		\$51,000		\$53,000	\$213,000
	<b>i. TOTAL DIRECT CHARGES</b>		\$649,996		\$649,985		\$649,981		\$649,799		\$649,927	\$3,249,688

**4. Explain in detail how you arrived at the total amount requested in each object class in each year of the activity. If you fail to provide sufficient details, we may disallow costs.**

**a. Personnel**

Personnel positions will be filled with experienced faculty and staff at CSUB and BC where possible to ensure success of the project. When possible, reassigned costs for these individuals in their current position are requested. A 2% Cost of Living Adjustment is built in for all personnel positions. Because the project focuses on developing a highly structured degree pathway in Engineering, it is critical to have personnel who are experienced in service and program development directly related to STEM fields. Further, because the project is fully staff- and faculty-driven, it is critical to the success of the project that all project developers are well-qualified in their fields, able to work well together as a team and have leadership skills and experience in developing programs and services while having compassion in working with diverse students. We plan to select well-qualified faculty/staff wherever possible and release them to fill each Key position to ensure this complex project remains on schedule in meeting all project objectives. **(See detailed cost breakdown for all Personnel in the Activity Budget form above.)** Following standard selection/hiring process for CSUB and BC, all additional project positions will be filled with qualified individuals with relevant experience/appropriate credentials; qualified replacements found as needed to ensure continued operations (hiring/replacement process for project personnel will begin with grant award notification in order to begin project on schedule). No supplanting will occur with grant funds. Every effort will be made to fill positions with Hispanics whenever possible.

**CSUB-Project Director (Years 1 – 5 @100% Time):** Dr. Talamantes will be the overall lead in this project. Dr. Talamantes is a Physics and Engineering professor at the School of Natural Science, Mathematics, and Engineering (NSME) where the project will be housed. Working with the Dean of NSME, Dr. Anne Houtman, an experienced educator and higher education leader they developed the vision for an engineering pathway that uses an innovative approach to teaching, incorporates continuous assessment that informs changes for improvement, reduces costs through increased productivity, and engages community colleges and industry and community in order to address a huge local problem: the lack of local STEM talent. The product of this vision is the development of the CSUB Power/Energy Engineering pathway. No other person is better qualified to lead this project. His contributions to the university, along with his exceptional style of leadership combined with his expertise in issues affecting Hispanic student success makes him the most qualified person to lead this project. He will be assisted by the Engineering Coordinator, Dr. Danforth, who currently leads the Computer Engineering track with tremendous success. Full details of Dr. Talamantes' qualifications and role/responsibilities are listed in the Key Personnel, Implementation and Management Plans.

Yr 1: \$85,000	2: \$86,700	3: \$88,434	4: \$90,203	5: \$92,007
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**CSUB-Engineering Coordinator (Dr. Danforth (Years 1 – 5 @ 50% time):** Replacement cost for Dr. Melissa Danforth are requested. She will be serving as the Engineering Coordinator and be part of the management team that will lead this project. She will be released at 50% of her time to ensure this large and complicated project stays on track in meeting all project objectives while staying within budget; she will also provide leadership for all components. Dr. Danforth has extensive experience managing NSF and Title V/STEM grants. Her qualifications include extensive experience in education research, computer science/engineering track development and she is especially qualified to address issues affecting Hispanic, women, and other underrepresented students' success in higher education. Other responsibilities will include the promotion, organization, and coordination of the synergistic activities between CSUB and BC faculty to ensure curriculum alignment and articulation. (see Key Personnel, Implementation Plan and Management Plan for qualifications and roles/responsibilities.)

Dr. Danforth: Yr 1: \$42,500	2: \$43,350	3: \$44,217	4: \$45,101	5: \$46,003
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**CSUB-Project Assistant (Years 1 – 5 @ 100% Time):** Funding is requested for well-qualified grant management assistance to assist the Project management team in record-keeping, project implementation, budget monitoring, performance reporting and related project activities. **Qualifications:** Associate degree or higher, experience assisting a multicultural population, paid work in an educational setting preferred, ability to prioritize time, identify persons who should be referred to other campus services, ability to efficiently use various computer software application programs and operate other audio-visual equipment, proofreading and good composition, grammar, and punctuation skills are necessary, ability to understand reporting requirements, produce accurate, technical information in a grammatically correct, attractive, and printed form.

Yr 1: \$38,000	2: \$38,760	3: \$39,535	4: \$40,326	5: \$41,132
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**CSUB-Engineering Student Support Services Specialist (Years 1 @ 50%; 2-40%; 3-40%; 4-25%; 5-25%):** A highly qualified professional with experience in engineering curriculum and learning design (preferably a PhD in engineering education), is needed to lead the transformation of engineering education services at CSUB. The ideal candidate will be well informed in engineering education teaching and learning methodologies as recommended by NAE and ASEE. This person will be responsible for working with engineering faculty and CSUB student services leaders and service providers to develop support services for students that are fully integrated with the pathway curriculum, including learning assistance and Supplemental Instruction. S/he will also work with CSUB Information Technology Services to develop IHeLP the online services program that will be an important pathway feature. Recognizing the importance of this position, the university will assume part of the cost each year, reducing thus the cost to the grant to 25% by year 5 with the intent to fully institutionalize it after year 5.

Yr 1: \$32,500	2: \$26,520	3: \$20,288	4: \$17,245	5: \$17,590
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**CSUB-Liberal Engineering Curriculum Specialist (Years 1@ 100%; 2-75%; 3-50%; 4-25%; 5-25%):** Funds are requested for a person with specialization in Engineering curriculum development preferably with previous experience in energy engineering. The ideal candidate will have a PhD in energy engineering or other related area. The recruitment and hiring process will follow state standards that ensure equal employment opportunity for all applicants, but efforts will be made to advertise in Hispanic publications as well as consult Hispanic organizations such as HACU. The LECS's funding will be reduced by 25% each year reaching institutionalization after year 5. The developer will collaborate closely with course instructors in choosing the best possible pedagogy applications within the liberal engineering framework.

Yr 1: \$38,500	2: \$31,416	3: \$32,044	4: \$20,428	5: \$20,837
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**CSUB-Engineering Transfer/Articulation Developer (Years 1-5@ 50%):** In 2008, Vincent Tinto declared that Access without Support is Not Opportunity. National research on barriers that prevent Latino students to succeed has shown that campus support services are more important for Hispanic success than mere access. Funds are requested for a specialist to develop culturally sensitive efforts designed to guide Hispanics entering engineering majors. These efforts include: (1) Collaboration with the Liberal Engineering Student Support Services Specialist to target community college and high school students in order to assess their preparation and readiness for college work; (2) Monitor and analyze data from the Early Assessment Program and coordinate intervention programs to assist high school students in raising their college readiness; (3) Collaboration with the BC MESA director and Local Coordinator to align student success activities for prospective community college STEM transfers; (4) Assist students in developing an Educational Plan and monitor their progress in following the plan; (5) Develop an Early Alert program for students that show signs of failure early in the semester (Intrusive Counseling); and (6) Work closely with

NSME faculty to raise their awareness in factors that affect Hispanic students' success and campus engagement.

Yr 1(50%): \$26,000	2 (50%): \$26,520	3 (50%): \$27,050	4 (50%): \$27,591	5 (50%): \$28,143
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**CSUB-Data Analysis/Researcher (Years 1-5 @ 50%):** The project's success hinges upon a solid development and evaluation plan. The project will be continuously evaluated in order to monitor student success and accomplishments. Data collection and analysis will be critical in informing a continuous improvement process. For such an intensive data-based project, a specialist with experience in education statistics is necessary to assist faculty with collection, analysis, and the establishment of benchmarks for tracking student outcomes for further improvement of the project. This person will also develop a student database for tracking purposes and use for longitudinal data analysis.

Yr 1(50%): \$26,000	2 (50%): \$26,520	3 (50%): \$27,050	4 (50%): \$27,591	5 (50%): \$28,143
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**BC – Partner Project Lead (Years 1-5 @15%):** BC Engineering Professor M. Elizabeth Rozell will dedicate at least 15% of her time coordinating BC's activities in the liberal engineering project. Professor Rozell currently serves as the Interim Dean of Instruction with supervisory responsibilities for the Mathematics, Science, and Engineering departments. Her responsibilities as the Partner Project Director will include the continuous development and maintenance of the engineering student pipeline from BC to CSUB. She already has a great working relationship with Dr. Talamantes (Lead Project Director). Her experience as an engineering faculty advisor at BC gives her the right qualifications to liaise with the CSUB Transfer/Articulation Developer to ensure a seamless transition of engineering students from BC to CSUB. She has had several academic leadership roles and was formerly the Director of the BC Engineering Program. Professor Rozell was responsible for attracting the MESA Program to Bakersfield College, served as the Director for two years, and remains actively involved as the faculty advisor. Throughout her career Professor Rozell has actively engaged in promoting mathematics and engineering among underrepresented students. Her role includes: coordinating/implementation of all BC strategies, working closely with CSUB/BC Project management team and other CSUB/BC key leaders and project personnel; Establishing policies and procedures for project oversight/meeting schedule at BC; Participation in all regular meetings with CSUB/BC Project Directors and Coordinator and other CSUB/BC personnel as needed; Ensure institutional integration and support for all project components to be implemented; Supervise and serve as resource person to other project staff; Provide leadership/encourage participation of BC faculty members in all project components. Professor Rozell will be responsible to communicate directly with the BC president Dr. Sonya Christian as a member of the BC Administrative Council.

Yr 1: No Cost	2: No Cost	3: No Cost	4: No Cost	5: No Cost
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**BC-Engineering Liaison (Years 1-5@50%):** A highly qualified person with STEM background and preferably Hispanic will be hired or reassigned from the existing staff pool at BC. The EL will develop articulation, outreach and student services for identified BC students with interest in Power/Energy engineering degrees. He/She will liaise with Counseling for student advisement and facilitate faculty and student communications. This person will communicate regularly with the CSUB Transfer/Articulation Advisor to identify transfer issues and coordinate solutions with other faculty and staff at the two institutions.

Yr 1: \$30,000	2: \$30,600	3: \$31,212	4: \$31,836	5: \$32,473
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**BC-Faculty Release (Years 1-5 @ 10% of full time equivalent):** Funds for stipends and other compensation for extra assignments are requested for BC faculty who have essential roles in the project. They will work closely with CSUB faculty to align the engineering curricula and redesign existing courses and laboratories. BC faculty will also receive training to develop student outcomes that align with national ABET accreditation standards. BC faculty will also undergo training in cultural sensitivity with emphasis in learning styles for Hispanic and other minorities that have been proven in helping students overcome cultural barriers. They will assist in developing IHeLP strategies for BC pathway students.

Yr 1: \$5,000	2: \$5,100	3: \$5,202	4: \$5,306	5: \$5,412
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**b. Fringe Benefits (\$471,416 over 5 years (CSUB: \$416,774 – BC: \$54,642)**

Fringe benefits are calculated on the basis of Federal and State laws and College/University agreements with staff. Fringe benefits are calculated at an average rate of 30% for all employees. The breakdown includes: FICA; Worker’s Compensation; Retirement; and Health Insurance.

Yr 1: \$97,050	2: \$94,646	3: \$94,510	4: \$91,688	5: \$93,522
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**c. Travel (\$40,00 over five years)**

Minimal funds (\$9,000 per year) are requested to support costs associated with faculty and staff participation in off-campus training in current best practices and site visits to model programs. Funds to cover travel expenses of the CSUB management team and the BC local coordinator to attend the annual project director’s meeting in Washington DC.

Yr 1: \$8,000	2: \$8,000	3: \$8,000	4: \$8,000	5: \$8,000
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**d. Equipment: (CSUB-\$626,708 for five years: BC-\$0).** The development of the Power/Energy Engineering pathway proposed in this project was conceived and finalized after consulting extensively with local industry, community as well as other universities with similar degrees such as Olin College, UC Davis, and UC Berkeley. After identifying the core curriculum, we contacted US Didactic (52 Riley Road - Suite 371 - Celebration, FL 34747 Phone: 888-440-5227) and requested quotes on equipment and supplies to equip the necessary laboratories. We were able to secure discounts of 35% to 40% on all items.

Additional quotes for supplies for the electrical engineering labs at CSUB and BC were obtained from Agilent Technologies a leader in testing and measurement equipment. In order to compare prices we also requested quotes for Textronix Inc. but we decide to go with Agilent because of the cost savings as well as adaptability.

Quotes for the physics and chemistry labs at BC were obtained by two vendors: Vernier Software Inc. (13979 SW Millikan Way Beaverton,

OR 97005-2886) and Pasco Scientific (10101 Foothills Blvd., Roseville, CA 95747 USA). After careful consideration, the faculty chose to accept the Vernier quote because it fit the Active Learning curricula in physics and chemistry better.

The following table shows a conceptual map for the development of the necessary labs in support of the development of the Power/Energy Engineering pathway at CSUB. The development of the physics, chemistry, and engineering laboratories at BC is strategically placed in their respective years in order to streamline and expedite transfer. The table provides a snapshot of the rationale used to justify the need for the requested equipment (this section) and supplies (section e) in this form. **Note** that the IHeLP program will use existing IT resources at CSUB.

<b>Concept Map For the Development of the Power/Energy Engineering Pathway</b>			
<b>Lead Institution: CSU Bakersfield</b>		<b>Partner Institution: Bakersfield College</b>	
<b>Power/Energy Engineering Pathway Development</b>		<b>Science/Math Curriculum</b>	<b>Engineering Curriculum</b>
<b>Year One</b>	Development of Engineering Fundamentals Laboratory (Freshman Curriculum)	1. Physics Laboratory 2. Technology Investment for Active Learning Curriculum	
<b>Year Two</b>	Fluid Mechanics Laboratory (Sophomore/Junior Curriculum)	1. Chemistry Laboratory 2. Technology Investment for Active Learning Curriculum	
	Thermodynamics Laboratory (Sophomore/Junior Curriculum)		
<b>Year Three</b>	Power Machines/Renewable Energy Engineering Laboratory (Junior Curriculum)		Introductory Engineering Laboratory (AC/DC Circuits)
<b>Year Four</b>	Electrical Engineering Laboratory (Junior/Senior Curriculum)	STEM Smart Classroom (Infusion of Tablet Technology in Support of Active Learning Collaborative Methods in STEM)	
<b>Year Five</b>	Power/Energy Engineering Training Lab (Senior Curriculum and Senior Projects)		Engineering 2D/3D Design Laboratory
	Advanced Materials/Thermal Laboratory (Senior Curriculum and Senior Projects)		
	Advanced Energy Conversion Laboratory (Senior Curriculum and Senior Projects)		

**Year One 2015-2016 Equipment**

**Lead Institution: CSU Bakersfield**

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**Partner Institution: Bakersfield College**

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**Grand Total Year One Equipment**

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**Year Two 2016-2017 Equipment**

**Lead Institution: CSU Bakersfield**

**Fluid Mechanics Sophomore/Junior Lab**

<b>Qty</b>	<b>Description</b>	<b>Model No.</b>	<b>Unit Price</b>	<b>Ext. Price</b>	<b>Discount (35%)</b>	<b>Final Price</b>
1	Basic Hydraulics Bench	HM 150	\$11,821.94	\$11,821.94	\$4,137.68	\$7,684.26
1	Pipe Friction Apparatus	HM 150.01	\$6,297.33	\$6,297.33	\$2,204.07	\$4,093.26
1	Hydrostatic Pressure Apparatus	HM 150.05	\$3,130.42	\$3,130.42	\$1,095.65	\$2,034.77
1	Bernulli's principle demonstrator	HM 150.7	\$5,342.42	\$5,342.42	\$1,869.85	\$3,472.57
1	Flow Visualization Apparatus	HM 150.10	\$11,417.33	\$11,417.33	\$3,996.07	\$7,421.26
1	Fluid friction apparatus	HM 150.11	\$20,642.79	\$20,642.79	\$7,224.98	\$13,417.81
1	Methods of Flow Measurement	HM 150.13	\$8,213.92	\$8,213.92	\$2,874.87	\$5,339.05
1	Osborne Reynolds Demonstrator	HM 150.18	\$6,041.79	\$6,041.79	\$2,114.63	\$3,927.16
1	Demonstration Pelton Turbine	HM 150.19	\$9,847.56	\$9,847.56	\$3,446.65	\$6,400.91
1	Losses in Bends and Fittings	HM 150.29	\$7,909.69	\$7,909.69	\$2,768.39	\$5,141.30
	<b>Sub Total</b>		<b>\$90,665.19</b>	<b>\$90,665.19</b>	<b>\$31,732.82</b>	<b>\$58,932.37</b>

**Thermodynamics Sophomore/Junior Lab**

<b>Qty</b>	<b>Description</b>	<b>Model No.</b>	<b>Unit Price</b>	<b>Ext. Price</b>	<b>Discount (35%)</b>	<b>Final Price</b>
1	Heat Exchanger Service Unit	WL 110	\$27,625.31	\$27,625.31	\$9,668.86	\$17,956.45
1	Plate Heat Exchanger	WL 110.02	\$9,187.42	\$9,187.42	\$3,215.60	\$5,971.82
1	Shell & Tube Exchanger	WL 110.03	\$8,953.17	\$8,953.17	\$3,133.61	\$5,819.56
1	Jacketed Vessel with Stirrer & Coil	WL 110.04	\$15,548.63	\$15,548.63	\$5,442.02	\$10,106.61
1	Methods of Temperature Measurement	WL 202	\$25,901.00	\$25,901.00	\$9,065.35	\$16,835.65
1	Free and Forced Convection Unit / Data	WL 352	\$42,000.00	\$42,000.00	\$14,700.00	\$27,300.00

Acquisition						
Thermal Radiation Unit with Data		WL 362	\$35,300.00	\$35,300.00	\$12,355.00	\$22,945.00
1 Acquisition					\$57,580.44	<b>106,935.09</b>
<b>Sub Total</b>			<b>\$164,515.53</b>	<b>\$164,515.53</b>		<b>\$165,867.47</b>

**Lead Institution Year Two Equipment**

**Partner Institution: Bakersfield College**  
No Equipment

\$-  
**\$196,455.20**

**Grand Total Year Two Equipment**

**Year Three 2017-2018 Equipment**

**Lead Institution: CSU Bakersfield**

**Power/Energy Engineering Lab (Junior/Senior)**

<b>Qty</b>	<b>Description</b>	<b>Model No.</b>	<b>Unit Price</b>	<b>Ext. Price</b>	<b>Discount (35%)</b>	<b>Final Price</b>
1	Synchronous Generator (1kW), with Control & Synchronizing Circuits	EUG	\$63,298.89	\$63,298.89	\$22,154.61	\$41,144.28
1	Generator Protection (EUG Required)	EGP_ADD	\$33,501.43	\$33,501.43	\$11,725.50	\$21,775.93
1	Advanced Photovoltaics Trainer	EPH2	\$36,505.85	\$36,505.85	\$12,777.05	\$23,728.80
1	Wind Power Plants with WindSIM	EWG1	\$56,863.58	\$56,863.58	\$19,902.25	\$36,961.33
1	Advanced Fuel Cell Trainer - Basic Equipment Set & Accessories	EHY 1 EXP	\$27,070.25	\$27,070.25	\$9,474.59	\$17,595.66
1	Electrolyzer, 30 liter/hour (1.06 cubic feet/h, 7.93 gallons/h) nominal	EHY 1 ETZ	\$27,500.23	\$27,500.23	\$9,625.08	\$17,875.15
<b>Sub Total</b>			<b>\$244,740.23</b>	<b>\$244,740.23</b>	<b>\$85,659.08</b>	<b>\$159,081.15</b>

**Lead Institution Year Three Equipment**

**Partner Institution: Bakersfield College**  
No equipment

\$-  
**\$159,081.15**

**Grand Total Year Three Equipment**

**Year Four 2018-2019 Equipment**

**Lead Institution: CSU Bakersfield**

**Electrical Engineering Lab (Junior/Senior)**

<b>Qty</b>	<b>Description</b>	<b>Model</b>	<b>No.</b>	<b>Unit Price</b>	<b>Ext. Price</b>	<b>Discount (35%)</b>	<b>Final Price</b>
1	Investigations on a Transformer	EUT		\$19,339.46	\$19,339.46	\$6,768.81	\$12,570.65
1	Transformer Protection; EUT Set Required	ETP		\$17,196.83	\$17,196.83	\$6,018.89	\$11,177.94
1	EUL Power Transmission Lines (EUL 4 Requires EUG)	EUL		\$29,656.08	\$29,656.08	\$10,379.63	\$19,276.45
1	Overcurrent Time Protection for Lines	ELP 1		\$8,834.52	\$8,834.52	\$3,092.08	\$5,742.44
1	Directional Overcurrent Time Protection for Lines	ELP 2		\$11,161.79	\$11,161.79	\$3,906.63	\$7,255.16
1	Overvoltage and Undervoltage Protection	ELP 3		\$5,853.17	\$5,853.17	\$2,048.61	\$3,804.56
1	Directional Power Relays	ELP 4		\$6,276.04	\$6,276.04	\$2,196.61	\$4,079.43
1	Protection for Parallel Lines	ELP 6		\$21,754.02	\$21,754.02	\$7,613.91	\$14,140.11
1	High-Speed Distance Protection	ELP 7		\$34,906.48	\$34,906.48	\$12,217.27	\$22,689.21
	Electric Power Distribution - Three-Phase Double Busbar System	EPD		\$20,869.67	\$20,869.67	\$7,304.38	\$13,565.29
1	Overcurrent Protection for Double Busbars (EPD Required)	EDP		\$31,933.83	\$31,933.83	\$11,176.84	\$20,756.99
	Intelligent Networks Pack - Smart Grid SCADA Software for PowerLab Designer, Instrumentation, and Power switch	ENET		\$21,965.48	\$21,965.48	\$7,687.92	\$14,277.56
	<b>Sub Total</b>			<b>\$229,747.37</b>	<b>\$229,747.37</b>	<b>\$80,411.58</b>	<b>\$149,335.79</b>

**Lead Institution Year Four Equipment**

**Partner Institution: Bakersfield College**

No equipment

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**Grand Total Year Four Equipment**

**\$149,335.79**

**Year Five 2019-2020 Equipment**

**Lead Institution: CSU Bakersfield**

**Materials/Thermal Lab**

<b>Qty</b>	<b>Description</b>	<b>Model No.</b>	<b>Unit Price</b>	<b>Ext. Price</b>	<b>Discount (40%)</b>	<b>Final Price</b>
1	Transmitted Light Polaroscope Set of 5 Photoelastic Models with	FL 200	\$7,367.85	\$7,367.85	\$2,947.14	\$4,420.71
1	Clamping Elements	FL 200.01	\$1,880.06	\$1,880.06	\$752.02	\$1,128.04
1	Photoelastic Model Simultaneous Testing of Notches,	FL 200.04	\$5,482.02	\$5,482.02	\$2,192.81	\$3,289.21
1	Universal Material Tester, 20 kN	WP 300	\$11,344.31	\$11,344.31	\$4,537.72	\$6,806.59
1	Data Acquisition Option	WP 300.20	\$5,475.94	\$5,475.94	\$2,190.38	\$3,285.56
1	Torsion Testing Machine, 200 Nm, Motor Driven	WP 510	\$20,309.46	\$20,309.46	\$8,123.78	\$12,185.68
1	5 Torsion Test Rods, Steel	WP 510.01	\$212.96	\$212.96	\$85.18	\$127.78
1	5 Torsion Test Rods, Brass	WP 510.02	\$212.96	\$212.96	\$85.18	\$127.78
1	5 Torsion Test Rods, aluminum	WP 510.03	\$212.96	\$212.96	\$85.18	\$127.78
1	<b>Sub Total</b>		<b>\$52,498.52</b>	<b>\$52,498.52</b>	<b>\$20,999.41</b>	<b>\$31,499.11</b>

**Energy Conversion Lab**

<b>Qty</b>	<b>Description</b>	<b>Model No.</b>	<b>Unit Price</b>	<b>Ext. Price</b>	<b>Discount (40%)</b>	<b>Final Price</b>
1	Gas Turbine (Two Shaft & Jet Engine Configurations)	ET 792	\$51,093.29	\$51,093.29	\$20,437.32	\$30,655.97
1	Four-Stroke Biodiesel Engine	CT 100.24	\$15,268.73	\$15,268.73	\$6,107.49	\$9,161.24
1	Four-Stroke Petrol Engine	CT 100.20	\$9,896.23	\$9,896.23	\$3,958.49	\$5,937.74
1	CT 110 Modification - BioDiesel	CT 110.BD	\$7,149.15	\$7,149.15	\$2,859.66	\$4,289.49
1	Spark Plug Pressure Transducer Test Stand for Single Cylinder Engines,	CT 100.14	\$10,672.00	\$10,672.00	\$4,268.80	\$6,403.20
1	7.5kW with Data Acquisition Electronic Engine Indicating System for CT	CT 110	\$21,964.89	\$21,964.89	\$8,785.96	\$13,178.93
1	110 Pressure Transducer for CT100.22 CT	CT 100.13	\$16,473.44	\$16,473.44	\$6,589.38	\$9,884.06
1	100.24	CT 100.16	\$10,123.13	\$10,123.13	\$4,049.25	\$6,073.88
1	Exhaust Gas Analyzing Unit	CT 159.02	\$12,650.29	\$12,650.29	\$5,060.12	\$7,590.17

<b>Sub Total</b>						
			<b>\$155,291.15</b>	<b>\$155,291.15</b>	<b>\$62,116.46</b>	<b>\$93,174.69</b>
<b>Power/Electrical Engineering Training Lab</b>						
<b>Qty</b>	<b>Description</b>	<b>Model No.</b>	<b>Unit Price</b>	<b>Ext. Price</b>	<b>Discount (35%)</b>	<b>Final Price</b>
5	UniTrain-I Interface with virtual instruments (Basic Labsoft VI); incl.LabVIEW Drivers	SO4203-2A	\$4,441.15	\$22,205.75	\$7,772.01	\$14,433.74
12	UniTrain-I Experimenter	SO4203-2B	\$723.65	\$8,683.80	\$3,039.33	\$5,644.47
5	UniTrain-I Extended three-phase power supply	SO4203-2D	\$1,168.21	\$5,841.05	\$2,044.37	\$3,796.68
5	UniTrain-I Measurement accessories, shunts and connection cables	SO4203-2J	\$483.71	\$2,418.55	\$846.49	\$1,572.06
5	UniTrain-I Storage case for one system	SO4201-2Y	\$708.83	\$3,544.15	\$1,240.45	\$2,303.70
	<b>Subtotal</b>			<b>\$42,693.30</b>	<b>\$14,942.66</b>	<b>\$27,750.65</b>
	<b>Lead Institution Year Five Equipment</b>					<b>\$152,424.45</b>
	<b>Partner Institution: Bakersfield College</b>					<b>\$-</b>
	No equipment					<b>\$152,424.45</b>

**e. Supplies (\$323,019 over five years (CSUB: \$185,124 – BC: \$137,053):**

Funds are requested each year for the development of the necessary laboratory facilities and equipment that will support the Power/Energy Engineering curriculum. Funds will also be used for professional development, instructional, information systems, assessment, tutorial and outreach supplies. Funds will also support the purchase of computers and supplies needed for the development of the smart classrooms at BC. (items with a unit cost of less than \$5,000). Projected costs include:

**Year One 2015-2016 Supplies**

**Lead Institution: CSU Bakersfield**

**Engineering Fundamentals (AC/DC Circuits/Power Electronics)**

<b>Qty</b>	<b>Description</b>	<b>Model No.</b>	<b>Unit Price</b>	<b>Ext. Price</b>	<b>Discount (35%)</b>	<b>Final Price</b>
8	Semiconductor Components	SO4204-5A	\$1,448.45	\$11,587.60	\$4,055.66	\$7,531.94
8	Transistor Multivibrators	SO4204-5D	\$1,956.54	\$15,652.32	\$5,478.31	\$10,174.01
8	Amplifier Technology	SO4204-5H	\$2,227.04	\$17,816.32	\$6,235.71	\$11,580.61
8	Field Effect Transistors	SO4204-5K	\$766.63	\$6,133.04	\$2,146.56	\$3,986.48
8	Op-Amps	SO4204-5M	\$1,712.75	\$13,702.00	\$4,795.70	\$8,906.30
8	Gates and Flips Flops	SO4204-6A	\$1,752.29	\$14,018.32	\$4,906.41	\$9,111.91
8	Sequential Circuits	SO4204-6C	\$2,199.50	\$17,596.00	\$6,158.60	\$11,437.40
8	Application Circuits	SO4204-6E	\$1,654.96	\$13,239.68	\$4,633.89	\$8,605.79
8	Converter Circuits	SO4204-6F	\$4,193.85	\$33,550.80	\$11,742.78	\$21,808.02
8	Power Semiconductor Devices	SO4204-5P	\$1,079.98	\$8,639.84	\$3,023.94	\$5,615.90
8	Power Supply Circuits	SO4204-5R	\$2,312.46	\$18,499.68	\$6,474.89	\$12,024.79
8	Switched Mode Power Supplies	SO4204-5S	\$1,797.94	\$14,383.52	\$5,034.23	\$9,349.29
8	Transients in DC and AC Networks	SO4204-3B	\$1,983.50	\$15,868.00	\$5,553.80	\$10,314.20
8	3-Phase Power Converters	SO4204-7N	\$4,105.48	\$32,843.84	\$11,495.34	\$21,348.50
8	Frequency Converter Drives	SO4204-7P	\$2,483.60	\$19,868.80	\$6,954.08	\$12,914.72
	<b>Sub Total</b>			<b>\$253,399.76</b>	<b>\$88,689.92</b>	<b>\$164,709.84</b>

**Lead Institution YEAR ONE Total Supplies**

**\$164,708.84**

**Partner Institution: Bakersfield College**

**Introductory Physics Laboratory Upgrades**

8	Vernier Introductory physics bundle			\$1,418.00	\$11,344.00	\$11,344.00
8	Laptop Tablets HP TouchSmart tm2t			\$1,049.00	\$8,392.00	\$8,392.00
1	Student Outreach Supplies			\$1,000.00	\$1,000.00	\$1,000.00

**Partner Institution YEAR ONE Total Supplies**

**\$20,736.00**

**Grand Total Year One Supplies**

**\$185,445.84**

**Year Two 2016-2017 Supplies**

**Lead Institution: CSU Bakersfield**

Qty	Description	Model No.	Unit Price	Ext. Price	Discount (35%)	Final Price
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No supplies for year two (See Equipment Table)

**Lead Institution Year Two Total Supplies**

**\$-**

**Partner Institution: Bakersfield College**

**Introductory Chemistry Laboratory Upgrades**

Qty	Description	Model No.	Unit Price	Ext. Price	Discount (35%)	Final Price
7	Vernier Introductory Chemistry bundle		\$1,619.00	\$11,333.00		\$11,333.00
7	Laptop Tablets HP TouchSmart tm2t		\$1,049.00	\$7,343.00		\$7,343.00
7	OHAUS Chemistry Balances		\$849.50	\$5,946.50		\$5,946.50
7	Chemistry Supplies Bundle		\$609.00	\$4,263.00		\$4,263.00
1	Student Outreach Supplies		\$1,100.00	\$1,100.00		\$1,100.00

**Partner Institution Year Two Total Supplies**

**\$29,985.50**

**Grand Total Year Two Supplies**

**\$29,985.50**

**Year Three 2017-2018 Supplies**

**Lead Institution: CSU Bakersfield**

Student Research Supplies and

1 Consumables

\$3,400.00

\$3,400.00

\$3,400.00

**Lead Institution Year Three Total Supplies**

**\$3,400.00**

**Partner Institution: Bakersfield College**

**Introductory Engineering Laboratory (DC/AC Circuits)**

<b>Qty</b>	<b>Description</b>	<b>Model No.</b>	<b>Unit Price</b>	<b>Ext. Price</b>	<b>Discount (35%)</b>	<b>Final Price</b>
7	Agilent Oscilloscopes (70Mhz, 2-channels)	DSOX2002A	\$1,238.00	\$8,666.00		\$8,666.00
7	Agilent Power Supplies (Dual output 30V, 5A)	U8002A	\$396.00	\$2,772.00		\$2,772.00
7	Agilent Electronic Instrumentation Training Kit	U3000A	\$200.00	\$1,400.00		\$1,400.00
7	Electronic Components bundle		\$465.00	\$3,255.00		\$3,255.00
7	Agilent Multimeters	U1272A	\$370.00	\$2,590.00		\$2,590.00
2	Instructor Laptop (HP TouchSmart tmt2)	Tmt2	\$1,049.00	\$2,098.00		\$2,098.00
24	Matlab Licenses	MTLB 2011	\$349.00	\$8,376.00		\$8,376.00
1	Student outreach materials		\$800.00	\$800.00		\$800.00
<b>Partner Institution Year Three Total Supplies</b>						<b>\$29,957.00</b>
<b>Grand Total Year Three Supplies</b>						<b>\$33,357.00</b>

**Year Four 2018-2019 Supplies**

**Lead Institution: CSU Bakersfield**

<b>Qty</b>	<b>Description</b>	<b>Model No.</b>	<b>Unit Price</b>	<b>Ext. Price</b>	<b>Discount (35%)</b>	<b>Final Price</b>
1	Student Project Supplies and Consumables		\$1,000.00	\$1,000.00		\$1,000.00
6	Agilent Oscilloscopes (70Mhz, 2-channels)	DSOX2002A	\$1,238.00	\$7,428.00		\$7,428.00
6	Agilent Power Supplies (Dual output 30V, 5A)	U8002A	\$396.00	\$2,376.00		\$2,376.00
6	Agilent Electronic Instrumentation Training Kit	U3000A	\$200.00	\$1,200.00		\$1,200.00
6	Electronic Components bundle		\$465.00	\$2,790.00		\$2,790.00
6	Agilent Multimeters	U1272A	\$370.00	\$2,220.00		\$2,220.00
<b>Lead Institution Year Four Total Supplies</b>						
						<b>\$17,014.00</b>

**Partner Institution: Bakersfield College**

**STEM Smart Classroom**

<b>Qty</b>	<b>Description</b>	<b>Model No.</b>	<b>Unit Price</b>	<b>Ext. Price</b>	<b>Discount (35%)</b>	<b>Final Price</b>
1	Instructor Laptop (HP TouchSmart tmt2)	tmt2	\$1,049.00	\$1,049.00		\$1,049.00
1	Instructor Podium with control panel (SmartDesks Inc.)		\$989.00	\$989.00		\$989.00
1	EXTRON Multimedia Control System		\$3,400.00	\$3,400.00		\$3,400.00
1	EPSON LCD Projector (XVGA, wireless)	Powerlite 915	\$1,099.00	\$1,099.00		\$1,099.00
1	Power Projector Screen		\$970.00	\$970.00		\$970.00
1	Installation Costs		\$1,850.00	\$1,850.00		\$1,850.00
12	Student HP Tablet Laptops		\$1,049.00	\$12,588.00		\$12,588.00
12	Mathematica Licenses (Math software)		\$349.00	\$4,188.00		\$4,188.00
<b>Partner Institution Year Four Total Supplies</b>						
						<b>\$26,133.00</b>
<b>Grand Total Year Four Supplies</b>						
						<b>\$43,147.00</b>

**Year Five 2019-2020 Supplies**

**Lead Institution: CSU Bakersfield**

<b>Qty</b>	<b>Description</b>	<b>Model No.</b>	<b>Unit Price</b>	<b>Ext. Price</b>	<b>Discount (35%)</b>	<b>Final Price</b>
	No supplies for Year Five (See equipment List)			\$-		\$-
<b>Lead Institution Year Five Total Supplies</b>						
				\$-		\$-

**Partner Institution: Bakersfield College**

**Engineering 2D/3D Design Classroom**

<b>Qty</b>	<b>Description</b>	<b>Model No.</b>	<b>Unit Price</b>	<b>Ext. Price</b>	<b>Discount (35%)</b>	<b>Final Price</b>
10	Instructor Laptop (HP TouchSmart tmt2)	tmt2	\$1,049.00	\$10,490.00		\$10,490.00
24	AutoCAD (with 2D and 3D modules)	ACD 2011	\$518.00	\$12,432.00		\$12,432.00
1	EXTRON Multimedia Control System		\$3,400.00	\$3,400.00		\$3,400.00
1	EPSON LCD Projector (XVGA, wireless)	Powerlite 915	\$1,099.00	\$1,099.00		\$1,099.00
1	Power Projector Screen		\$970.00	\$970.00		\$970.00
1	Installation Costs		\$1,850.00	\$1,850.00		\$1,850.00
<b>Partner Institution Year Five Total Supplies</b>						
						<b>\$30,241.00</b>
<b>Grand Total Year Five Supplies</b>						
						<b>\$30,241.00</b>

**f. Contractual:** No contractual funds are necessary.

**g. Endowment:** No endowment funds are requested.

**h. Other (\$213,000 over 5 years - CSUB: \$213,000-BC:\$0)**

**i.) External Evaluation (\$75,000 over five years):**

**Dr. Daniels, Director of CSUB Public Service Institute:** Dr. Daniels will be primarily responsible for overseeing implementation of the project evaluation plan which was informed by his Institute’s evaluation approach. He will work closely with the CSUB Activity Task Force and the CSUB IRPA to ensure that data collection and analysis meet the standards/objectives of the project and are appropriate to provide evidence for continuous improvement and efficacy of services. He will help develop all the tools and methods needed for longer-term evaluation relevant to the Title V Cooperative Arrangement project. He will provide objective detailed reports to the management team which include recommendations to improve the validity and value of evaluation as needed. He will assist in meeting all federal reporting requirements.

Yr 1: \$15,000	2: \$15,000	3: \$15,000	4: \$15,000	5: \$15,000
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**ii.) Tutors/Peer Mentors (\$59,000 over five years):** Minimal grant funds are requested each year to integrate mentoring and tutoring services into the new Engineering program at CSUB, the MESA and STEM program at BC, and Summer Bridge Academies for Project Lead the Way high school students. Funds will also be used to support the involvement of student mentors/tutors to pilot test improved project strategies and participate in training as needed. Minimal increases for years 3 through 5 are requested to serve the needs of students as enrollments increase.

Total: Yr 1: \$10,000	2: \$10,000	3: \$12,000	4: \$13,000	5: \$14,000
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**iii.) Research Apprentices (\$59,000 over five years):** Funds to employ CSUB upperclassmen as research apprentices to assist faculty in developing undergraduate research projects for the new pathway – a highly recommended high-intensity practice for underrepresented students. The RA’s will also assist other lower and upper division students during the performance of the collaborative laboratory activities. Minimal increases for years 3 through 5 are requested to serve the needs of pathway students as enrollments increase.

Yr 1: \$10,000	2: \$10,000	3: \$12,000	4: \$13,000	5: \$14,000
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**iv.) ABET Consultant (\$20,000 Yrs: 4-5).** ABET accreditation is critical for the eventual sustainability of the new program. The accreditation process is very rigorous but cannot begin before the program graduates its first student. According to the implementation plan, the first graduates are expected in year 4 of the grant at which time the ABET consultant will start working with CSUB officials to prepare the application. Grant funds (\$10,000 per year for Yrs 4-5) are requested to hire an experienced consultant who will advise CSUB during the accreditation process.

Yr 1: \$0	2: \$0	3: \$0	4: \$10,000	5: \$10,000
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