Program Summary

Thank you for the time and effort you put forth in your report. Through the USAP process, we are working to create a culture of continuous improvement; setting specific and measurable goals is an important step in the process of moving IPFW toward this culture of improvement. Part of this effort is getting individuals and units at IPFW to think differently about planning and the future. The work of Electrical and Computer Engineering is critical to IPFW and we greatly appreciate the time you spent on this significant endeavor. Thank you again for being part of this important initiative.

Criterion: #1: Mission - How does your unit support the mission of the university? This may include your mission and vision statements. (no more than 200 words)

**Question:** Mission - How does your unit support the mission of the university? This may include your mission and vision statements. (no more than 200 words)

The Department of Engineering will be split into 2 departments starting July 2015. This report corresponds to what is envisioned for the Electrical and Computer Engineering (ECE) department. The ECE department will host the undergraduate computer engineering (CmpE) and electrical engineering (EE) degree programs - as well as the master of science in engineering (MSE) degree program in the areas of computer, electrical, and systems engineering (SE). The current Mission Statement of the Department of Engineering will be revised to better represent the nature of the new ECE department.

The educational objectives of the undergraduate engineering programs have to comply with the requirements of the engineering accreditation board (ABET). They are aimed to describe the anticipated accomplishments of our graduates 3-5 years AFTER graduation. The objectives are to produce graduates who:

- Function and communicate effectively to solve technical problems.
- Advance professionally to roles of greater engineering responsibilities, and/or by transitioning into leadership position in business, government, and/or education.
- Participate in life-long learning through the successful completion of advanced degree(s), continuing education, and/or engineering certification(s)/licensure or other professional development.
- Demonstrate a commitment to community by applying technical skills and knowledge to support various service activities.

ABET requires that all these objectives be assessed continuously. Quantitative and qualitative data must be collected to show the achievement or not of these objectives as well as the measures taken to address any found weakness.

Criterion: #2: Accomplishments - Please list significant accomplishments from the last three years as they align with Plan 2020 goals

**Question:** I. Foster Student Success - Please list significant accomplishments from the last three years as they align with Plan 2020 goal area I: Foster student success.
• Number of Undergraduate CmpE and EE degrees
  2011-12: 8
  2012-13: 15
  2013-14: 29
  From those graduates, for the ones who are not enrolled in a full time graduate degree program, the employment rate in an engineering job is 100%

• Number of graduate degrees (MSE) in the areas of Computer, Electrical, and Systems engineering. The number in parenthesis is the total MSE degrees awarded, i.e. includes the mechanical engineering area.
  2011-12: 10 (11)
  2012-13: 13 (13)
  2013-14: 11 (13)
  From those graduates, for the ones who are not enrolled in a full time graduate degree program, the employment rate in an engineering job is 100%

• Number of senior design projects in the computer and electrical engineering areas as well as multidisciplinary (with the mechanical engineering program).
  2011: 2
  2012: 3
  2013: 8
  The majority of these projects are 100% funded by the local industry. The sponsors often hire some of the participating students when they complete their degree requirements. More information about the senior design projects can be found in the Department of Engineering website.

• Results from Fundamentals of Engineering (FE) Exam.
  This exam is the first of two examinations that engineers must pass in order to be licensed as a Professional Engineer in the state of Indiana. Students enrolled in their last year of an ABET-accredited engineering degree program are eligible to take this exam. The National Council of Examiners for Engineering and Surveying (NCEES) is the organization that administers this exam.
  Since 2011, 11 ECE seniors have taken the exam and 10 passed it (a passing rate of 91%). The NCEES website reports as 78% the pass rate for electrical and computer engineering majors from ABET accredited programs who took the exam within 12 months of graduation. Taking this exam is not a degree requirement for engineering students. Each student has to pay a fee of $225 to the NCEES in order to take the exam. Therefore mainly students from majors for which a state license is very important, e.g. civil engineering, mechanical engineering, take the exam.

• Sixty one undergraduate engineering degrees were awarded in the 2013-2014 AY. Twenty nine of those degrees were in Computer Engineering and Electrical Engineering. The Office of Institutional Research and Analysis was asked to find out how long it took for those students to graduate. The IR office can only track those students who started at IPFW. There is not enough information about those who transferred from other campuses and the ones who were re-admitted.
  Thirty four out of the sixty one students started at IPFW. From those 34, 25 graduated in 6 years or less, i.e. a graduation rate of 73%. Assuming that all the remainder 27 students (the ones that transferred or were re-admitted) took more than 6 years the graduation rate drops to 41%, which is still substantially higher than the overall 6 year graduation rate for IPFW (about 25%) and also higher than the 2020 Strategic Plan goal (30%).

• In 2013, the combined engineering (Civil, Computer, Electrical, and Mechanical) stop-out rate was 7.8% and for the freshman engineering the rate was 31.8%.

• In its 2015 rankings of the best colleges and universities in the United States the U.S. News and
World Report ranked IPFW as #1 in the northeast Indiana region and tied for #63 in the country for Best Undergraduate Engineering Programs at schools where no doctorate degrees are offered. IPFW outpaced the engineering programs at Taylor University (tied at #122), Trine University (also tied at #122), and the Indiana Institute of Technology (#142).

- In collaboration with the Coordinator of the Freshman Engineering program, Dr. Moor, and faculty members of the future Civil and Mechanical Engineering department the engineering courses of this program have been substantially overhauled to improve the success and retention rate of the students in that program. The new courses are being offered for the first time in the 2014-2015 AY. It is expected that in the coming semesters the ECE department will commit two experienced tenured faculty to teach in the freshman program. In the spring of 2015 Dr. Yanfei Liu and Dr. Pomalaza-Ráez, both with extensive experience in teaching freshman engineering courses, will teach all the sections of ENGR 128 – Engineering Fundamentals II. Details about the Freshman Engineering program can be found in the separate USAP report for that program.

**Question:** II. Creation of Knowledge - Please list significant accomplishments from the last three years as they align with Plan 2020 goal area II: Promote the Creation, Integration, and Application of Knowledge.

**Publications**
Publications by the faculty and students of the ECE department are listed below. Detailed information about these publications can be found in the Department of Engineering website. Many of the publications are the result of technical collaborations with engineering scholars and students from across the whole world.

**Books and Book Chapters**
- 2011: 3
- 2012: 1
- 2013: 3

**Refereed Journal Papers**
- 2011: 12
- 2012: 9
- 2013: 10

**Refereed Conference Papers**
- 2011: 12
- 2012: 21
- 2013: 18

**Question:** III. Regional Hub - Please list significant accomplishments from the last three years as they align with Plan 2020 goal area III: Serve as a Regional Intellectual, Cultural, and Economic Hub for Global Competitiveness.
External Research Grants from Federal Agencies and Local Industry

The research projects where the ECE faculty participated are listed below. Excluded from this list are sponsored projects conducted by Dr. Todor Cooklev (Center of Wireless Communications), Dr. David Cochran (Center of Systems Engineering) and Dr. Scott Moor (Freshman Program) since each is submitting a separate USAP report for their corresponding unit.

2011-12: $10,886 (PI: Dr. Eroglu - $8,690, PI: Dr. Eroglu - $2,196)
2012-13: $70,399 (PI: Dr. Eroglu, Co-PI: Dr. Pomalaza-Ráez - $42,940, PI: Dr. Eroglu - $21,880 and PI: Dr. Thompson - $5,579)
2013-14: $49,233 (PI: Dr. Eroglu- $29,690, PI: Dr. Thompson-$12,343, PI: Dr. Thompson - $7,200)
2014-December 2014: $138,697 (PI: Dr. Eroglu, Co-PI: Dr. Oloomi : $130,699, PI: Dr. Eroglu- $7998)

The dollar figures listed above were provided by the IPFW office of Research, Engagement, and Sponsored Programs and by the IPFW office of Institutional Research and Analysis.

It is worth to mention that in the summer of 2010 an NSF grant of $691,495 was awarded to support engineering graduate students in the areas of Wireless Communications and Systems Engineering (both areas are part of the new ECE department). This grant did not require any contribution from IPFW, i.e. the graduate students were supported 100% from the grant funds. It also explains the spike in the enrollment and degrees awarded by the MSE program during the period 2011-2013. ECE faculty members who secured that grant are Dr. Cooklev, Dr. Oloomi, and Dr. Pomalaza-Ráez.

Technical Regional Conferences and Workshops organized by faculty of the ECE department
2011
- IEEE Radio Frequency Workshop
2012
- Engineering Research & Design Conference
2013
- Engineering Research and Design Conference
- Energy Systems Un-Conference

Workshops for high school teachers and students
In 2012 these workshops were organized for high school teachers and students to increase the interest among high school students in STEM areas. This program was made possible thanks to an external grant funded by NASA INSGC and secured by Dr. Eroglu.

Question: IV. - Create a Stronger Univ - Please list significant accomplishments from the last three years as they align with Plan 2020 goal area IV: Create a Stronger University through Improving the Support of Stakeholders and the Quality and Efficiency of the Organization.
The Department of Engineering has had a steady growth in the number of majors and degrees granted for the last several years. With four different undergraduate engineering degrees, a graduate program in four engineering areas, and a freshman engineering program, the management and direction of the department had become unwieldy and lacking of focus. While these are all engineering programs, each program has a separate curricula and distinct philosophical differences. Moreover, increased demands for research productivity and industrial engagement have further taxed the department. Under the current structure, the only feasible management approach is to stay in “maintenance mode” – there is little time to explore opportunities for improvement, innovation, or growth. Up to now IPFW is the ONLY university in the US that has fours accredited engineering degrees being offered by a single department.

Through a comprehensive process that started in 2011 a proposal to split the department in two departments was approved by the IPFW administration in the spring of 2014. It should be noted that in 2012, on their last evaluation of the IPFW engineering program, ABET recommended that the computer and electrical engineering programs be separated from the civil and mechanical engineering programs as an independent department. Thus starting July 2015 there will be two engineering departments: the Department of Civil and Mechanical Engineering and the Department of Electrical and Computer Engineering. This realignment will group the more closely related programs that share portions of their curriculum. This type of division is not uncommon in institutions that have an engineering history and enrollment similar to IPFW. Two examples are the engineering programs at Purdue Calumet and the West Point Military Academy. The proposed departments will share the freshman engineering program and the graduate program.

Advantages of the new structure

- This restructuring will make the department more focused and nimble to effectively address issues such as recruitment, retention, funded research, and marketing.
- Separation into closely related programs provides better name recognition when compared to a generic “Department of Engineering.” This type of distinction will help attract students as well as faculty and future department chairs.
- This division will substantially increase the quality of the management of the programs in each department which will lead to better outcomes when the accreditation board reviews the programs.

**Question:** Other Accomplishments - Please list any other significant accomplishments from the last three years that do not align with Plan 2020.

N/A

**Criterion:** #3: Accreditations - Program specific accreditation and status

**Question:** Accreditations - What program-specific accreditations and status do you have, if any?
The undergraduate computer and electrical engineering programs are periodically evaluated by ABET. For the CmpE and EE programs the governing members of ABET are appointed by the Institute of Electrical and Electronic Engineers (IEEE), the world's largest association of technical professionals. To become a licensed professional engineer, one common prerequisite is graduation from an ABET accredited program. The same requirement is found in the industry when they hire engineers and in engineering graduate programs when they process applications.

It is then of extreme importance for the IPFW engineering programs to be accredited by ABET. To successfully renew the accredited status every engineering program must continuously assess its program and educational objectives and make the proper changes to keep pace with the fast changes in technology.

**Question:** Constraints/Benefits - How do these accreditations constrain or benefit the work of your unit, if applicable?

The benefits of having a continuous evaluation by ABET is that needed changes in the curriculum cannot be delayed, that laboratories and classrooms have to be continuously upgraded, and that an adequate number of full time faculty be maintained in order to properly deliver the curriculum. Given the current and near future budget constrains at IPFW it is going to take careful collaboration with the administration to have a successful accreditation review the next time ABET comes to IPFW (2016).

**Criterion:** #4: Laws and Mandates - Federal and state laws or mandates that your unit addresses

**Task Force:** N/A

**Question:** Federal and State Laws - What federal and/or state laws or mandates do you address, if any?

**Question:** Constraints/Benefits - How do these federal and state laws or mandates constrain or benefit the work of your unit?

**Criterion:** #5: Inefficiencies - Activities that you spend resources on inefficiently or in ways that do not support the mission.

**Question:** Inefficient use of resources - On what activities, if any, do you spend resources (money, time, people, etc.) inefficiently or in ways that do not support the mission of your unit or the university? List as many as apply.

Decisions that directly impact the quality of the delivery of the curriculum are often made without previous consultation with the people directly involved with students, i.e. the faculty. It is not uncommon to have academic administrators and personnel from a support unit to come up with decisions and solutions that will directly impact the teaching without first discussing that impact with the affected academic unit. A lot of time is wasted trying to correct wrong decisions when we find them out after the fact. In short, there is the need of more transparency, discussion, and collaboration when making any decision that will directly impact the quality of the education we are trying to provide.
Criterion:  #6: IR and Budget Review - Review of your department profile and budget

**Question:** Contextualize IR data - Upon review of your IR Department Profile (for academic units) and FY 14-15 Budget information, are there any data you want to correct or contextualize? To view your profile or budget visit the Office of Institutional Effectiveness website: http://www.ipfw.edu/offices/ir/profiles/
The current Department of Engineering Profile has the combined data for all the engineering programs. For the purposes of this report and with the assist of the office of IR we have been able to separate some of the information that corresponds to the new ECE department. We are very thankful for the efforts of the IR office to get the profiles as accurate as possible. They do not have control on the information they receive from other IPFW offices such as HR, Payroll, Registrar, etc. when they generate the department profiles. This scenario has led to issues that need to be corrected in the future. We have the following comments and suggestions.

- The department expenses reported in the profiles as well as in other documents circulated by the VCAA office include a substantial percentage of the expenses associated with the following two IPFW centers of excellence: Wireless Communication Technology and Systems Engineering. These are relative large amounts of moneys that are being added to the expenses of the department of engineering. These centers are NOT part of the department of engineering nor will they be part of the new engineering departments. Their expenses need to be reported separately. Currently the only association that the engineering departments have with the centers is that their directors are appointed as faculty members in engineering and as such they teach courses in their areas of expertise. Their teaching load is reduced since they have been given release time to manage the centers.
- The profile list as revenues the tuition and fees that students pay when they take engineering courses. Any engineering curriculum is such that about 50% of the total credit count is in courses from other programs (mathematics, physics, chemistry, and general education). Because of the nature of the engineering curricula we don’t offer general education courses that are taken by students from other programs. Instead, engineering majors (currently more than 400) populate many courses in other programs as they progress in their studies. Without these engineering students those other programs would not be able to count as revenues the tuition and fees that they pay when taking their courses.

An additional metric in the profiles should be the total amount of money that the majors in a program pay to IPFW. With the assist of the IR office we have the following figures for the total tuition and fees for the AY 2013-2014

Undergraduate ECE students: $724,228.98
Undergraduate CME students: $1,105,856.21
Freshman Engineering students: $1,485,992.37
Total Tuition and Fees paid by Undergraduate Engineering Students: $3,378,128.55

This last figure is more than twice of what the profiles report as tuition revenues for the engineering programs. Without the engineering majors IPFW would not have any of that revenue. These students came to IPFW to get an engineering degree not a degree in those other programs that happen to offer courses that they take to meet their degree requirements. ABET doesn’t require that math and science courses be taken in those departments. ABET only requires that a particular material be taught. As other engineering programs in the nation do, we could easily design courses with that material and hire LTCs to teach them and in that way increase our credit count, if that is a metric that is given a lot of weight when evaluating the health of program at IPFW.

**Criterion:** #7: Goal One - In this criterion, you will identify your unit goals and tell us how they align to Plan 2020, how they are measured, and what resources you need to meet them.

**Task Force:**
1. Comment on the specificity of the goal:

Should two goals have been included (separate assessment from curriculum issues)?

2. Comment on the goal's measures:

Does ABET include assessment of student learning?

3. Comment on the unit’s ability to achieve the goal (include a consideration of the departmental profile and budget data):

Achievable

4. Comment on the goal’s relevance:

High

5. Comment on the timeline of the goal:

Achievable and appropriate

Possible opportunities for collaboration or suggestions for addressing a gap:

**Question:** Unit Goal - What is your unit goal?

Review & update curricula and related documents such as:

- Assessment plans for the EE and CmpE degree programs
- Senior Design Course sequence
- Dual degree programs with other engineering programs within and outside IPFW
- Review and update required and technical elective courses that are currently dated due to advances in technology or changes in accreditation requirements

**Question:** IPFW Goal - What 2020 goal(s) does this unit goal align with? List as many as apply. If it does not align, you may write “NA” or clarify.

1.A.1 Improve quality and fidelity of assessment process of degree/certificate programs, General Education program, and Baccalaureate Framework

1.A.2 Use assessment data to improve student learning

1.C.1 Develop and promote interdisciplinary programs where there are sufficient university assets and anticipated employment needs

**Question:** Priority Level - Is the unit goal high, medium, or low priority? Limit your high-priority unit goals to 3 to 5.

High

**Question:** Actions - What action(s) does your unit plan to take to support this unit goal?
Current

• Faculty subcommittees have been recently constituted to address each curricula item of this goal

Near future (spring 2015)

• Review current requirements of the engineering accreditation board (ABET)
• Contact IPFW programs who might be interested to collaborate on senior design projects and get their feedback to revise our current guidelines
• Contact other programs within and outside IPFW with whom we have dual degree programs

2015-2015 AY

• Collect feedback from our constituency (faculty, students, industrial advisory board, alumni, and employers) to review and update required and technical electives courses

**Question: Metrics** - With what metrics will you assess progress toward accomplishing this unit goal on an annual basis?

• The engineering programs will have a comprehensive review by ABET in 2016. Their initial written evaluation of our programs will be in the fall of 2016
• Number of formal interdisciplinary design projects with other programs. An initial goal is to have of 3-4 projects per semester in 2 years
• Number of students enrolled in non ECE dual-degree programs. An initial goal is to have of 3-5 in years.
• Revised courses to be taught in two years

**Question: Resources** - Are you able to accomplish this unit goal with your current resources?

Yes. This review and update process is crucial for our new department in order to become an efficient independent academic unit. The entire ECE faculty is committed to successfully accomplish this goal in the next 2 semesters.

**Question: Needed Resources** - If you don’t have enough resources, what additional resources do you need to accomplish this unit goal?

N/A

**Question: Challenges** - What challenges, other than financial resources, might affect your progress toward accomplishing this unit goal?

Sufficient clerical and administrative support will be important when collecting information to support this goal. In the spring of 2015 we will still be under the structure of one department and 4 different engineering programs with multiple and divergent demands on the time of the department chair and the clerical staff.

**Question: Timeline** - If achieving this unit goal will take longer than one year, what is your timeline for implementing and accomplishing it?
Taking more than one year is not an option. The ABET visit is in 2016 and we should have completed this goal before that date. The Self-Study report for ABET has to be written in the spring of 2016.

**Criterion:** #8: Goal Two - In this criterion, you will identify your unit goals and tell us how they align to Plan 2020, how they are measured, and what resources you need to meet them.

**Task Force:**

1. **Comment on the specificity of the goal:**
   
   Goal lacks specificity and should include baseline measurements and targets so that success can be defined.

2. **Comment on the goal's measures:**
   
   Appropriate

3. **Comment on the unit’s ability to achieve the goal (include a consideration of the departmental profile and budget data):**
   
   Not within their control

4. **Comment on the goal’s relevance:**
   
   Relevant

5. **Comment on the timeline of the goal:**
   
   Appropriate

   Possible opportunities for collaboration or suggestions for addressing a gap:

**Question:** Unit Goal - What is your unit goal?

Operational Efficiency

- Budget Transparency
- Institutional Support
- Facilities

**Question:** IPFW Goal - What 2020 goal(s) does this unit goal align with? List as many as apply. If it does not align, you may write “NA” or clarify.

IV.B.5 Continue increasing transparency in resource allocation, budget formation and administration, and personnel decisions

IV.B.1 Resource allocation prioritization informed by performance metrics

IV.A.2 Establish an integrated system of program reporting, review, assessment and accreditation that is aligned to performance metrics
**Question:** Priority Level - Is the unit goal high, medium, or low priority? Limit your high-priority unit goals to 3 to 5.

High

**Question:** Actions - What action(s) does your unit plan to take to support this unit goal?

- A subcommittee has been appointed to address space usage policies such as ECE laboratories and classrooms
- A subcommittee has been appointed to write a comprehensive multiyear ECE laboratory plan. Currently the Department of Engineering has no laboratory plan
- For the duration of the 2014-2015 AY we have requested to the department chair that expenses charges to the laboratory account be transparent so the ECE faculty is informed of how that budget is being used. One third of the laboratory budget should be used for ECE laboratories and not on laboratories for other engineering programs.
- We have requested to the IPFW upper administration to develop a policy on how S&E moneys are allocated to departments. Currently IPFW has none that we know of.

**Question:** Metrics - With what metrics will you assess progress toward accomplishing this unit goal on an annual basis?

- The laboratory plan completed by the end of 2015
- Space use and allocation policies completed by the end of 2015
- A detailed list of expenses charged this AY to the department laboratory budget should be submitted by the department chair to the ECE faculty before the end of the spring semester.
- Develop policies and metrics on how S&E budget is allocated to departments by the end of this fiscal year.

**Question:** Resources - Are you able to accomplish this unit goal with your current resources?

No

**Question:** Needed Resources - If you don’t have enough resources, what additional resources do you need to accomplish this unit goal?

- Until we are an independent department we have no control on the laboratory budget thus to accomplish transparency of this budget will depend on the collaboration of the current department chair.
- The development of a transparent and rational policy for S&E allocation is in the domain of the upper administration. They have been asked to do so as part of the recommendations from last year’s University Budget Committee. It is expected that the administration will develop those policies before the end of this fiscal year.

**Question:** Challenges - What challenges, other than financial resources, might affect your progress toward accomplishing this unit goal?

The components of this goal that are not within direct control of the ECE faculty cannot be guaranteed to be carried out within the expected timeline.
**Question:** Timeline - If achieving this unit goal will take longer than one year, what is your timeline for implementing and accomplishing it?

The components of this goal in the control of the ECE faculty have to be completed before the next ABET visit (fall 2016). So at most one semester delay can be allowed.

The components of this goal in control of the IPFW upper administration should also be completed before the next ABET visit but we have no way to enforce on them this deadline.

**Criterion:** #9: Goal Three - In this criterion, you will identify your unit goals and tell us how they align to Plan 2020, how they are measured, and what resources you need to meet them.

**Task Force:** 1. Comment on the specificity of the goal:

   Goal is well written.

   2. Comment on the goal's measures:

   Metrics are excellent.

   3. Comment on the unit’s ability to achieve the goal (include a consideration of the departmental profile and budget data):

   Achievable

   4. Comment on the goal’s relevance:

   High

   5. Comment on the timeline of the goal:

   Achievable

   Possible opportunities for collaboration or suggestions for addressing a gap:

   N/A

**Question:** Unit Goal - What is your unit goal?

Initiate a five-year combined Bachelor of Science / Master of Science in Engineering (BS/MSE) program: students receive both Bachelor's Degree (BS in Computer Engineering or BS in Electrical Engineering) and Master’s degree (MSE) in five years.

**Question:** IPFW Goal - What 2020 goal(s) does this unit goal align with? List as many as apply. If it does not align, you may write “NA” or clarify.

I.C.7 Establish links between baccalaureate and post-baccalaureate programs.

I.C.8 Respond to regional demand with appropriate post-baccalaureate credentials.
**Question:** Priority Level - Is the unit goal high, medium, or low priority? Limit your high-priority unit goals to 3 to 5.

High

**Question:** Actions - What action(s) does your unit plan to take to support this unit goal?

Actions:

- Develop curriculum plan for the 5-year combined BS/MSE program
- Develop application, admission and graduation policies
- Start the 5-year combined BS/MSE program within two years
- Plan related course offerings accordingly

Data Collection:

- Contact undergraduate students who meet admission criteria about their interest in the 5-year BS/MSE program
- Contact local/regional industry (e.g., Industrial Advisory Board) about their need and support of the 5-year BS/MSE program

**Question:** Metrics - With what metrics will you assess progress toward accomplishing this unit goal on an annual basis?

- Start the 5-year combined BS/MSE program within two years
- Recruit 10% of undergraduate ECE students to enroll in the 5-year BS/MSE program within the first year of implementation. Currently, there are around 18% of EE and CmpE majors pursuing dual CmpE/EE degrees (13 out of 73). It is expected that at least half of them will be qualified and interested in the 5-year BS/MSE program.
- Contribute to increased enrollment of MSE program by 30% within the first year of implementation, 50% over five years. Currently, there are 17 ECE and SE students in the MSE program. The current total number of MSE students is 19. The ECE and SE areas of the MSE program will be under the jurisdiction of the new ECE department.

**Question:** Resources - Are you able to accomplish this unit goal with your current resources?

Yes, with good planning of courses. For example, a good balance between the senior-level technical electives and graduate courses so that the graduation of other regular ECE students will not be affected. We will also look into offering courses that can be combined 400/500 level courses to better utilize our resources and increase enrollment. The number of faculty we have will be adequate.

**Question:** Needed Resources - If you don’t have enough resources, what additional resources do you need to accomplish this unit goal?

More GTA support would definitely help recruiting our top undergraduate student into this 5-year program. These GTAs would better teach the labs compared with graduate students with the bachelor degree from other schools. It would also free the faculty from teaching labs, so more graduate courses can be offered to sustain our proposed 5-year BS/MSE program and MSE graduate program.
Question: Challenges - What challenges, other than financial resources, might affect your progress toward accomplishing this unit goal?

The ECE programs will become an independent department starting Fall 2015. There will be a lot of operational and curricular issues to be handled in 2015, which may affect the progress of this unit goal.

Question: Timeline - If achieving this unit goal will take longer than one year, what is your timeline for implementing and accomplishing it?

The 5-year BS/MSE program will be initiated and implemented within 2 years.

Criterion: #10: Goal Four - In this criterion, you will identify your unit goals and tell us how they align to Plan 2020, how they are measured, and what resources you need to meet them.

Task Force: 1. Comment on the specificity of the goal:
   Goal would be more meaningful with baseline measurements and targets.

   2. Comment on the goal’s measures:
   Metrics are well written.

   3. Comment on the unit’s ability to achieve the goal (include a consideration of the departmental profile and budget data):
   Achievable

   4. Comment on the goal’s relevance:
   Relevant

   5. Comment on the timeline of the goal:
   Achievable

   Possible opportunities for collaboration or suggestions for addressing a gap:

   Interdisciplinary collaborations STEAM

Question: Unit Goal - What is your unit goal?

Increase faculty productivity in scholarly work and external grant acquisition

Question: IPFW Goal - What 2020 goal(s) does this unit goal align with? List as many as apply. If it does not align, you may write “NA” or clarify.
Question: Priority Level - Is the unit goal high, medium, or low priority? Limit your high-priority unit goals to 3 to 5.

High

Question: Actions - What action(s) does your unit plan to take to support this unit goal?

- Faculty will be provided assistance with GTA support for their teaching and research activities.
- Residuals from external funding can be used to support faculty in attending professional conferences and other scholar activities currently not funded due to a very limited S&E funds

Question: Metrics - With what metrics will you assess progress toward accomplishing this unit goal on an annual basis?

- Increase of 10% annual productivity in the number of publications by the end of 2016 and by 50% in 2020.
- Increase the amount of external funding to $100,000/year by 2020. The average for the last 3 years is $43506.

Question: Resources - Are you able to accomplish this unit goal with your current resources?

No.

Question: Needed Resources - If you don’t have enough resources, what additional resources do you need to accomplish this unit goal?

- An increase of GTA to about 5 per year is needed. Currently only one 0.25 FTE GTA has been assigned to assist with the ECE curriculum. We have as many or more laboratory requirements than other degree programs in IPFW which have been assigned a lot more GTAs. IPFW doesn’t have any rationale or criteria of how many GTAs a program is assigned.
- Increase the amount of S&E funds. The Department of Engineering with 20 faculty members has about $26,000 of S&E annual budget. IPFW departments with 6 or 7 faculty members have the same amount of S&E funds. As for the case of allocation of GTAs, IPFW currently has no rationale or criteria for the assignment of S&E. This small budget of S&E funds doesn’t allow for the support of faculty to attend technical conferences negatively affecting their scholarly work.

Question: Challenges - What challenges, other than financial resources, might affect your progress toward accomplishing this unit goal?
**Question:** Timeline - If achieving this unit goal will take longer than one year, what is your timeline for implementing and accomplishing it?

Assuming that proper resources are allocated starting July 2015 the 2016 goal is within reach as well as the goals for 2020

**Criterion:** #11: Goal Five - In this criterion, you will identify your unit goals and tell us how they align to Plan 2020, how they are measured, and what resources you need to meet them.

**Task Force:**

1. Comment on the specificity of the goal

   Goal needs an action word (e.g., create, establish, develop)

   Information on catalyst for development or showing potential demand would strengthen

2. Comment on the goal's measures:

   Excellent

3. Comment on the unit’s ability to achieve the goal (include a consideration of the departmental profile and budget data):

   Challenging

4. Comment on the goal’s relevance:

   Relevant

5. Comment on the timeline of the goal:

   Achievable

   Possible opportunities for collaboration or suggestions for addressing a gap:

**Question:** Unit Goal - What is your unit goal?

Master of Science Degree in Electrical and Computer Engineering (MSECE)

**Question:** IPFW Goal - What 2020 goal(s) does this unit goal align with? List as many as apply. If it does not align, you may write “NA” or clarify.
I.C.8  Respond to regional demand with appropriate post-baccalaureate credentials

I.E.2  Develop activities and experiences that promote success in student achievement through programs with strong learning outcomes, high graduation rates, and strong job placement prospects

I.E.3  Build and strengthen relationships with regional partners to increase research and scholarly collaboration in signature programs

I.E.4  Promote majors and programs with strong job placement opportunities in the region and beyond

**Question:** Priority Level - Is the unit goal high, medium, or low priority? Limit your high-priority unit goals to 3 to 5.

Medium

**Question:** Actions - What action(s) does your unit plan to take to support this unit goal?

- Faculty committee appointed to work on the MSECE degree proposal
- Collection of supporting documents for the submission of a formal proposal, first to IPFW administration, and then to Purdue University West Lafayette administration
- Make proper changes to the proposal as suggested the PUWL administration and resubmit the proposal
- Have the proposal submitted to the Indiana Board of Higher Education (ICHE)

**Question:** Metrics - With what metrics will you assess progress toward accomplishing this unit goal on an annual basis?

- Committee appointed in the fall of 2015
- Proposal presented and reviewed by the IPFW and the PUWL administrations by the end of the 2016-2017 AY
- Resubmit the proposal in the fall of 2017
- Proposal approved by PUWL and submitted to ICHE by the end of spring semester of 2018
- Start the MSECE degree program in the 2018-2019 AY

**Question:** Resources - Are you able to accomplish this unit goal with your current resources?

No.

**Question:** Needed Resources - If you don’t have enough resources, what additional resources do you need to accomplish this unit goal?

Support to a graduate program in any field of engineering needs to be increased by the IPFW administration. Currently the only way to have engineering graduate students is if they pay their own way or we secure external grants to pay 100% for their tuition fees and stipends. This is not a sustainable model for any graduate program. IPFW needs to develop a criteria on how it funds GTAs. We don’t know of any policy that explains why some programs have 10, 12,… GTAs funded by IPFW and others have pretty much none, like in engineering. Hence, the MSECE program needs 4 GTA positions to sustain this program.
**Question:** Challenges - What challenges, other than financial resources, might affect your progress toward accomplishing this unit goal?

Only PUWL and IUPUI offer an MSECE degree program. Both institutions will see IPFW offering this type of degree as an over-reach for our institution. For several years IPFW has been offering a very successful Master of Science in Engineering degree (MSE) program with concentrations in computer and electrical engineering. The curricula and requirements of these MSE/CmpE and MSE/EE degree are not different from a formal MSECE degree program. However the intercampus politics on this and other degree programs cannot be discounted as we discovered some years ago when we had to work very hard to get the MSE approved by PUWL and ICHE.

**Question:** Timeline - If achieving this unit goal will take longer than one year, what is your timeline for implementing and accomplishing it?

This is a long term goal with a completion time estimated to be in the 2017-18 AY. It can easily slip into one or two more years depending on how fast the proposal moves through the many levels of approval within IPFW and at PUWL

**Criterion:** #12: Goal Six - In this criterion, you will identify your unit goals and tell us how they align to Plan 2020, how they are measured, and what resources you need to meet them.

**Task Force:** Explore the possibility of offering concentrations in the BS degrees in the Electrical and Computer Engineering department that will be established in July 2015 with the split of the Department of Engineering. entered in 12-14

1. Comment on the specificity of the goal:

   Goal and metrics don’t seem to mesh

2. Comment on the goal's measures:

3. Comment on the unit’s ability to achieve the goal (include a consideration of the departmental profile and budget data):

   Achievable

4. Comment on the goal’s relevance:

   Relevant – medium

5. Comment on the timeline of the goal:

   Achievable

   Possible opportunities for collaboration or suggestions for addressing a gap:

**Question:** Unit Goal - What is your unit goal?
Explore the possibility of offering concentrations in the BS degrees in the Electrical and Computer Engineering department that will be established in July 2015 with the split of the Department of Engineering.

**Question:** IPFW Goal - What 2020 goal(s) does this unit goal align with? List as many as apply. If it does not align, you may write “NA” or clarify.

I.C.1 Develop and promote interdisciplinary programs where there are sufficient university assets available and anticipated employment needs.

I.C.3 Promote academic programs for international market.

I.E.1 Identify and develop signature programs that respond to regional needs, build on faculty expertise, and uniquely distinguish IPFW from other institutions.

I.E.2 Develop activities and experiences that promote success in student achievement through programs with strong learning outcomes, high graduation rates, and strong job placement prospects

**Question:** Priority Level - Is the unit goal high, medium, or low priority? Limit your high-priority unit goals to 3 to 5.

Medium

**Question:** Actions - What action(s) does your unit plan to take to support this unit goal?

- Form a committee to work to investigate the process and feasibility of establishing concentrations in the ECE department (fall 2015).
- If feasible the committee will prepare and submit a proposal to the ECE faculty (spring 2016).
- Prepare documents and submission a formal proposal, first to IPFW, and then to Purdue University West Lafayette (fall 2016).

**Question:** Metrics - With what metrics will you assess progress toward accomplishing this unit goal on an annual basis?

Once the concentrations are in place the following metrics will be used to measure the success of their implementation

- Enrollment in the courses comprising a concentration area
- Number of graduates from the concentration area
- Survey among freshmen about the concentration area as a recruiting tool
- Employer and Alumni surveys to gauge the impact of concentration areas

**Question:** Resources - Are you able to accomplish this unit goal with your current resources?

The intention is to accomplish this goal with the current resources. However it is expected that the feasibility analysis will provide a more accurate estimation of the needed resources.

**Question:** Needed Resources - If you don’t have enough resources, what additional resources do you need to accomplish this unit goal?
Although this goal generally does not require additional resources, the future ECE Department must have adequate LTL and/or GTA budget.

**Question:** Challenges - What challenges, other than financial resources, might affect your progress toward accomplishing this unit goal?

The process itself may take longer than anticipated.

**Question:** Timeline - If achieving this unit goal will take longer than one year, what is your timeline for implementing and accomplishing it?

The process begins in the fall of 2015. We plan to submit a formal proposal in the spring or fall of 2016. Depending on the approval process this goal can take one or two additional years.

**Criterion:** #13: Goal Seven - In this criterion, you will identify your unit goals and tell us how they align to Plan 2020, how they are measured, and what resources you need to meet them.

**Question:** Unit Goal - What is your unit goal?

**Question:** IPFW Goal - What 2020 goal(s) does this unit goal align with? List as many as apply. If it does not align, you may write “NA” or clarify.

**Question:** Priority Level - Is the unit goal high, medium, or low priority? Limit your high-priority unit goals to 3 to 5.

**Question:** Actions - What action(s) does your unit plan to take to support this unit goal?

**Question:** Metrics - With what metrics will you assess progress toward accomplishing this unit goal on an annual basis?

**Question:** Resources - Are you able to accomplish this unit goal with your current resources?

**Question:** Needed Resources - If you don’t have enough resources, what additional resources do you need to accomplish this unit goal?
Question: Challenges - What challenges, other than financial resources, might affect your progress toward accomplishing this unit goal?

Question: Timeline - If achieving this unit goal will take longer than one year, what is your timeline for implementing and accomplishing it?

Criterion: #14: Goal Eight - In this criterion, you will identify your unit goals and tell us how they align to Plan 2020, how they are measured, and what resources you need to meet them.

Question: Unit Goal - What is your unit goal?

Question: IPFW Goal - What 2020 goal(s) does this unit goal align with? List as many as apply. If it does not align, you may write “NA” or clarify.

Question: Priority Level - Is the unit goal high, medium, or low priority? Limit your high-priority unit goals to 3 to 5.

Question: Actions - What action(s) does your unit plan to take to support this unit goal?

Question: Metrics - With what metrics will you assess progress toward accomplishing this unit goal on an annual basis?

Question: Resources - Are you able to accomplish this unit goal with your current resources?

Question: Needed Resources - If you don't have enough resources, what additional resources do you need to accomplish this unit goal?

Question: Challenges - What challenges, other than financial resources, might affect your progress toward accomplishing this unit goal?
Criterion: #15: Goal Nine - In this criterion, you will identify your unit goals and tell us how they align to Plan 2020, how they are measured, and what resources you need to meet them.

**Question:** Unit Goal - What is your unit goal?

**Question:** IPFW Goal - What 2020 goal(s) does this unit goal align with? List as many as apply. If it does not align, you may write “NA” or clarify.

**Question:** Priority Level - Is the unit goal high, medium, or low priority? Limit your high-priority unit goals to 3 to 5.

**Question:** Actions - What action(s) does your unit plan to take to support this unit goal?

**Question:** Metrics - With what metrics will you assess progress toward accomplishing this unit goal on an annual basis?

**Question:** Resources - Are you able to accomplish this unit goal with your current resources?

**Question:** Needed Resources - If you don’t have enough resources, what additional resources do you need to accomplish this unit goal?

**Question:** Challenges - What challenges, other than financial resources, might affect your progress toward accomplishing this unit goal?

**Question:** Timeline - If achieving this unit goal will take longer than one year, what is your timeline for implementing and accomplishing it?
#16: Goal Ten - In this criterion, you will identify your unit goals and tell us how they align to Plan 2020, how they are measured, and what resources you need to meet them.

**Question:** Unit Goal - What is your unit goal?

**Question:** IPFW Goal - What 2020 goal(s) does this unit goal align with? List as many as apply. If it does not align, you may write "NA" or clarify.

**Question:** Priority Level - Is the unit goal high, medium, or low priority? Limit your high-priority unit goals to 3 to 5.

**Question:** Actions - What action(s) does your unit plan to take to support this unit goal?

**Question:** Metrics - With what metrics will you assess progress toward accomplishing this unit goal on an annual basis?

**Question:** Resources - Are you able to accomplish this unit goal with your current resources?

**Question:** Needed Resources - If you don’t have enough resources, what additional resources do you need to accomplish this unit goal?

**Question:** Challenges - What challenges, other than financial resources, might affect your progress toward accomplishing this unit goal?

**Question:** Timeline - If achieving this unit goal will take longer than one year, what is your timeline for implementing and accomplishing it?