



## PATNA WOMEN'S COLLEGE

Autonomous  
PATNA UNIVERSITY

3<sup>rd</sup> Cycle NAAC Accredited at 'A' Grade with CGPA 3.58/4

*'College with Potential for Excellence' (CPE) status accorded by UGC*

## OUTCOME BASED EDUCATION (OBE) POLICY

### 1. Preamble

Patna Women's College (Autonomous) is committed to actively engage in the mission of higher education in India aimed at enhancing the competence of graduates to meet global standards. To ensure holistic development and measurement of student performance, the college shall implement a stringent and methodical Outcome Based Education (OBE) mechanism. The mechanism will focus on evaluating student performance based on outcomes, giving due weightage to knowledge, skills, and attitude. This educational philosophy of the institution will ensure that graduates are well-rounded and prepared to thrive in a globalized world.

### 2. Scope

The OBE framework will provide guidance for aligning the teaching and learning processes within the institution to achieve the expected outcomes during a student's academic tenure at the College.

- 2.1 The guidelines of this policy are applicable to the students, faculty, and staff of Patna Women's College.
- 2.2 The norms laid herein are applicable to all academic programmes, courses and curricular activities undertaken by the members.

### 3. Objectives

The following are the objectives of the OBE policy:

- 3.1 To establish a structured and comprehensive framework for teaching and learning processes that focuses on achieving specific learning outcomes by students.
- 3.2 To ensure that the graduates possess the desired knowledge, skills, and attitudes required for their professional and personal growth and are capable of meeting global standards.
- 3.3 To provide a student-centred approach to education that emphasizes measurable learning outcomes and continuous improvement in teaching and learning methods.



- 3.4 To design a learner-centric and outcome-focused education system.
- 3.5 To define Graduate Attributes and Programme Educational Objectives (PEOs) in alignment with the vision and mission of the College.
- 3.6 To establish an outcome-based assessment system that measures the attainment of outcomes at course and programme levels.

#### 4. OBE Committee

The OBE process in the institution shall be governed by the committee. The composition of the committee is given below:

Principal	–	Chairman
Deans	–	Ex-Officio Members
Controller of Examinations	–	Ex-Officio Examination Office Members
IQAC Representative	–	Ex-Officio IQAC Member
Co-ordinator	–	Faculty Nominee
Members	–	Faculty Nominees

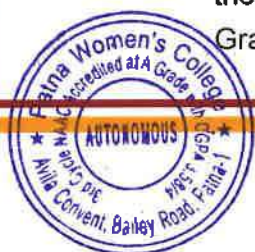
#### 5. Roles and Responsibilities

The roles and responsibilities pertaining to the implementation of OBE policy are as follows:

- 5.1 The OBE Committee shall be responsible for designing the policy and system of OBE and evaluating outcomes.
- 5.2 The committee is tasked with guiding the implementation of OBE in all departments of the institution.
- 5.3 The committee must periodically monitor the OBE process and conduct an annual review of its effectiveness.
- 5.4 The committee will be responsible for framing and mapping the graduate attributes, PEOs, PSOs, POs, and COs of various programmes and courses.
- 5.5 The committee shall be responsible for collating and reviewing the attainment results of outcomes.
- 5.6 The committee shall be responsible for ensuring the quality assurance of the curriculum and pedagogical process of the institution in order to attain the desired outcomes.

#### 6. Definitions

- 6.1 **Graduate Attributes:** The level of understanding, knowledge comprehension, skill development, competencies, attitudinal formation that the students at the institute must imbibe during their education are termed as Graduate Attributes.



- 6.2 **Programme Educational Objectives:** The objectives that the students are expected to attain after the successful completion of the programme are termed as Programme Educational Objectives (PEO). PEOs are drawn from the vision and mission of the institution. They highlight the academic and professional accomplishments expected to be achieved.
- 6.3 **Programme Outcomes:** Programme outcomes (POs) are the quantified and measurable results that are expected to be achieved by each student towards the end of the programme. In simple terms these are the graduate attributes that the students are expected to attain at the completion of the programme.
- 6.4 **Course Outcomes:** Course Outcomes (COs) are the quantified and measurable results that are expected to be achieved by each student on completion of each course. COs are specific to each and every course in a program.

## 7. Outcome Based Education (OBE) Framework

The OBE framework of the Patna Women's College is depicted in Fig.1

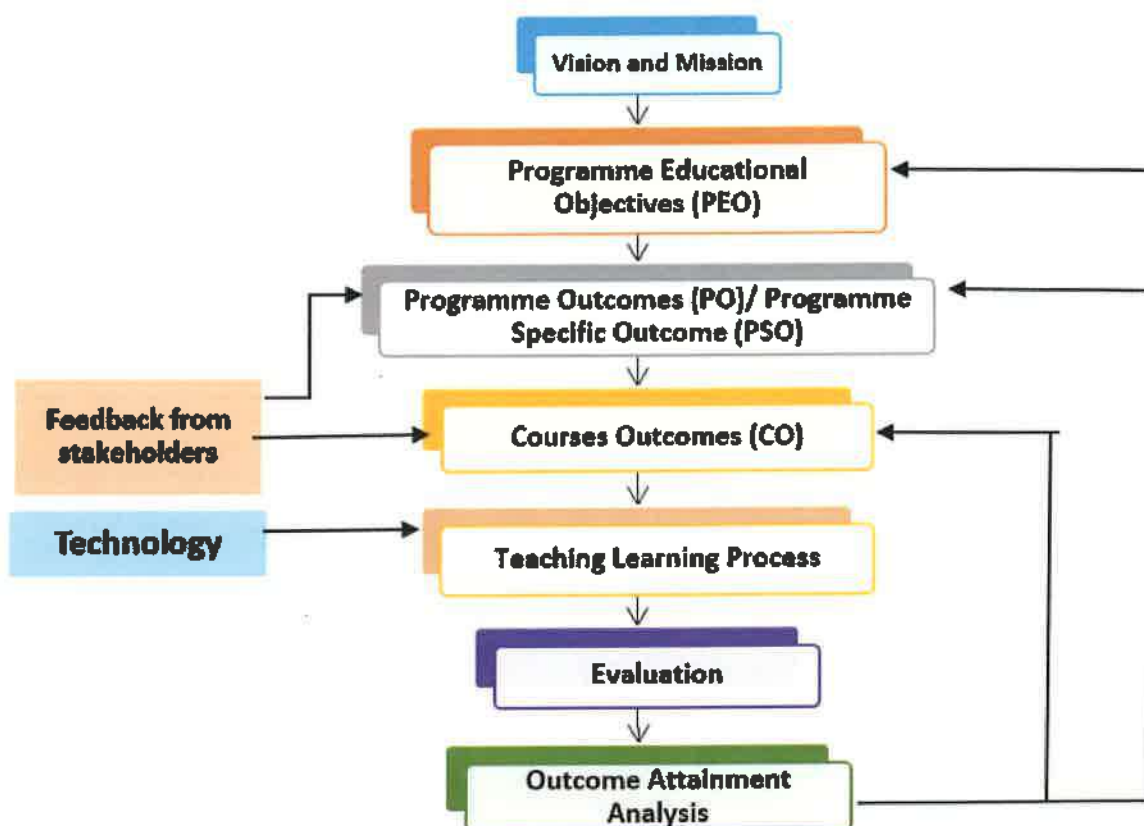


Fig. 1. Outcome Based Education Framework



- (i) Outcome Based Education is learner- centric. The PEOs shall be drawn from the vision and mission of the College. POs, PSOs and COs are to be derived from the PEOs.
- (ii) The teaching learning process must be developed according to the PEOs and POs.
- (iii) The Programme outcomes act as a reference guide to set the course outcomes (COs). The course curriculum shall aspire to fulfil the COs and POs.
- (iv) Pedagogy and teaching-learning processes shall integrate all essential components to achieve the outcomes.
- (v) Formative assessment (CIA) and Summative assessment (End Semester Examination) shall incorporate in outcome attainment measurements.
- (vi) The OBE framework shall be improved based on feedback received from stakeholders.
- (vii) The Outcome Attainment Analysis shall provide the necessary input regarding attainment of COs, POs and PEOs.

#### 8. OBE Implementation Process

The OBE implementation comprises of the following process:

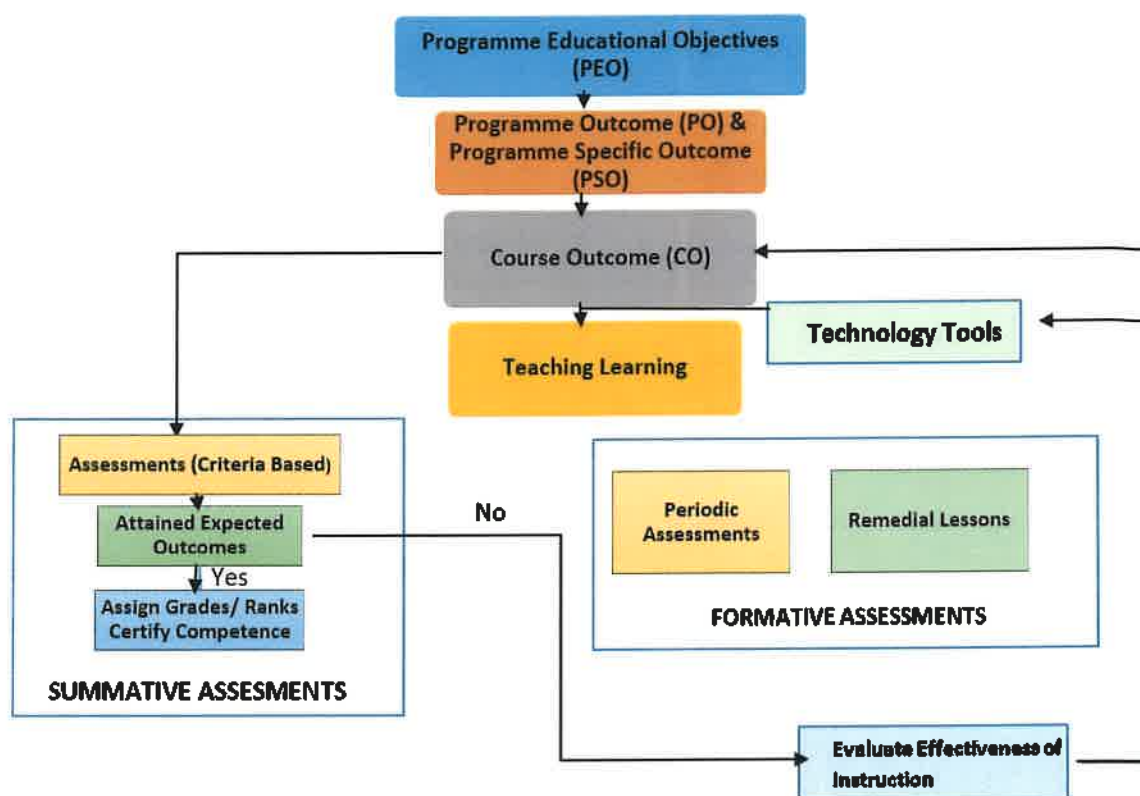
- (i) The OBE committee in consonance with IQAC shall ensure that the PEOs are in tandem with the vision and mission of the College.
- (ii) The POs and COs shall be defined by the department guided by the respective Deans.
- (iii) COs are to be framed using Bloom's Taxonomy specifying the different sub-domains of learning. The departments shall implement the necessary teaching-learning process and skill development activities for the fulfilment of these outcomes.
- (iv) OBE system shall be reviewed during the annual feedback from stakeholders.

#### 9. Outcome- Based Assessment and Evaluation

The assessment methods shall aim to evaluate the student performance at the course level in terms of attaining the COs and the performance of all the courses for the attainment of POs. The two methods of assessment, namely, **Formative** and **Summative assessment** are shown in Fig. 2.







**Fig. 2. Outcome Based Assessment and Evaluation**

9.1 **Formative Assessment:** Periodic Assessment or Continuous Internal Assessment (CIA), which carries 30% weightage shall be the formative assessment under the OBE framework.

9.2 **Summative Assessment:** Summative Assessment shall be undertaken through an End Semester (ESE) and shall carry a weightage of 70% of the total assessment.

## 10. Mapping and Computation of Attainment Level

The implementation of OBE is complete with mapping and attainment level computation.

- (i) Course outcomes shall be mapped with programme outcomes. One CO may be mapped with more than one PO and vice versa.
- (ii) The department shall ensure that all the COs are sufficient to measure the attainment level of POs.
- (iii) The attainment shall be measured at the programme and course level. Benchmarks shall be set for PO and CO attainment.
- (iv) Attainment of course outcomes shall be measured using two attainment indicators: CO attainment indicator 1 and CO attainment indicator 2.



- (v) CO attainment indicator 1 shall measure the attainment levels of outcomes of every course based on the average scores of a batch of students across all the course outcomes of a particular programme. It shall be based on average marks secured by the students.
- (vi) CO attainment indicator 2 shall measure the attainment at course level based on the percentage of students of a batch attaining the course outcomes across all the courses of a particular programme.

10.1 **Computation of CO Attainment for UG Programmes:** Course Outcome Attainment Indicator 1 for UG programmes is shown in Table 1

**Table 1. Course Outcome Attainment Indicator 1**

Attainment Levels (Percentage of Marks)		Attainment Status
Level 2	50% and above	Attained
Level 1	Less than 50%	Not Attained

**Interpretation**

- Level 2: Average score of 50% and above in course outcomes of a particular course.
- Level 1: Average score of less than 50% in course outcomes of a particular course.

Course Outcome Attainment Indicator 2 for UG programmes is shown in Table 2.

**Table 2. Course Outcome Attainment Indicator 2**

Attainment Levels (Percentage of Students)		Attainment Status
Level A	More than 90%	Attained
Level B	More than 80%	Attained
Level C	More than 70%	Attained
Level D	More than 60%	Attained
Level E	50% and above	Attained
Level F	Less than 50%	Not Attained

**Interpretation of CO Attainment Levels (UG)**

- Level A - More than 90% of the students have attained the COs of a particular course.
- Level B - More than 80% of the students have attained the COs of a particular course.
- Level C - More than 70% of the students have attained the COs of a particular course.



- Level D - More than 60% of the students have attained the COs of a particular course.
- Level E - 50% and above of the students have attained the COs of a particular course.
- Level F - COs of a particular course have not been attained.

### 10.2 Computation of PO Attainment for UG Programmes

PO attainment shall be measured as the average percentage of marks obtained by all the students across all the courses of the programme that are mapped to a particular PO. The attainment of programme outcomes is indicated at two levels. Table 3 depicts the various levels of PO attainment in UG programmes.

**Table 3. Levels of PO Attainment of UG Programmes**

Attainment Levels (Percentage of Marks)		Attainment Status
Level 2	60% and above	Attained
Level 1	Less than 60%	Not Attained

#### Interpretation of PO Attainment Levels (UG)

- Level 2: Average score of 60% and above in courses mapped to a particular PO.
- Level 1: Average score of less than 60% in courses mapped to a particular PO.

### 10.3 Computation of CO Attainment for PG Programmes

Course Outcome Attainment Indicator 1 for PG programmes is shown in Table 4

**Table 4. Course Outcome Attainment Indicator 1**

Attainment Levels (Percentage of Marks)		Attainment Status
Level 2	55% and above	Attained
Level 1	Less than 55%	Not Attained

#### Interpretation

- Level 2: Average score of 55% and above in course outcomes of a particular course.
- Level 1: Average score of less than 55% in course outcomes of a particular course.



Course Outcome Attainment Indicator 2 for PG programmes is shown in Table 5.

**Table 5. Course Outcome Attainment Indicator 2**

Attainment Levels (Percentage of Students)		Attainment Status
Level A	More than 90%	Attained
Level B	More than 80%	Attained
Level C	More than 70%	Attained
Level D	More than 60%	Attained
Level E	50% and above	Attained
Level F	Less than 50%	Not Attained

#### **Interpretation of CO Attainment Levels (PG)**

- Level A - More than 90% of the students have attained the COs of a particular course
- Level B - More than 80% of the students have attained the COs of a particular course
- Level C - More than 70% of the students have attained the COs of a particular course
- Level D - More than 60% of the students have attained the COs of a particular course
- Level E - 50% and above of the students have attained the COs of a particular course
- Level F - COs of a particular course have not been attained

#### **10.4 Computation of PO Attainment for PG Programmes**

PO attainment shall be measured as the average percentage of marks obtained by all the students across all the courses of the programme that are mapped to a particular PO. The attainment of programme outcomes is indicated at two levels. Table 6 depicts the various levels of PO attainment in UG programmes.

**Table 6. Levels of PO Attainment of PG Programmes**

Attainment Levels (Percentage of Marks)		Attainment Status
Level 2	60% and above	Attained
Level 1	Less than 60%	Not Attained





### **Interpretation of PO Attainment Levels (PG)**

- Level 2: Average score of 60% and above in courses mapped to a particular PO.
- Level 1: Average score of less than 60% in courses mapped to a particular PO.

### **11. Review of OBE System**

The OBE committee shall review the OBE system of the institution based on stakeholder feedback and analysis of industry trends. Due attention shall be given to incorporate the needs of the students and developmental concerns of society and nation. The policy shall be updated by the OBE committee to incorporate changes in the Government policies, new trends in higher education and future innovations by the institution.



## **Annexure 1**

### **PO and CO Mapping and Computation of CO and PO Attainment - Sample**

The CO-PO mapping of MCA programme is depicted below:

#### **(a) MCA Program Outcomes**

Programme Outcomes and Specific Outcomes

Upon completion of the two-year Masters programme in Computer Applications (MCA), the students will be able to:

PO : Work with advanced IT tools and techniques in their domain.

PSO 1: Create systems through software development to solve problems in Industry domain areas.

PSO 2: Contribute to societal growth through research in their chosen field.

PSO 3: Perform both as an individual and in a team through good analytical, design and implementation skills.

PSO 4: Possess professional development through continuous learning.

PSO 5: Comprehend, explore and build up computer programs in the areas allied to Algorithms, System Software, Multimedia, Web Design and Big Data Analytics for efficient design of computer-based systems of varying complexity.

PSO 6: Pursue careers in IT industry/consultancy/research and development, teaching and allied areas related to computer science.

#### **(b) Sample Course Outcomes**

**Course Title:** Software Engineering

**Course Code:** MCA CS1T01

After the completion of the course, the students will be able to:

- Explain a process model for a software project development.
- Prepare the SRS, Design document, Project plan of a given software system.
- Apply project management and requirement analysis, principles to SW project development.
- Analyse the cost estimate and problem complexity using various estimation techniques.
- Generate test case using the techniques involved in selecting: Analyse  
a) White Box testing b) Black Box testing
- Explain the advantages of configuration management and risk management activities.



- (c) **PO and CO mapping and attainment:** The COs pertaining to the course are mapped with PO.

The formative assessments, CIA, comprises of (i) assignment, (ii) activity based learning and (iii) seminar a total of 30 marks. The summative assessment comprises of End Semester Examination (ESE), for a total of 70 marks.

Attainment target for the course is set at 60 marks (CIA 18 marks and ESE 42 marks). Marks secured by the students are computed in terms of CO1 and CO2 to arrive at the CO attainment. The results of the analysis are presented in Table 1.

**Table 1. CO Attainment of Software Engineering Course**

Course	CO1 Attainment (18)	CO2 Attainment (42)	Course-wise CO Attainment (60)	Level of Attainment
MCA CST01 – Software Engineering	22	48	70	Level 2

The CO attainment level of Software Engineering course pertaining to CO1 and CO2 has attained the benchmark of 60 marks.

- (d) **CO attainment of all courses in MCA Programme:**

The CO attainment analysis of the MCA Programme is depicted in Table 2.

Course	Maximum Marks	CO1 Attainment (18 out of 30) (12 out of 20) (24 out of 40) (120 out of 200)	CO2 Attainment (42 out of 70) (18 out of 30) (36 out of 60) (180 out of 300)	Course-wise CO Attainment (60 out of 100) (30 out of 50) (60 out of 100) (300 out of 500)	Level of Attainment	Percentage of attainment	Level of attainment in terms of % of students	PO Mapping
MCA CS1T01 - Software Engineering	100	21.59	48.46	70.05	Level 2	92.86	Level A	PO1
MCA CS1T02 – Advanced Database Management System	100	23.39	44.96	68.36	Level 2	87.50	Level B	PO5
MCA CS1T03 – Design & Analysis of Algorithm	100	22.25	47.25	69.50	Level 2	100.00	Level A	PO5
MCA CS1T04 – Computer Networks & Security	100	26.07	50.30	76.38	Level 2	98.21	Level A	PO1
MCA CS1L05 – Lab on Responsive Web Designing	100	34.48	56.32	90.80	Level 2	100.00	Level A	PO5



MCA GI1T1 – Statistical and Numerical Computing	100	21.16	46.88	68.04	Level 2	76.79	Level C	PO5
MCA SE1L01 – Lab based on Statistical Package	50	16.27	27.20	43.46	Level 2	100.00	Level A	PO2
MCA SE1L02 – Training on Computer Networking	50	16.61	27.41	44.02	Level 2	100.00	Level A	PO3
MCA CS2T06 – Object Oriented Analysis and Designing	100	24.52	51.79	76.30	Level 2	98.21	Level A	PO1
MCA CS2T07 – Distributed Computing	100	23.88	49.07	72.95	Level 2	98.21	Level A	PO5
MCA CS2L08 – Mini Project 1(Lab)	100	35.84	55.02	90.86	Level 2	100.00	Level A	PO6
MCA GI2T2 – Optimization Techniques	100	25.77	55.79	81.55	Level 2	98.21	Level A	PO2
MCA DSE2T1 – Elective 1	100	23.80	42.36	66.16	Level 2	89.29	Level B	PO3
MCA DSE2T2 – Elective 2	100	27.30	49.64	76.95	Level 2	100.00	Level A	PO4
MCA SE2L03 – Technical Presentation & Report Writing	50	17.88	25.32	43.20	Level 2	100	Level A	PO3
MCA SE2L04 – Personality Development & Inter Religious Values	50	17.20	27.05	44.25	Level 2	100.00	Level A	PO2
MCA CS3T09 – Advanced Web Designing using J2EE	100	20.86	46.07	66.93	Level 2	89.29	Level B	PO6
MCA CS3T10 – Cloud Computing	100	20.91	44.23	65.14	Level 2	89.29	Level B	PO2
MCA CS3T11 – Data & Web Mining	100	21.79	50.48	72.27	Level 2	96.43	Level A	PO2
MCA CS3L12 – Mini Project II(Lab)	100	31.46	54.30	85.77	Level 2	100.00	Level A	PO6
MCA DSE3T3 – Elective 3	100	23.05	56.48	79.54	Level 2	100.00	Level A	PO4
MCA DSE3T4 – Elective 4	100	21.29	44.84	66.13	Level 2	98.21	Level A	PO5
MCA SE3L05 - MOOCs	50	14.79	20.07	34.86	Level 2	89.29	Level B	PO4
MCA SE3L06 - Seminar	50	15.21	25.46	40.68	Level 2	100	Level A	PO3
MCA CS4P13 - Internship	100	35.64	52.38	88.02	Level 2	100.00	Level A	PO4
MCA CS4P14 – OJT Project	500	164.41	248.04	412.45	Level 2	100.00	Level A	PO6





From the above table, it is observed that,

- (i) CO attainment indicator 1: All the 24 courses have attained CO benchmark of 60%.
- (ii) CO attainment indicator 2: CO benchmark is attained in all the 24 courses.

**Table 3. CO Attainment Level for all 24 courses**

Attainment Level	Number of Courses	Attainment Status
Level A	18	Attained
Level B	5	Attained
Level C	1	Attained
Level D	0	Not Applicable
Level E	0	Not Applicable
Level F	0	Not Attained

The above table 3 indicates that out of 24 courses, 18 courses are attained with Level A, 5 courses are attained with Level B, and only 1 course has been attained with Level C. It is observed that CO benchmark is attained in all the 24 courses.

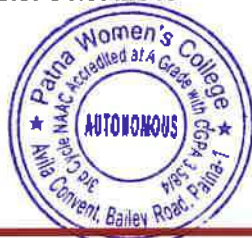
- (e) **PO attainment of MCA Programme:** CO attainment implies PSO attainment. PSO attainment implies PO attainment. The PSO attainment analysis is depicted in Table 4.

**Table 4. Levels of PSO Attainment of MCA**

PSO Attainment		Attainment Level	Attainment Status
PSO1	74.24	Level 2	Attained
PSO2	78.59	Level 2	Attained
PSO3	80.54	Level 2	Attained
PSO4	78.63	Level 2	Attained
PSO5	72.63	Level 2	Attained
PSO6	74.46	Level 2	Attained

Table 4 shows that all the PSO1, PSO2, PSO3, PSO4, PSO5 and PSO6 have attained the benchmark of 60%. Hence, it is inferred from PSO that the programme outcomes of the MCA programme have been attained.

Date: 01.07.2019



*M. Tanisha A.C.*  
(Sister M. Tanisha A.C.)

**SUPERIOR  
Avila Convent  
Bailey Road  
Patna**

*M. Rashmi A.C.*  
(Dr. Sister M. Rashmi A.C.)  
**Principal**  
**Patna Women's College**  
Autonomous  
Patna University  
Bailey Road, Patna - 1