



**Deccan Education Society's
Fergusson College (Autonomous), Pune
Internal Quality Assurance Cell**

Outcome Based Education (OBE) Policy and Procedures

Purpose

OBE is a performance- based education system that encompasses each part of an educational system around outcomes. The core philosophy of OBE rests in adhering to student-centric learning approach used to measure student's performance based on pre-determined set of outcomes. It gives a clear picture of what is important for students to be able to do, then organising the curriculum, instructions and assessments to make sure that the learning ultimately happens (Spady 1994). By the end of the educational experience, each student should have achieved the goal (outcomes). One of the significant advantage of Outcome Based Education is in bringing out reforms in curriculum framework that has to be outcome based; constant up gradation of academic resources; raising quality of research and teaching; technology integration in the teaching-learning processes; bringing out clarity among students as to what is expected from them after completion of the programme and for teachers in bringing focus on what to teach, how to teach and evaluate.

Fergusson College has adopted Learning Outcome based Curriculum Framework (LOCF) from 2019 and to strengthen Outcome Based Education implementation further steps has been taken by IQAC in the year 2020 and a policy has been framed.

Objectives

- To adhere to Outcome Based Education by using student-centric learning approach and measure student's performance based on pre-determined set of outcomes.
- To create, encourage and maintain a favorable empowering learning environment and facilitate learner-centric teaching and learning process in the institution.
- To bring out reforms in curriculum framework that has to be outcome based; constant up gradation of academic resources; raising quality of research and teaching; technology integration in the teaching-learning processes.
- To impart quality learning experiences that lead to attainment of the PEOs,

POs, PSOs and COs and demonstrate the graduate attributes focused on by the institution.

- To organize the curriculum content, teaching, learning and assessment methods in alignment with COs, POS, PSOs, PEOs and mission statement of the institution constructively.
- To define course outcomes that reflect higher order thinking skills of cognitive domain as per classification of revised Bloom's Taxonomy and are in terms of requisite global competencies for the sustainable future.
- To contribute to the Total Quality Management of the College and initiate a wide concept for the quality enrichment and enhancement initiatives.
- To practice Continuous Quality Improvement (CQI) on real time basis through reviews, feedbacks, gap analysis and corrective actions.

OBE Team

OBE Team looks into the effective dissemination of information and implementation of OBE process. It consists of Principal, IQAC coordinator, members of IQAC and OBE coordinator from each department. OBE coordinators are highly committed to take a representational role and their role is to actively participate in relaying OBE related information to relevant departments wherever required and also help department to implement OBE process smoothly. This committee shall play an active role in developing and implementing the OBE model in college. It shall put in place the reasonable infrastructure required to ensure that the outcomes are measured and achieved. The committee will assist and advice IQAC in matters relating to OBE within the college.

Responsibilities of the OBE Team

- To establish Vision and Mission statement of Fergusson College.
- Define Program Educational Objectives (PEOs) and Programme Outcomes (POs) of each programme in alignment with vision and mission statement of Fergusson College.
- To validate the attainment of mission statement and Program Educational Objectives (PEOs) of each program.
- Guide respective departments in defining Programme Specific Outcomes (PSOs)
- Map PEOs with POs and help department to map PEOs with PSOs
- Guide faculty in defining Course Outcomes (COs) with Bloom's Taxonomy for each Course.
- Guide faculty to map CO with POs and PSOs at suitable levels of Bloom's Taxonomy.
- Guide faculty in mapping content/Module/Topics with COs.

- Guide faculty in mapping Questions with CO's at Bloom's Taxonomy levels & Assessments
- Suggest multiple and customized assessment tools and methods that suit the students of diverse nature and serve as a background for measuring learning outcomes/ performances.
- Define rubrics with Bloom's Taxonomy and COs
- Track OBE process in departments and assure its smooth implementation.
- Guide in measuring the attainment of each PO through Direct/Indirect assessments
- Assess the attainment of pre-defined objectives and outcomes
- Arrange for training and orientation sessions for staff and students
- Circulate OBE related notices and circulars for staff and students
- Disseminate OBE related information through various means.
- Any other work related to development and implementation of OBE framework

OBE Process and Procedures

Fergusson College is committed to adopt and initiate the implementation of OBE in the institution in the phase wise manner. The core philosophy of outcome based education rests in adhering to a student centric learning approach used to measure students' performance based on a predetermined set of outcomes. For this, implementation process of OBE module has been designed in a planned way by following set procedures.

I. Defining Outcomes and Development of OBE framework

Program Educational Objectives (PEOs), Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) are the building blocks for OBE framework/system. These has been defined with the help of all stakeholders.

Process followed for defining Programme Specific Outcomes (PSOs) with Programme Educational Objectives (PEOs)

1. **Program educational objectives (PEOs):** PEOs are the broad statements which specify what the graduates of the program are expected to achieve within 4-5 years of completing the programme. PEOs has been defined following the Mission of the College and inputs are taken from the stakeholders and published on college website. Four PEOs have been written targeting five different programme run by college, i.e. B.A., M.A., B.Sc., M.Sc and B.Voc.

Sample PEOs for M.Sc. programme:

PEO1	Facilitate value-based holistic and comprehensive learning by integrating traditional and innovative learning practices to match the highest quality standards and train students to be effective leaders in their chosen fields and career.
PEO2	Provide conducive environment to unleash their hidden talents, creative potential, nurture the spirit of critical thinking and encourage them towards higher education so as to cater the needs of the industry/society and contribute for the development of the nation.
PEO3	Equip students with skills needed to adapt better to ever changing global scenario by encouraging innovative practices, research competence and entrepreneurial skills and gain access to career opportunities in multidisciplinary domains.
PEO4	Develop a sense of social responsibility, ethics and equity to transform students into commitment-oriented professionals having strong attitude towards sustainable development for betterment of society.

2. **Programme outcomes (POs):** POs are the statements that describe what graduates of any undergraduate or postgraduate Arts, Science and Vocational programme should demonstrate at the time of completion of graduation. Once PEOs has been defined, these objectives led to the development of POs. POs which were earlier referred to as Graduate Attributes is all about what is expected from a graduate in his years of graduation. As POs of all professional programmes in engineering and other areas are identified at national level by NBA and concerned accrediting agency, no agency has defined the POs of General Higher Education programme in India. Therefore, college with the help of stakeholders have defined nine POs specific for five different programme (i.e. B.A., M.A., B.Sc., M.Sc. and B.Voc.) offered by Fergusson College keeping in mind PEO statements and referring sample POs given in 'NAAC Institutional Accreditation Manual for Self Study Report for Autonomous Colleges' and POs defined by NBAs as per Washington Accord's Programme Learning Outcome. For defining POs, inputs were taken from IQAC members, Heads of the department, Programme coordinators, senior faculty members, alumni and external academic experts collectively. Theses inputs were analyzed by the IQAC and OBE-Team. After proper revisions, POs were finalized and communicated to Academic council members and published on the college website.

Sample Program Outcomes (POs) for M.Sc Programme

PO1	Disciplinary Knowledge: Demonstrate comprehensive knowledge of the discipline that form a part of an postgraduate programme. Execute strong theoretical and practical understanding generated from the specific programme in the area of work.
PO2	Critical Thinking and Problem solving: Exhibit the skill of critical thinking and understand scientific texts and place scientific statements and themes in contexts and also evaluate them in terms of generic conventions. Identify the problem by observing the situation closely, take actions and apply lateral thinking and analytical skills to design the solutions.
PO3	Social competence : Exhibit thoughts and ideas effectively in writing and orally; communicate with others using appropriate media, build effective interactive and presenting skills to meet global competencies. Elicit views of others, present complex information in a clear and concise and help reach conclusion in group settings.
PO4	Research-related skills and Scientific temper: Infer scientific literature, build sense of enquiry and able to formulate, test, analyse, interpret and establish hypothesis and research questions; and to identify and consult relevant sources to find answers. Plan and write a research paper/project while emphasizing on academics and research ethics, scientific conduct and creating awareness about intellectual property rights and issues of plagiarism.
PO5	Trans-disciplinary knowledge: Create new conceptual, theoretical and methodological understanding that integrates and transcends beyond discipline-specific approaches to address a common problem.
PO6	Personal and professional competence: Perform independently and also collaboratively as a part of team to meet defined objectives and carry out work across interdisciplinary fields. Execute interpersonal relationships, self-motivation and adaptability skills and commit to professional ethics.
PO7	Effective Citizenship and Ethics : Demonstrate empathetic social concern and equity centred national development, and ability to act with an informed awareness of moral and ethical issues and commit to professional ethics and responsibility.
PO8	Environment and Sustainability: Understand the impact of the scientific solutions in societal and environmental contexts and demonstrate the knowledge of and need for sustainable development.
PO9	Self-directed and Life-long learning: Acquire the ability to engage in independent and life-long learning in the broadest context of socio-technological changes.

Programme Specific Outcome (PSOs)

PSOs are the statements that describe what the graduates of a specific educational programme should be able to do at the time of graduation. These statements have been written by specific departments for a particular programme that department is offering (eg. B.A. Psychology, M.A. Economics, B.Sc. Chemistry, M.Sc. Physics etc.) based on four competencies related to specific graduate programme. POs involved inputs from Head of the departments, Programme coordinator, all faculty member and other stakeholders. These inputs were analyzed by the IQAC and OBE-Team. After proper revisions, PSOs were finalized and communicated to Board of Studies (BoS) committee members, Academic council and published on the college website.

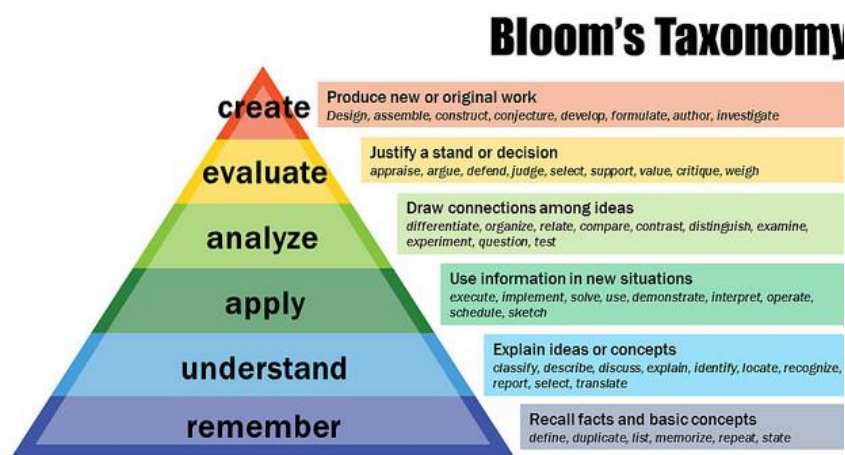
Sample PSOs for M.Sc. Biochemistry:

PSO No.	Program Specific Outcomes(PSOs) Upon completion of this programme the student will be able to
PSO1	Academic competence (i) Articulate fundamental concepts, principles and processes underlying the field of biochemistry and its different branches (ranging from biomolecules, metabolism, nutrition, cell biology, genetics, enzymology, immunology, physiology, endocrinology, plant biochemistry, molecular biology to genetic engineering, neurochemistry) and its linkage with related disciplinary areas/subjects. (ii) Demonstrate an understanding and be able to explain a wide range of biochemical techniques (e.g. basic molecular biology, genetic engineering, microbiology methods, spectrophotometry, enzyme kinetics, chromatography, electrophoresis, immunological assays)
PSO2	Personal and Professional Competence (i) Exhibit decision making skills in subject related tasks, demonstrate soft skills and sustain in life science industry. (ii) Plan experimental methodology and perform independent laboratory-orientated numerical calculations, data interpretation, scientific writing and authentic reporting. (ii) Identify biochemistry related problems and use appropriate concepts and methods to solve them.
PSO3	Research Competence (i) Review scientific literature, develop a hypothesis and formulate scientific protocols and conduct appropriate experiments. (ii) Plan and execute research projects professionally while emphasizing on academic and research ethics, scientific misconduct and creating awareness about intellectual property rights and issues of plagiarism (iii) Integrate informatics and statistical skills to explore and authenticate

	biological data for experimental and research purpose
PSO4	Entrepreneurial and Social competence (i) Design techniques and solutions towards specific areas related to biochemistry such as industrial, clinical, health, agriculture and others. (ii) Demonstrate social skills, social communication and interpersonal communication and participate in an effective and constructive way in different environments of social and working life.

Course Outcomes (COs): These are the outcomes every student is expected to gain at the end of completion of each course (subject). These are listed and based on them the course curriculum is finalized. COs are narrower statements that describe what students are expected to know, and be able to do at the end of each course. It should reflect what level of knowledge students gained, skills acquired and attributes developed upon successful completion of the course; COs must be measurable, attainable and manageable in number. COs should contribute to attain POs in such a way that each CO should address at least one of the POs and PSOs and also each PO and PSO must be reasonably addressed by adequate number of COs. COs have been defined by the course/subject teacher which has been kept to six COs for 2-4 credits course as per the recommendations given in 'NAAC Institutional Accreditation Manual for Self-Study Report for Autonomous Colleges'. Following pointers were followed while drafting COs:

- COs should begin with an action verb that denotes the level of learning expected as per revised Bloom's taxonomy. Terms such as know, understand, learn are not used as they are not specific enough to be measurable.
- Measurable verb should be followed by the statement which describe the knowledge and abilities student should demonstrate.
- COs should be clear to the students and teachers and proper verbs from all the six cognitive domains (Remember, Understand, Apply, Analyze, Evaluate and Create) of Bloom's taxonomy should be used.
- All course contents should be considered while writing COs



COs were defined by teachers based on above steps and inputs were taken from Head of the departments, Programme coordinator and all faculty member. These inputs were analyzed by the IQAC and OBE-Team. After proper revisions, COs were finalized and communicated to BoS committee, Academic council and published on the college website.

Sample COs for M.Sc. Biochemistry:

Title of the Course and Course Code	Metabolism (CHB4202)	Number of Credits : 04
On completion of the course, the students will be able to:		Bloom's Cognitive level
CO1	Recall the structure of metabolic intermediates and names of enzymes.	1
CO2	Explain and illustrate the steps in biochemical pathways along with their regulations.	2
CO3	Apply knowledge of genetics and enzymology to understand the formation of specific intermediates in biochemical pathways and inborn errors of metabolism.	3
CO4	Classify the types of metabolic reactions and outline the concepts of bioenergetics.	4
CO5	Justify varied conditions required for the occurrence of desired metabolic reactions.	5
CO6	Rearrange and write the correct sequence of fates of metabolic products based on the specified physiological conditions.	6

II. OBE Implementation and Mapping Process

OBE implementation and mapping process is supported by an outcome-based education software to bring operational ease and efficiency towards OBE process and provides assessment reports. College shall follow the following mentioned levels of mapping.

- 1. Mapping of mission statement with Program Educational Objectives (PEOs):** Take stakeholders opinion to map the mission statement with PEOs and give appropriate weightage on the scale of 0 to 3 (0- None, 1- Low, 2- Medium, 3-High). Inputs are analyzed by IQAC and OBE Team and approved by Academic council.
- 2. Mapping of Program Educational Objectives (PEOs) with Programme Outcomes (POs):** Take stakeholders opinion to map the PEOs statements with POs and give appropriate weightage on the scale of 0 to 3 (0- None, 1- Low, 2-

Medium, 3-High). Inputs are analyzed by IQAC and OBE Team and approved by Academic council.

3. **Mapping of Program Educational objectives (PEOs) with Programme Specific Outcomes (PSOs):** This should be done at specific departmental level as per the following instructions:

- i. Mapping process of PSOs and PEOs should be done on the principle that the faculties involved have a thorough understanding of the programme curriculum, content, PSOs and PEOs.
- ii. For PSO-PEO mapping, set an appropriate weightage on the scale of 0 to 3 (0- None, 1- Low, 2- Medium, 3-High) and prepare a mapping matrix.
- iii. Head of the department, Programme coordinator, OBE coordinator and all faculties should come together and discuss, analyze and finalize the weightage given on mapping matrix.

	PEO1	PEO2	PEO3	PEO4
PSO1				
PSO2				
PSO3				
PSO4				

- iv. Share the final mapping matrix with the Board of Studies (BoS) committee members along with PSOs and PEOs statements and get the approval (through email).

1. **Mapping of Course Outcomes (COs) with Programme Outcomes (POs) and Programme Specific Outcomes (PSOs):** The COs should be mapped to the POs/PSOs which will provide the quantitative measurement of how well the program outcomes are achieved. Following instructions should be followed for the process:

- a) Faculty involved in preparing and teaching COs based on the syllabus should map the COs with POs and PSOs with the help of other senior faculties and prepare a mapping matrix as follows

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1													
CO2													

- b) Strength of correlation should be assessed on the basis of teacher's understanding of course content and be given a weightage on the scale of 0 to 3 (0- None, 1- Low, 2- Medium, 3-High)

- c) Faculty should share CO-PO/PSO mapping matrix with Head of the department, Programme coordinator and OBE coordinator for their inputs. Once approved, share the mapping matrix with BoS committee members and get the approval.
- d) All COs should be mapped to relevant POs and PSOs and not to all. Ideally COs of a particular course should be mapped to 2-4 POs and 2 PSOs (approximately). On the completion of a particular programme, COs would be mapped to the maximum POs and PSOs.

2. Mapping of CO with Assessments and Questions

Methods of assessments are most vital tools to monitor the process of OBE. Assessment methods include direct methods and indirect methods. Direct method of CO assessment is based on **Internal examination (Concurrent evaluation or CE)** as well as **End Semester Examination (ESE)** using various modes which should cover all the COs throughout the semester. To achieve this, faculty should prepare a question bank where each question/assignment should be mapped to the corresponding CO.

Table: Direct Assessment tool used for CO attainment

Sr. No.	Evaluation (Theory)	Max Marks	Mode of Assessment	Mapping of Questions with Course Outcome
1	Concurrent Evaluation (CE – I) (Internal)	20	Theory: Group Discussion or Report or Note or Book Review or Assignment or Essay or Written Test or Open Book Test or Seminar or Presentations	As per the course and CO
2	Concurrent Evaluation (CE – II) (Internal)	20	Theory: MCQ/Subjective test/ Combination of different question types	As per the course and CO
3	End Semester Examination (ESE)	60	Theory: Subjective paper based test	Based on all the CO and entire syllabi

Sr. No.	Evaluation (Practical)	Max Marks	Mode of Assessment	Mapping of Questions with Course Outcome
1	Concurrent Evaluation (CE – I) (Internal)	10	Assignment, questions/test or other assessment method as per the course requirement	As per the course and CO

2	Concurrent Evaluation (CE – II) (Internal)	10	Report/Journal, viva, conduction of practical, questions/test or other assessment method as per the course requirement	As per the course and CO
3	End Semester Examination (ESE)	30	Practical examination as per the course	Based on all the CO and entire syllabi

Outcomes for the programme which has Project component as a course in their syllabus, is also assessed as per the OBE guidelines using rubrics and direct assessment is done via Internal (CE) and End Semester Exam (ESE).

Indirect assessment in the form of various surveys such as exit survey, employer feedback and alumni feedback should be planned and maintained at department level. Rubrics are formulated for the various assessments methods like seminars, assignment, project courses.

3. Attainment Process

The attainment of COs, POs and PSOs should be evaluated by direct and indirect assessment tools which should be given weightage of 80% and 20% respectively.

Direct attainment of COs should be measured by the various assessment methods adopted during Continuous Evaluations (CE) and End Semester Examinations (ESE). The performance of the students in the examinations during the semester in each course should be used to compute the level of attainment of the POs and PSOs through the mapping of questions to COs and COs to POs and PSOs

The attainment of each CO will be computed by setting the class average mark as the threshold target decided by the faculty from individual department along with OBE coordinator and other faculty members.

The threshold targets are quantized and measured on a scale (0-3) as follows:

% of CO attainment	Class average >70%	Class average > 50% and <= 70%	Class average <=50%
CO attainment level	3	2	1

For each course, the attainment level of each CO should be compared with predefined threshold targets, and if not attained, the concerned faculty should prepare a gap analysis report and take necessary steps for the improvement to reach the target.

4. Attainment Analysis

Head of the department along with OBE coordinator and faculty should analyse the attainment reports of each course and make a plan to improve student learning and assessment methods. The OBE process-involving outcome based teaching learning and assessment provide a clear picture of the strength and weakness of the programme at different levels. This process should be utilised to devise action plans for improvement which should be implemented in the next semester.

This analysis will determine whether there is a need for improvement of the CO attainment process for the next semester. CO attainment analysis report inclusive of action plans for the next semester will be sent to Head of Department (HOD) for verification and placed in Course File.



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