Curriculum Innovation through the integration of Manufacturing related materials and quality control Standards for different level engineering students from freshmen to graduates (CIMS)

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Project Goal and Objectives

- **Goal**: create a systematic framework for different level engineering students to strengthen education and learning about manufacturing related materials and quality control standards and standardization.

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Project Goal and Objectives

- **Objectives**
  1. **Develop innovative course modules to use in current undergraduate engineering curriculum to improve students' career readiness.**
  2. **Develop graduate certificate program to advance students' professional preparedness.**
  3. **Create an online based cost-effectiveness structure to enhance education and learning impacts.**

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Project Approaches

- The project team will conduct **four major activities** to impact different level engineering students including freshmen, junior/senior, and graduates.

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Project Approaches

- **Activity 1**: Developing manufacturing related materials standards course learning modules
- **Activity 2**: Developing three levels quality control standards learning modules
- **Activity 3**: Developing graduate level manufacturing related standards certificate program
- **Activity 4**: Organizing Webinar and Annual e-Conference on manufacturing related standards

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Significant Accomplishments

- **Expected deliverables** :
  - Three different level learning modules on material selection and testing standards,
  - Three different level learning modules on quality control standards,
  - One new graduate course, and one graduate level certificate program.

- **Expected Outcomes**:
  - The three different level learning modules on each topic will give the students symmetric training on manufacturing related standards, which will ensure their success in engineering career and lifelong learning

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Significant Accomplishments

- **Short term goal**: increase TAMUK engineering students' awareness of standard and standardization by creating sustainable and cost-effectiveness curriculum structure

- **Long term goal:** adequately prepare college graduates for the workplace (especially in manufacturing sector) with standards and standardization concepts with positive impacts on state and regional economy.

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Evaluation

- The evaluation plan consists of two components
  1. Objectives based evaluation plan utilizes internal research objectives designed to track progress toward meeting all proposed research objectives.
  2. Outcomes based evaluation plan designed to verify project success.

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Evaluation

- The comprehensive evaluation plan includes specific quantitative and qualitative measures to
  1. Evaluate techniques and methods and their appropriateness to the proposed research objective (formative)
  2. Measure success in achieving objectives at end of project (summative)
  3. Provide the disclosure of both expected and unanticipated project outcomes

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Communication Plan

Sustainability, Scalability, Replicability

- All the modules and course contents will be available to TAMUK and other Institutions of Higher Education through online learning platforms, such as Blackboard and Moodle.
  - Can be directly applied to various majors:
    - IE, ME, Manufacturing Engineering, System Engineering
  - The instructors have the flexibility to decide how much of each topic to include in their own courses.

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Communication Plan

Sustainability, Scalability, Replicability (cont.)

- Webinars and e-conference will be used to promote the adoption of the modules and the teaching experiences.
- Collaboration with industries will also provide the opportunities to the project team to scale the modules to short courses for the needs from industries.

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Communication Plan

Dissemination and Sharing

- Project website will be created and updated regularly during and beyond the project period
  - project background & progress,
  - webinars and e-conference schedules,
  - links of the module contents,
  - educational resources,
  - IHE and industry collaborators,
  - contact information

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Communication Plan

Dissemination and Sharing (cont.)

- Present the project accomplishment on the ASEE annual conferences
- Quarterly periodical reports will be generated to complete a high quality final summary paper
- Students' accomplishment based on the training from the course modules, such as the senior design projects will be presented on TAMUK senior design conferences, Javelina Research Symposium, and Pathway Research Symposium

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Thank You