# GOVERNMENT INSTITUTE OF SCIENCE

# Aurangabad

(Post-graduate and Research Institute of Maharashtra Government)


# VISION DOCUMENT

## Institute Patronage

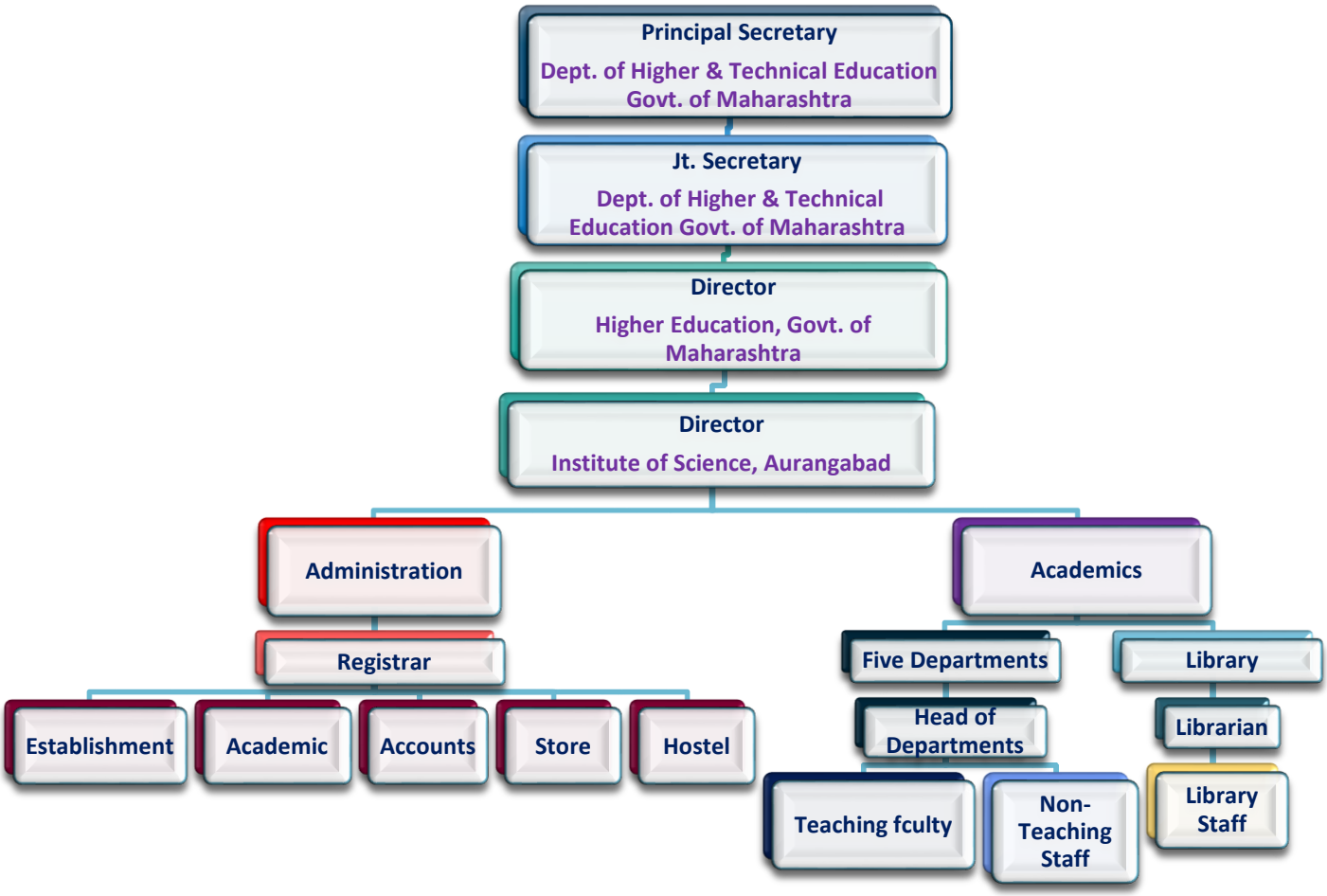
Maharashtra
Government, Mumbai

Director,
Higher Education,
Pune

Dr. Babasaheb Ambedkar
Marathwada University,
Aurangabad


Government Institute
of Science, Aurangabad

## Institute organization



# 1. Preamble

The Government Institute of Science, Aurangabad forerunner post graduate and research Institute established and funded by Department of Higher Education, Government of Maharashtra in 1974. The Institute is affiliated to Dr. Babasaheb Ambedkar Marathwada, University, Aurangabad. The Institute is the only Post-graduate and Research Institute in Marathwada region.

The Institute is well known for its commitment to offer post-graduation education and research in botany, microbiology, geology, biophysics and biotechnology. In last five decades the Institute contributed in generating efficient scientific human resource by offering excellent training to its admitted students. The massive number professionals including scientific stalwarts working in industry, academic institutes and government sector are pedagogically sculptured by the institute.

The sole crux of the Institute is to provide quality higher education to majority of students from under-privileged region of Marathwada.

# 2. Institute at Glance

Government Institute of Science, Aurangabad is established on 14$^{th}$ August 1974. The Institute offers post graduate (PG) education in 05 frontline subjects Biophysics, Biotechnology, Botany, Geology and Microbiology with intake capacity 20 students. Except botany all the remaining subjects are not being taught in the University. The departments are recognized as Research Centres by Dr. Babasaheb Ambedkar Marathwada University, Aurangabad. The Institute is recognized by UGC under 2f (5$^{th}$ Jan, 1980) and 12B (3$^{rd}$ Sep, 1985). The Institute is identified and supported by DST, New Delhi, under scheme FIST Program – 2012. The curriculum offered by Institute is designed by keeping in view of the updates and needs of skills required to cater the local to global requirements of broad spectrum of fields.

# Institute infrastructure

- Separate hostel for boys and girls (Boys hostel having a capacity of 60 students, and girl's hostel (capacity 60) and Minority girl's hostel with total capacity of 100).
- Separate residential quarter for Director and quarters for non-teaching staff.
- A multipurpose hall with a 200 seating capacity.
- Administrative block consisting of Director's office with attached conference hall, office of the Registrar, for other offices and IQAC hall.
- Gamma radiation center
- Separate Central library with internet connectivity.

- Three two storied buildings housing classrooms, labs, staff rooms etc. for 5 courses
- Student activity center having a multipurpose hall, reading room, indoor game facility etc.
- High speed Internet connectivity in the campus.

## 3. Departments

| SR.NO | DEPARTMENT | ESTABLISHMENT YEAR | PROGRAMME |
|---|---|---|---|
| 1. | **Botany** | **1974; 1985** | **Ph.D.; M.Sc.** |
| 2. | **Microbiology** | **1976** | **M.Sc., Ph.D.** |
| 3. | **Biophysics** | **1980** | **M.Sc., Ph.D.** |
| 4. | **Geology** | **1984** | **M.Sc., Ph.D.** |
| 5. | **Biotechnology** | **1996** | **M.Sc., Ph.D.** |

Intake capacity for above post graduate courses is 20 students per subject. Admission to Ph.D. is as per guidelines of Dr. Babasaheb Ambedkar Marathwada University, Aurangabad.

## 4. Vision

### Providing quality education, skill based education and research in frontline subjects

**The Institute of Science, Aurangabad is a premier science Institute of Marathwada region, pursuing for academic and scientific excellence, catering to the needs of Maharashtra, striving for its holistic development by providing quality learning and research skills.**

## 5. Mission

- To develop students with scientific temperament, moral and ethical values and multifaceted proactive personality by providing quality education.
- Institute of Science will very soon opt for autonomy.
- Institute will evolve system(s) to provide quality education to suit local, regional, national needs and needs that will arise due to globalization.
- Institute will grow in multi directions with innovative approaches to serve community/industries academia at large in front line areas in this new millennium in the field of Science and Technology.
- To develop and strengthen Industry-Institute participation directly in teaching, learning processes and financial aspects of the Institute.
- To start the new departments that will suit our goals, mission and objectives.

# 6. Objectives

- To provide equal opportunities and equity for the students of Marathawada for higher education.
- To generate human resources, so as to fulfill the local needs of industries
- To enable the students of Marathwada region to participate in national level competition in the field of Science and Technology.
- To inculcate research culture in the students
- To develop rain water harvesting to meet the scarcity of water problem.
- To develop and implement microbial technology for solid waste management.
- To extend the consultancy services to solve the local problems relating to agriculture and industries.
- To propagate and make awareness of science education.
- Efforts will be taken to generate funds through short term courses
- Production of mushrooms, organic manure, single cell protein, biofertilizers
- To collaborate with departments of Institute and other institutions and universities.

# 7. SWOC Analysis of Institute

| Strengths | |
|---|---|
| 1. | Availability of sufficient qualified teaching staff, majority of faculties have Ph. D. qualification. |
| 2. | Institute is a recognized research center of affiliating university, total 09 faculty members are recognized research guides |
| 3. | Separate classrooms and practical laboratories for M.Sc. Part I, II and research students. |
| 4. | Central Computer laboratory developed under DST-FIST scheme |
| 5. | Stable and high demand ratio for the courses. |
| 6. | Available courses are compressive and competent to meet local to national needs of various fields |
| 7. | Frequent visits of alumni occupying key positions in academics and industries |
| 8. | Student-centric academic planning and implementation |
| 9. | Regular participation of students/teachers in National/International conferences, summer training, workshops and symposia |
| 10. | Open access to Instrumentation facilities for students and researchers |
| 11. | Consultancy services for groundwater exploration, plant material identification for forensic investigation, soil testing, and gamma irradiation, etc. |
| 12. | Placement and Training Cell. |
| 13. | Active involvement of faculty members in research projects sponsored by various agencies |
| 14. | Good research publication profile by publishing research in peer review, impact factor research journal of national/international repute. |
| 15. | Successful implementation of government's scholarships and fellowships |
| 16. | Boys and girls hostels and minority girls hostel facility within campus |

| Weakness | |
|---|---|
| 1. | Limited / inadequate funding for purchase and maintenance of sophisticated equipment |
| 2. | Lack of awareness about the contents and prospects of the interdisciplinary subjects offered and poor communication skills due to rural background |
| 3. | Vacant teaching positions |
| 4. | Abolishment of the non-teaching posts (laboratory staff) due to policy decision |
| 5. | No provision of funds for initiating in-house projects |
| 6. | Constrains on hostel facility due to high demand ratio (since it is shared among Institute of Science and Forensic Science Institute). |
| 7. | Least scope to take student and faculty development decision |
| 8. | Inadequate fellowship covering all students who are pursuing Ph.D. No funds for field visits, study tours and participation in conferences/workshop/symposia etc. |

| Opportunities | |
|---|---|
| 1. | Scope for consultancy services. |
| 2. | Avail funding from various funding agencies. |
| 3. | Establish MoU with industry, research and academic institutes. |
| 4. | Faculty can acquire additional qualifications in allied fields by pursuing their Post-Doctoral research. |
| 5. | Offer workshop / short term training courses in various allied subjects. |
| 6. | Departments have potential to establish further interdisciplinary activities in teaching and research. |
| 7. | Establishment of sophisticated instrumentation laboratory with availability of state-of-art instrumental, procedural and computational facility. |
| 8. | Organize state/national level quiz/workshop/conference |

| Challenges | |
|---|---|
| 1. | **Explore new trends of research in varied discipline with limited available facilities and funds.** |
| 2. | **Separate faculty / specialization laboratories and financial budgets.** |
| 3. | **MIS for administration, teaching and library.** |
| 4. | **Enriched e-content and availability of literature to all from library.** |
| 5. | **Faculty development initiatives, travel grants, participation grants and study tour etc.** |
| 6. | **Rapid advances and deluge of information putting enormous stress on existing curricula and infrastructure.** |
| 7. | **Need for high value up gradations in content and infrastructure in resource constraint environment.** |
| 8. | **Filling of vacant position, getting more funds to enable for maintaining and improving department position in current competition so as to sustain students interest in courses offered at Institute.** |

# 8. Key challenges

For fulfillment and proper implantation of the vision and mission of the Institute, it is necessary to overcome a few constrain which are inevitable in various phases of development of Institute. There is restriction on academic, administrative and financial freedom that institute can overcome through autonomous status. The Institute is committed to provide complete transparency in all its admission and academic process for effective and transparent governance.

### The identified key challenges

- Enrich the employability value of student by providing soft and professional skill
- Organize Campus interviews / placements (as less number of students are available for each subject, 20)
- Acquiring autonomous status
- Separate budget at par to university PG department

- ❖ Modernization and extension of the Hostel facilities, laboratories and staff rooms, etc.
- ❖ Research in limited facilities and resources
- ❖ Attracting and retaining staff and students

# 9. Goals

## Short term goals

- ➢ Up-gradation of infrastructure including laboratories, staff rooms, class rooms, boys and girls hostels.
- ➢ Avail ICT enabled teaching learning facilities, smart classrooms (proposal has been already submitted to RUSA).
- ➢ Implementation of RUSA funding for overall improvement of institute
- ➢ Submitting proposals to funding agencies like UGC STRIDE, DBT and DST etc.
- ➢ Promote faculty to prepare Moodle, MOOC for students by faculty
- ➢ Will provide language labs and spoken tutorials to students and staff
- ➢ To provide high speed Wi-Fi connectivity in campus
- ➢ Renovation of auditorium
- ➢ To construct canteen facility and lunch home for students and faculty
- ➢ To establish MoU with Premier Institutions, research centers, Universities and Government sectors (like TIFR, Mumbai)
- ➢ Preparation for NAAC Re- accreditation (3rd cycle)
- ➢ Completion of data entry with SOUL software, digitalization of issuing of books and increasing online resources

## Midterm goals

- ➢ To establish of gymkhana and health center
- ➢ Starting Moodle and MOOC for students in relevant subjects
- ➢ NAAC re-accreditation (3rd cycle)
- ➢ To establish linkage with incubation center of affiliated university
- ➢ Initiation of self-financed bridge courses and short term training in varied disciplines (Remote sensing and GIS, molecular diagnostic for trait purity, nanobiotechnology, IPR and patents etc.)
- ➢ Development of commercial algal production and tissue culture laboratory.

## Long term goals

- ➢ Establishment of Botanical garden
- ➢ Establishment of Central Instrumentation Centre
- ➢ E-consortium development

- Expansion / new hostel for boys and girls
- Online library facility, digitization of thesis and rare books
- Up-gradation to green Institute (Eco toilets, solar panel, rain water harvesting and solid waste management)
- Starting new PG programs
- Academic autonomy

## 10. College development committee

**Institute – CDC has been decided and forwarded to higher authorities for approval. Following are members of CDC**

| Sr. no. | Name |
|---|---|
| 1 | **Joint Director** |
| 2 | **Director of Institute** |
| 3 | **Mr. S. G. Kulkarni** |
| 4 | **Dr. A. N. Salve** |
| 5 | **Dr. A. G. Jadhav** |
| 6 | **Dr. J. J. Bhuktar** |
| 7 | **Mr. D. Tiwari** |
| 8 | **Non Govt. Representative** |
| 9 | **Non Govt. Representative** |
| 10 | **General Secretary - Student** |

## 11. Education at Institute

- The Institute follows the curriculum designed by Dr. Babasaheb Ambedkar Marathwada University, Aurangabad.
- At the beginning of every academic year, all the departments prepare an academic calendar, teaching plan and time table to be implemented during the year.
- The Institute encourages the teachers to attend workshops and orientation program organized by the Board of Studies in respective subjects to acquaint them with the depth of theory, practical, and the reference material.
- Teachers are made in-charge of various aspects of curriculum with respect to planning and execution, a teacher is in-charge of group of student and guides them for seminars and projects, right from reviewing of literature to presentation.
- Continuous monitoring of the students as a part of internal assessment.

- Undertaking field visits to understand concepts, in Geology and Life sciences.
- Industrial visits to understand production, technical and manufacturing processes.
- Every department submits their plan for organizing lecture of eminent personalities/scientist to promote the students to choose research career.

**The Institute is presently offering post graduate program in 05 disciplines. To maintain quality in such diversified area of education, commitment from the Institute is necessary. The institute aims to improve the pedagogical environment, so that it becomes learning centric.**

# 12. Action Plan

## Academic

- Compulsory review of curriculum is planned to be exercised every three years. It should include revision of curriculum, introduction of new courses, review of evaluation system etc. This review will be on the basis of the feedback received from teachers, alumni, students, industry and other stakeholders. While carrying out the review exercise expert from leading institution and also from surrounding industry should be involved.
- Computer literacy for all staff members (Teaching and non- teaching)
- Renovation of the existing laboratory is of immediate importance. State of the art laboratories needs to be established. More emphasis should be given to field training and laboratory teaching.
- Efforts for getting fellowship (10,000/month) from Government to students perusing Ph.D., funds for field visits, study tours and participation in conferences/workshop/symposia etc.
- To nurture the hidden creativity of students, every department should have / establish professional student association. The activity of the association should be encouraged.
- Students will be taught business ethics and soft skill courses. Special body language training must be given to students for their growth in corporate world.
- NSS/Sports should be made necessary for all students by assigning credits.
- Each department will undertake a promotional plan for faculty members to travel to neighboring institutions and deliver lectures there to motivate the students for doing PG in different disciplines at GISA.

- Interaction with MCC and other industries, MCED should be initiated, a functional industry institute interaction needed for entrepreneurship development in various aspects.
- Preparing plans for increasing consultancy services (Antimicrobial testing, Green audit, water testing etc.)
- Institute is offering five post graduate programs. New postgraduate programs and short term courses will be started
- Bridge courses and short term training to cater the needs of students to adopt inter and trans-disciplinary nature of science.

## Student activity center

- It is planned to develop student activity center in the campus to cater the needs of increasing student strength.
- It is planned to develop sports complex to provide facilities for all kinds of indoor and outdoor games.
- The student counseling service will also be part of this. The counseling will help depressed students to feel motivated towards their studies and career.

## Training to non-teaching staff

- Workshop and hands on training to enhance computer literacy
- Interactive session on stress management and work ethics

## Human Resource Recruitment & Development

- Recently sufficient positions of faculty have been appointed through MPSC. Institute will make hard and sincere efforts to fill up all the vacancies (12) in faculty positions. The institute also needs technically trained manpower for the laboratories. The institute will also take care of professional development of faculty and non-faculty members of the institute.
- Institute proposes following action plan
- Provisions will be made for appointing visiting faculty and distinguished honorary faculty. (Funds are required to pay the honorarium)
- Industry experts will be invited to deliver talk and have interactions with faculty and students.
- Faculty members will be sponsored for qualification improvement and skill improvement wherever necessary.
- Efforts will be made to skill development for higher studies.
- Supporting technical and administrative staff will be periodically encouraged for continual training in new technology and modern working methods.

## Resource generation

- In the next decade, institute wishes to develop expertise and competencies to offer consultancy services to the industry. The expertise available in the institute will be given publicity so as to attract needy industries. For this, institute shall also strengthen alumni relations and will explore the possibilities of research and consultancies. Periodic round table meetings with senior alumni will be done to achieve the target.

## Research

The institute will contribute in the advancement of knowledge in basic sciences to emerging areas. Research culture needs to be fostered in the minds of faculty and young students. Following are the identified thrust areas for research-

| Department | Thrust research areas |
|---|---|
| Biotechnology | Bioremediation, Plant pathology, and Pharmaceutical microbiology |
| | Drug discovery |
| | Bioremediation, Photochemistry |
| | Nano-biotechnology |
| | Drug discovery |
| | Applied Mycology, Plant Pathology and fungal nanotechnology |
| Microbiology | Geomicrobiology, Bioinstrumentation, Biopolymers and Thermophiles |
| | Enzymology, Bacterial Protease, Human microbiome Pharmaceutical microbiology |
| | Microbial Biotechnology, Bio-nanotechnology |
| | Enzyme technology and Process development |
| | Halophile and Protease inhibitor |
| | Microbial bioremediation |
| Botany | Ethnobotany, Plant biotechnology, Cytology, Mutation breeding, Molecular biology |
| | Algology and plant ecology |
| | Phyto-chemistry, Palynology |
| Geology | Hydrogeology, Hydro-geochemistry, Ground water exploration |
| | Micropaleontology, Stratigraphy, Geomorphology and hydrogeology |
| | Paleontology –Stratigraphy and Ichnology |

| Department | Thrust research areas |
|---|---|
| Biophysics | Ultrasound Biophysics, Structural and kinetic based studies in bio-macromolecules |
| | Radiation Biophysics, Free Radical Biology , |

## The alumni association

Functional Alumni association is actively involved in development of Institute. Majority of alumni are contributing by sharing their expertise and experience for overall development of students. Alumni are also helping in placement of students.

## Institute social responsibility

**As an institute of national importance, Institute realizes its responsibility towards the society. In order to satisfy the needs of the society, a center will be established which will focus on the following broad areas -**

- Arranging faculty development program for faculty members of surrounding institutes and also faculty of this institute.
- Entrepreneurship awareness and innovation.
- Social awareness about local and national problems and to find possible technological solutions.
- Skill development for rural and persons from backward society of Marathwada.

## Career development cell

Institute strongly feels its responsibility in placing all the students for summer training and also for their career. To be successful in their career students' needs to be trained properly during their studies. For this, a carrier development cell will be established. The cell will consist of one-two teacher and supporting staff. The center will offer career counseling, personality development and soft skill development training. It will also provide guidance to students to help them to choose correct career option.

## 13. Institute Road Map

Organization of student centric activities annually in all subjects, for popularization of institute programs at state and national level to attract and retain students. Efforts will be taken for increasing funds for student centric activities. Creating MoU with various academic centers, industries and research institutes for exchange of facilities and initiate programs of mutual interest.

- 2020-21: renovation and up gradation / modernization of laboratories, staff rooms and class rooms for ICT based education to meet quality education.
- Development of e material/Creating MOOC courses for institute students

- 2021-22: Upgrading of faculty members, encouraging them for perusing higher studies-PhD
- NAAC accreditation and efforts for rising present accreditation grade
- 2022-23: Increasing the number of guides and thus elevating research structure of Institute. Institute to apply for autonomous status.
- 2023-24 To achieve research excellence
- 2024-25 Center for excellence in government colleges

## 14. Final word

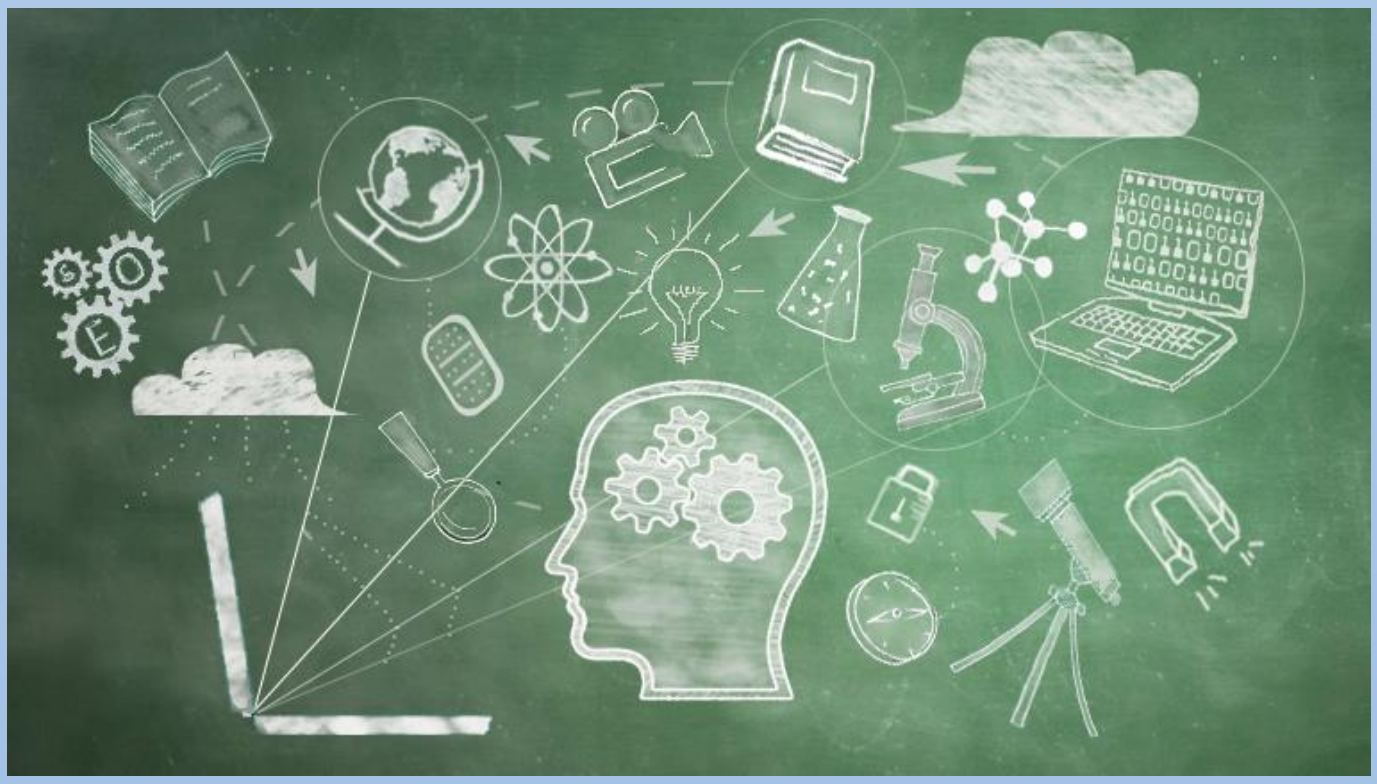
**This vision document is prepared after carrying out SWOC analysis by various stakeholders and also by arranging brainstorming sessions. Some of the steps have already been taken to achieve the desired goal.**

**The progress will be periodically reviewed in order to take suitable corrective actions, if necessary. We are assured that with this vision document and with dedicated efforts of all faculty members and stakeholders, a significant progress of the Institute will be definitely achievable.**

* * * * *

# Cultivation of mind should be the ultimate aim of human existence

Dr. B. R. Ambedkar



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