

STRATEGIC PLAN

(2020-2025)



Department of Physics

J.C. BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA, FARIDABAD

(Formerly YMCA University of Science and Technology)

NAAC 'A' Grade accredited State University

Sector-06, Delhi Mathura Road, Faridabad -121006 (Haryana)

About the Department

The Department of Physics was initially a part of Department of Humanities and Sciences and it became a full-fledged department in 2018. The department of Physics runs the undergraduate program (B.Sc. Honors), post-graduate program (M.Sc.) and doctoral degree program for the students who satisfy the eligibility conditions laid by the university and UGC from time to time. There are thirteen regular faculty members in the Department. Faculty members are enriched with quality teaching experience backed by excellent research in different fields. The Department is nationally known for its contribution in various research domains like material science, nanotechnology, semiconductor devices and energy storage devices.

Vision

A department that can effectively harness its strengths to create an academically stimulating atmosphere, evolving into a well-integrated system that synergizes the efforts of its competent faculty towards imparting intellectual confidence that aids comprehension and complements the spirit of inquiry.

Mission

- To create well-rounded individuals ready to comprehend scientific and technical challenges offered in the area of specialization.
- To counsel the students so that the roadmap becomes clearer to them and they have the zest to turn the blueprint of their careers into a material reality.
- To encourage critical thinking and develop their research acumen by aiding the nascent spirit for scientific exploration.
- Help them take economic, social, legal and political considerations when visualizing the role of technology in improving quality of life.
- To infuse intellectual audacity that makes them take bold initiatives to venture into alternative methods and modes to achieve technological breakthroughs.

Strategic Goals

Flexibility is necessary to combat undesired effects in rapidly changing science, society and technology. In an era of advances in science and changing society, the department will adopt planning in response to change and to emerging opportunities.

For this purpose, the following strategic plan is proposed:

- As teaching and learning process is an important part of academics, so content of the syllabi will be revised according to advancements in the respective fields.
- Advanced methods of classroom learning such as flipped classrooms, mind mapping, smart boards, overhead projectors etc. may be introduced.
- Efforts will be made to introduce digital learning in the department.
- Students will be encouraged to participate in the cultural activities at university as

well as state level programmes.

- Assessment and evaluation methods will be improved in examination system with time.
- Induction and welcome programs may be organized to introduce students to the department.
- Extension lectures by eminent resource persons will be organized for the students to make them aware about the recent developments in diverse areas of Physics.
- Inter departmental Science-Quizzes will be organized.
- Efforts will be made to organize National / International conferences.
- Efforts will be made to conduct value-added courses / workshop / short term courses (STC) for UG, PG and research students.
- Educational tours will be arranged to visit National Laboratories / Institutes.
- National Science Day will be celebrated to motivate the young students for their engagement to solve the scientific problems.
- Consultation programs will be arranged to encourage the students for National and International Scholarships / Fellowships.
- Lectures on career counselling and placement will be organized.
- Students will be encouraged to actively participate in the placement opportunities provided by the university.
- Relationship with the different employers and alumni will be strengthened for better employment of the students of the department.
- System of feedback from the parents, students and alumni will be strengthened for the improvement/ upliftment of the department.
- Wider range of ideas and opinions are key factors for the advancements of science. Diversity ensures the contribution of wide range of ideas and opinions in the development of science. Efforts will be made to sustain diversity in the department by ensuring an inclusive climate, welcoming to all students, faculty and staff regardless of caste, religion, culture, gender, sexual orientation and disability status.

SWOC Analysis

Strength

- Qualified and experienced faculty members.
- Continuous upgradation of curriculum in the light of current R & D requirements.
- Industry and Market friendly courses.
- Collaboration among Physics department and national research labs.
- Strong democratic and scientific system of departmental administration.
- Expert lectures and interaction with the eminent persons of diverse areas.
- Counselling, guidance and mentoring of students.

- Excellent research background of newly recruited faculty.

Weakness

- Lacking international faculty.
- Vacant Teaching / Technical / Support staff positions.
- Inadequate alumni support.
- Soft skill issues of students from rural background.
- Shortage of infrastructure and research facilities.

Opportunities

- Excellent employment avenues
- Huge scope for expansion and growth
- Increasing demand for physics under-graduate and post-graduates courses
- Increasing avenues in higher research
- Inter-disciplinary applications such as Nano-Technology, Bio-Technology and Environmental Science.

Challenges

- Mushrooming of Private universities / Engineering colleges and upcoming state universities.
- Higher pay packages in education in private sector.
- PG courses in affiliated colleges.
- Fast changing innovations at national/international level.
- Rapid advancement of technology.

Action Plan

2020-21

- As teaching and learning process is an important part of academics, therefore the content of the syllabi will be revised according to advancements in the respective fields.
- Because of fast changing technologies and advancement in experimental accuracy, enhancement in experimental infrastructure is necessary for the department. So we will make efforts to upgrade M.Sc. laboratories and research laboratories through the development of new experiments, procurement of new equipment.
- Value added courses on the topic of “Synthesis and characterization of Nanomaterials, Futuristic research and related experimental techniques” and Advanced Materials and Their Pathways” will be conducted
- National Science Day will be celebrated to make the students feel proud to be physics students.
- System of feedback from the parents, students and alumni will be strengthened for the improvement/upliftment of the department.

- Latest edition of relevant text books along with their e-copies will be procured to enrich the departmental library.
- Relationship with the different employers and alumni will be strengthened for the employment of the students.
- Faculty members will be encouraged to submit research projects to various funding agencies.
- Efforts will be made to collaborate with national and international institutions.
- Best practice for mentoring and carrier development for faculty and staff that promote equitable opportunities for carrier success will be implemented.
- The honest ethical practices of scholarship and teaching are essential in the academic environment. We will make efforts to inculcate these qualities in our students.

2021-22

- Advanced methods of classroom teaching and learning such as flipped classrooms, smart boards, overhead projectors etc. may be introduced.
- Efforts will be made to advertise physics courses and make the course contents accessible to engineering students at all levels to enhance connection between technology, industry and fundamental physics.
- New specializations (e.g. Material Science, Nuclear Physics and Electronics) will be introduced in M.Sc. (Physics) course.
- Full utilisation of the existing facilities in the department such as equipment's and instruments will be ensured.
- Consultation programmes will be organized to encourage the students for national and international scholarships/fellowships.
- Expert lectures series by the eminent resource persons will be organised to aware the students about the recent developments in the different streams.
- Efforts will be made to organise national / international conferences.
- Awareness about the environmental effects on health and hygiene will be inculcated in students through lectures and seminars.
- Inter-departmental science quizzes will be organized under Pragyanaam society of the department.
- Educational tours will be arranged to visit national laboratories/ institutes.
- Efforts will be made for proper documentation of the departmental activities, students and alumni database etc.
- National Science Day will be celebrated in the department.

2022-23

- Efforts will be made to introduce the new PG Program in Master in Technology (M. Tech.) in Nanoscience & Engineering.
- Faculty members will be encouraged to adopt innovative methods for class room teaching like brain mapping etc.
- A workshop on "Intellectual Property Rights" will be conducted to promote the culture of filing patents.
- Faculty members will be encouraged to establish international collaborations and visit to the internationally recognized research institutions / universities in India and abroad.

- Digital learning will be encouraged.
- Quality research will be encouraged in the department.
- Students as well as faculty members will be encouraged for interdisciplinary research.
- National Science Day will be celebrated in the department.
- Alumni will be invited for the career counselling of the students in the department.
- Students-teachers and parents- teacher relationships will be strengthened through existing feedback mechanism.
- Present evaluation and assessment method of examination will be improved.
- National Science Day will be celebrated in the department.

2023-24

- To apply for research grant under FIST program of DST to establish infrastructure and state of the art equipment in the department.
- Syllabi will be reviewed and updated as per advancement in the different fields.
- Extension lectures by the eminent resource persons and national/international webinars will be organised.
- Relevant textbooks and e-books will be purchased for the departmental library.
- Educational tour will be arranged.
- Existing equipment and apparatus in the laboratories will be reviewed and updated.
- For the environmental awareness, extension lectures and seminars will be organised.
- Students will be encouraged and motivated to participate in cultural activities.

2024-25

- Establishment of Incubation Centre for Fabrication of Energy Storage devices.
- Existing digital learning process will be reviewed and enhanced.
- Efforts will be made to strengthen the national and international collaborations.
- Honest ethical practices of scholarship and teaching are essential in academic environment. We will make efforts to develop these qualities in the students.
- National and international conferences will be organized
- Faculty members and students will be motivated to publish their research work in high impact factor journals of national / international repute.

ACTIVITY CALENDER 2020-21

(Because of the Covid Pandemic, the activity calendar may change)

July 2020:

- Admission Process- Second Week for B.Sc. students.
- Short term Course (STC) on “Research and Development on Composite Materials “in collaboration with Department of Mechanical Engineering of JCBUST, YMCA Faridabad under TEQIP-III.
- Invited Talk on Experimental Nuclear Physics by Dr. Pushendra Pal Singh of IIT Ropar.
- One week-long ‘Induction Programme’ for its newly admitted students of undergraduate programmes of Science, Management, Computers and Arts streams at JCBUST, YMCA, Faridabad.

August 2020:

- Admission Process for M. Sc. students
- Quiz competition on Physics Quiz by Pragyanaam Society, Department of Physics, JCBUST, YMCA, Faridabad.
- Orientation Programme for Newly Admitted students- First Week of August.

September 2020:

- Extension Lecture & Training Programme- Career Counselling & Placement Activity- First Fortnight of September
- Observing Teacher's Day- 5th September.
- Expert lecture on History of Nuclear Physics by Prof. A. K. Jain of IIT, Roorkee.

October 2020:

- Expert Lecture on "Next Generation Solar Cells" by Dr. Trilok Singh of Indian Institute of Technology, Kharagpur

November 2020:

- Value added Course on the topic "Synthesis and Characterisation of Nanomaterials".
- Extension Lecture- (Career Counselling & Placement Activity)- Third Week of November.

December 2020:

- State Level Camp under Vidyanthi Vigyan Manthan (VVM), a nationwide science talent search multi-level exam, and celebration of National Youth Day on the occasion of birth anniversary of Swami Vivekanand at JCBUST, YMCA, Faridabad.
- Semester Examinations for B.Sc. III, V semester and M.Sc. 3rd semester.
- Orientation Programme for B.Tech. and M.Sc. 1st semester students.

January 2021:

- Career Counselling & Placement Activity.
- Mentor-Mentee meeting for the counselling of students.

February 2021:

- International webinar on Modern Nuclear Physics.
- Value added course on Futuristic Research & Related Experimentation Techniques.

- Career Counselling & Placement Activity related Workshop.
- Special Lecture on Science Communication to observe National Science Day- 28th February.

March 2021:

- Student's Activity to observe International Women's Day- March 8th
- Mentor-Mentee meeting for the counselling of students.
- Career Counselling & Placement Activity.

April 2021:

- Mentor-Mentee meeting for the counselling of students.
- Career Counselling & Placement Activity.
- Semester Examinations for B.Sc. I semester and M.Sc. I semester.

May 2021:

- Semester Examinations for B.Sc. 1st and M.Sc. 1st semester.
- Value added course on Advanced Material and Their Pathways (AMTP-2021)

June 2021:

- Field Project Work / dissertation / Internship of M.Sc. students.
- Mentor-Mentee meeting for the counselling of students.
- Career Counselling & Placement Activity.
- B.Sc. 4th semester and M.Sc. 4th semester examinations.