THE STANDARD FIREWORKS RAJARATNAM COLLEGE FOR WOMEN (AUTONOMOUS), Sivakasi

(Affiliated to Madurai Kamaraj University, Reaccredited with "A" Grade by NAAC, College with Potential for Excellence by UGC & Mentor Institution under UGC PARAMARSH)

NAAC SSR Cycle IV (2015-2020)

1.1. CURRICULUM DESIGN AND DEVELOPMENT

1.1.1. CURRICULUM DEVELOPMENT AND IMPLEMENTATION

Guidelines for Outcome Based Education
2017 and later

THE STANDARD FIREWORKS RAJARATNAM COLLEGE FOR WOMEN (AUTONOMOUS), SIVAKASI – 626 123.
(Affiliated to Madurai Kamaraj University, Re-accredited with A Grade by NAAC and College with Potential for Excellence by UGC)

DEPARTMENT OF _____
**UG/PG/M.Phil DEGREE PROGRAMME IN _____**

GUIDELINES FOR OUTCOME BASED EDUCATION WITH CHOICE BASED CREDIT SYSTEM
(For those admitted in June 2017 and later)

A. PREAMBLE

The institutional vision is to emerge as a premier institution offering need-based, value conscious and career-oriented quality education to empower rural women with communicative competency and employment potential. With the advent of Autonomy in the year 2005, Choice Based Credit System (CBCS) is followed and it offers much flexibility to innovate and design the contents of each programme and align it with the institutional mission. Quality assurance developments in higher education have encouraged us to move towards outcomes-based approach to teaching, learning and assessment. Programme specifications define the students in terms of what they can do at the end of a programme or a particular level of study. This is a change from the more traditional approach where teachers tended to define courses in terms of what is taught, rather than what the student can do at the end of the course or programme. More directed and coherent curriculum, "more relevant" Graduates to industry and other stakeholders and Continuous Quality Improvement (CQI) are the benefits of OBE.

A student-centered paradigm in higher education entails a shift from a more input-oriented curricular design based on the description of course content, to outcomes-based education in which the course content is developed in terms of learning outcomes. The implementation of **Outcome Based Education with CBCS** as per the UGC guidelines from the academic year 2019-2020 will definitely mark a paradigm shift from traditional education.

B. OUTCOME BASED EDUCATION (OBE) FRAMEWORK
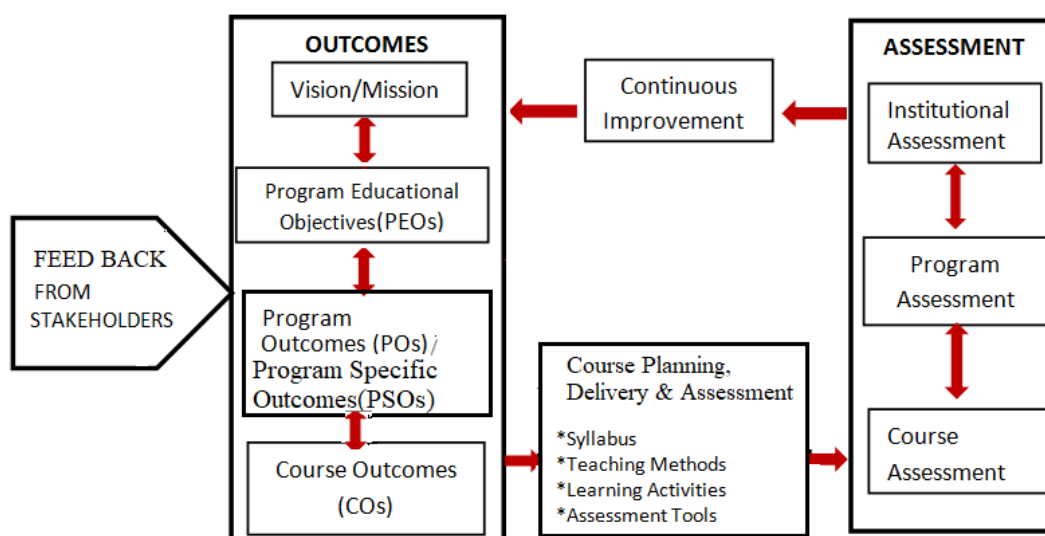
C. PROGRAMME EDUCATIONAL OBJECTIVES, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

Programme Educational Objectives (PEOs):

PEOs are broad statements that describe the career and professional achievements that the programme is preparing the graduates to achieve within the first few years after graduation. PEOs should be consistent with the mission of the Institution. PEO's can be measured by a PO-PEO matrix. The PEO's should evolve through constant feedback from alumnae, students, industry, management etc,. It is mandatory that each PEO should be mapped to atleast one of the POs.

The Graduates will

PEO1: Industry ready and preparedness for higher studies
PEO2: Pursue research / Innovate for real time solutions
PEO3: Capacity building for Entrepreneurship and self employment
PEO4: Exhibit ethical values in professional and personal life

Programme Outcomes (PO):

Programme Outcomes are narrower statements that describe what students are expected to know and be able to do upon the graduation. These relate to the skills, knowledge and behaviour that students acquire in their study through the programmes.

PO1: Disciplinary knowledge

Apply the knowledge of Arts, Science and Humanities to address fundamental and complex questions appropriate to their programmes.

PO2: Critical thinking, Problem solving and Analytical reasoning

Make use of appropriate knowledge and skills to identify, formulate, analyze and solve problems in order to reach substantiated conclusions.

PO3: Research related skills and scientific reasoning

Critically analyze research processes, products and practices with a view of strategic use of data in their field.

PO4: Communication skills and Digital literacy

Demonstrate skills in oral and written communication and make use of ICT in various learning ambience.

PO5: Team work and Leadership quality

Interact productively with people from diverse backgrounds as both leaders/mentors and team members with integrity and professionalism.

PO6: Multicultural competence with Moral and ethical awareness

Defend the society against gender and environmental issues with moral and ethical awareness.

PO7: Self-directed and Life-long learning

Formulate their own educational needs in a changing world in ways sufficient to maintain their competence and to allow them to contribute to the advancement of knowledge.

Programme Specific Outcomes (PSO):

Programme Specific Outcomes denote what the students should be able to do at the time of graduation. They are programme specific. It is mandatory that each PO should be mapped to the respective PSO specified in the programme in order.

By the completion of the UG/PG/M.Phil……………. programme, the learners will be able to

PSO1: Disciplinary knowledge
PSO2: Critical thinking, Problem solving and Analytical reasoning
PSO3: Research related skills and scientific reasoning
PSO4: Communication skills and Digital literacy
PSO5: Team work and Leadership quality
**PSO6:** Multicultural competence with Moral and ethical awareness
PSO7: Self-directed and Life-long learning

BLOOM'S TAXONOMY:

Bloom's Taxonomy was created in 1956 by an educational psychologist Dr. Benjamin Bloom in order to promote higher forms of thinking in education, such as analyzing and evaluating concepts, processes, procedures, and principles, rather than just remembering facts. It is most often used when designing educational, training, and learning processes.
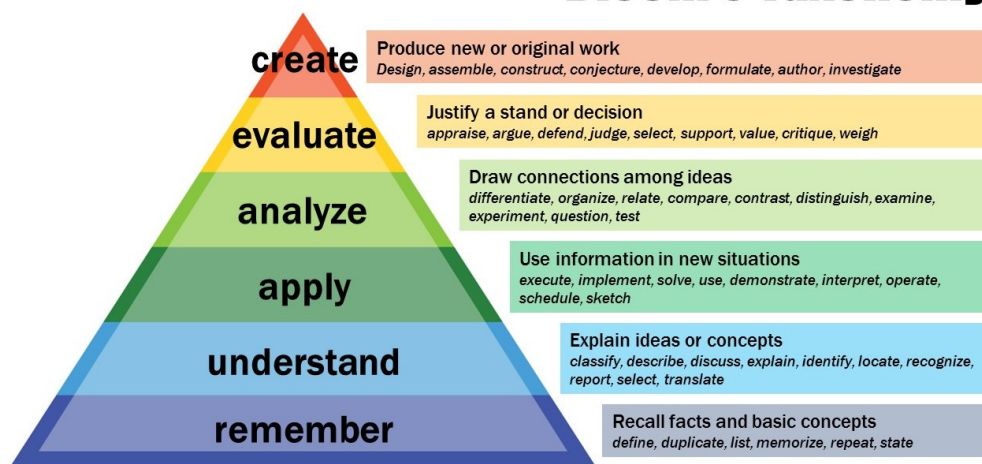
The K-levels mentioned in the diagram are usually denoted as [k1] to [k6] respectively from the bottom.

Course Outcomes (CO):

Course Outcomes are narrower statements that describe what students are expected to know and be able to do at the end of each course. These relate to the skills, knowledge, and behaviour that students acquire in their study through the course. Each course comprises five COs and the keywords used to define COs are based on Bloom's Taxonomy [k1] to [k6].

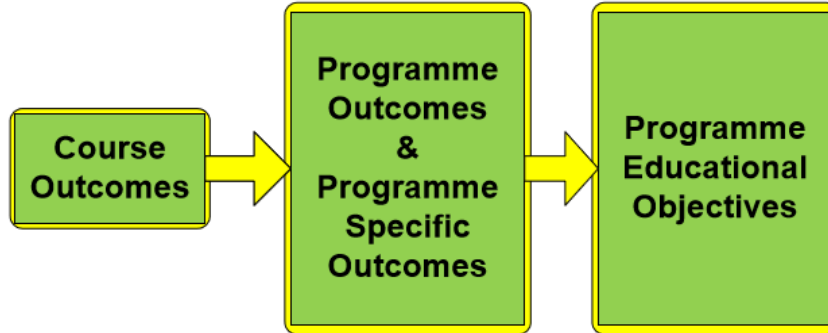On successful completion of the course, the learners should be able to

CO1: [k1] / [k2]
CO2: [k3]
CO3: [k4]
CO4: [k5]
CO5: [k6]

D. CO-PO &PO-PEO relationship:

E. CO – PO MAPPING OF COURSES:

After CO statements are developed by the course in-charge, COs will be mapped with any possible POs based on the relationship exist between them. A CO must be mapped to atleast one PO. The PO's which are not related to any of the COs in a particular course may be left blank. All the courses together must cover all the POs. The CO-PO matrix for a course is as shown below.

The correlation between COs and PO can be defined by three levels using the Letter Grades H, M, L which denotes respectively High (H), Medium (M), Low (L) and '-' for no correlation.

The concept of Six Sigma is used for calculating weighted percentage of contribution of each course in attainment of respective POs. As per Six Sigma Tool- Cause and Effect Matrix, the weightage of H, M and L are 9, 3 and 1 respectively.

CO-PO Mapping table (Course Articulation Matrix)

POs / COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1							
CO2							
CO3							
CO4							
CO5							
Weightage of the course							
Weighted percentage of Course contribution to POs							

The levels of contribution are denoted by Grades and weightages H-High (9), M-Medium (3), L-Low (1)

Weighted percentage of Contribution of the Course in attainment of PO1= Weightage of the course / Total weightage of all courses contributing PO1 computed based on correlation between COs and POs

Programme Articulation Matrix (PAM):

Course Code	Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7
Total Weightage of all courses contributing to POs								

PO-PEO Mapping Matrix:

PEOs POs	PEO1	PEO2	PEO3	PEO4
PO1	X	X	X	
PO2	X	X		
PO3	X	X		
PO4	X		X	
PO5	X		X	X
PO6			X	X
PO7		X		

(Mark X to map a PO to a PEO)

F. MEASUREMENT OF ATTAINMENT OF DESIRED GOALS:

Course Outcome (CO) is measured through the performance of students by the various assessment tools adopted for that particular course. Each evaluation tool is mapped to a particular verb in Bloom's Taxonomy and further each verb is mapped to a particular CO. Once the Course Outcome is measured, the PO can be measured using a CO-PO matrix.

Measurement of PO attainment shall be done by direct and indirect methods. Direct assessment method and indirect assessment method are considered for 80% and 20% weightages respectively. Target levels of attainment shall be fixed by the Course teacher and Heads of the respective departments.

Direct assessments (rubric based) - Conventional assessment tools such as Term Test, Quiz, Seminar, Assignment and End Semester Examination.

Indirect assessments – Course Survey, Graduate Exit Survey, Feedback from Alumnae, Employer and Parents.

G. ASSESSMENT PROCESS:

Assessment is one or more processes carried out by the institution that identify, collect and prepare data to evaluate the achievement of course outcomes and programme outcomes.

I. Assessment Process for CO Attainment:

For the evaluation and assessment of CO's and PO's, rubrics are used.

(i) **CO Assessment Rubrics:**

Course Outcome is evaluated based on the performance of students in the Continuous Internal Assessments and in End Semester Examination of a course. Internal assessment contributes 25% and End Semester assessment contributes 75% to the total attainment of a CO.

(ii) **CO Assessment Tools:**

The description of Assessment tools used for the evaluation of COs and POs is given below.

Mode of Assessment	Assessment Tool	Description	Evaluation of Course Outcomes	Related POs
Theory Courses- Internal Assessment (Weightage 25%)				
Direct (Weightage 80%)	Theory-Term Test	Three written examinations are conducted and average of best two is considered	The questions in the three Term Tests, Quiz and Assignment are framed in such a way that they cover all the COs of respective course. The final attainment for each CO under direct assessment is calculated by taking average of the CO attainments from Term Tests, Assignment and Quiz.	PO1 to PO7
	Assignment	One Assignment is given per course		
	Quiz/Seminar	One Quiz/Seminar is conducted for each course		
Theory Courses- External Assessment(Weightage 75%)				
	End Semester Examination	Examination at the end of the course of 3- hour duration	It covers the entire syllabus of the course. It would generally satisfy all course outcomes for a particular course. The COs are evaluated based on the set attainment levels.	PO1 to PO7
Practical Courses - Internal Assessment (Weightage 40%)				
	Observation	Day to day evaluation	Lab exercises are planned to cover all COs and CO attainment is calculated.	PO1 to PO7
	Model Practical Examination	Model Exam is conducted for each lab course.		

Practical Courses - External Assessment (Weightage 60%)				
	End Semester Practical Examination	Examination at the end of the course of 3- hour duration	The final attainment for each CO under direct assessment is calculated by taking average of the CO attainments in Observation, Model Practicals and End Semester Practical Examination	PO1 to PO7
Indirect (Weightage 20%)	Course Survey	This survey gives the opinion of the students on attainment of Course Outcomes	At the end of each course an exit survey is collected from the students and Considered for the CO attainment under Indirect assessment	PO1 to PO7

(iii) **CO Attainment:**

Direct CO Attainment:

Course outcomes of all courses are assessed and the CO wise marks obtained by all the students are recorded for all the assessment tools mentioned above. The respective CO attainment level is evaluated based on set attainment rubrics.

Attainment Levels of COs

Assessment Methods	Attainment Levels	
Internal Assessment	Level 1	60% of students scoring more than average marks or set target marks in internal assessment tools
	Level 2	70% of students scoring more than average marks or set target marks in internal assessment tools
	Level 3	75% of students scoring more than average marks or set target marks in internal assessment tools
End Semester Examination	Level 1	60% of students scoring more than average marks or set target marks in End Semester Examination
	Level 2	70% of students scoring more than average marks or set target marks in End Semester Examination
	Level 3	75% of students scoring more than average marks or set target marks in End Semester Examination

Target setting for Assessment method:

For setting up the target of internal assessment tools, the average of last three tests must be taken into consideration and it should be kept as target. If the average marks are not available then current average can also be used as target.

For setting up the target of End Semester Examination, the average of the last year examination shall be set as target. If the average marks are not available then current average can also be used as target.

Formula for Attainment for each CO:

Attainment = Percentage of students who have scored more than the target marks

$$\% \text{ of Attainment } = \frac{\text{Number of students who scored more than the target}}{\text{Total number of students}} * 100$$

➢ Internal Attainment is the average of attainments obtained using various internal assessment tools.
➢ For Theory Courses,
  Direct CO Attainment =25% of internal attainment + 75% of End Semester attainment
➢ For Practical Courses,
  Direct CO Attainment =40% of internal attainment + 60% of End Semester attainment

Indirect CO Attainment:

At the end of each course, an exit survey is collected from the students and it gives the opinion of the students on attainment of Course Outcomes. A questionnaire is designed to reflect the views of the students about the attainment of course outcomes.

Overall CO Attainment = 80% of Direct CO Attainment + 20% of Indirect CO Attainment

In each course, the level of attainment of each CO is compared with the predefined targets, if the target is not reached, the course teacher takes necessary steps for the improvement to reach the target.

If the average attainment of a particular course for two consecutive years is greater than 80% of the maximum attainment value (i.e. 80% of 3 = 2.4), then for that particular course the current rubrics for attainment must be changed to analyze continuous improvement.

II. ASSESSMENT PROCESS FOR OVERALL PO ATTAINMENT

With the help of CO against PO mapping, the PO attainment is calculated. PO assessment is done by giving 80% weightage to direct assessment and 20% weightage to indirect assessment. Direct assessment is based on CO attainment, where 75% weightage is given to attainment through End Semester examination and 25% weightage is given to attainment through internal assessments. Indirect assessment is done through Graduate exit survey.

PO Assessment Tools

Mode of Assessment	Assessment Tool	Description
Direct Attainment (Weightage 80%)	CO Assessment	This is computed from the calculated CO Attainment value for each Course
Indirect Attainment (Weightage 20%)	Graduate Exit survey	At the end of the programme, Graduate Exit Survey is collected from the graduates and it gives the opinion of the graduates on attainment of Programme Outcomes

Direct Attainment of POs for all Courses

At the end of the each programme, the direct PO assessment is done from the CO attainment of all courses. The direct PO attainment for a particular course is determined from the attainment values obtained for each course outcome related to that PO and the CO-PO mapping values. For the evaluation and assessment of CO's and PO's, the same set of rubrics is used.

Programme Articulation Matrix (PAM):

Course Code	Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7
Average Direct PO Attainment								
Direct PO Attainment in %								

Indirect Attainment of POs for all Courses

POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
Graduate Exit survey							
Indirect PO Attainment							

Indirect PO Attainment = 20% of PO Attainment from Graduate Exit survey

Attainments of POs for all Courses

POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
Direct Attainment (Weightage 80%)							
Indirect Attainment (Weightage 20%)							
Overall PO Attainment							

Overall PO Attainment = 80% of Direct PO Attainment + 20% of Indirect PO Attainment

III. ASSESSMENT PROCESS FOR PROGRAMME EDUCATIONAL OBJECTIVES

The curriculum is designed so that all courses contribute to the achievement of PEOs. The marks secured by the students in these courses indicate the level of achievement of the PEOs. In addition, Alumnae survey, Placements of students and progression to higher studies also contribute to the attainment of PEOs.

Type of Assessment	Assessment Tool	Assessment criteria	Data collection frequency	Responsible entity	Indicators for Attainment of PEO
Direct Weightage 70%	PO Assessment	This is computed from the calculated PO Attainment values for each Course			PEO-1 PEO-2 PEO-3 PEO-4
Indirect Weightage 30%	Alumnae Survey Weightage 10%	Once in a year, Alumnae Survey is collected from the alumnae and it gives the opinion of the alumnae on attainment of Programme Outcomes and their achievements			PEO-1 PEO-2 PEO-3 PEO-4
	Placement Record Weightage 10%	Number of students Placed	Once in a year	Placement cell	PEO-1 PEO-2 PEO-3 PEO-4
	Higher Education Weightage 10%	Number of students opted for higher education	Once in a year	Department	PEO-1 PEO-2 PEO-3 PEO-4

The attainment of the PEOs

Direct Evaluation of Programme Outcomes (POs) of the concerned PEO

POs	PEO1	PEO2	PEO3	PEO4
PO1				
PO2				
PO3				
PO4				
PO5				
PO6				
PO7				
Average Direct PEO Attainment in %				
Total Direct PEO Attainment				

Indirect Attainment of PEOs

PEOs	PEO1	PEO2	PEO3	PEO4
Alumnae Survey				
Average PEO Attainment from Alumnae Survey				

% of Indirect Attainment from placement $= \dfrac{\text{Number of students who have got placement}}{\text{Total number of students}} * 100$

% of Indirect Attainment from higher studies $= \dfrac{\text{Number of students who pursue higher studies}}{\text{Total number of students}} * 100$

Indirect PEO Attainment = 10% attainment of Alumnae survey + 10% Attainment from placement+ 10 % Attainment from higher studies

Overall PEO Attainment = 70% of Direct PEO Attainment+ Indirect PEO Attainment

Expected Level of Attainment for each of the Programme Educational Objectives

PEO	Level of Attainment
Value >=70%	Excellent
Value > = 60 and value < 70	Very good
Value > = 50 and value < 60	Good
Value > = 40 and value < 50	Satisfactory
Value < 40	Not Satisfactory

Level of PEO attainment

Graduation Batch	Overall PEO Attainment	Whether Expected level of PEO is achieved?

Process of Redefining the PEOs:

The college has always been involving the key stake holders in collecting information and suggestions with regard to curriculum development and curriculum revision. Based on the information collected the objectives of the programme are defined, refined and are inscribed in the form of PEO's. The level of attainment of PEO's defined earlier will be analyzed and will identify the need for redefining PEOs. Based on identified changes in terms of curriculum, regulations and PEOs, the administrative system like BOS, Academic Council and Governing Body involve appropriate actions.