**Curriculum Gap Identification and Action Taken**

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1. **Introduction:**

The objective of this report is to analyze the curriculum of the first-year engineering Applied Physics course, identify gaps in alignment with desired learning outcomes, and document actions taken to address these gaps. This analysis is based on the syllabus and performance in quizzes conducted throughout the course.

1. **Syllabus Overview:** The course comprises six modules:
   1. Lasers
   2. Fibre Optics
   3. Interference in Thin Films
   4. Electrodynamics
   5. Quantum Physics
   6. Basics of Semiconductor Physics
2. **Curriculum Gap Identification:** Upon reviewing the syllabus, teaching methodology, and feedback from students, the following gaps were identified:
3. **Time Constraints for Deep Learning:** The 26-lecture schedule poses challenges for covering all topics in depth, leading to surface-level understanding of complex concepts.

**Action:** Topics were prioritized based on complexity and relevance. Supplementary learning materials, such as video tutorials and reading assignments, were shared to cover fewer complex topics outside of lecture hours.

1. **Conceptual Understanding:** Quiz analysis revealed weaker performance in sections involving applied problem-solving, particularly in Quantum Mechanics and Electromagnetic Theory.

**Action:** Conducted tutorials during free lab sessions focusing on problem-solving techniques in Quantum Mechanics and Electromagnetic Theory.

1. **Insufficient Practical Exposure:** Students reported difficulties in correlating theoretical concepts with practical applications in the lab, particularly in modules such as Fiber Optics and Electrodynamics.

**Action:** Lab experiments were designed to include hands-on and simulations that directly connect theoretical knowledge to practical applications. For the Fiber Optics module, students performed a hands-on experiment to calculate the numerical aperture and acceptance angle of a given optical fiber, directly applying the formulae and concepts discussed in classroom teaching.

Similarly, a virtual lab experiment (simulation) on the “Determination of Magnetic Flux Density” was introduced during lab sessions to enhance students' understanding of electricity and magnetism, thereby reinforcing the theoretical concepts covered in the Electrodynamics module.

1. **Assessment Gaps:** Existing assessments focus primarily on recall and understanding, with minimal emphasis on higher-order cognitive skills such as application, analysis, and problem-solving.

**Action:** Quizzes were restructured to include problem-solving and application-based questions. Open-ended assignments were introduced to evaluate critical thinking and practical knowledge

1. **Conclusion:** Continuous efforts to align the curriculum with evolving engineering requirements will ensure better learning outcomes and enhanced career readiness for students.
2. **Recommendations:** 
   1. There is currently no rigorous assessment mechanism to evaluate student understanding of laboratory sessions or to measure the practical skills they have developed**.** It is suggested to implement practical examinations to assess student’s practical knowledge and skills. These exams can include a viva component, can be conducted by inviting an external examiner, to ensure a comprehensive and unbiased evaluation of the student’s understanding and proficiency in the subject matter.
   2. Expand the use of virtual labs and simulations for classroom teaching as well.
   3. Conduct periodic surveys and assessments to identify and address ongoing challenges.