Contents

SOCIETY OF ST. FRANCIS XAVIER, PILAR'S
FR. CONCEICAO RODRIGUES COLLEGE OF ENGINEERING
(Approved by AICTE & Affiliated to University of Mumbai)
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RESEARCH PROMOTION POLICY

Effective from 17th Oct 2022

DR. KETKI JOSHI
In-charge Research and Development

DR. SURENDRA RATHOD
Principal

Moulding Engineers Who Can Build the Nation

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Preamble:

Fr. Conceicao Rodrigues College of Engineering encourages multidisciplinary quality research related to science, engineering and technology in the domain of Computer Engineering, AI and Data Science, Electronics engineering, Mechanical engineering, Sciences and Humanity. Academic research, funded research projects, and the creation of intellectual property in the engineering and technology domains are all part of the research activities. The institute strives to create a vibrant research environment for faculty and students engaged in emerging areas. A research and development committee is formed to support the research ecosystem and channel the related activities.

Vision:

To foster an environment conducive to multi-disciplinary research in engineering and technology.

Mission:

1. To promote inventiveness and moral research among faculty, students, and alumni.
2. To encourage interdisciplinary and collaborative research that benefits various facets of society and industry.

Objectives:

- To inspire faculty and students to realize their research potential and improve their involvement in research and development activities.
- To support collaboration and interdisciplinary research projects.
- To support the students and faculty in their efforts to create, protect, and leverage Intellectual Property Rights.

In light of these goals, a research and development committee has been formed at Fr. CRCE to strengthen the institute's presence in the field of research by actively promoting research culture and facilitating research activities.

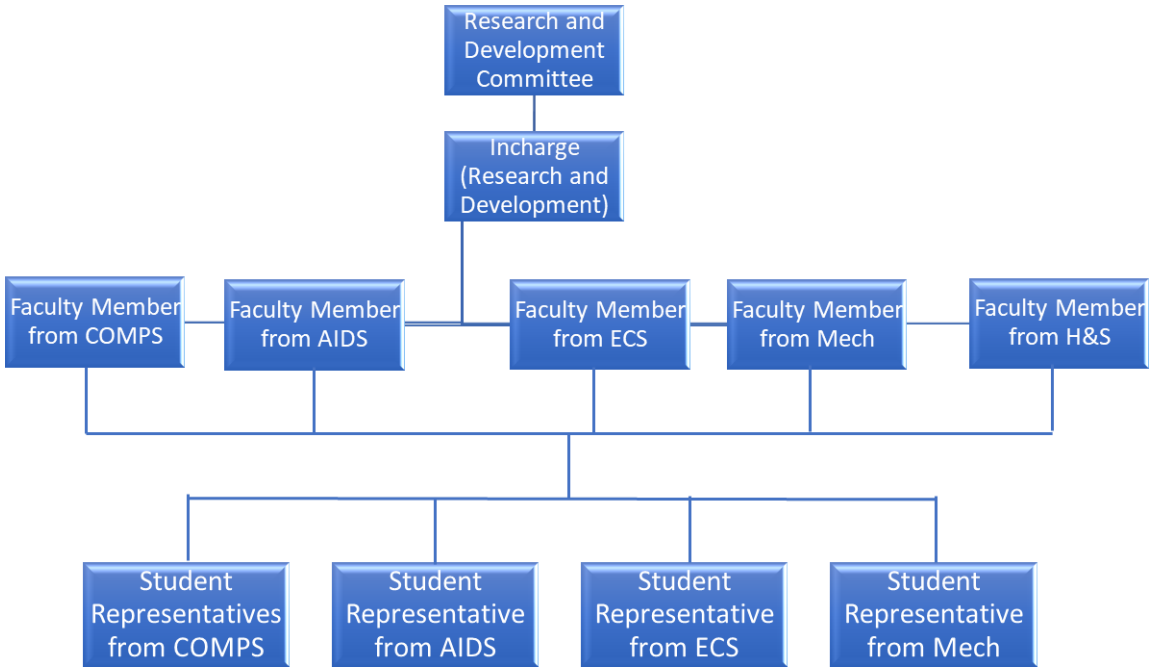
Short-Term Objectives:

- Conducting faculty and student development programmes to improve understanding of research and IPR.
- Creating awareness and encouraging quality research publications in standard journals.
- Creating awareness and encouraging students and faculty to apply and publish patents and IPR.
- Facilitating applications for research grants to various funding agencies

Long-Term Objectives:

- Collaborating with national/international agencies on research projects and IPRs.
- Enhancing research contribution by the students and faculty in the institute and improve its research ranking.
- Channelizing efforts by researchers to receive grants, commercialization of Patents and IPRs and the technology transfer.
- Engaging the researchers in providing technology solutions to practical problems implementable in the industry and society.

Structure of Research and Development Committee



Roles and Responsibilities of the Committee:

Faculty Members in the Research Committee:

1. To work toward motivating Institute faculty and students to achieve R&D objectives, short-term and long-term research and development goals.
2. Encourage faculty to write effective research proposals and to provide the necessary assistance when applying to various funding agencies.
3. Encourage faculty and students to organise and attend conferences/STTP/workshops/Seminars/Training/FDP/SDP related to cutting-edge technology, research, and intellectual property.
4. Raise awareness of, and encourage, quality publications, research contributions, and IP generation among faculty and students.
5. To familiarise students with new technological innovations and research prospects.

Student Representatives in the Research Committee:

1. Assist faculty members in organising various events such as workshops, seminars, trainings, and certification courses to promote research and intellectual property rights.
2. Informing students about various R&D initiatives and research project opportunities, and encouraging them to participate in related activities.
3. Encouraging students to publish research papers or apply for patents related to minor or major projects completed during the academic course.

Department of Electronics and Computer Science

Major Thrust Areas and Research Facilities

Abstract:

The department was established in 1987 with B.E. in Electronics Engineering. From the academic year 2019-20, the course is renamed to Electronics and Computer Science to cope up with the 4th Industrial revolution. The perfect blend of knowledge of computer technologies with electronics provides the path to the new edge computing. In line with one of the missions of the department "To cultivate an ambience to encourage innovation, research and entrepreneurship skills", the R & D cell promotes research culture and research projects in the department by providing computing as well as hardware facilities. The main focus is to develop multi-disciplinary projects that address the societal problems in real-life. One of the possibilities could be by integrating AI/ML solutions in Internet of Things (IoT) in areas like Smart farming, Healthcare, Smart Cities, etc. Novel research in solving security issues in IoT is also a desired outcome. The department also aims to produce quality research publications and competent multi-disciplinary projects by students and faculties. The department/institute also offers honours/minor Degree programs in Artificial Intelligence and machine learning, cyber security and, Block chain.

Objectives:

1. To investigate and analyse the issues related to power consumption, security, data privacy and data linking in real-world and provide solution using IoT and related technologies.
2. To design, analyse and develop automated system with appropriate consideration for public health and safety, and the cultural, societal, and environmental considerations.
3. To develop system and applications programs by optimizing, analysing and investigating the theoretical analysis of the algorithms.

Research Domains:

The department has following research domains mainly.

1. Internet of Things
2. Automation
3. Computation and Algorithms
4. VLSI Design

Research Facilities:

The facilities available with departments/Institute are as follows:

Thrust Areas	**Description**	**Facilities/ resources**
Internet of Things	Issues related to Power consumption, Security, Data privacy, Complexity of Data, Issues related to data linking and processing	Raspberry Pi4 Model B (4GB) Kit with Sensors, Node MCU ESP8266 Board, IOT based digital electronics workbench, IOT Sensor Interface, ESA 51 E, PIC 18Fxx Board with LED USB Interface
Automation	Nonlinear Systems, Multi-agent systems and their coordinated control, Intelligent Data Mining Algorithms and Applications, Health Monitoring and Intelligent Fault Diagnosis Systems, Soft-Computing in Modelling and Control, Brain Computer Machine Learning, Unmanned Aerial Vehicles	Instrumentation and Transducer trainer with on board Sensor and Actuators, 6 Axis Robotic, Arm with 250gm Payload Capacity, Industrial 4 port I/O link IFM Germany make with Temperature and speed I/O Sensors, PLC TRAINER-10 with Allen Bradly micrologix 1400(with software license), HUMAN MACHINE INTERFACE (HMI), WINLOG PRO,32TAG WEB ENABLED SCADA SOFTWARE
Computation & Algorithms	Data structures, Algorithms, Computer organization and architecture, Operating system, Object oriented programming, Image processing, Machine Learning, Deep Learning, Artificial Intelligence	Department has three computing laboratory with state-of-the-art software/tools like Jupyter, Tensorflow, JDK, PGAdmin, Hadoop. Specialized high end Machine learning server with 32GB GPU to cater to ML projects.
VLSI Design	Analog CMOS VLSI Design, Mixed Signal Design, FPGA based System Design	FPGA prototype boards, Simulation tools

Department of Mechanical Engineering

Major Thrust Areas and Research Facilities

The department presently offers B.E. (Mechanical Engineering), M.E. (Mechanical Engineering) with specialization in CAD/CAM and Robotics and Doctoral Program in Mechanical Engineering. The department also offers honours programs in Robotics, 3D Printing, Data Science and IOT.

Having a legacy in production engineering since its establishment in 1984 and experience in offering Mechanical Engineering program at PG and PhD level, the department converted UG program in production engineering into mechanical engineering in 2019-20, in response to the changing industry requirements. With an experienced and qualified pool of faculty and state-of-art laboratories, the department has the following research domains and departmental/institute level facilities.

Research Domains:

The department has three research domains.

1. Manufacturing
2. Design
3. Automation

Research Domains	Thrust Areas	Research Facilities
Manufacturing	Design of CNC Systems Smart materials Nano materials Composite materials Material characterization Microstructure analysis Minimum quantity lubrication machining MQL Machining with nano-fluids Sheet metal forming Plastic injection moulding Additive manufacturing Computer Aided Manufacturing Manufacturing System Simulations Discrete Event Simulation Manufacturing Process Simulations Machine vision and applications	Production Grade CNC Machines MQL unit High resolution inverted microscope with material analysis software Digital UTM Fatigue Tester Metallurgical Furnace 3D Printer Arena Manufacturing System Simulation software

Design	Computer Aided Design Computer Aided Engineering Simulation based Design and Optimization using Finite Element Analysis (FEA) Simulation based Design and Optimization using Computational Fluid Dynamics (CFD)	Modelling and Analysis softwares: Autocad, Solidoworks, Ansys, NX11 Machine Learning and data analytics softwares
Automation	Mechatronics and IOT Industrial Robotics Vision Systems	Automation Softwares: Fluidsim for Pneumatics and Hydraulics PLC Systems Robotic Arm

Department of Computer Engineering

Major Thrust Areas and Research Facilities

The Department of Computer Engineering was established in 1991. The department offers B.E. in Computer Engineering, a four-year degree program with an intake of 120 students. It has excellent infrastructure and highly qualified and professionally skilled faculty. The department conducts various training programs to help faculty and students to improve their technical knowledge. The Department has received a Research Grant from the Department of Science and Technology (DST), and Mumbai University for Innovative Projects and Minor Research Grant. It has signed MoU with several companies like Tata Consultancy Services, IBM and D-Link. Graduates of our department have been recruited by major IT companies such as TCS, Accenture, Morgan Stanley, JP Morgan Chase, ZS, Seclure, SAP, Amdocs to name a few.

Abstract:

The Department of Computer Engineering has a goal to increase the number of innovative and mostly multi-disciplinary research projects through the efforts of faculty members and students. This results in the nurturing of research activities, the procurement of equipment and the development of state-of-the-art research facilities. These projects address the requirements of real-life problems. More importantly, one of the major mandates of the Department of Computer Engineering is to participate in international conferences and reputed journals. The issue of concern to society is also addressed by the faculty members and students through sponsored projects. The deliverables of the R&D endeavour are innovative and affordable technology and products.

Thrust Areas and Subareas of Computer Engineering Department:

Big Data, IoT, AI, and automation are the key components of Industry 5.0 in every industry. Therefore, it is crucial to investigate interdisciplinary fields for computer science and engineering applications. Cyber Physical Systems is one of these areas, where joint research projects are carried out with other departments.

Research domain	**Description**	**Facility**
Data Science, Artificial Intelligence and Computing	Machine Learning, Deep Learning, Natural Language Processing, Big Data Analytics, Data and Web Mining, Machine Vision, Cloud Computing	Advance Computing Lab supported with Deep Learning and Cloud server.

Cyber Physical Systems	Blockchain Technology, Cryptography and Network Security, Cybernetics, Human-Computer Interaction, Robotics, Quantum Computing, Internet of Things	Network and Security Lab supported with D Link DCS wireless kit and switches.
Software and System Engineering	Algorithms, Computer Architecture, Operating system, Database Systems Software Engineering	Programming and Database Lab

Department of Artificial Intelligence and Data Science Engineering

Major Thrust Areas and Research Facilities

Globalization, fast-paced growth of data and technological advancement has created a lot of exciting career opportunities. Data Science and Artificial Intelligence are the two most important technologies in the world today. While Data Science makes use of Artificial Intelligence in its operations, modelled after the natural intelligence possessed by humans, Artificial Intelligence is the algorithmic intelligence that is possessed by the machines to perform various autonomous actions. Data Science is a multi-disciplinary field that has conquered industries around the world. It has brought about a fourth industrial revolution in the world today. This is a result of the contribution by the massive explosion in data and the growing need of the industries to rely on data to create better products. We have become a part of a data-driven society. Data has become a dire need for industries that need data to make informed decisions. Fr. CRCE offers a new-age BE program in Artificial Intelligence and Data Science with the main objective of setting up students' careers in the most high-demand industry of the twenty-first century. Department has an experienced pool of faculty and UpToDate computing lab facilities to excel in this domain. Yet, our relatively small size makes for a collaborative and cooperative environment within which a broad set of research groups flourish.

Thrust Areas and Subareas of AI&DS Department:

Research domain	**Description**	**Facility**
Data Science, Artificial Intelligence and Computing	Machine Learning, Neural networks and Deep Learning Data Mining Natural Language Processing, Big Data Analytics, Data and Web Mining, Machine Vision, Cloud Computing Pattern Recognition Data warehousing	Advance Computing Lab supported with Deep Learning and Cloud server and Workstations with configuration such as Intel core i7-11700, 16Mb cache, 8 core, 16GB, DDR4, 1TB HDD, Nvidia T1000

Department of Humanities and Science

Major Thrust Areas and Research Facilities

Humanities and Science department established in 1984. With an experienced and qualified pool of faculty and state-of-art laboratories, the department has the following research domains and departmental/institute level facilities.

The department has four research domains-

1. Physics
2. Chemistry
3. Mathematics
4. Communication Skills

Research Domains	Thrust Areas
Physics	Material Science Conducting Polymer and their Nanocomposites Material characterization
Chemistry	Plant Extraction Medicinal Chemistry Material Chemistry Nanochemistry Environmental Chemistry
Mathematics	Mathematical Finance Game Theory Environmental Science
Communication Skills	English Literature Communication Skills

Research Facilities:

Department has sufficient facilities to conduct experimental as well as theoretical research in mathematics, sciences and humanities. Various test and measuring instruments are available in the department.

Institute Initiatives to Promote Research and Development

International Conference on Advances in Computing, Communication and Control

A biennial multidisciplinary International Conference on Advances in Computing, Communication and Control (ICAC3) is organised by Fr. Conceicao Rodrigues College of Engineering. The primary goal of this conference is to promote research and development activities in Computing, Communication and Control in India and the rest of the world. The Conference also aims to offer a collaborative platform for the people in Academics, Research and Industry to address emerging issues and solutions in the above-mentioned areas. The previous seven editions of the Conference were organized in January 2009 (In cooperation with ACM), January 2011 (Springer), January 2013 (Springer), April 2015 (Procedia Computer Science), December 2017 (IEEE), December 2019 (IEEE) and December 2021(IEEE Xplore) respectively. The best paper award is also given to the authors whose work represents breakthrough research in the respective field.

Anti-plagiarism software

Turnitin Anti-plagiarism software is purchased by the institute to facilitate the submission of quality research papers. It is essential that the software is extensively used by the faculty to check originality of Research Papers, Doctoral Thesis, PG and UG reports by the students.

Sponsored Research Projects:

Fr. CRCE encourages faculty to submit a research project for extramural funding to various institutions such as the All India Council for Technical Education (AICTE), Department of Science and Technology (DST), University Grant Commission (UGC), University of Mumbai etc. The Research and Development Committee will provide assistance and support in the submission of sponsored research projects to various funding agencies. The committee will facilitate proposal review by involving senior researchers from the institute related to the respective domain to evaluate and comment on necessary improvements related to the idea, methodology, feasibility, novelty, and contribution.

Even though all teachers are encouraged to apply for various research grants, it is mandatory for Professors and Associate Professors to apply for Major Research Grants in every academic year. Annual performance of Professors and Associate Professors will be judged based on the research grants applied and amount of research grant fetched.

Workshops/Seminars/FDPs/STTPs/SDPs:

Fr. CRCE has organised and shall continue to organise a variety of workshops, seminars, FDPs, STTPs, SDPs, and trainings on cutting-edge technologies, research, and intellectual property. The committee on research and development will encourage faculty and students to organise and participate in such activities. The committee will plan and carry out various Research and IPR-related activities to facilitate idea exchange and promote research culture, with the goal of improving individuals' and the institute's research profile.

Research Collaboration and Memorandum of Understanding (MoU):

The Research and Development Committee, in collaboration with the research guides of the research centre and experienced faculty members from various domains, will facilitate the signing of Memorandums of Understanding (MOU) related to research activities with various organisations. Annual performance of faculty shall be judged on successful research collaboration with industries and research

The institute has MoUs with various organizations/universities/institutes Tata Consultancy Services, IBM, D-Link, University of Texas at EL Paso. Synergy Consultancy, Christiani Sharpline to name a few.

Research Scholars Colloquium:

Research colloquium is the proposed activity which can be conducted during the international conference ICAC3 being organised by the institute biennially. The research scholars and faculty working on sponsored project will be presenting their ongoing research project or sponsored project. The activity will be open to all the faculty, students and research scholars with the objective of facilitating interaction and sharing the latest results and findings with the faculty and students interested in the related field. The award may be given to the best presentation to encourage quality research and development.

Paper publications / Patent Applications related to B.E./M.E./PhD Project Work

B.E./M.E. students are required to publish a paper or apply for patent / copyright based on the outcomes of the major project. It is essential that the students follow industry standards specific to their domain and use open-source software Latex while writing project reports. For PhD all the norms related to publications given by University of Mumbai should be followed.

Paper publications / Patent Publications by Faculty

1. Faculty publications and patents are integral part of ranking and accreditation of programs and institutes. Good quality publications indicate research culture of the institution and can bring laurels to the institute and faculty involved. Hence faculty are required to publish paper or file a patent every year. It is mandatory for every faculty to publish at least one journal paper in an academic year.

2. Quality of publication has always been a matter of concern and hence it is necessary to set minimum acceptable standards. At Fr. CRCE, publication by faculty would be claimed if it is published in **SCI, Scopus or Web of Science index journal**.

3. It is mandatory for everyone to write '**Fr. Conceicao Rodrigues College of Engineering**' as an affiliation in the papers. Affiliation should be mentioned in full and not the acronyms like CRCE.

4. All faculty members should create and use **ORCHID ID** and should be linked to the Scopus.

Incentives / awards for research achievements:

Financial support to Undergraduate students for paper presentation at national / international conference: Undergraduate students are eligible to get financial assistance in the form of partial reimbursement of the conference registration fee on successful presentation of the paper at national / international conference with necessary prior approvals. Research and Development committee can scrutinise the applications and institute financial supports will be based on quality of paper, quality of journal/conference and impact of research.

Best Ph.D. Thesis: Ph.D. thesis of all the research scholars completing Ph.D. from the college research centre during the academic year will be evaluated by an expert panel. Best Ph.D. Thesis will be awarded to the researcher having most significant research contribution among the candidates. The evaluation will be based on the criteria related to publications in national and international journals, conferences and transactions, book chapters, awards and recognitions, collaborative research, funding and IPRs. Rubrics for evaluation of best thesis shall be developed.

Research Grant: A faculty member working on a research project funded by external agency will be provided necessary support from the institute for its completion and will be permitted to use the infrastructure and research equipment available in the institute, with prior approval through proper channel. Institute may issue 'Letter of Appreciation' to a faculty member who successfully complete the funded research project.

Annual Reports:

The research and development committee will prepare the following annual reports at the end of academic year:

- R&D activities conducted during the year
- Faculty and student contribution to research
- List of publications by faculty and students

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RESEARCH ETHICS POLICY

Effective from 17th Oct 2022

DR. B. S. DAGA
Member Secretary (Institutional Ethics Committee)

DR. SURENDRA RATHOD
Principal

Moulding Engineers Who Can Build the Nation

Section 1: Objective

FR. CONCEICAO RODRIGUES COLLEGE OF ENGINEERING, a premier Engineering College,is committed to develop best quality technical personnel with sound knowledge in basic engineeringprinciples, technical skills, innovative research capabilities and exemplary professional conduct to use technology for the benefit of society with the highest ethical values. The college is established to impart uninterrupted dissemination of knowledge to top ranking students from all sections of thesociety. The college is responsible to cultivate higher values of honesty, integrity, responsibility, mutual respect for persons and property and respect for humanrights.

In order to achieve this, appropriate guidelines are framed to enforce professional ethics in the personal conduct which will be binding on all the students and staff in the college. Institutional Ethics Committee is constituted to formulate Research Ethics Policy for FR. CONCEICAORODRIGUES COLLEGE OF ENGINEERING.

Section 2: Institutional Ethics Committee (IEC)

The Institutional Ethics Committee shall be comprised of senior faculty members with Principal asthe Chairman of the committee. An IEC is established to formalize institutions commitment to the promotion of high scientific and ethical standards in the interest of communities and researchers. All research involving human subjects or data related to human subject as a patient should be conducted in accordance with the three basic principles, namely Beneficence, Respect for Persons and Justice.

Section 3: Responsibilities of Institutional Ethics Committee

- Formulate the Research Ethics Policy for Fr CRCE
- Provide independent and competent review of all ethical aspects of research proposals
- Review research proposals submitted to it within a reasonable time and document its views in writing to the applicant's
- Safeguard the dignity, rights, safety, and well-being of all study participants and communities paying special attention to investigations that may involve vulnerable participants
- Consider the suitability of Investigator(s) for the proposed study with respect to relevant qualification, training and experience.
- Report breaches of Research Ethics Policy or non-compliance of ethical practices among students, facultyand staff to the Principal for taking necessary actions.
- Recommend actions on non-compliance of ethical practices among students, faculty and staff
- Propose corrective actions on report of non-adherence to the Policy.
- Remain trained and up to date on the regulatory requirements

- Make amendments and clarity to the Policy as and when required.
- If required then review following documents to arrive at the conclusion:
  - (i) Experimental Methodology
  - (ii) Protocols followed during experimentation
  - (iii) Investigators profile
  - (iv) Investigators agreement with sponsor
  - (v) Investigators undertaking

Section 4: Responsibilities of the Students/Scholars

It shall be the responsibility of the students and scholars to:

(i) Read, understand and be aware of this Research Ethics Policy and subsequent amendments brought to it.

(ii) Respect the laws of the country, rights of individuals and to conduct in a responsible and dignified manner at all times. One must show due respect to people while interacting for academic purposes by way of data collection, and surveys for student projects.

(iii) Obtain written consent from human subjects/participants and prior approval of Research Ethics Committee in projects involving any kind of direct measurement of human physiological parameters such as ECG/EMG etc.

(iv) Ensure that, the rights of an individual will be respected and their property and life will not be put under threat at any circumstances. Academic work must not pose a risk or danger to people or the environment. Necessary clearances and permits/licenses must be obtained while handling, storing and disposing of radioactive, toxic or harmful materials.

(v) Follow ethical practices in publications/thesis/project reports etc. by checking plagiarism and by avoiding self-plagiarism. Be cautious to avoid so-called "predatory journals" which publish papers with minimal or no review. It is unethical to publish in such journals of this nature.

(vi) Carefully avoid data fraud and all unacceptable forms of data manipulation, such as or subtracting data points at will, editing images to produce a false result, creating images artificially and presenting them as data or using the same figure or table to describe different experiments. The conclusions claimed in a research paper must be genuine.

(vii) Honestly claim authorship of documents. The list of authors in research papers, reviews, books, monographs or policy documents should not be manipulated to give undue credit to those who have not contributed (“honorary authorship") or deny credit to those who have contributed sufficiently.

(viii) Improve the balance of under-represented sections and provide supportive environment by avoiding bias, favouritisms and discrimination of any kind. Academic communities are enriched by the presence of people of different ethnicities, genders, religions, castes, tribes, socio- economic strata, affiliations, backgrounds and sexual orientations. There must not be direct or indirect bias or discrimination against any individual based on the above categories.

Section 5: Responsibilities of Staff

It shall be the responsibility of the members of staff to:

(i) Read, understand and be aware of this Ethics Policy and subsequent amendments brought to this Research Ethics Policy.

(ii) Respect the rights of individuals and to conduct in a responsible, unbiased and dignified manner at all times. One must show due respect to people while interacting for academic purposes by way of data collection, and surveys for student projects.

(iii) Obtain written consent from human subjects/research participants and prior approval of Ethics Committee in projects involving direct measurement of human physiological parameters such as ECG/EMG etc.

(iv) Ensure that, the rights of an individual will be respected and their property and life will not be put under threat under any circumstances. Academic work must not pose a risk or danger to people or the environment. Necessary clearances and permits/licenses must be obtained while handling, storing and disposing of radioactive, toxic or harmful materials.

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Section 6: Procedures for Corrective Action

This Policy is envisaged to employ procedures for dealing with allegations of researchmisconduct, as well as any other kind of misconduct as described in this document, against itsstaff and students.

It is compulsory for researchers to adhere to norms of engineering practice and follow all safetyguidelines. Researcher should take more pre-caution when human subjects are involved or design & development of products to be used on human subjects are involved. Institute stronglydiscourages the unethical practices or data collection, data analytics, data reproduction or drawing inference from the data.

(i) Corrective action:

If a publication or report/thesis is found to contain plagiarism or manipulated data, the concerned department must ensure that a correction or retraction is published in the same placeas the original paper.

On the other side, if a decision is found to have been made based on a bias or conflict of interest,then it should be overturned and the process must be repeated from first step, if necessary.

In general, every effort must be made to ensure that an unethical action does not succeed in propagating false knowledge or incorrect decisions.

(ii) Punitive action

Should be as per the norms of regulating bodies, publication houses and government agencies.

Campus Placement Policy

Students and parents are requested to read this thoroughly before signing. Placement is a privilege to the students not a right. These guidelines are framed to ensure equality and fairness of opportunity to all the students. The guidelines will ensure that maximum number of students getting campus placement. This document has to be signed by all Final year students before academic year.

Rules for students participating in the campus :

1. Students will be provided with placement assistance in the final academic year.
2. College suggests that all students interested in the campus placement to undergo training programs conducted by competent industry trainers as training increases success of placement(s).
3. The campus recruitment may happen on campus / off the campus at company office or pooled campus college as decided by college / company(s).
4. Students will be allowed to participate in any number of company(s) process as long as they do not get offer and they are serious and responsible in each of the company(s) process.
5. Offers are categorized based on CTC and/or Profile , For Academic year 2021-22, CTC band / categories are:

CTC	Offer Type	Profile
5 LPA or less	Normal	Any Profile
10 LPA or less	Dream	Any Profile
15 LPA or less	Dream +	Any Profile
Further in slab of 5 LPA	Super dream...	Any Profile
Any CTC	Core	Profile for Core branches like Production, Mechanical, Electronics etc.

1. Eligibility criteria for any of the company(s) will be as decided by the visiting company.
2. Student(s) with offer in higher CTC band can't participate for companies which fall in lower CTC band irrespective of accepting or declining the higher CTC offer.
3. Student(s) can hold only one offer in any of the CTC bands irrespective of accepting or declining the current offer.
4. Core offer students will not be eligible to participate further in any company(s) irrespective of accepting or declining the core offer.
5. Any interested student(s) who is having non-core offer in normal CTC band will be eligible for participating in Core company(s) process.
6. Student selected in Dream or higher band, transcript will not be issued for one calendar year from the last date of their final examination irrespective of acceptance or rejection or leaving the job after joining.
7. College does not have control over the Role(s) / Profile(s) offered during the hiring process and/or at the time of joining, Joining date, employment terms & conditions of the company.
8. If the scheduled campus drive is cancelled by company(s), the college will not be responsible.
9. Student(s) who gets offer from Job portals / off campus drives, on their own efforts are requested to inform the college about the same and such students will be continued to be treated as unplaced and interested can continue to participate in the campus drives conducted by the college.
10. Change of choice from campus placement to further studies category is permitted with prior permission from the Principal provided student does not have any offer.
11. Any participating student(s) who is not serious / irresponsible / dishonest in any of the company(s) process will be disqualified and will not be allowed to participate in further company(s) process.
12. All placed students have to submit copy of the offer letter / letter of intent to the branch faculty I/c for the purpose of office records.
13. Principal will have the discretionary powers to decide on any particular rule / company / student on a case to case basis keeping balance of interests of the college, student and company(s) and Principal's decision will be final.

Rules for further studies / other career interest:

1. Any eligible interested student can participate in the bulk recruiter / other companies decided by the college without blocking the transcripts.
2. Any point of time student can change their choice from further studies category to campus placement category with prior permission from the Principal.
3. Any student who has Dream or higher and / or core offer will not be eligible for the transcript for one calendar year from date of completion of the final examination irrespective of accepting, declining the offer or resigning from the job.

Declaration by the student and parent(s):

1. I have understood the rules for the campus placement, higher studies and other career options**.**
2. I will be participate in the campus placement program / I have decided to opt for higher studies or other career options

[Strike out whichever is not applicable]

Student Details:

Roll No: _____ Name: _____ Signature with date: _____

Parents Details:

Name(s): _____ Signature(s) with date: _____

_____ _____

Fr. CRCE, Bandra, Mumbai

FR. CONCEICAO RODRIGUES COLLEGE OF ENGINEERING
(Affiliated to Mumbai University and Approved by AICTE)

FR. AGNEL ASHRAM, BANDSTAND, BANDRA(W), PIN- 400050

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INNOVATION AND STARTUP POLICY

A Guiding Framework for Faculty and Students

Paving the way of Entrepreneurship

SOCIETY OF ST. FRANCIS XAVIER, PILAR'S
FR. CONCEICAO RODRIGUES COLLEGE OF ENGINEERING
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Ref. : CRCE / 2022 /372 *Date* : October 28, 2022.

Declaration Form

Dear Sir,

This is to inform the Ministry of Education Innovation Cell (MIC) that our Institution's Innovation Council (IIC-FrCRCE) has been formed as per the format prescribed by MIC under the Presidentship of **Dr. Surendra Singh Rathod.** As an institution, we are committed to support activities suggested by MIC as per the prescribed schedule and timelines. Please find below the details regarding council members.

Institution's Innovation Council Composition

Position	Designation	No.	Name
President	Principal	1	Dr. Surendra Singh Rathod
Vice President	Assistant Professor	1	Prof. Ashwini Pansare
Convener	Assistant Professor	1	Prof. Kranti Wagle
NISP Coordinator	Assistant Professor	1	Prof. Swati Ringe
Innovation Activity Coordinator	Assistant Professor	1	Prof. Dipali Koshti
Startup Activity Coordinator	Associate Professor	2	Dr. V. S. Jorapur
	Assistant Professor		Prof. Prachi Patil
Internship Activity Coordinator	Assistant Professor	1	Prof. Unik Lokhande
IPR Activity Coordinator	Assistant Professor	2	Dr. Ketaki Joshi
	Assistant Professor		Prof. Garima Tripathi
Social Media Coordinator	Assistant Professor	1	Prof. Jayen Modi
ARIIA Coordinator	Professor	1	Dr. D.V Bhoir
NIRF Coordinator	Assistant Professor	1	Prof. Supriya Kamoji
E-Cell in-charge	Assistant Professor	1	Prof. Prajkta Bhangale
Member- Collaborations	Assistant Professor	1	Prof. Swapnali Mahadik
Tinkering Lab	Assistant Professor	1	Prof. Saurabh Kulkarni
Network Enabler	Training and Placement	1	Mr. Mahesh Sharma
Innovation Coordinator(Student)	Student Coordinator	1	Anwaya Belwalkar
Startup Coordinator (Student)	Student Coordinator	1	Riddhi Oza
IPR Coordinator	Student Coordinator	1	Bilal Ahmed
Social Media Coordinator	Student Coordinator	1	Chris Gracias
Internship Coordinator	Student Coordinator	1	Upmanyu Jha
Representative from nearby Incubation Centre	Member	1	Prof. K. T. Talele, SPTBI, Mumbai
Representatives of SIDBI / NABARD / Lead Bank / Investor	Member	1	Sr. Manager, Union Bank of India, Hill Road, Bandra-West, Mumbai 50
Technical Experts from nearby Industry	Member	1	Mr. Govind Gaundalkar, Microdevice Tech
Alumni Entrepreneurs	Member	1	Mr. Ayush Jain, UthopiaTech
Students from the host institution	Council in-Charge Student	27	Ivan Dsilva , Deon Gracias, Mathew Lobo, Christina Tomy, Anshula Raina, Rachana Chavan, Santo Sunny, Esha Sharma, Kyle Dsouza, Hudah Ansari, Ayush Batra, Grace Pereira, Prachi Mohare, Pratham Kambli, Joel Sam, Chirag Jadhav, Vijay Prajapati, Sahil Bane, Keith Mendonca, Eric Fernandes, Sandra Thayyil, Shaunak Aital, Deon Gracias, Shibu Mathew, Andrea Pinto, Ayushi, Joseph William

(DR. S.S. RATHOD)
PRINCIPAL

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DEFINITIONS

MoE:-	Ministry of Education
AICTE:-	All India Council of Technical Education
MIC:-	MoE Innovation Cell
IIC-FrCRCE :-	Institute Innovation Council of Fr. C. R.C. E.
NISP:-	National Innovation and Startup Policy
E-Cell:-	Entrepreneurship cell
IPR:-	Intellectual Property Rights
SPV:-	Special Purpose Vehicle is a subsidiary created by parent company to isolate financial risk
Pre-Incubation:-	It represents process which works with entrepreneurs who are in early stages of setting up their company. Usually entrepreneurs come into such programs with just an idea of early prototype/product/service.

Preamble

Ministry of Education Innovation cell (MIC) along with All India Council of Technical Education (AICTE) released National Innovation and Startup Policy 2019 in September 2019.

With the understanding of recent trends, Fr. Conceicao Rodrigues College of Engineering (Fr.CRCE) have joined this NISP campaign to nurture "Innovation and Startup" culture.

The committee comprising faculty members from Institute Innovation Council(IIC), Entrepreneurship Cell(E-Cell), Start-up Cell, Intellectual Property Rights (IPR) cell, Internship coordinator and External members like startup founders, Entrepreneurs, Alumni is formed to discuss, formulate institute level startup policy and implementation of all innovation and entrepreneurship related activities within the institute. The institute is in the process of applying the incubation facility within the campus.

Vision

"Moulding Engineers Who Can Build The Nation"

Mission

To Facilitate a platform for innovative minds to transform their ideas into viable business propositions to start a business venture.

Short Term Objectives

1. To facilitate generation of Innovative solution for real life problems.
2. To encourage and stimulate campus startups in the institution.

Long Term Objectives

To link INNOVATION to ENTERPRISES leading to FINANCIAL SUCCESS.

1. Strategies and Governance

- Innovation and Entrepreneurship (I & E) Promotion is an important activity at Fr. Conceicao Rodrigues College of Engineering (Fr.CRCE). Specific objectives and associated performance indicators are to be identified for assessment.

- Implementation of Entrepreneurial vision will be achieved through mission statements rather than Stringent Control System.

- The NISP implementation team is formulated to achieve this agenda.

- Investment in entrepreneurial activities is a part of the institutional financial strategy. Currently 0.3% of budget of the total annual budget of the institution is allocated for funding and supporting innovation and startups related activities through the creation of separate "Innovation Fund". Minimum 1% of total annual budget is proposed.

- The financial strategy involves raising funds from diverse sources as mentioned below.

  - Encourage to bring in external funding through government (state and central) agencies such as DST, DBT, MHRD, AICTE, TDB, TIFAC, DSIR, CSIR, BIRAC, NSTEDB, NRDC, Startup India, Invest India, MeitY, MSDE, MSME, UoM etc. and non-government sources.

  - Approach private and corporate sectors to generate funds, under Corporate Social Responsibility (CSR) to support technology incubators.

  - Engage alumni actively to get Sponsorships, Mentoring or Consulting support.

- Importance of innovation and entrepreneurial agenda is known across the institute. It is promoted and **highlighted at institutional programs such as conferences, convocations, workshops etc.**

- Action plan is formulated at Institute level, which is in line with the current document along with well-defined short-term and long-term goals. Micro action plans are to be developed by the departments to accomplish the policy objectives.

- Product to market strategy for startups will be developed.

- Development of entrepreneurship culture will not be limited within the boundaries of the institution.

- This Policy will be updated time to time as per the need.

2. Startups Enabling Institutional Infrastructure

- Creation of pre-incubation and incubation facilities for nurturing innovations and startups at the institute is the high priority. Objective is to link INNOVATION to ENTREPRISES leading to FINANCIAL SUCCESS.

- IIC-FrCRCE cell is established as per the guidelines issued by MoE Innovation Cell at the institute. In order to support pre-incubation; IPR cell, Startup cell, E-cell and Student clubs have been set up for facilitating and mobilizing resources from different sources.

- This facility is available 24x7 to all the stakeholders of the institution.

- Mentoring and other relevant services through Pre- incubation/Incubation units will be offered in turn for fees and(or) zero payment basis. The modalities regarding equity sharing will depend upon the nature of services offered by these units.

- A separate incubation facility may be established as a support system at the institutional level for pre-incubation, incubation, IPR protection, industry linkages, exposure to entrepreneurial ecosystem, etc.

3. Nurturing Innovations and Startups

Institute will facilitate the startup activities / technology development by assisting student/faculty/staff (the potential entrepreneur) in the following manner.

- Permission to use institute infrastructure and facilities like Project lab, Computers, Printer, scanner, Fax machine, Internet Connection, Cubicle for brainstorming sessions, access to college library, conference room and video conferencing facility as per the requirement.

- Encouragement to do Short term/Part-time entrepreneurship training.

- Mentoring support on regular basis.

- Facilitation in a variety of areas including technology development, ideation, design thinking, find raising, financial management, cash-flow management, new venture planning, business development, product development, social entrepreneurship, product costing, marketing, brand development, human resource management as well as law and regulations impacting a business.

- At present Mumbai University does not allow student entrepreneurs to earn credits for working on innovative prototypes/Business Models. Efforts to be made so that student inventors may be allowed to opt for start-up in place of their **mini project/ major project**, seminars, internship.

- The area in which a student wants to initiate a startup may be **interdisciplinary** or multi-disciplinary. However, the student must describe how they will separate and clearly distinguish their ongoing research activities as a student from the work being conducted at the start up.

- Student entrepreneurs are allowed to use the address of Hostel (or) pre-incubation and (or) incubation unit to register their venture while studying at the institute.

- Student entrepreneurs will be allowed to sit for the examination, even if their attendance is less than the minimum permissible percentage, by taking prior permission from the institute with some criteria.

- Every faculty may be encouraged to mentor startups.

- Participation in start-up related activities needs to be considered as a legitimate activity of faculty and considered while evaluating the annual performance of the faculty. Institute will update/change/revise performance evaluation policies for faculty and staff as stated above.

- Institute incubation facility may link the startups to other seed-fund providers/angel funds/venture funds or itself may set up seed fund once incubation activities mature.

- Institute incubation facility may extend startup facility to Alumni of the institute as well as outsiders.

- Institute incubation facility will allow licensing of IPR from institute to start up. Ideally students and faculty members intending to initiate a start-up based on the technology developed or co-developed by them or the technology owned by the institute, should be allowed to take a license on the said technology on easy term, either in terms of equity in the venture and/ or license fees and/ or royalty to obviate the early stage financial burden.

- In return for the services and facilities, the legal entity designated by the institute incubation facility may take 1 to 5% equity/ stake in the startup/ company, based on use of brand, faculty contribution, infrastructure support and use of the institute's IPR. The legal entity designated by the institute would normally take nominal equity share, unless its full- time faculty/ staff have substantial shares. Other factors for consideration should be space, infrastructure, mentorship support, seed- funds, support for accounts, legal, patents etc.

- For staff and faculty, the legal entity designated by the institute would not take more than 20% of shares that staff faculty takes while drawing full salary from the institution; however, this share will be within the 5% cap of company shares, listed above.

- No restriction on shares that faculty / staff can take, as long as they do not spend more than 20% of office time on the startup in an advisory or consultative role and do not compromise with their existing academic and administrative work / duties. In case the

faculty/ staff holds the executive or managerial position for more than three months in a startup, then they may go on sabbatical/ leave without pay/ earned leave.

- In case of compulsory equity model, Startup may be given a cooling period of 3 months to use incubation services on rental basis to make a final decision based on satisfaction of services offered by the legal entity designated by the institute/incubator. In that case, during the cooling period, the legal entity designated by the institute cannot force startups to issue equity on the first day of granting incubation support

- The institute could consider providing services based on a mixture of equity, fee-based and/ or zero payment model. So, a startup may choose to avail only the support, not seed funding, by the institute on rental basis.

4. Product Ownership Rights for Technologies Developed at Institute

- When institute facilities / funds are used substantially or when IPR is developed as a part of curriculum/ academic activity, IPR is to be jointly owned by inventors and the institute.

- Inventors and institute could together license the product / IPR to any organisation including for commercial benefits, with the patentee having the primary say. License fees could be either / or a mix of

    - Sale and transfer fees or one-time technology transfer fees
    - Royalty as mutually agreed
    - Shares/partnership in the company licensing the product

- An institute may not be allowed to hold the equity as per the current statute, so SPV may be requested to hold equity on their behalf or as amended from time to time.

- On the other hand, if product/ IPR is developed by innovators not using any institute facilities, outside office hours (for staff and faculty) or not as a part of curriculum by student, then product/ IPR will be entirely owned by inventors in proportion to the contributions made by them. In this case, inventors can decide to license the technology to third parties or use the technology the way they deem fit.

- If there is a dispute in ownership, a minimum five member committee consisting of two faculty members (having developed sufficient IPR and translated to commercialization), two of the institute's alumni/ industry experts (having experience in technology commercialization) and one legal advisor with experience in IPR, will examine the issue after meeting the inventors and help them settle this, hopefully to everybody's satisfaction. Institute can use alumni/ faculty of other institutes as members, if they cannot find sufficiently experienced alumni / faculty of their own.

- Institute IPR cell or incubation center will only be a coordinator and facilitator for providing services to faculty, staff and students. They will have no say on how the invention is carried out, how it is patented or how it is to be licensed. If the institute is

to pay for patent filing, they can have a committee which can examine whether the IPR is worth patenting and own the patent. The committee should consist of faculty who have experience and excelled in technology translation.

- The institute's decision-making body with respect to incubation / IPR technology-licensing will consist of faculty and experts who have excelled in technology translation. Other faculty in the department / institute, including heads of department, heads of institutes, deans or registrars, will have no say in the above.

- Institute promotes Interdisciplinary research and publications or startup and entrepreneurship.

5. Organizational Capacity, Human Resources and Incentives

- All departments work in coherence for development interdisciplinary projects by student teams.

- Periodically some external subject matter experts such as guest lecturers or alumni are engaged for strategic advice and bring in skills which are not available internally.

- Faculty and staff is encouraged to do courses on innovation, entrepreneurship management and venture development.

- The stakeholders who actively contribute and support entrepreneurship agenda are rewarded with sabbaticals, office and lab space for entrepreneurial activities, institutional awards, training, points in the appraisal for consideration of promotion.

6. Creating Innovation Pipeline and Pathways for Entrepreneurs at Institute Level

- NISP awareness is generated among students, faculty and staff to know the value of entrepreneurship and its role in career development or employability from time to time.

- Students are encouraged to select elective subjects like entrepreneurship development. Integration of education activities with enterprise-related activities is done in teaching learning process.

- Students are encouraged to develop entrepreneurial mindset through experiential learning by exposing them to training in cognitive skills and Initiatives like idea and innovation competitions, hackathons, workshops, bootcamps, seminars, conferences, exhibitions, mentoring by academic and industry personnel, throwing real life challenges.

- Awards and recognition are routinely organized.

- Institute endeavours to link their start-ups and companies with a wider entrepreneurial ecosystem and by providing support to students who show potential, in the pre-startup phase. Connecting student entrepreneurs with real life entrepreneurs will help the students in understanding real challenges which may be faced by them while going through the innovation funnel and will increase the probability of success.

- Institute has established the Institution's Innovation Council (IIC) as per the guidelines of MoE's Innovation Cell and allocates appropriate budget for its activities. IICs guide institutions in conducting various activities related to innovation, startup and entrepreneurship development. Collective and concentrated efforts are undertaken to identify, scout, acknowledge, support and reward proven student ideas and innovations and to further facilitate their entrepreneurial journey.

- Networking events may be organized to create a platform for the budding entrepreneurs to meet investors and pitch their ideas.

- Institute may provide business incubation facilities like premises at subsidized cost. Laboratories, research facilities, IT services, training, mentoring etc. to the aspiring startups.

- A culture is promoted to understand that money is not FREE and is risk capital. The entrepreneur must utilize these funds and return. While funding is taking risk on the entrepreneur, it is an obligation of the entrepreneur to make every effort possible to prove that the funding agency did right in funding him/ her.

- Institute envisages to develop a ready reckoner of Innovation Tool Kit, which must be kept on the homepage on the institute's website to answer the doubts and queries of the innovators and enlisting the facilities available at the institute.

7. Norms for Faculty Startups

- Roles of faculty may vary from being an owner/ direct promoter, mentor, consultant or as on-board member of the startup.

- Institute should work on developing a policy on 'conflict of interests' to ensure that the regular duties of the faculty don't suffer owing to his/her involvement in the startup activities.

- Faculty startup may consist of faculty members alone or with students or with faculty of other institutes or with alumni or with other entrepreneurs.

- Faculty must clearly separate and distinguish on-going research at the institute from the work conducted at the startup/ company.

- In case of selection of a faculty start up by an outside national or international accelerator, a maximum leave (as sabbatical/ existing leave/ unpaid leave/ casual

leave/ earned leave) of one semester/ year (or even more depending upon the decision of review committee constituted by the institute) may be permitted to the faculty.

- Faculty must not accept gifts from the startup.
- Faculty must not involve research staff or other staff of the institute in activities at the startup and vice-versa.
- Human subject related research in startups should get clearance from the ethics committee of the institution.

8. Pedagogy and Learning Interventions for Entrepreneurship Development

- Institute has adopted a diversified approach like cross disciplinary learning, mentoring, innovative lab experiments, case studies, presentations to produce desirable learning outcomes focusing innovation.
- Student clubs/ bodies/ departments are created for organizing competitions, bootcamps, workshops, awards, etc.
- Institute has started awarding annual 'INNOVATION TROPHY' to motivate students to come up with outstanding ideas.
- Entrepreneurship education is imparted to students at curricular/ co-curricular/ extra- curricular level through elective/ short term or long-term courses and seminars on innovation, real life success and failure stories by internal and external stakeholders to evolve the culture of collaboration.
- In the beginning of every academic session, the institute conducts an induction program about the importance of Innovation and Entrepreneurship so that freshly inducted students are made aware about the entrepreneurial agenda of the institute and available support systems.
- Pedagogical changes need to be done to ensure that the maximum number of student projects and innovations are based around real life challenges.

9. Collaboration, Co-creation, Business Relationships and Knowledge Exchange

- Institute incubation facility will collaborate with potential partners, resource organizations, micro, small and medium sized enterprises (MSMEs), social enterprises, schools, alumni, professional bodies, entrepreneurs, incubators, finance teams, legal teams, Government bodies like BMC to build an ecosystem to support entrepreneurship and co-design the programs with stakeholder involvement.

- Institute incubation facility will organize networking events for better engagement of collaborators and knowledge gain.

- Knowledge management should be done by the institute through development of innovation knowledge platforms using inhouse Information & Communication Technology (ICT) capabilities.

10. Entrepreneurial Impact Assessment

Impact assessment with well-defined evaluation parameters should be done for all entrepreneurial activities like

- Engagement of all departments and faculty in the entrepreneur teaching and learning.
- Support system provided at the institutional level for pre-incubation, incubation, IPR protection, industry linkages, exposure to entrepreneurial ecosystem, etc.
- Satisfaction of participants.
- New business relationships created by the institutes.
- Number of startups created.

Impact assessment for measuring the success should be in terms of sustainable social, financial and technological impact in the market. COMMERCIAL success is the ONLY measure in the long run.

FR. CONCEICAO RODRIGUES COLLEGE OF ENGINEERING

(Affiliated to Mumbai University and Approved by AICTE)

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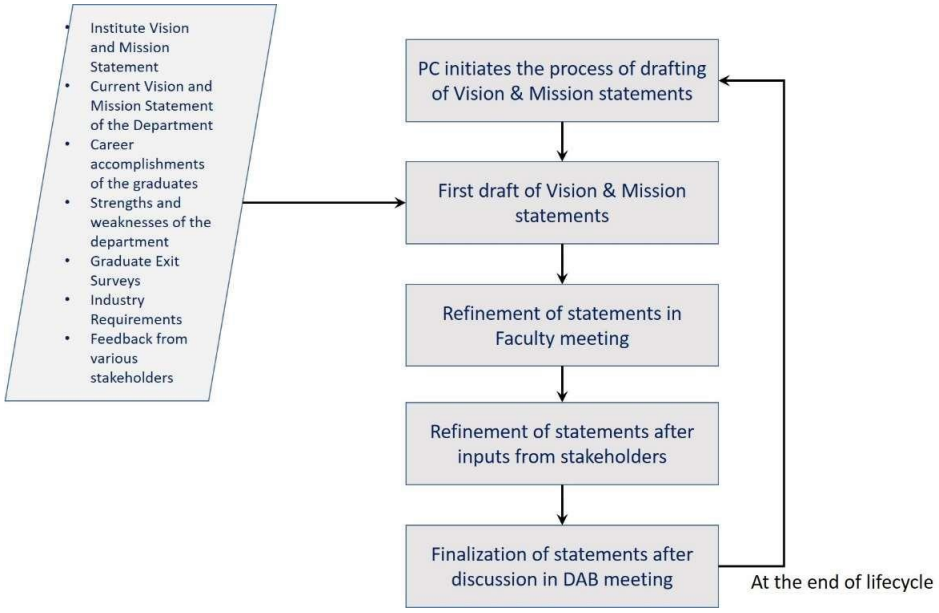
PROCESSES HANDBOOK

List of Processes

- Process of Defining/Redefining Vision and Mission of the Department
- Process of Defining/Redefining Programme Educational Objectives (PEO) of the Department
- Process for identifying extent of compliance of the University curriculum for attaining the Program Outcomes and Program Specific Outcomes
- Process to Measure CO attainment
- Process to Measure PO/PSO attainment
- Process to improve learning experience
- Process for Collaborative Learning
- Process to identify weak learners
- Process to identify Strong Learners
- Process to prepare academic calendar
- Process to ensure adherence to Academic Calendar
- Project Process
- Process to improve quality of internal assessment
- Placement Process
- Academic Audit Process
- Faculty appraisal and development system
- Mentoring process

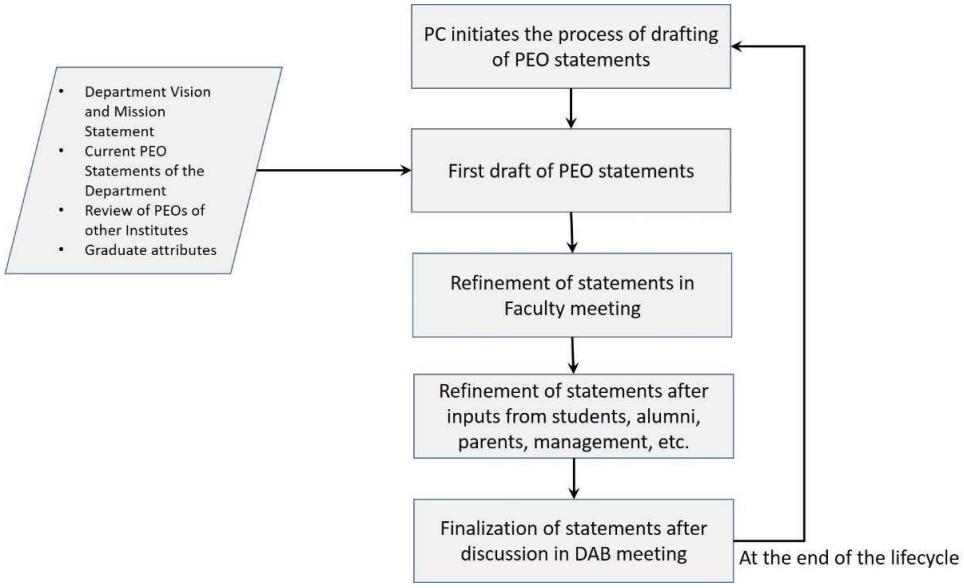
Process of Defining/Redefining Vision and Mission of the *Department*

- Vision and mission statement is defined through direct engagement of all the faculty members, Department Quality Assurance Cell (DQAC) and the Department Advisory Board (DAB). Also, few students and alumni are included in the process directly or indirectly.
- Programme Coordinator (PC) initiates the process of defining/redefining of statements at appropriate time (end of the lifecycle of statements).
- At the beginning, DQAC drafts vision and mission statements. The Institute vision and mission statement, current statements (in second iteration onwards), career accomplishments of the graduates, strength and weakness of the department, graduate exit surveys, requirements of industries, feedback from various stakeholders, etc. to be consider for formulation of statements.
- PC organizes faculty meeting to discuss the draft. DQAC refines the statements using the feedback in the faculty meeting.
- PC organizes meetings of various stakeholders to discuss refined statements or takes feedback through surveys of selected students, alumni and other stakeholders like industry representatives, parents, management, etc. DQAC refines the statements based on the inputs.
- The refined statement is discussed in DAB meeting. Based on the feedback, DQAC finalizes the vision and mission statements.



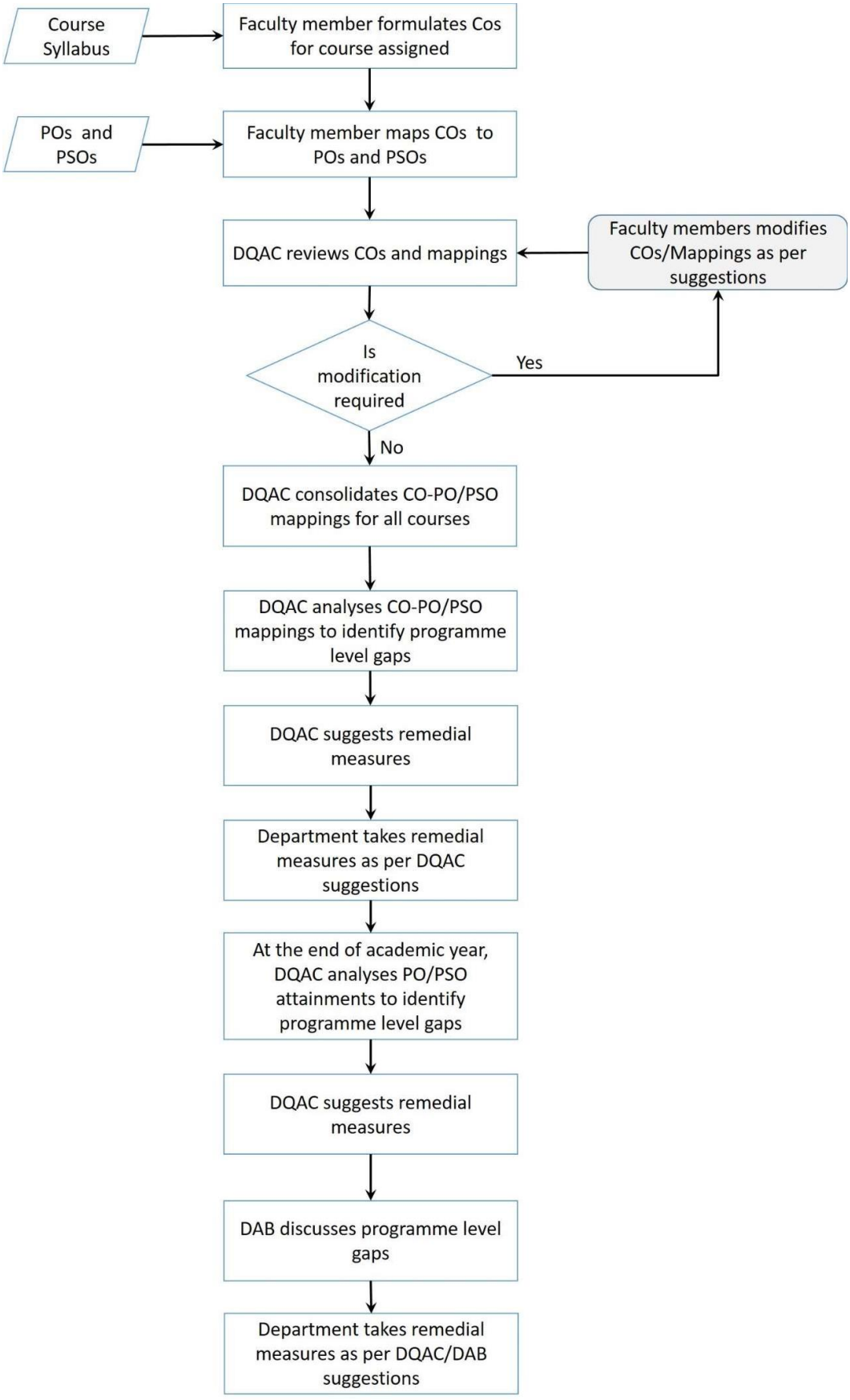
Process of Defining/Redefining Programme Educational Objectives (PEO) of the Department

- Programme Coordinator (PC) initiates the process of defining/redefining of statements at appropriate time (end of the lifecycle of statements).
- At the beginning, DQAC drafts programme educational objectives. The department vision and mission statement, current statements (in second iteration onwards), graduate attributes, review of PEOs of other institutes, etc. to be consider for formulation of statements.
- DQAC organizes the faculty meeting to discuss the draft version. DQAC refines the statements as per the suggestions in meeting.
- DQAC organizes meetings of various stakeholders to discuss refined statements or takes feedback through surveys of selected students, alumni and other stakeholders like industry representatives, parents, management, etc. DQAC refines the statements based on the inputs.
- DAB discusses the refined statement DAB meeting. Based on the feedback, DQAC finalizes the vision and mission statements.



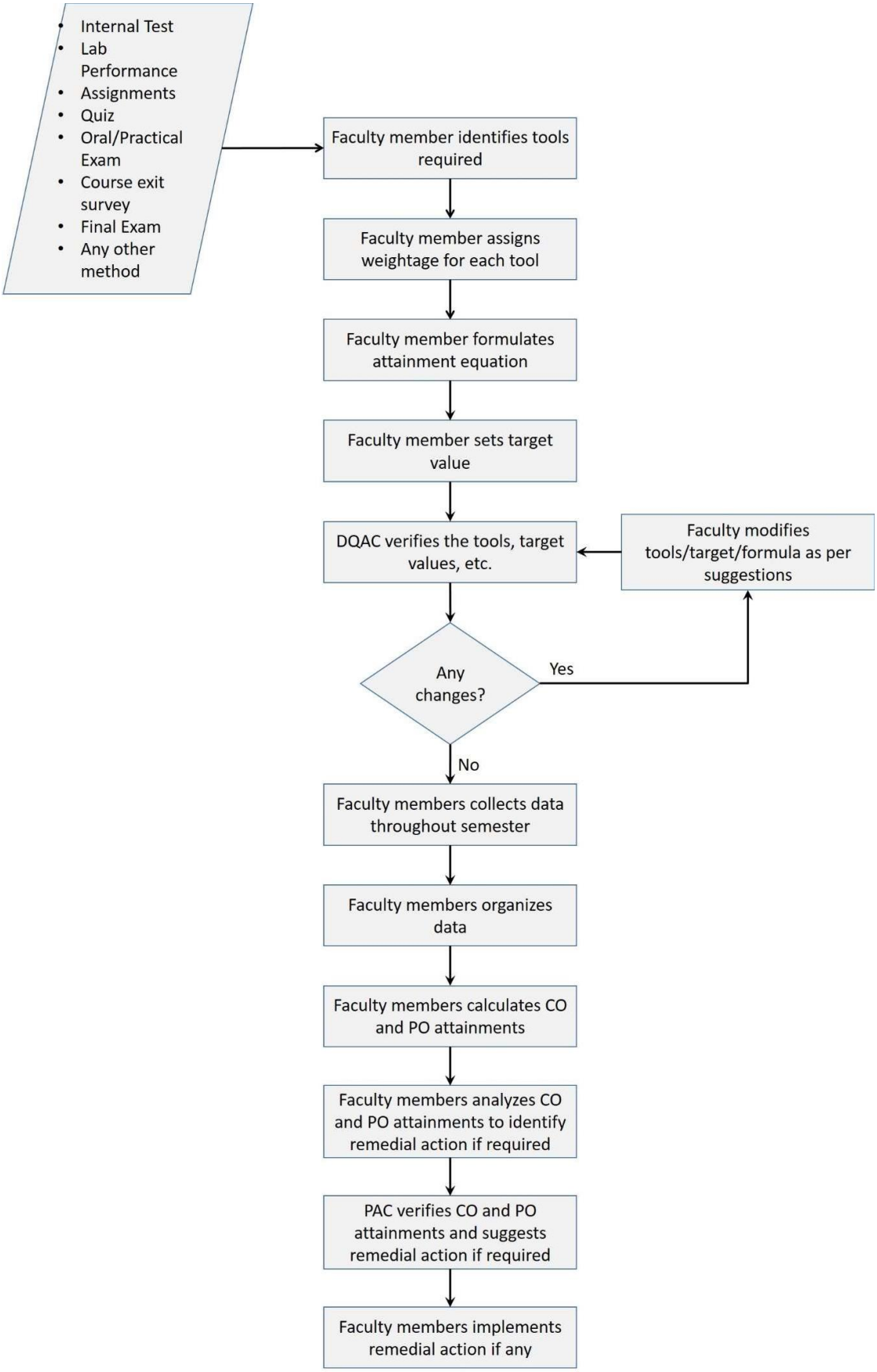
Process for identifying extent of compliance of the University curriculum for attaining the Program Outcomes and Program Specific Outcomes

- Faculty member formulates Course Outcomes (COs) and map to POs and PSOs for the course assigned before commencement of the semester and submit to DQAC for review.
- Department Quality Assurance Committee (DQAC) reviews COs and mappings and give feedback to concerned faculty member.
- Faculty member refines or changes COs and mappings if required based on DQAC feedback.
- DQAC consolidates all CO-PO/PSO mappings of all courses and analyses the mappings to identify deficiencies in the University curriculum and program level gap (i.e., a course needs to be included in curriculum or any activities need to be organized).
- Faculty members analyze course syllabus to identify course level gap (i.e., a particular topic needs to be included in a course).
- Faculty members uses their observations and/or looks for future data to identify course/curriculum gap if any.
- Faculty member takes remedial measure if any course level gap is identified.
- DQAC analyzes PO and CO attainment levels to identify program level curriculum gap or course level gap.
- DQAC suggests remedial measures to bridge programme level gaps
- Further, PC takes feedback from Departmental Advisory Board (DAB), Experts from Industry, Academia to figure out the gap in the curriculum for attaining POs and PSOs.


Course Syllabus
Faculty member formulates Cos for course assigned
POs and PSOs
Faculty member maps COs to POs and PSOs
DQAC reviews COs and mappings
Faculty members modifies COs/Mappings as per suggestions
Is modification required
Yes
No
DQAC consolidates CO-PO/PSO mappings for all courses
DQAC analyses CO-PO/PSO mappings to identify programme level gaps
DQAC suggests remedial measures
Department takes remedial measures as per DQAC suggestions
At the end of academic year, DQAC analyses PO/PSO attainments to identify programme level gaps
DQAC suggests remedial measures
DAB discusses programme level gaps
Department takes remedial measures as per DQAC/DAB suggestions

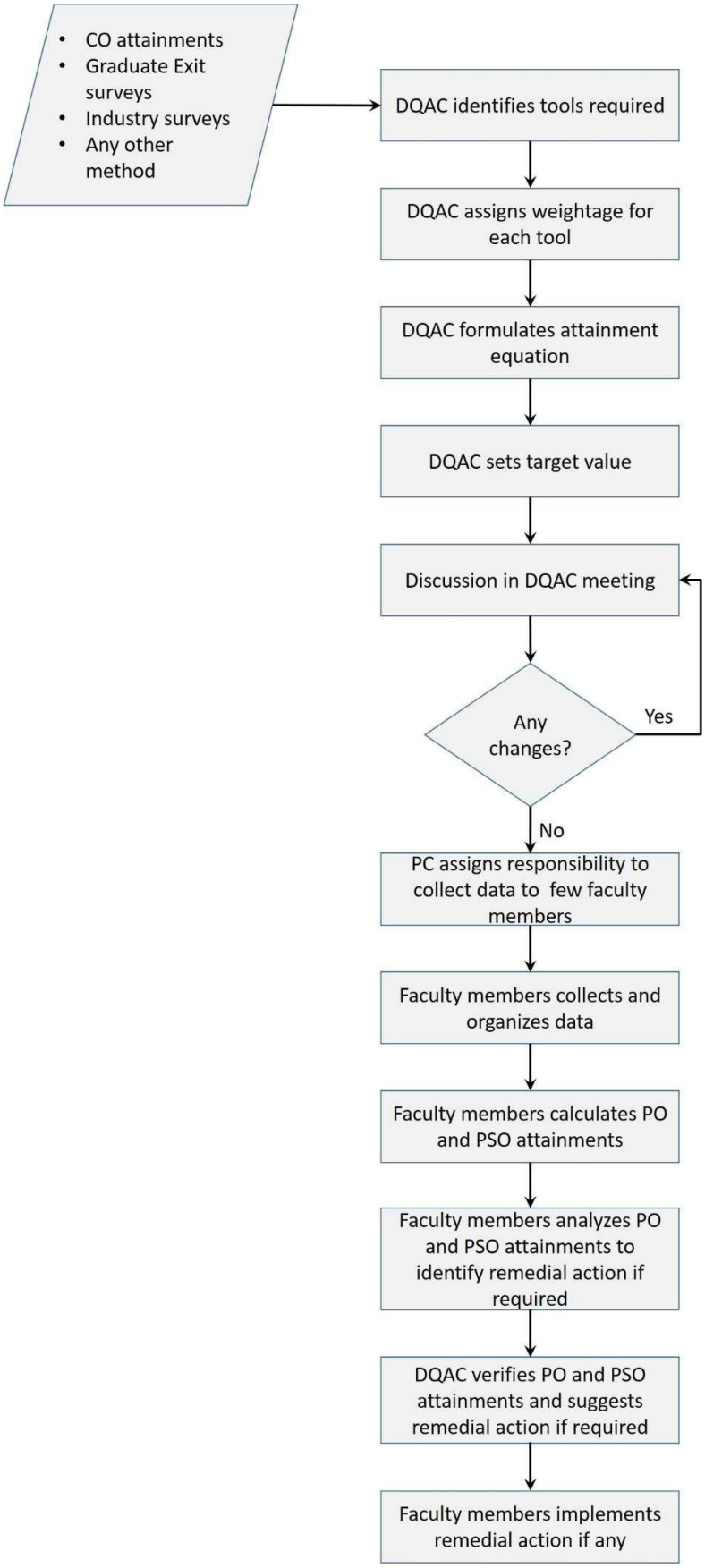
Process to Measure CO attainment

- Faculty member identifies tools required to measure CO attainment for each CO.
- Faculty member assigns weightage for each tool.
- Faculty member formulates equation to calculate attainment.
- Faculty member sets target level for CO attainment.
- DQAC verifies the method/tools/target value of CO attainment calculation and suggests tools, target values, etc. if required.
- Based on feedback from DQAC, faculty member makes appropriate changes.
- Faculty member collects the data throughout semester as per the tools selected for measuring CO attainment.
- Faculty member organizes data.
- Faculty member calculates CO and PO attainments for said course.
- Faculty member analyzes CO attainment to identify remedial actions if necessary.
- DQAC verifies attainment and suggests remedial action.
- Faculty member implements remedial measures during following year to improve CO attainment or sets new target value.


Internal Test
Lab Performance
Assignments
Quiz
Oral/Practical Exam
Course exit survey
Final Exam
Any other method
Faculty member identifies tools required
Faculty member assigns weightage for each tool
Faculty member formulates attainment equation
Faculty member sets target value
DQAC verifies the tools, target values, etc.
Faculty modifies tools/target/formula as per suggestions
Any changes?
Yes
No
Faculty members collects data throughout semester
Faculty members organizes data
Faculty members calculates CO and PO attainments
Faculty members analyzes CO and PO attainments to identify remedial action if required
PAC verifies CO and PO attainments and suggests remedial action if required
Faculty members implements remedial action if any

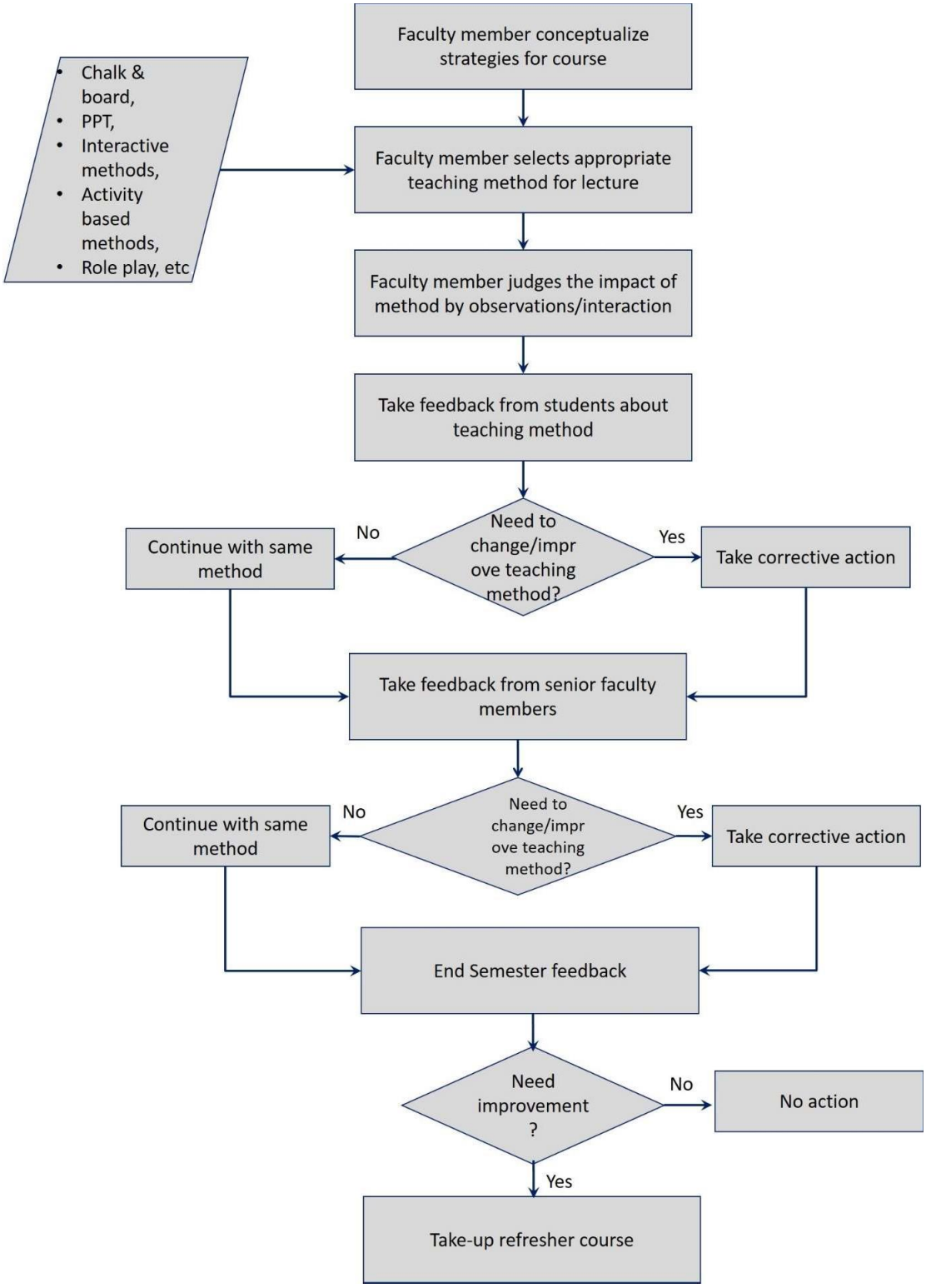
Process to Measure PO/PSO attainment

- DQAC identifies tools required to measure PO and PSO attainment for each PO and PSO.
- DQAC assigns weightage for each tool depending type of data, etc.
- DQAC formulates equation to calculate attainment.
- DQAC sets target level for PO and PSO attainment.
- DQAC finalizes the method/tools/target value of PO and PSO attainment calculation.
- PC assigns responsibility to few faculty members to collect data and designates one of the faculty member as coordinator.
- Respective faculty member collects the data at the end of semester/year as per the tools selected for measuring PO and PSO attainment.
- Respective faculty member organizes data.
- Coordinator calculates consolidated PO and PSO attainments.
- Coordinator analyzes PO and PSO attainments.
- DQAC verifies attainment and suggests remedial action.
- DQAC ensures implementation of remedial measures to improve PO and PSO attainment at department level or sets new target value during next academic year.


CO attainments
Graduate Exit surveys
Industry surveys
Any other method
DQAC identifies tools required
DQAC assigns weightage for each tool
DQAC formulates attainment equation
DQAC sets target value
Discussion in DQAC meeting
Any changes?
Yes
No
PC assigns responsibility to collect data to few faculty members
Faculty members collects and organizes data
Faculty members calculates PO and PSO attainments
Faculty members analyzes PO and PSO attainments to identify remedial action if required
DQAC verifies PO and PSO attainments and suggests remedial action if required
Faculty members implements remedial action if any

Process to improve learning experience

- Faculty member conceptualizes strategies for different teaching methods such as chalk & board, power point presentation, interactive methods, activity based methods, role play, etc.
- Faculty member identifies appropriate method for particular lecture
- Faculty member provides course material to students.
- Faculty member judges the impact of the method by interaction/observations
- Faculty member takes regular feedback from student about effectiveness of teaching
- Faculty member checks whether teaching method need to change or improve
- Faculty member takes feedback about teaching method from colleagues/senior faculty members
- As per the suggestions, faculty member changes or improves teaching
- Based on the mid-term feedback and end-semester feedback, faculty member identifies refresher course/faculty development program/MOOC course if required.
- Faculty member attends the selected course.


Faculty member conceptualize strategies for course
Chalk & board,
PPT,
Interactive methods,
Activity based methods,
Role play, etc
Faculty member selects appropriate teaching method for lecture
Faculty member judges the impact of method by observations/interaction
Take feedback from students about teaching method
Need to change/improve teaching method?
No
Continue with same method
Yes
Take corrective action
Take feedback from senior faculty members
Need to change/improve teaching method?
No
Continue with same method
Yes
Take corrective action
End Semester feedback
Need improvement ?
No
No action
Yes
Take-up refresher course

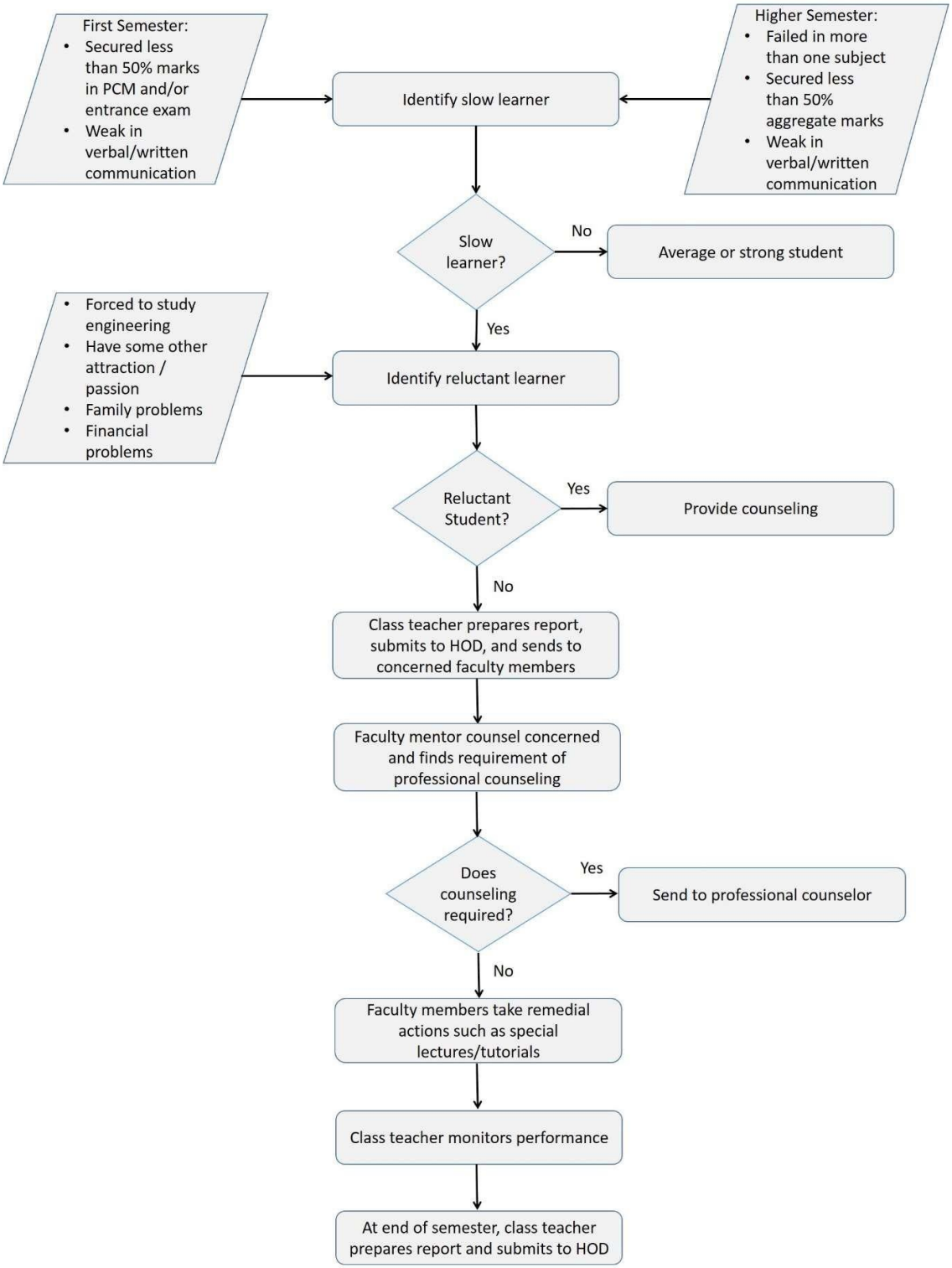
List of documents:

- Lesson plan
- Feedback proofs
- Proofs for Corrective actions
- Proofs for refresher courses

Process for Collaborative Learning

Process to identify weak learners

- Beginning of first semester, identify weak learners using following criteria:
    - < 50% aggregate marks in PCM
    - < 50 percentiles in entrance exam
    - Weak in verbal and/or written communication (by observations)
- Identify whether the student is a reluctant student or not by finding following information:
    - Forced to study engineering
    - Have some other attractions
    - Have some family problems
    - May have to work and study
- From second semester onwards, identify weak learners using following criteria:
    - Failed in more than one subject
    - Secured < 50% aggregate marks in previous examination
    - Weak in verbal and/or written communication
- The class teacher prepares the report of the weak students and submit to HOD.
- HOD sends report to concerned faculty members.
- Subject teachers identify the weak students in respective course and takes remedial actions.
- Organize special classes/tutorials for weak students
- Monitor progress of the weak students
- Provide counseling if required
- If student performance does not improve, find the reason and identify the different method to improve learning



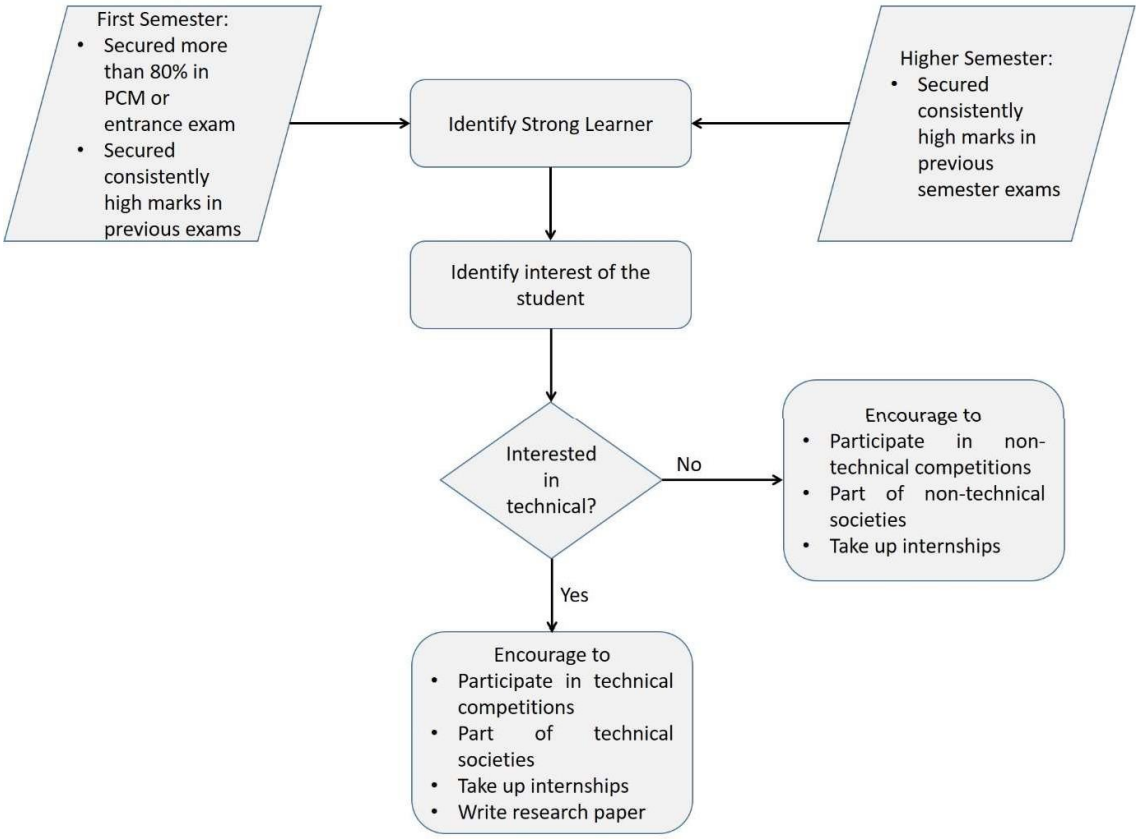
List of documents:

- Analysis sheet indication slow learners
- List of reluctant students
- Mentoring reports
- Professional counselor report if any

- Remedial coaching report
- End semester performance report of slow learners

Strong Learners

- Identify strong students based on following criteria:
    - During first semester:
        - Secured more than 80% in PCM or entrance exam
        - Secured consistently high marks in previous exams
    - At higher semester
        - Secured consistently high marks in previous semester exams
- Identify interest of the students
- If student is interested in technical aspects, encourage student to
    - Participate in technical competitions
    - Part of technical societies
    - Take up internships
    - Write research paper
- If student is interested in non-technical aspects, encourage student to
    - Participate in non-technical competitions
    - Part of non-technical societies
    - Take up internships



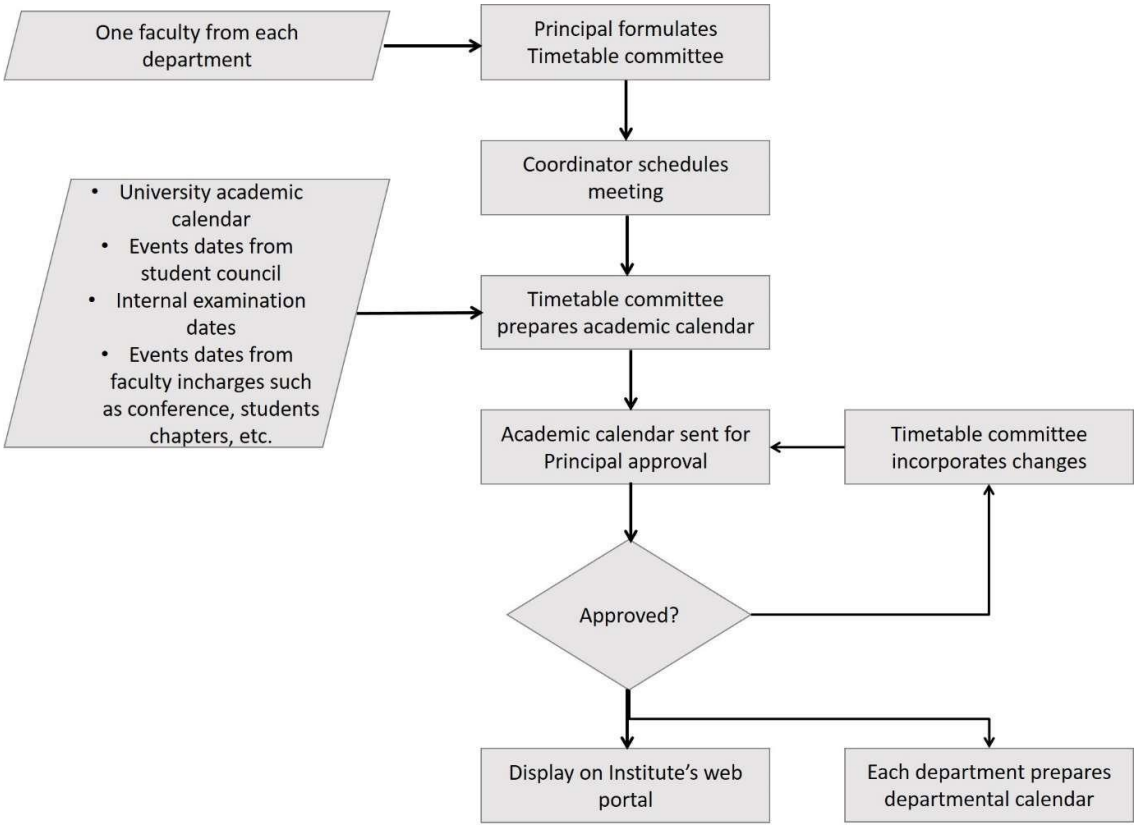
List of documents:

- Analysis sheet indication bright students
- List of students
    - Member of technical/non-technical teams

- Participation in competitions
- Internships

Process to prepare academic calendar

1. Principal formulates Timetable committee which includes atleast one member from each department.
2. Coordinator schedules meeting for preparation of time table and academic calendar.
3. Timetable committee collects data from concerned faculty incharges, office, examination cell, etc.
4. Timetable committee prepares Institute academic calendar.
5. Coordinator sends academic calendar to Principal for approval.
6. If any suggestions given by Principal, timetable committee modifies the academic calendar.
7. Coordinator ensures publication of academic calendar on Institute portal.
8. Each department prepares departmental calendar based on Institute academic calendar.

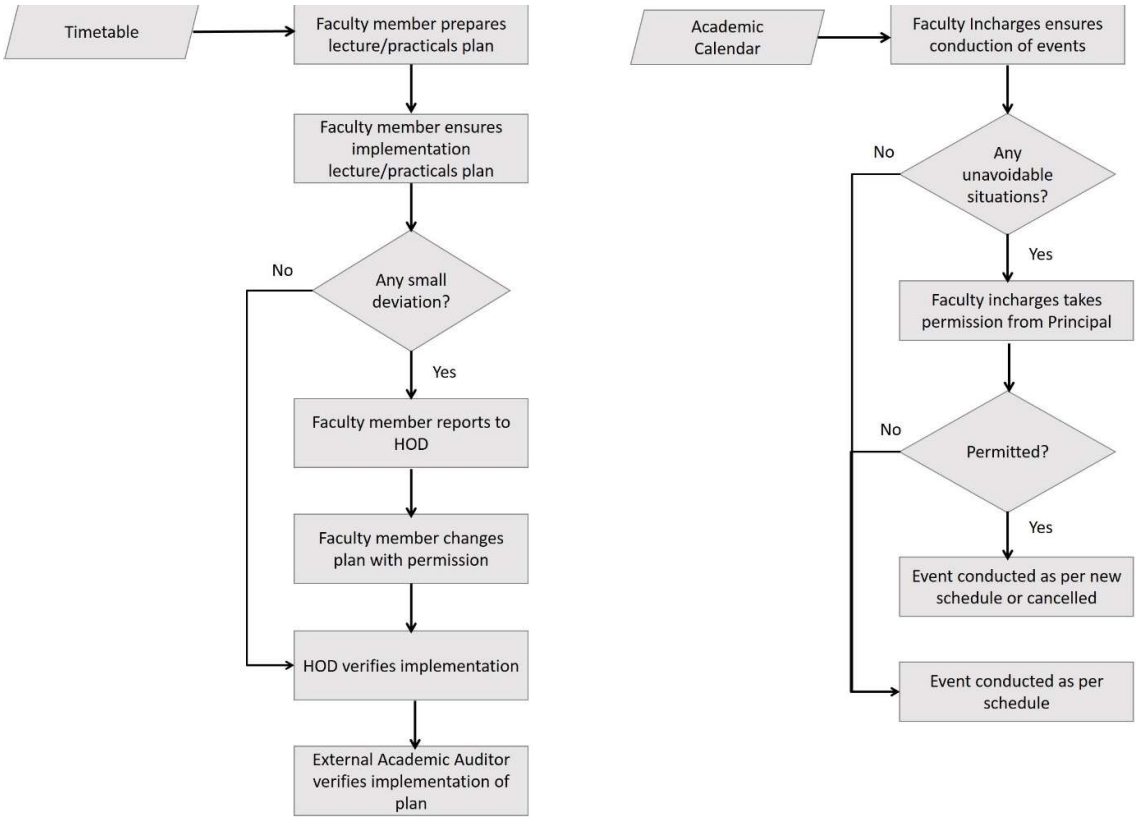


List of documents:

- Circular regarding formulation of committee
- Circular regarding meeting
- Approval communication

Process to ensure adherence to Academic Calendar

- Faculty member plans lectures/practicals based on the time table.
- Faculty members ensures conducting lectures/practicals as per the plan.
- In case of small deviation, faculty member reports to Head of the Department and with permission, faculty member make the changes in the plan.
- Head of the Department verifies the implementation of lecture/practical plan.
- External academic auditor verifies the implementation of the lecture/practical plan.
- Faculty in-charges ensure conduction of the events as per the academic calendar.
- In case of unavoidable circumstances, faculty in-charges make the changes in the event date with prior permission of the Principal.



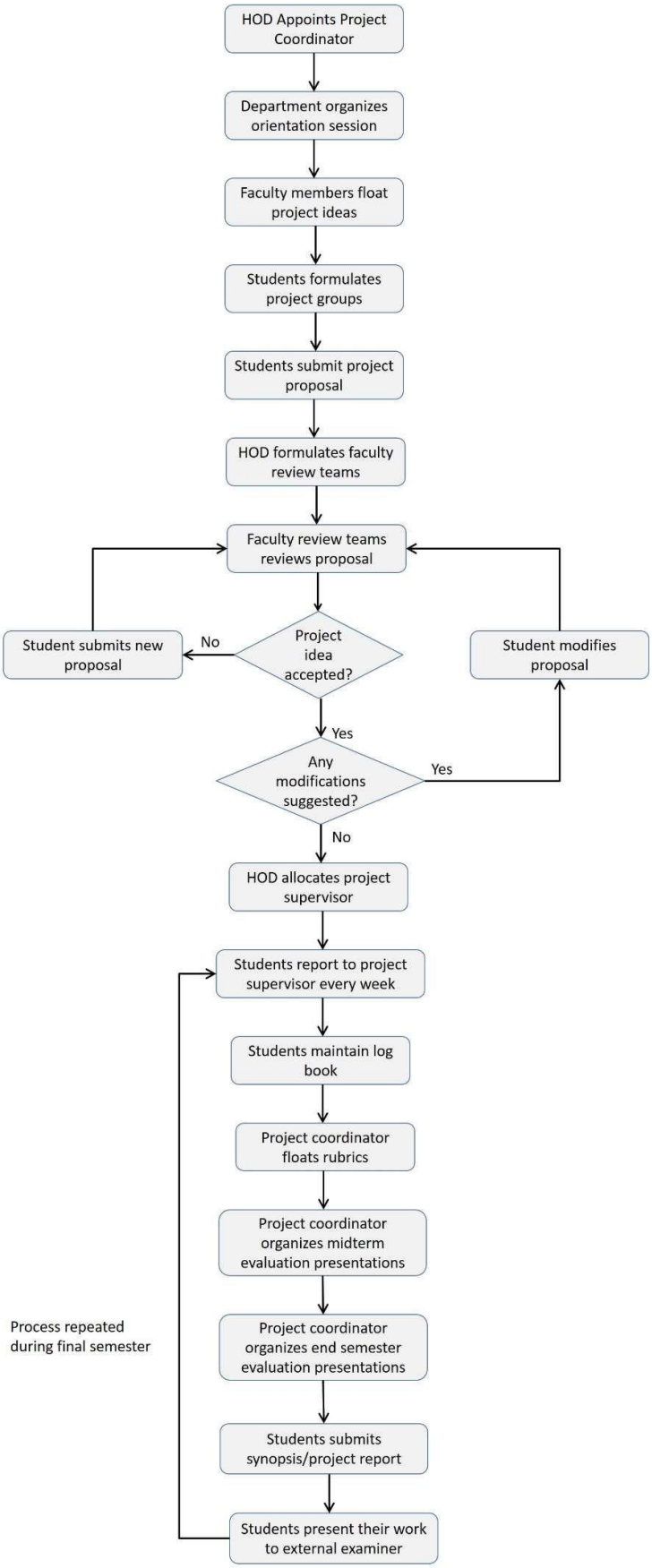
List of documents:

- Sample lesson plan
- Deviation sample
- Sample of external academic auditor report
- Academic calendar
- Circulars regarding events
- Mapping of actual event dates with academic calendar
- If dates are changed then circulars/permission regarding change

Project Process

1. Head of the department appoints project coordinator.
2. At end of sixth semester, department organizes orientation session for project selection.

3. Faculty members float the project ideas.
4. Student formulates project group as per the University guidelines.
5. Student select project from ideas float by department or their own idea.
6. At the beginning of the seventh semester, students submit project proposal in prescribed format.
7. HOD and project coordinator formulates faculty teams to review project ideas.
8. Coordinator organizes session for reviewing project idea.
9. Faculty teams reviews the project ideas based on feasibility, innovations, etc.
10. If project idea is not accepted, student need to propose new idea.
11. If project idea is accepted, but need modifications, student need to modify proposal and resubmits for review.
12. HOD allocates project supervisor based on the project domain and faculty expertise.
13. Student reports to project supervisor every week and appraise and discuss about progress of the project.
14. Project coordinator floats project evaluation rubrics.
15. Project coordinator organizes progress review session at the mid of the semester.
16. Project coordinator organizes pre-final progress review session at the end of the semester.
17. Student submit synopsis/project report.
18. During end semester, student present their project work to external examiner.
19. Steps 13-18 repeated in final semester.

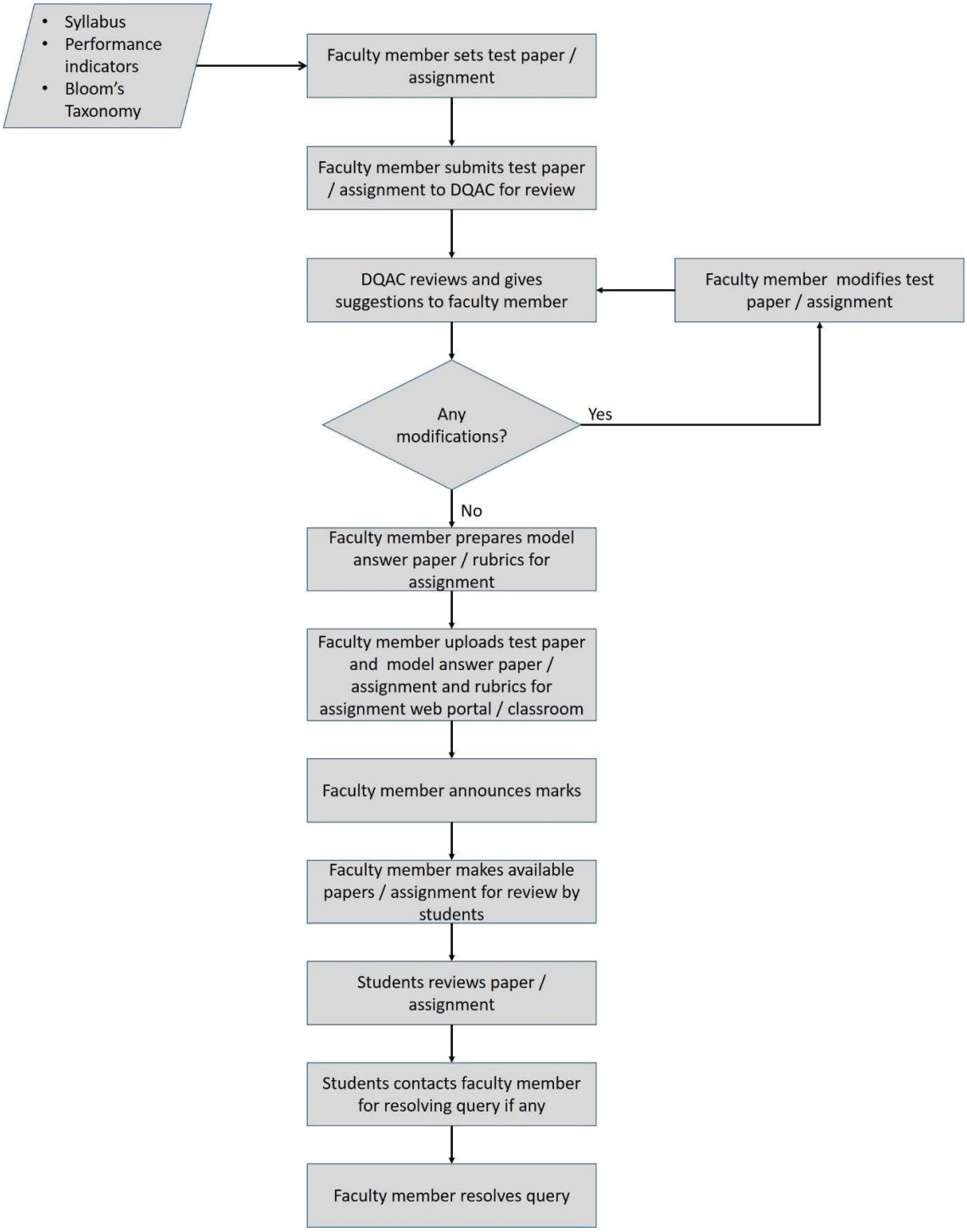

HOD Appoints Project Coordinator
Department organizes orientation session
Faculty members float project ideas
Students formulates project groups
Students submit project proposal
HOD formulates faculty review teams
Faculty review teams reviews proposal
Project idea accepted?
No
Student submits new proposal
Student modifies proposal
Yes
Any modifications suggested?
Yes
No
HOD allocates project supervisor
Students report to project supervisor every week
Students maintain log book
Project coordinator floats rubrics
Project coordinator organizes midterm evaluation presentations
Project coordinator organizes end semester evaluation presentations
Students submits synopsis/project report
Students present their work to external examiner
Process repeated during final semester

List of documents:

- Appoint letter/circular of project coordinator
- Circular regarding orientation session and attendance
- List of projects offered by faculty members
- List of project groups
- Project proposals submitted by students
- Circular regarding formulation of faculty teams
- Circular regarding proposal presentation
- Grading sheet regarding proposal
- Circular regarding assignment of project supervisor
- Log book
- Rubrics
- Midterm evaluation reports
- Pre-final evaluation reports
- External examiner report

Process to improve quality of internal assessment

- Faculty member sets unit test paper/assignment based on syllabus considering performance index, Bloom's taxonomy, COs, etc.
- Faculty member submits test paper/assignment to DQAC for review.
- DQAC reviews test paper/assignment and gives feedback to faculty member.
- Faculty member prepares model answer paper and marking scheme for test paper, and rubrics for assignment.
- Faculty member uploads test paper/assignment and model answer paper on web portal/classroom.
- Faculty member corrects test paper/assignment as per the marking scheme/rubrics.
- Faculty members announce marks and makes available answer paper/assignment for review by students.
- Student contact faculty member if they have any query.
- Faculty member clears the query raised by student.

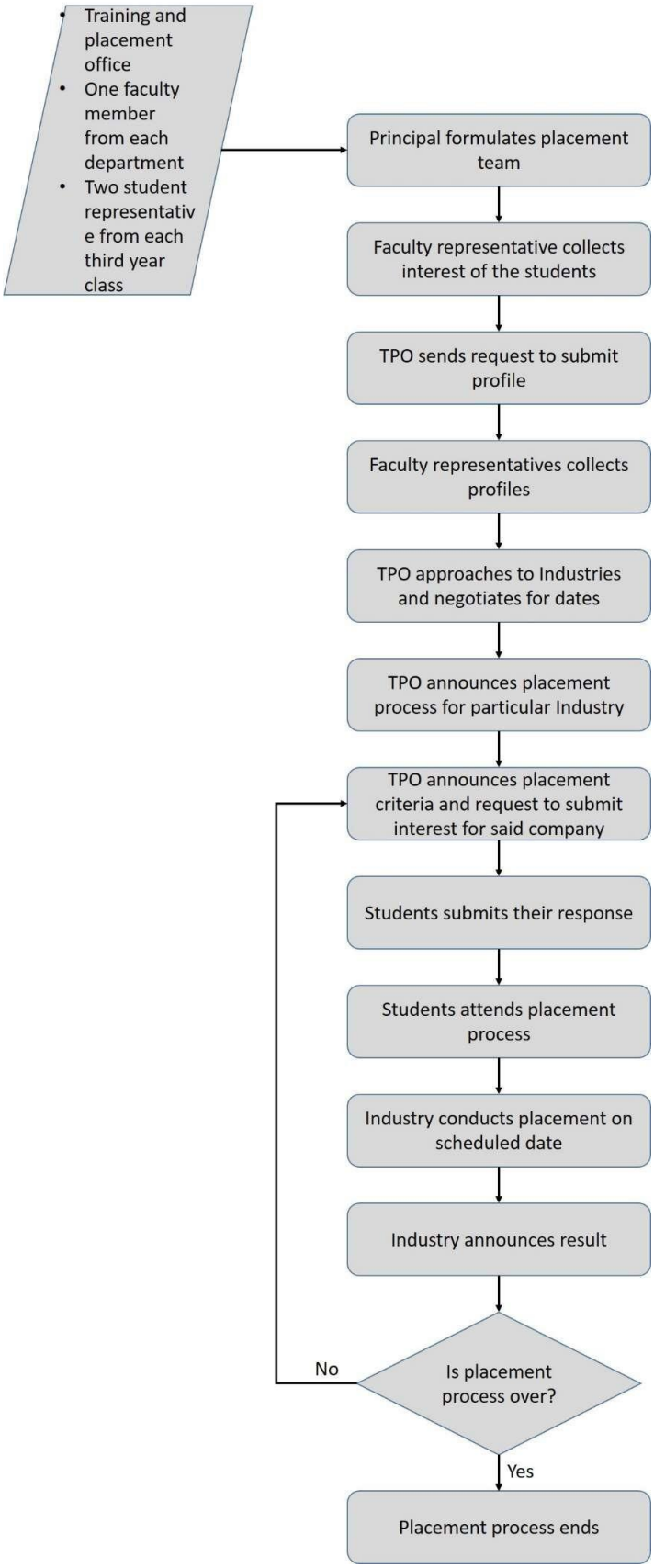


List of documents:

- Circular regarding submission of test paper/assignment to DQAC
- Circular regarding the DQAC meeting about review of test paper/assignment
- Review reports of test papers/assignments
- Sample test paper, model answers, assignment, rubrics for assignment
- Proof regarding uploads of paper/assignment on wen portal/classroom

Placement Process

1. Principal formulates Training and placement team consisting of Training and Placement Officer (TPO), one faculty member from each department, two student representatives from each third year class.
2. End of sixth semester, faculty representatives collects data about interest of the students like whether they are interested in placement or higher studies or other.
3. TPO sends request to submit profile from interested students.
4. Students submits their profile to TPO through faculty representatives.
5. TPO approaches to different industries and negotiates about dates of campus visit.
6. TPO announces placement process dates for a particular industry.
7. TPO announces company criteria and asks for the list of students interested in that industry.
8. Student submits his/her response through student representative.
9. Student attends placement process on scheduled date.
10. Industry conducts placement process as per schedule.
11. Industry announces results at the end of the process.
12. Steps 6 to 10 repeated for different industries.

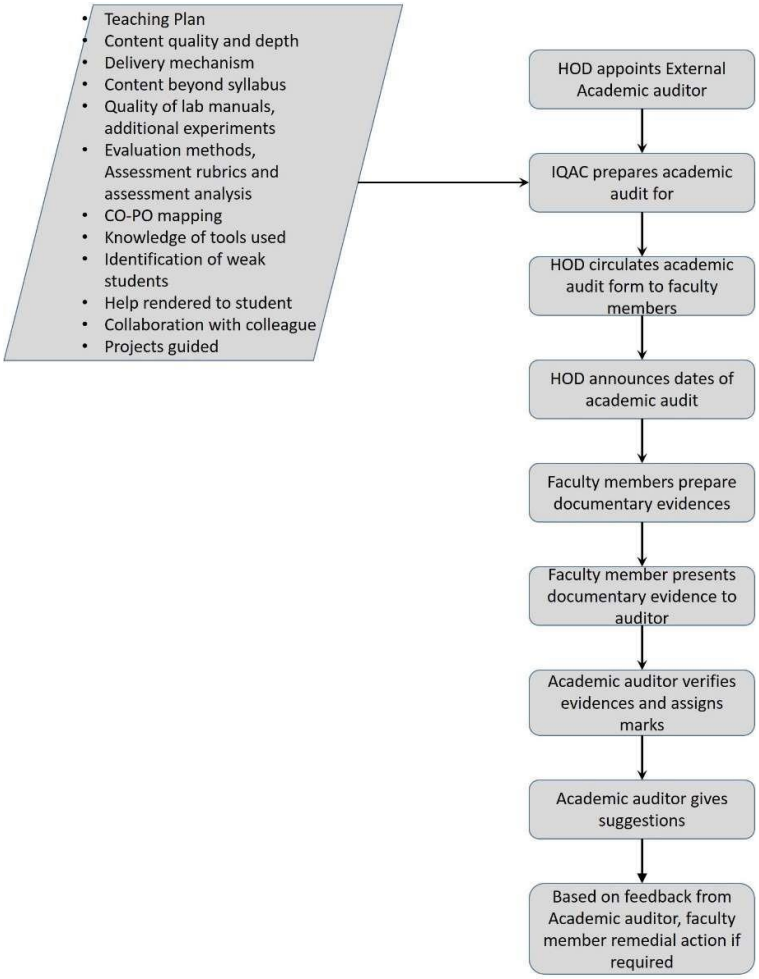

Training and placement office
One faculty member from each department
Two student representative from each third year class
Principal formulates placement team
Faculty representative collects interest of the students
TPO sends request to submit profile
Faculty representatives collects profiles
TPO approaches to Industries and negotiates for dates
TPO announces placement process for particular Industry
TPO announces placement criteria and request to submit interest for said company
Students submits their response
Students attends placement process
Industry conducts placement on scheduled date
Industry announces result
Is placement process over?
No
Yes
Placement process ends

List of documents:

- Circular regarding formulation of placement team
- Excel sheet – data regarding interest of students
- Circular regarding submission of profiles
- Student profiles
- Email communication to industries
- Circulars/emails regarding the announcement of placement
- Response sheet for particular industry
- Placement results

Academic Audit Process

- Head of the department appoints external auditor.
- IQAC prepares academic audit form considering following parameters:
    - Teaching Plan
    - Content quality and depth
    - Delivery mechanism
    - Content beyond syllabus
    - Quality of lab manuals, newly added experiments
    - Evaluation methods, Assessment rubrics and assessment analysis
    - CO-PO mapping
    - Knowledge of tools used
    - Identification of weak and bright students
    - Help rendered to student
    - Collaboration with colleagues
    - Projects guided
- HOD circulates external audit form among faculty members.
- HOD announces dates of the external audit.
- Faculty member prepares course files and other related documents.
- Faculty member presents their course files to external auditor.
- External auditor assesses the course files and assigns marks as per audit form, puts appropriate remarks.
- External auditor gives suggestion to concerned faculty member.
- Based on the feedback from external auditor, faculty member takes remedial actions if necessary.

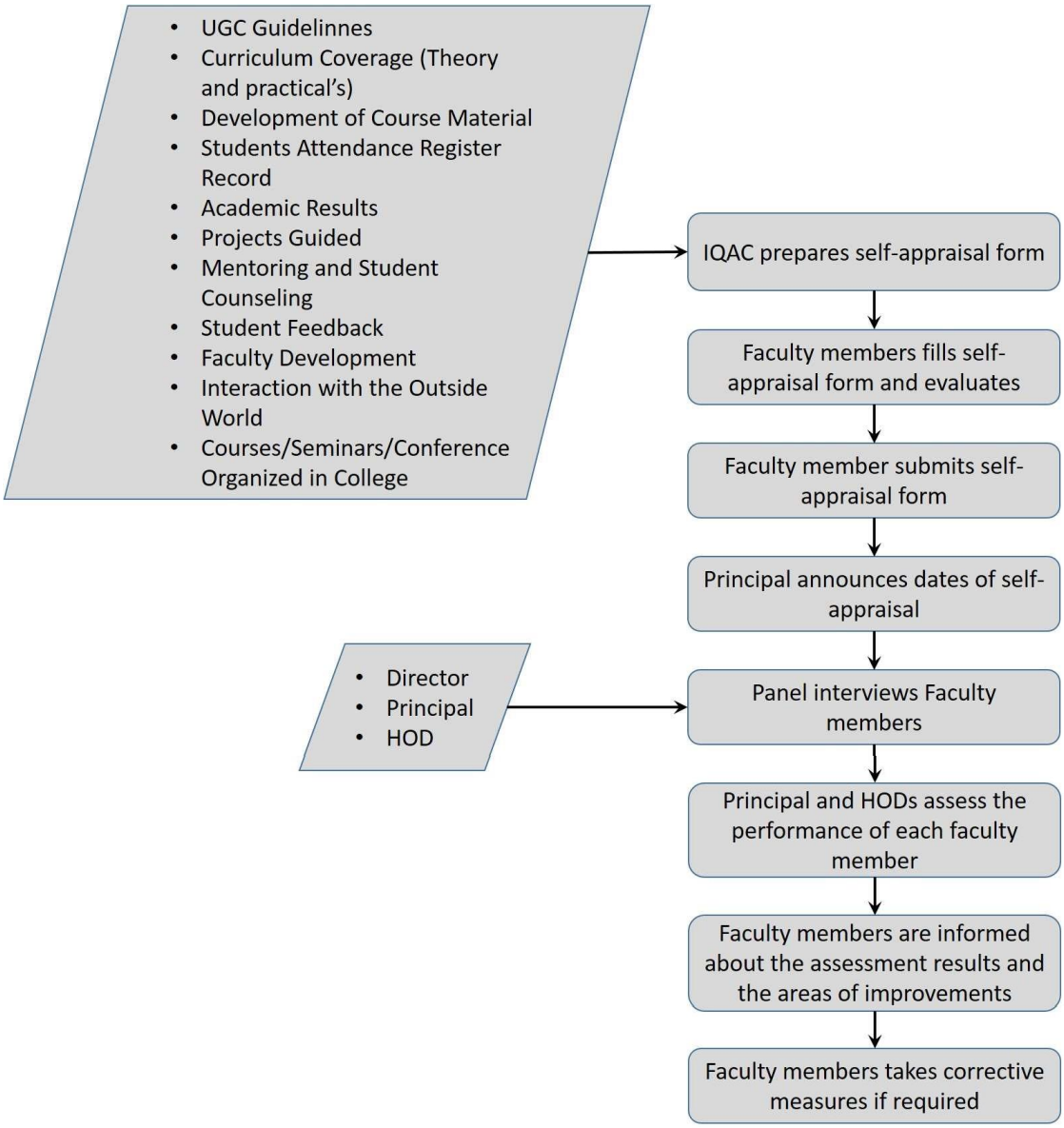


List of documents:

- Appoint letter of external academic auditor
- Blank academic audit form
- Notice regarding academic audit
- Completed academic audit forms
- Remedial measures if any

Faculty appraisal and development system

- IQAC prepares self-appraisal form as per UGC guidelines considering following parameters:
    - Curriculum Coverage (Theory and practical's)
    - Development of Course Material
    - Students Attendance Register Record
    - Academic Results
    - Projects Guided
    - Mentoring and Student Counseling
    - Student Feedback
    - Faculty Development
    - Interaction with the Outside World
    - Courses/Seminars/Conference Organized in College
    - Publications
- Faculty members fills self-appraisal form and evaluates.
- Faculty member submits self-appraisal form in office.
- Principal announces dates of self-appraisal.
- Panel consisting of Director, Principal and HOD interviews Faculty members.
- Principal and HODs assess the performance of each faculty member.
- The assessment process is transparent and faculty members are informed about the assessment results and the areas of improvements.
- Accordingly, faculty decides the corrective measures to improvise the performance and follows the same in the following year.

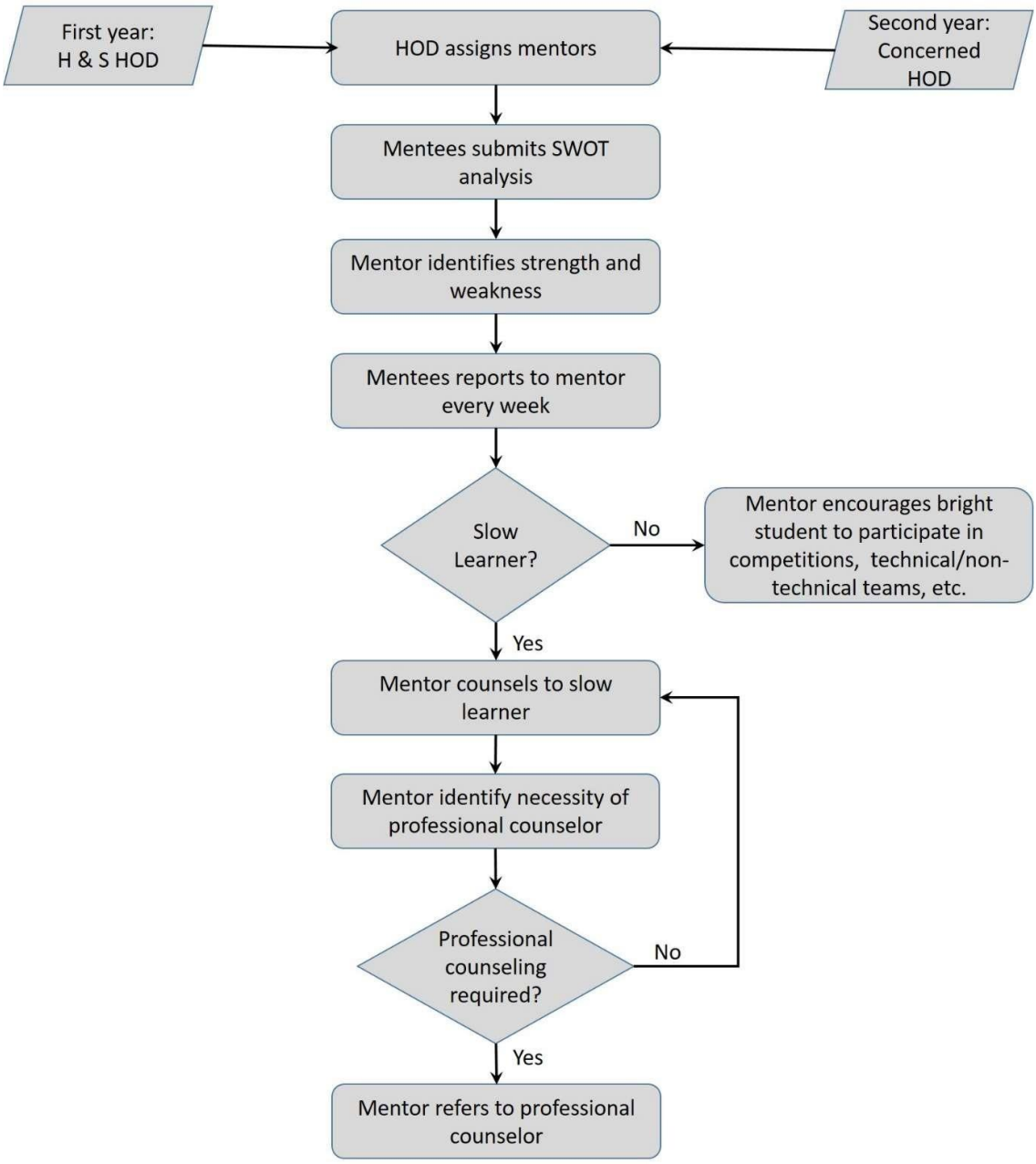


List of documents:

- Blank self-appraisal form
- Notice regarding appraisal
- Completed self-appraisal forms

Mentoring process

- At entry, H & S HOD assigns mentors to mentees (Approximately 20 students are assigned to one mentor).
- During third semester, concerned HOD assigns mentors to mentees (Approximately 6 students are assigned to one mentor). The mentor continues mentoring till the students successfully graduates.
- If any faculty member resigns/retires, HOD reassigns mentor to respective students.
- Mentees reports to mentor once in week.
- Mentees submits SWOT analysis to mentor.
- Mentor identifies weakness and strengths of student and accordingly guides the student.
- Mentor counsels the slow learner to enhance the performance. If mentor finds the need of professional counseling, then he directs student to professional counsellor.
- Mentor encourages fast learner to participate in various competitions, members of technical/non-technical teams.
- Mentor continuously monitors performance of mentee and takes remedial measures if necessary.



Documents Required:

- Notices regarding assignment of mentors
- Mentoring file – to be maintained by mentor
    - SWOT analysis submitted by student
    - Data related with identification of weak/bright students
    - Mentoring report as per template
    - Professional counselor report if any