



The Abdus Salam
International Centre
for Theoretical Physics
Physics Without Frontiers



CURRICULUM DEVELOPMENT AT SHERUBTSE COLLEGE, ROYAL UNIVERSITY OF BHUTAN



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PRESENTATION OUTLINES

- Introduction
- Background of the Physics Programme at Sherubtse College
- Curriculum Development Process
- Overview of the modules
- Curriculum Highlights and Benefits
- Conclusions

INTRODUCTION

- Welcome to the presentation on the Physics Programme Review and Curriculum Development.
- Our goal is to create a comprehensive and dynamic curriculum that prepares students for various career opportunities and fosters a deep understanding of fundamental physics principles and their applications.

BACKGROUND OF THE PHYSICS PROGRAMME

- The teaching of undergraduate physics at Sherubtse College had its beginnings in the early 1980's, founded on a course of study that was prepared by Delhi University in India.
- In 2007, persuaded by the Royal University of Bhutan, the department of physics drew up a curriculum that awarded Bachelor of Science degrees in physics and mathematics, physics and chemistry. After its approval by the university, it came into effect in 2009.
- In 2017, the programme of study in physics evolved into a Bachelor of Science degree in Physics and which continues to this day. In the intervening period, it has undergone minor revisions of one form or another.

CURRICULUM DEVELOPMENT PROCESS

Curriculum development is a systematic process aimed at creating an effective educational program.

- It involves:
- ***Needs Assessment*** - Understanding student needs and expectations through data collection.
- ***Setting Objectives*** - Defining clear and measurable learning goals aligned with the institution's vision.
- ***Content Selection*** - Choosing relevant and up-to-date content to support learning objectives.

- ***Curriculum Design*** - Creating a coherent and well-structured curriculum based on selected content.
- ***Teaching Strategies*** - Implementing engaging and effective teaching methods to support learning.
- ***Assessment and Evaluation*** - Designing assessments to measure student progress and provide feedback.
- ***Implementation*** - Putting the curriculum into practice with faculty and staff support.
- ***Monitoring and Review*** - Continuously evaluating the curriculum and gathering feedback.
- ***Revision and Improvement*** - Making necessary revisions to enhance the curriculum.

We believe, a well-developed curriculum ensures a high-quality educational experience.

Continuous improvement and responsiveness to student needs are key to effective curriculum development.

OVERVIEW OF THE MODULES

We are planning to design a Physics Programme with carefully curated modules to provide a comprehensive and enriching learning experience. Each module serves a specific purpose and contributes to building a strong foundation in physics.

Year I [Common Modules]

Year II, Sem I

- (a) Mechanics
- (b) Waves & Oscillations
- (c) Differential Equations
- (d) Electromagnetism
- (e) Laboratory I

Year II, Sem II

- (a) Mathematical Methods for Physics
- (b) Physics of Renewable Energy-I(*Physics of renewable energy by Martin Stutzmann*)
- (c) Analogue Electronics
- (d) Thermodynamics and heat transfer
- (e) Laboratory II

Year III, Sem I

- (a) Linear Algebra
- (b) Optics
- (c) Digital Electronics
- (d) Modern Physics (*Nuclear Physics, Particle Physics & Relativity*)
- (e) Laboratory III

Year III, Sem II

- (a) Statistical Physics
- (b) Solid State Physics
- (c) Quantum Physics
- (d) Computational Physics
- (e) Laboratory IV

Year IV, Sem I

- (a) Physics of Renewable Energy-II
- (b) Communication Systems
- (c) Capstone project-(Phase I)

Year IV, Sem II

- (a) Scientific Report Writing
- (b) Capstone Project-(Phase II)

Capstone Project:

- Significance: Culmination of learning, applying knowledge to real-world projects.
- Application: Showcasing skills, creativity, and preparation for future endeavors.

Each module in our Physics Programme plays a crucial role in building a strong foundation and fostering innovation.

Together, we prepare students for diverse career opportunities and empower them to contribute to scientific advancements and sustainable practices.

CURRICULUM HIGHLIGHTS

- Comprehensive and dynamic curriculum spanning four years.
- Emphasis on core physics principles and practical applications.
- Integration of renewable energy physics, electronics, and communication systems.
- Hands-on laboratory experience to reinforce theoretical knowledge.
- Encouragement of interdisciplinary exploration and research.

BENEFITS OF THE CURRICULUM

- Graduates equipped with a solid foundation in physics principles.
- Preparation for diverse career opportunities in renewable energy, electronics, research, and technology-driven industries.
- Encouragement of innovation and problem-solving skills.
- Contribution to sustainable development and addressing global challenges.

CONCLUSIONS

- The Physics Programme Review and Curriculum Development aims to provide students with a well-rounded education in physics.
- We are committed to fostering critical thinking, creativity, and research skills.
- Thank you for your attention and support in shaping the future of physics education at our institution.