

CENTRALIZED ADMISSION PROCESS (CAP) SYSTEM

Complete System Documentation

Application Requirements & Knowledge Base

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System: B.E/B.Tech Admission Management System for Maharashtra
Technology Platform: .NET Core Web Application
Prepared For: Engineering College Admission Process

DOCUMENT CONTROL

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PART A: APPLICATION REQUIREMENTS DOCUMENT

1. EXECUTIVE SUMMARY

1.1 Purpose

This document defines the comprehensive functional and non-functional requirements for the Centralized Admission Process (CAP) Management System for B.E/B.Tech admissions in Maharashtra. The system aims to digitize and streamline the entire admission process from candidate registration through final admission confirmation.

1.2 Scope

In Scope:

- Online registration and application form management

- Document upload and verification (E-Scrutiny and P-Scrutiny modes)
- Merit list generation (Provisional and Final)
- Grievance management
- Option form (choice filling) system
- Multi-round seat allotment
- Self-verification and seat acceptance
- Institute reporting management
- Payment processing
- Communication (SMS, Email, WhatsApp)
- Support ticketing system
- Special category admissions (JK Migrant, NRI, OCI, PIO, CIWGC)
- Reporting and analytics

Out of Scope:

- Post-admission academic management
- Fee management beyond seat acceptance
- Hostel allocation
- Scholarship processing (except TFWS)
- Alumni management
- Placement services

1.3 Stakeholders

| Stakeholder Group | Count (Approx.) | Primary Functions |
|------------------------|--------------------|---|
| Candidate Applicants | 100,000+ per cycle | Apply, upload documents, fill option form, accept seats |
| E-Scrutiny Officers | 200+ | Online document verification |
| Facilitation Centers | 50+ locations | Physical verification support |
| Engineering Institutes | 500+ colleges | Final admission, document verification |
| Support Officers | 50+ | Query resolution |
| System Administrators | 10+ | System configuration, oversight |
| University Officials | 10 jurisdictions | Policy implementation, oversight |

1.4 System Goals

Primary Objectives:

- Eliminate manual paperwork and reduce processing time by 70%

- Ensure transparent, merit-based seat allocation
- Prevent duplicate admissions and fraudulent applications
- Provide real-time tracking and updates to all stakeholders
- Centralize admission data for analytics and future planning
- Support 100,000+ applications per admission cycle
- Handle 3 CAP rounds efficiently

Success Metrics:

- 99.9% system uptime during admission period
 - < 3 seconds page load time
 - Zero data loss
 - < 1% payment failure rate
 - 90%+ candidate satisfaction score
 - 100% audit trail compliance
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2. SYSTEM OVERVIEW

2.1 System Context

The CAP system is a comprehensive admission management platform that serves as the central hub for engineering admissions in Maharashtra. It connects multiple stakeholder groups and integrates with external systems for entrance exam results, payment processing, and document storage.

2.2 Key Features

For Candidates:

- Self-service registration and application
- Multiple entrance exam support
- Real-time application status tracking
- Document upload with validation
- Online verification option
- Merit list checking
- Choice filling (up to 300 institutes)
- Allotment tracking
- Self-verification system
- Payment integration

- Grievance raising
- Support ticketing

For Verification Officers:

- Dashboard with application queues
- Online document verification tools
- Discrepancy marking (Mandatory/Optional)
- Application revert/confirm workflow
- Grievance approval system
- Workload distribution

For Facilitation Centers:

- Slot booking management
- Physical verification workflow
- Application editing on behalf of candidates
- Document scanning and upload
- Real-time capacity tracking

For Institutes:

- Intake declaration system
- Allotted candidate list
- Document verification at admission
- Admission confirmation
- Vacancy reporting

For Administrators:

- Merit list generation and publication
- Seat matrix management
- Timeline configuration
- User management
- Report generation
- System monitoring

2.3 System Architecture Approach

Technology Stack:

- Backend: .NET Core 8.0 Web APIs
- Frontend: React with TypeScript
- Database: Microsoft SQL Server 2022
- Document Storage: Azure Blob Storage / Cloud Storage
- Cache: Redis
- Message Queue: Azure Service Bus / RabbitMQ
- Payment Gateway: Razorpay
- SMS/Email Gateway: Third-party service providers
- Hosting: Azure App Services or On-premise IIS

Architectural Principles:

- Microservices-based design for scalability
- RESTful APIs for all operations
- Stateless application tier
- Database per service pattern
- Event-driven communication between services
- CQRS pattern for complex queries
- API Gateway for security and routing

3. SYSTEM MODULES

3.1 Module Overview

| Module ID | Module Name | Description | Priority |
|-----------|-------------------------|---|----------|
| REG-001 | Registration Module | Entrance exam validation, personal details capture, OTP verification, Application ID generation | Critical |
| APP-001 | Application Form Module | 10-step application form, candidature type, category, qualification, documents | Critical |
| VER-001 | Verification Module | E-Scrutiny and P-Scrutiny workflows, discrepancy management | Critical |
| MERIT-001 | Merit List Module | Merit calculation, provisional/final list generation, multi-parameter ranking | Critical |
| GRIEV-001 | Grievance Module | Application unlock requests, grievance workflow, approval system | High |
| OPT-001 | Option Form Module | Institute shortlisting, preference setting, confirmation | Critical |
| ALLOT-001 | Allotment Module | Multi-round seat allocation, allotment letter generation | Critical |

| Module ID | Module Name | Description | Priority |
|-------------|----------------------------|--|----------|
| SELFVER-001 | Self-Verification Module | Merit detail verification, discrepancy raising, benefit validation | Critical |
| SEAT-001 | Seat Acceptance Module | Payment processing, seat confirmation, freeze/betterment options | Critical |
| INST-001 | Institute Reporting Module | Final admission, document verification at institute | Critical |
| SUPP-001 | Support/Ticketing Module | Query management, ticket workflow, multi-level escalation | High |
| SPEC-001 | Special Admissions Module | JK Migrant counseling, NRI/OCI/CIWGC admissions | High |
| PAY-001 | Payment Module | Fee calculation, payment gateway integration, reconciliation | Critical |
| NOTIF-001 | Notification Module | SMS, Email, WhatsApp notifications | High |
| INTAKE-001 | Intake Approval Module | Institute capacity declaration, seat matrix generation | Critical |
| REPORT-001 | Reporting Module | Dashboard, analytics, audit trails | Medium |
| USER-001 | User Management Module | Authentication, authorization, role management | Critical |

3.2 Module Details

3.2.1 Registration Module (REG-001)

Purpose: Enable candidates to register for CAP by validating their entrance exam scores and capturing basic details.

Key Functions:

- Entrance exam validation (MAH CET, JEE, NEET, Diploma, D.Voc)
- Real-time result fetching from external exam systems
- Personal details capture (name, parents' names, DOB, gender, religion, nationality)
- Communication details (address with cascading dropdowns, mobile, email)
- Password creation with security requirements
- Dual OTP verification (mobile and email)
- Application ID generation in format: Course-Year-SerialNumber
- Duplicate prevention (mobile/email uniqueness check)
- Multi-channel communication (SMS, Email, WhatsApp)

Input Requirements:

- Entrance exam details (application number, roll number, DOB)
- Personal information (11 mandatory fields)
- Address details (state, district, taluka, village, PIN)
- Valid mobile number (10 digits)
- Valid email address
- Password (8+ characters with complexity)
- Captcha validation

Output:

- Unique Application ID
- Login credentials
- Confirmation via SMS/Email/WhatsApp

Business Rules:

- Non-zero entrance exam score mandatory
- One application per mobile number per cycle
- One application per email per cycle
- OTP validity: 5 minutes
- Maximum 3 OTP retry attempts
- Application ID cannot be reused or changed

3.2.2 Application Form Module (APP-001)

Purpose: Comprehensive 10-step application form capturing all candidate details required for admission.

10 Steps:

1. Personal Details (Pre-filled from registration)
2. Candidature Type Selection (17 types)
3. Home University & Category Details
4. Special Reservation Details
5. Qualification Details (SSC, HSC/Diploma/D.Voc)
6. Entrance Exam Details (JEE/NEET/MHT-CET)
7. Photo & Signature Upload
8. Document Upload (30+ document types)

9. Payment (with fee calculation and exemptions)

10. Submission with OTP confirmation

Key Functions:

- Dynamic form based on candidature type
- Automatic home university assignment
- Category-wise document requirements
- Photo/signature specification validation
- Multiple document upload with format/size checks
- Version control for edits
- Progress tracking
- Auto-save functionality
- Payment gateway integration
- Confirmation with dual authentication (password + OTP)

Candidature Types (17):

- Maharashtra Type A (SSC & HSC from Maharashtra, domiciled/born in Maharashtra)
- Maharashtra Type B (Candidate/parent domiciled in Maharashtra)
- Maharashtra Type C (Parent is Central Govt employee posted in Maharashtra)
- Maharashtra Type D (Parent is State Govt employee/retired)
- Maharashtra Type E (Maharashtra-Karnataka border area, Marathi mother tongue)
- Outside Maharashtra State (OMS)
- JK Migrant J-1 (Displaced from J&K/Ladakh due to terrorism)
- JK Migrant J-2 (Children of IAS/IPS/IFS/military transferred to J&K)
- JK Migrant J-3 (Children of J&K police combating terrorism)
- JK Migrant J-4 (Kashmiri Pandits/Hindu families in Kashmir Valley)
- Foreign Students
- NRI (Non-Resident Indian)
- PIO/OCI (Person of Indian Origin/Overseas Citizen of India)
- CIWGC (Children of Indian Workers in Gulf Countries)
- NEUT (North Eastern States and UTs)
- JKSSS/PMSSS (Special scholarship schemes)
- FN-ICCR (Foreign nationals under ICCR)

Home University Assignment:

- Automatically determined based on HSC passing district
- 10 universities with defined jurisdictions
- Affects seat allocation preferences (HU/OHU/SL)

Category Management:

- Open (can apply for EWS if income < ₹8 lakh)
- SC (Scheduled Caste)
- ST (Scheduled Tribe)
- DT/VJ (De-notified Tribes/Vimukta Jati)
- NT-1 (NT-B), NT-2 (NT-C), NT-3 (NT-D)
- OBC (Other Backward Class)
- SBC (Special Backward Class)
- SEBC (Socially and Educationally Backward Class)

Auto-Conversion Rule: If category documents are invalid → Automatic conversion to OPEN/Non-EWS

Document Upload Specifications:

- Format: PDF, JPG, PNG
- Size: Maximum 5MB per document
- Photo: 200x230 pixels, max 100KB
- Signature: 200x80 pixels, max 50KB
- Document retention: 5 years minimum
- Version control: All uploads tracked with timestamps

Payment Integration:

- Gateway: Razorpay
- Fee exemption: MHT-CET candidates with unchanged category
- Category-based fee structure
- Payment reconciliation for failed transactions
- Non-refundable fees
- Payment history tracking

3.2.3 Verification Module (VER-001)

Purpose: Verify candidate-submitted information and documents through online or physical scrutiny.

Two Verification Modes:

E-Scrutiny Mode (Electronic/Online):

- Candidate uploads all documents
- System auto-assigns verification officer
- Officer verifies documents electronically
- Discrepancies marked as Mandatory or Optional
- Mandatory issues → Application reverted to candidate
- Optional issues → Benefit removed, provisional confirmation
- No physical visit required
- Online grievance mechanism

P-Scrutiny Mode (Physical):

- Candidate books slot at Facilitation Center (FC)
- Time slots: 9 AM to 5 PM (7 slots per day)
- Candidate visits FC with original documents
- FC officer verifies in person
- Officer can edit application on behalf of candidate
- Immediate issue resolution
- Confirmation on same day (if documents valid)

Verification Steps:

- Step 1: Personal Details (name, parents, gender, nationality)
- Step 2: Candidature Type validation
- Step 3: Home University & Category (caste certificates, NCL, validity)
- Step 4: Special Reservations (PWD, Defence, TFWS, Orphan, Minority)
- Step 5: Qualifications (SSC, HSC/Diploma marks verification)
- Step 6: Entrance Exam scores (JEE/NEET/MHT-CET)
- Step 7: Photo and Signature validation

Discrepancy Types:

Mandatory Discrepancies:

- Name mismatch
- DOB mismatch
- Gender mismatch
- Qualification marks mismatch

- Entrance exam scores mismatch
- Photo/signature quality issues
- Missing mandatory documents **Action:** Application reverted to candidate for correction

Optional Discrepancies:

- Category document issues → Convert to OPEN
- Candidature type document issues → Convert to OMS
- PWD certificate issues → Remove PWD benefit
- Defence certificate issues → Remove Defence benefit
- TFWS certificate issues → Remove TFWS benefit **Action:** Remove claimed benefit, proceed with provisional confirmation

Scrutiny Mode Change:

- Allowed before final confirmation
- Requires OTP verification
- E to P: FC booking required
- P to E: Auto-assign officer

FC Slot Booking:

- District-wise FC selection
- Date selection (available dates shown)
- Time slot selection (capacity-based availability)
- Visual indication: Green (available), Red (full)
- Booking confirmation via SMS/Email/WhatsApp
- Rescheduling allowed (subject to availability)

Officer Assignment:

- Auto-assignment for E-Scrutiny based on workload
- Cannot be changed by candidate
- SC Code displayed after submission

3.2.4 Merit List Module (MERIT-001)

Purpose: Generate merit-based rankings for all confirmed candidates to enable fair seat allocation.

Merit List Types:

Three Main Categories:

1. **All India Merit List:** All confirmed candidates nationwide
2. **Maharashtra State Merit List:** Maharashtra Type A-E candidates who appeared for MHT-CET
3. **JK Merit List:** JK Migrant candidates (J-1 to J-4)

Two Subject Categories:

1. **PCM Group:** Physics, Chemistry, Mathematics
2. **PCM/PCB Group:** For Schedule IV courses only (Biotechnology, Food Engineering, etc.)

Total Merit Lists: 6 (3 types × 2 subject categories)

Merit Calculation Parameters (21 factors):

Primary Sorting:

- Entrance exam total percentile (JEE/MHT-CET/NEET)

Tie-Breakers (in order):

1. Physics percentile
2. Chemistry percentile
3. Mathematics/Biology percentile
4. HSC PCM aggregate percentage
5. HSC Mathematics percentage
6. HSC Physics percentage
7. HSC total percentage
8. SSC total percentage
9. SSC Mathematics percentage
10. SSC Science percentage
11. SSC English percentage
12. Date of Birth (older candidate preferred)

JEE vs MHT-CET Priority:

- If candidate has both JEE and MHT-CET scores
- JEE takes precedence as primary exam
- Both scores displayed in merit list

Merit List Publication:

- **Provisional Merit List:** Published after verification deadline
- **Grievance Period:** 3-4 days for corrections

- **Final Merit List:** Published after grievance period closes

Merit List Information:

| Data Field | All India | Maharashtra State | JK List |
|---------------------|-----------|-------------------|---------|
| Merit Number | ✓ | ✓ | ✓ |
| Application ID | ✓ | ✓ | ✓ |
| Candidate Name | ✓ | ✓ | ✓ |
| Merit Exam | ✓ | ✓ | ✓ |
| Total Percentile | ✓ | ✓ | ✓ |
| Subject Percentiles | ✓ | ✓ | ✓ |
| Category | - | ✓ | - |
| Gender | - | ✓ | ✓ |
| PWD/Def/EWS/TFWS | - | ✓ | - |
| Orphan/Minority | - | ✓ | - |
| HSC Marks | ✓ | ✓ | ✓ |
| SSC Marks | ✓ | ✓ | ✓ |

Merit Status Check:

- Public link available
- Requires: Application ID + Date of Birth
- Shows: Merit number(s), list type(s), percentile

3.2.5 Grievance Module (GRIEV-001)

Purpose: Provide a one-time opportunity for candidates to correct their applications before final merit list publication.

Grievance Period:

- Duration: 3-4 days after Provisional Merit List
- Last opportunity to make changes
- No modifications allowed after Final Merit List

Grievance Types:

- Document correction
- Information update
- Category change
- Candidature type correction

- Qualification marks correction
- Other issues

Grievance Workflow:

For E-Scrutiny Candidates:

1. Login to candidate account
2. Click "Raise Grievance"
3. Select grievance type
4. Upload supporting documents
5. Submit with description
6. Receive Grievance Reference Number
7. SC officer reviews
8. If approved → Application unlocked for editing
9. Candidate edits and re-submits
10. Re-verification by SC officer

For P-Scrutiny Candidates:

1. Visit Facilitation Center
2. Present original documents
3. FC officer reviews grievance
4. If valid → Application unlocked
5. FC officer makes corrections
6. Upload corrected documents
7. Confirmation on same day

Limitations:

- One active grievance at a time
- Must have valid reason with proof
- Approval not guaranteed
- Subject to timeline (3-4 days only)
- Cannot raise new grievance if one is pending

Grievance Status:

- Submitted
- Under Review

- Approved (application unlocked)
- Rejected (with reason)
- Resolved (after re-verification)

3.2.6 Option Form Module (OPT-001)

Purpose: Allow eligible candidates to select preferred institutes and courses for seat allocation.

Eligibility:

- Candidates in Final Merit List
- Maharashtra State candidates
- All India candidates
- **Not applicable:** JK candidates (separate counseling process)

Four-Step Process:

Step 1: Shortlist Your Options

- Search filters:
 - Course name (mandatory)
 - University
 - District
 - Institute status (Government/Private)
 - Institute autonomy status
 - Minority status (Linguistic/Religious)
 - TFWS availability
- Add institutes to shortlist
- Maximum 300 institutes allowed
- Remove unwanted institutes

Step 2: Set Your Preference

- Drag and drop institutes to set order
- First selection = First preference (most important)
- Can reorder anytime before confirmation
- Reset option available

Step 3: Option Form Summary

- Review all selections

- Check preference numbers
- Institute details displayed:
 - Institute code
 - Institute name
 - University name
 - Seat category (SL/HU/OHU)
 - Course name
 - Choice code (unique identifier)
- Add/Remove/Move choices
- Direct choice code entry option

Step 4: Confirm Option Form

- Final review
- Enter login password
- OTP verification required
- **Only confirmed forms considered for allotment**
- Cannot edit after confirmation deadline

Important Points:

- First preference is most critical
- Order carefully (based on actual preference)
- Consider: Location, fees, reputation, placement, infrastructure
- Cannot change after deadline
- Confirmed option form locked for allotment processing

Choice Code System:

- Unique code for each Institute-Course combination
- Format: Institute Code + Course Code
- Used for direct entry if candidate knows specific choices
- Helps in faster option form filling

3.2.7 Allotment Module (ALLOT-001)

Purpose: Allocate seats to candidates based on merit, preferences, and seat availability across multiple CAP rounds.

Allotment Algorithm Inputs:

- Final Merit Lists (all types)
- Confirmed Option Forms
- Seat Matrix (institute-wise, course-wise, category-wise)
- Reservation rules
- Previous round status (for Round 2 and 3)

Allotment Process:

1. Process candidates in merit order
2. Check option form preferences sequentially
3. Verify seat availability
4. Apply category reservations
5. Apply HU/OHU/SL rules
6. Allocate highest preference available seat
7. Update seat matrix
8. Generate allotment letter

Three Allotment Scenarios:

Scenario 1: First Preference Allotment

- Candidate gets their 1st choice
- **Status: AUTO-FREEZE**
- Seat automatically confirmed
- Must pay seat acceptance fee
- Must report to institute
- **NOT eligible for further CAP rounds**
- This is FINAL allotment

Scenario 2: Other Preference Allotment (2nd, 3rd, or lower)

- Candidate gets seat but not 1st preference
- **Two options:**

Option A: FREEZE

- Accept this seat permanently
- Pay fee and report to institute
- **NOT eligible for further rounds**

- This becomes FINAL allotment

Option B: BETTERMENT

- Accept this seat temporarily
- Pay fee and report to institute
- **REMAIN eligible for next rounds**
- Can upgrade if better seat available
- If no upgrade, retain current seat

Scenario 3: No Allotment

- No seat available per preferences
- Automatically eligible for next round
- Can update option form
- Check vacancy matrix before next round

Multiple CAP Rounds:

Typical Structure:

- **CAP Round I** → Vacancy Report → **CAP Round II** → Vacancy Report → **CAP Round III**

Each Round Includes:

1. Vacancy matrix publication
2. Option form filling period
3. Allotment processing
4. Seat acceptance period
5. Institute reporting period
6. Vacancy calculation

Eligibility for Next Round:

- Candidates with BETTERMENT status
- Candidates with no allotment in current round
- Candidates who got allotment but didn't take any action
- **NOT eligible:** Candidates with AUTO-FREEZE or FREEZE status

Allotment Letter Contents:

- Application ID
- Merit number

- Institute allotted
- Course allotted
- Choice code allotted
- Preference number allotted
- Seat type (HU/OHU/SL, Category)
- Benefits taken (category, PWD, Defence, etc.)
- CAP round number
- Instructions for next steps

Seat Matrix Management:

- Updated after each round
- Shows: Total seats, filled seats, vacant seats
- Category-wise breakdown
- Institute-wise, course-wise details
- Real-time updates during allotment

3.2.8 Self-Verification & Seat Acceptance Module (SELFVER-001 & SEAT-001)

Purpose: Allow candidates to verify their merit details and confirm seat acceptance before final admission.

Four-Step Process:

Step 1: Self-Verification

21 Parameters to Verify:

1. Gender
2. Candidature Type
3. Category of admission
4. EWS status
5. PWD status
6. Defence status
7. Orphan status
8. TFWS status
9. Linguistic Minority status
10. Religious Minority status
11. HSC Total marks

12. HSC Physics marks
13. HSC Chemistry marks
14. HSC Mathematics marks
15. HSC English marks
16. SSC Total marks
17. SSC Mathematics marks
18. SSC Science marks
19. SSC English marks
20. Entrance exam percentile
21. Subject-wise percentiles

Verification Process:

- Review each parameter
- Compare with allotment letter
- Select "Correct" or "Incorrect"
- If Incorrect: Provide correct value in textbox
- System validates against uploaded documents

Self-Verification Outcomes:

If All Correct:

- Proceed to seat acceptance
- No further verification needed

If Any Incorrect:

- System generates automatic grievance
- Sent to Facilitation Center
- FC reviews documents
- **Two sub-outcomes: a) Benefit Taken Based on Wrong Data:**
 - Allotment CANCELLED
 - After FC correction, eligible for next round
- **b) Benefit NOT Taken:**
 - Information updated
 - Can proceed with seat acceptance

Step 2: Choose Seat Acceptance Option

Three Options:

AUTO-FREEZE:

- Automatically applied for 1st preference allotment
- No choice given
- Must accept and report

BETTERMENT:

- For other preference allotments
- Accept current seat
- Remain eligible for next rounds
- Can upgrade if better option available
- Must report to current institute

FREEZE:

- For other preference allotments
- Accept current seat permanently
- NOT eligible for further rounds
- Final decision

Step 3: Pay Seat Acceptance Fee

Fee Structure:

- As per brochure/notification
- Varies by category
- Payment via Razorpay
- Online payment only
- Payment confirmation via SMS/Email

Payment Process:

1. Review fee amount
2. Click "Pay Now"
3. Redirected to payment gateway
4. Complete payment
5. Return to portal
6. Payment status updated automatically

7. Receipt generated

Payment Reconciliation:

- For failed transactions
- Amount debited but not reflected
- Submit transaction details
- Manual reconciliation within 24-48 hours

Important:

- Fee is NON-REFUNDABLE
- Must pay within deadline
- No seat confirmation without payment
- Failure to pay → Seat cancelled

Step 4: Confirm Seat Acceptance Letter

- Final review of all details
- Enter login password
- OTP verification
- Seat Acceptance Letter generated
- Download and print
- Must carry to institute for reporting

Deadline Importance:

- All steps must be completed within specified timeline
- Missing deadline → Seat forfeited
- Automatic cancellation
- Ineligible for further rounds

3.2.9 Institute Reporting Module (INST-001)

Purpose: Final document verification and admission confirmation at the allotted institute.

Who Must Report:

- All candidates with AUTO-FREEZE status
- All candidates who selected FREEZE
- All candidates who selected BETTERMENT

When to Report:

- Within specified timeline (typically 3-5 days)
- As per admission schedule
- Check institute-specific reporting dates

What to Carry:

Mandatory Documents (Original + Photocopy):

- Seat Acceptance Letter (printed)
- Payment receipt
- Allotment letter
- All documents uploaded during application:
 - SSC mark sheet
 - HSC/Diploma mark sheet
 - Entrance exam score card
 - Leaving certificate
 - Nationality certificate
 - Domicile/Birth certificate
 - Category certificates (if applicable)
 - Caste validity certificate
 - NCL certificate (if applicable)
 - PWD/Defence/TFWS certificates
 - All candidature-type specific documents

Additional Documents:

- Passport size photographs (6-8 copies)
- Identity proof (Aadhaar card, PAN card)
- Migration certificate (if from other state/board)
- Gap certificate (if applicable)
- Character certificate

Process at Institute:

1. Report to admission desk
2. Document verification by institute officer
3. Original vs uploaded comparison
4. If documents match:

- Admission confirmed
- Pay balance fees (if any)
- Collect ID card
- Register for courses
- Attend orientation

5. If documents don't match:

- Admission denied
- Seat cancelled
- No refund of seat acceptance fee

Important Points:

- Physical presence mandatory
- Cannot send representative
- All originals must be presented
- Institute keeps photocopies
- Originals returned after verification
- Late reporting not allowed
- No extension of deadline

Consequences of Not Reporting:

- Seat automatically cancelled
- Forfeiture of seat acceptance fee
- Ineligible for subsequent CAP rounds
- Seat released for vacancy report
- Cannot claim that seat later

3.2.10 Support & Ticketing Module (SUPP-001)

Purpose: Provide candidates with a structured mechanism to raise queries and get assistance during the admission process.

When to Raise Ticket:

- Technical issues (OTP not received, upload errors, payment failures)
- Administrative queries (document requirements, eligibility, rules)
- Process-related questions (verification status, merit list, allotment)
- System problems (login issues, slow performance)

Ticket Categories:

1. Technical Queries:

- System errors
- Login problems
- OTP delivery issues
- Payment gateway failures
- Document upload errors
- Page loading issues
- Browser compatibility

2. Administrative Queries:

- Eligibility criteria
- Document requirements
- Category rules
- Reservation policies
- Candidature type clarifications
- Fee structure
- Deadline extensions (if any)

3. Other Queries:

- Process-related questions
- Status inquiries
- General guidance

How to Raise Ticket:

1. Login to candidate account
2. Go to "Support" section
3. Click "Generate Ticket"
4. Fill ticket form:
 - Login ID (pre-filled)
 - Category (dropdown)
 - Query description (textbox)
 - Attachment (optional, for screenshots/documents)
5. Submit

6. Note Ticket ID

Ticket Workflow:

Status Types:

- **Pending:** Just submitted, awaiting assignment
- **In-Process:** Assigned to officer, under review
- **Replied:** Response provided by officer

Resolution Process:

1. Ticket assigned to support officer (auto)
2. Officer reviews query and attachments
3. Researches solution/answer
4. Drafts response
5. Admin approves response
6. Response sent to candidate via email
7. Status updated to "Replied"

Response Timeline:

- Target: Within 48-72 hours
- Critical issues: Within 24 hours
- Technical emergencies: Within 4-6 hours

Ticket Limitations:

- One active ticket at a time
- After resolution:
 - Can reopen if unsatisfied
 - Can raise new ticket
- Cannot delete submitted tickets
- All tickets tracked in system

Viewing Ticket Status:

1. Login to account
2. Go to "Check Ticket Status"
3. View ticket list showing:
 - Ticket ID

- Category
- Submission date/time
- Current status

4. Click "View" for detailed response

Escalation:

- If not satisfied with response
- Click "Reopen Ticket"
- Provide additional details
- Escalated to senior officer
- Higher priority processing

4. USER ROLES & ACCESS CONTROL

4.1 Role-Based Access

| Role | Access Level | Key Permissions |
|-----------------------------|--------------|--|
| Candidate | User | View own application, submit forms, upload documents, check status, raise grievances |
| E-Scrutiny Officer | Officer | View assigned applications, verify documents, mark discrepancies, approve/reject |
| Facilitation Center Officer | Officer | Book slots, verify physical documents, edit applications, upload documents |
| Support Officer | Officer | View tickets, draft responses, resolve queries |
| Institute Admin | Admin | View allotted candidates, verify final documents, confirm admissions, report vacancies |
| System Administrator | Super Admin | Full system access, user management, configuration, merit list generation, reports |
| University Official | Admin | View jurisdiction data, oversight, policy implementation |

4.2 Authentication & Security

Multi-Factor Authentication:

- Password (8+ characters, complexity requirements)
- OTP verification for critical operations
- Session timeout: 30 minutes of inactivity

- IP-based access control (for admin users)

Password Requirements:

- Minimum 8 characters
- At least one uppercase letter
- At least one lowercase letter
- At least one number
- At least one special character
- Cannot contain username or email
- Password history: Cannot reuse last 3 passwords

Session Management:

- Secure session tokens
- Automatic logout after 30 minutes idle
- Force logout on password change
- Single session per user (except admins)

Data Security:

- SSL/TLS encryption for all communications
 - Data encryption at rest
 - PII data masking in logs
 - Audit trail for all critical operations
 - Regular security audits
-

5. FUNCTIONAL REQUIREMENTS

5.1 Registration & Application

FR-001: Entrance Exam Validation

- System shall validate entrance exam scores from external systems in real-time
- System shall support multiple exam types (MAH CET, JEE, NEET, Qualifying Exam)
- System shall reject applications with zero scores
- System shall allow foreign candidates to register with FCR number

FR-002: Duplicate Prevention

- System shall prevent duplicate registrations using same mobile number

- System shall prevent duplicate registrations using same email address
- System shall validate uniqueness at the time of OTP generation

FR-003: OTP Management

- System shall generate 6-digit numeric OTP
- System shall send OTP via SMS and Email simultaneously
- System shall allow maximum 3 retry attempts
- System shall expire OTP after 5 minutes
- System shall implement rate limiting (1 OTP per minute)

FR-004: Application ID Generation

- System shall generate unique Application ID in format: Course-Year-SerialNumber
- System shall ensure no duplicate Application IDs
- System shall display Application ID immediately after successful registration

FR-005: Dynamic Form Rendering

- System shall display form fields based on selected candidature type
- System shall show/hide sections dynamically
- System shall validate mandatory fields for each candidature type

FR-006: Home University Assignment

- System shall automatically assign home university based on HSC passing district
- System shall use predefined district-to-university mapping
- System shall allow candidates to view their assigned home university

FR-007: Category Auto-Conversion

- System shall automatically convert category to OPEN if documents are invalid
- System shall notify candidate of category conversion
- System shall log all conversions for audit

FR-008: Document Upload

- System shall validate file format (PDF, JPG, PNG only)
- System shall validate file size (max 5MB per document)
- System shall validate photo/signature dimensions
- System shall store documents in secure cloud storage
- System shall generate unique URL for each document

- System shall maintain version history of uploaded documents

FR-009: Application Versioning

- System shall create new version on every edit before submission
- System shall store complete application snapshot as JSON
- System shall allow viewing all versions
- System shall track version creator and timestamp

FR-010: Payment Processing

- System shall calculate fees based on category and exam type
- System shall integrate with Razorpay payment gateway
- System shall handle payment success/failure callbacks
- System shall generate payment receipt
- System shall maintain payment history
- System shall provide payment reconciliation mechanism

5.2 Verification & Scrutiny

FR-011: Scrutiny Mode Selection

- System shall allow candidates to choose between E-Scrutiny and P-Scrutiny
- System shall auto-assign officer for E-Scrutiny mode
- System shall enable slot booking for P-Scrutiny mode
- System shall allow mode change before final confirmation

FR-012: E-Scrutiny Officer Assignment

- System shall auto-assign applications to officers based on workload
- System shall distribute applications evenly
- System shall not allow candidates to change assigned officer

FR-013: Verification Dashboard

- System shall display categorized application queues for officers
- System shall show counts for: New, Picked Up, Reverted, Re-submitted, Verified
- System shall allow filtering and searching applications

FR-014: Discrepancy Management

- System shall allow officers to mark fields as Mandatory or Optional discrepancy
- System shall automatically revert application if mandatory discrepancy found

- System shall automatically remove benefit if optional discrepancy found
- System shall send notification to candidate about discrepancies

FR-015: FC Slot Booking

- System shall display available FCs based on selected district
- System shall show date-wise slot availability
- System shall use color coding (Green: Available, Red: Full)
- System shall prevent overbooking
- System shall send confirmation SMS/Email after booking
- System shall allow rescheduling (subject to availability)

FR-016: FC Verification

- System shall allow FC officers to unlock applications with candidate OTP
- System shall allow FC officers to edit applications on behalf of candidates
- System shall allow FC officers to upload documents
- System shall create version on FC edits
- System shall lock application during FC editing

FR-017: Acknowledgement Generation

- System shall generate printable acknowledgement after successful verification
- System shall include verification officer/FC details
- System shall display unique acknowledgement number

5.3 Merit List & Grievance

FR-018: Merit Calculation

- System shall calculate merit score based on 21 parameters
- System shall use predefined weightage and tie-breaking rules
- System shall handle JEE priority over MHT-CET when both present
- System shall calculate separately for PCM and PCM/PCB groups

FR-019: Merit List Generation

- System shall generate 6 merit lists (3 types × 2 subjects)
- System shall assign unique merit numbers in ascending order
- System shall publish provisional merit list first
- System shall publish final merit list after grievance period

FR-020: Merit Status Check

- System shall provide public link to check merit status
- System shall require Application ID and DOB for validation
- System shall display merit number(s) if found in list(s)

FR-021: Grievance Submission

- System shall allow candidates to raise one grievance at a time
- System shall require grievance type selection
- System shall allow document attachment
- System shall generate unique grievance reference number

FR-022: Grievance Approval

- System shall send grievances to appropriate SC/FC for review
- System shall unlock application if grievance approved
- System shall notify candidate of approval/rejection
- System shall allow re-verification after correction

FR-023: Grievance Period Enforcement

- System shall activate grievance module only during specified period
- System shall automatically close after deadline
- System shall prevent new grievances after closure

5.4 Option Form & Allotment

FR-024: Option Form Shortlisting

- System shall allow searching institutes by multiple filters
- System shall display eligible institutes based on candidature type
- System shall allow adding up to 300 institutes
- System shall allow removing institutes from shortlist

FR-025: Preference Setting

- System shall allow drag-and-drop reordering
- System shall save preferences in real-time
- System shall allow resetting preferences
- System shall display choice codes for each selection

FR-026: Option Form Confirmation

- System shall require password and OTP for confirmation
- System shall lock option form after confirmation
- System shall prevent editing after deadline
- System shall mark only confirmed forms for allotment

FR-027: Seat Allotment Algorithm

- System shall process candidates in merit order
- System shall allocate highest preference available seat
- System shall apply category reservations
- System shall apply HU/OHU/SL rules
- System shall update seat matrix in real-time
- System shall generate allotment letter

FR-028: Multi-Round Processing

- System shall support multiple CAP rounds
- System shall carry forward BETTERMENT candidates to next round
- System shall exclude AUTO-FREEZE and FREEZE candidates
- System shall allow option form modification between rounds

FR-029: Allotment Letter

- System shall generate PDF allotment letter
- System shall include all allotment details
- System shall provide download and print options
- System shall send via email

5.5 Seat Acceptance & Reporting

FR-030: Self-Verification

- System shall display 21 parameters for verification
- System shall allow marking each as Correct/Incorrect
- System shall provide textbox for correct values if marked incorrect
- System shall generate automatic grievance if any field marked incorrect

FR-031: Benefit Validation

- System shall check if allotment based on incorrect data
- System shall cancel allotment if benefit taken on wrong data

- System shall allow proceeding if benefit not taken

FR-032: Seat Acceptance Options

- System shall auto-set AUTO-FREEZE for 1st preference allotments
- System shall offer FREEZE/BETTERMENT options for other preferences
- System shall disable options after selection
- System shall track status for next round eligibility

FR-033: Payment Gateway Integration

- System shall calculate seat acceptance fee
- System shall integrate with Razorpay
- System shall handle payment callbacks
- System shall generate receipt
- System shall mark payment as non-refundable

FR-034: Seat Acceptance Letter

- System shall generate PDF seat acceptance letter
- System shall require password and OTP confirmation
- System shall include institute reporting instructions
- System shall send via email

FR-035: Reporting Deadline Tracking

- System shall track institute reporting deadline
- System shall send reminder notifications
- System shall auto-cancel seat if not reported
- System shall forfeit fee on cancellation
- System shall update vacancy for next round

5.6 Communication & Notifications

FR-036: Multi-Channel Notifications

- System shall send notifications via SMS, Email, and WhatsApp
- System shall use templates for consistency
- System shall track delivery status
- System shall retry on failure (max 3 attempts)

FR-037: Notification Triggers

- Application ID generation
- Application submission
- Verification status (Confirmed/Reverted)
- Merit list publication
- Grievance approval/rejection
- Option form confirmation
- Allotment announcement
- Payment confirmation
- Seat acceptance confirmation
- Reporting reminders

FR-038: Communication Preferences

- System shall use registered mobile and email
 - System shall allow candidates to verify contact details
 - System shall not allow disabling critical notifications
-

6. NON-FUNCTIONAL REQUIREMENTS

6.1 Performance Requirements

NFR-001: Response Time

- Page load time: < 3 seconds for 95% of requests
- API response time: < 500ms for 90% of requests
- Document upload: Should support 5MB file in < 10 seconds
- Search results: < 2 seconds
- Report generation: < 30 seconds for standard reports

NFR-002: Throughput

- Support 10,000 concurrent users during peak hours
- Handle 100,000+ registrations in admission cycle
- Process 50,000+ merit calculations within 2 hours
- Generate allotment for 50,000+ candidates within 4 hours
- Support 1,000 simultaneous payment transactions

NFR-003: Scalability

- Horizontal scaling capability for web servers
- Database partitioning for large datasets
- Load balancing across multiple servers
- Auto-scaling based on traffic patterns
- CDN integration for static content

6.2 Availability & Reliability

NFR-004: Uptime

- 99.9% availability during admission season (May-September)
- 99% availability during off-season
- Maximum planned downtime: 4 hours per month (during maintenance windows)
- Maintenance windows: Only between 11 PM - 5 AM

NFR-005: Backup & Recovery

- Automated daily backups at 2 AM
- Hourly incremental backups during critical periods
- Point-in-time recovery capability
- Backup retention: 90 days
- Disaster recovery site with 4-hour RTO
- Regular DR drills (quarterly)

NFR-006: Fault Tolerance

- Redundant web servers (minimum 3)
- Database replication (primary + 2 replicas)
- Automatic failover capability
- Circuit breaker pattern for external service calls
- Graceful degradation for non-critical features

6.3 Security Requirements

NFR-007: Authentication & Authorization

- Role-based access control (RBAC)
- Multi-factor authentication for critical operations
- Password encryption using bcrypt/Argon2
- Session management with secure tokens

- Automatic session timeout (30 minutes)
- IP whitelisting for admin users

NFR-008: Data Security

- TLS 1.3 encryption for all communications
- AES-256 encryption for data at rest
- PII data masking in logs and reports
- Secure document storage with access control
- SQL injection prevention
- XSS and CSRF protection

NFR-009: Audit & Compliance

- Complete audit trail for all critical operations
- User activity logging
- Change tracking for all data modifications
- Tamper-proof audit logs
- Audit log retention: 7 years
- Compliance with Indian IT Act and data protection regulations

NFR-010: Payment Security

- PCI-DSS compliance for payment processing
- No storage of card details
- Secure payment gateway integration
- Transaction encryption
- Fraud detection mechanisms

6.4 Usability Requirements

NFR-011: User Interface

- Responsive design (mobile, tablet, desktop)
- Browser support: Chrome, Firefox, Safari, Edge (latest 2 versions)
- Mobile-first design approach
- Accessibility compliance (WCAG 2.1 Level AA)
- Intuitive navigation
- Progress indicators for multi-step processes
- Contextual help and tooltips

NFR-012: User Experience

- Maximum 3 clicks to reach any feature
- Auto-save for forms every 30 seconds
- Clear error messages with corrective actions
- Confirmation dialogs for critical actions
- Undo capability where applicable
- Print-friendly layouts

NFR-013: Multilingual Support

- English (primary)
- Marathi (regional language)
- Language switcher on all pages
- Consistent terminology across languages

6.5 Maintainability

NFR-014: Code Quality

- Modular architecture
- Clean code principles
- Comprehensive code documentation
- Unit test coverage: > 80%
- Integration test coverage: > 60%
- Automated testing in CI/CD pipeline

NFR-015: Monitoring & Logging

- Application performance monitoring (APM)
- Real-time error tracking
- Server health monitoring
- Database performance monitoring
- Alert system for critical issues
- Centralized logging system
- Log retention: 180 days

NFR-016: Deployment

- Automated deployment pipeline (CI/CD)

- Blue-green deployment strategy
- Rollback capability
- Database migration scripts
- Configuration management
- Environment parity (dev, staging, production)

6.6 Compliance & Standards

NFR-017: Data Retention

- Application data: 5 years
- Document images: 5 years
- Audit logs: 7 years
- Payment records: 10 years (tax compliance)
- Anonymization of PII after retention period

NFR-018: Regulatory Compliance

- Information Technology Act, 2000
 - Personal Data Protection Bill (India)
 - Right to Information Act, 2005
 - State education regulations
 - AICTE guidelines
-

7. DATA MANAGEMENT REQUIREMENTS

7.1 Master Data

Master Data Tables:

Geographic Data:

- States (with codes)
- Districts (with state mapping)
- Talukas (with district mapping)
- Villages (with taluka mapping)

University Data:

- University master (10 universities)
- University jurisdiction mapping (district-wise)

Institute Data:

- Institute master (500+ colleges)
- Institute types (Government/Private/Autonomous)
- Institute minority status
- Institute TFWS availability

Course Data:

- Course master (B.E/B.Tech branches)
- Course eligibility (PCM/PCB requirements)
- Schedule IV courses list

Entrance Exam Data:

- Exam types (MAH CET, JEE, NEET)
- Exam conducting bodies
- Score types (percentile/marks)

Category Data:

- Admission categories (10 types)
- Caste master (with category mapping)
- Category reservation percentages

Document Type Data:

- Document master (30+ types)
- Mandatory/optional classification
- Candidature-type wise requirements

7.2 Transaction Data

Application Data:

- Candidate registrations
- Application forms (all versions)
- Application status tracking
- Modification history

Document Data:

- Uploaded documents metadata

- Document URLs (blob storage)
- Upload timestamps
- Verification status

Verification Data:

- Verification records
- Discrepancy records
- Officer assignments
- Verification timestamps

Merit Data:

- Merit scores (all parameters)
- Merit list assignments
- Merit number mappings
- Category-wise rankings

Grievance Data:

- Grievance submissions
- Grievance approvals/rejections
- Resolution details
- Timestamp tracking

Option Form Data:

- Institute shortlists
- Preference orders
- Confirmation timestamps
- Choice codes

Allotment Data:

- Seat allocations
- Allotment rounds
- Seat acceptance status
- Institute reporting status

Payment Data:

- Payment transactions

- Gateway responses
- Reconciliation records
- Receipt generation

Communication Data:

- SMS logs
- Email logs
- WhatsApp logs
- Delivery status

Support Data:

- Support tickets
- Ticket responses
- Escalation history
- Resolution status

7.3 Data Integrity

Referential Integrity:

- All foreign key relationships enforced
- Cascade delete where appropriate
- Prevent orphan records

Data Validation:

- Check constraints for valid ranges
- Unique constraints for identifiers
- Not-null constraints for mandatory fields
- Default values where applicable

Data Consistency:

- Transaction management for multi-table operations
- Optimistic concurrency control
- Distributed transaction handling

7.4 Data Archival

Archival Policy:

- Archive completed admission cycles after 2 years
- Move to separate archive database
- Maintain read-only access
- Compress archived data
- Periodic archive cleanup after retention period

Archival Schedule:

- Annual archival (post-admission season)
 - Incremental archival for large tables
 - Minimal impact on live system
-

8. INTEGRATION REQUIREMENTS

8.1 External System Integrations

INT-001: Entrance Exam Systems

MAH CET Results Integration:

- Source: Maharashtra State CET Cell
- Protocol: REST API / SFTP
- Data: Application number, Roll number, DOB, Scores
- Frequency: Real-time during registration
- Error Handling: Fallback to manual entry if API unavailable

JEE Main Results Integration:

- Source: National Testing Agency (NTA)
- Protocol: REST API
- Data: Application number, DOB, Percentiles
- Frequency: Real-time during registration
- Authentication: API key-based

NEET Results Integration:

- Source: National Testing Agency (NTA)
- Protocol: REST API
- Data: Roll number, DOB, Percentiles
- Frequency: Real-time during registration

- Authentication: API key-based

INT-002: Payment Gateway Integration

Razorpay Integration:

- Protocol: REST API
- Functions:
 - Create payment order
 - Process payment
 - Verify payment signature
 - Fetch transaction status
 - Generate refund (if applicable)
- Security: API key + Secret
- Webhooks: For payment status updates
- Reconciliation: Daily automated reconciliation

INT-003: SMS Gateway Integration

SMS Service Provider:

- Protocol: HTTP API
- Message Types:
 - OTP delivery
 - Application status updates
 - Allotment notifications
 - Payment confirmations
- Delivery Reports: Real-time status tracking
- Retry Logic: 3 attempts with exponential backoff
- Rate Limiting: As per provider limits

INT-004: Email Service Integration

Email Service Provider:

- Protocol: SMTP / API
- Email Types:
 - OTP delivery
 - Application confirmation
 - Verification status

- Merit list notification
- Allotment letters
- Payment receipts
- Templates: Pre-configured HTML templates
- Attachments: PDF support for letters
- Tracking: Open and click tracking

INT-005: WhatsApp Business API

WhatsApp Integration:

- Protocol: WhatsApp Business API
- Message Types:
 - Application ID notification
 - Status updates
 - Quick alerts
- Templates: Pre-approved message templates
- Media: Support for PDF attachments
- Opt-in: User consent required

INT-006: Document Storage Integration

Azure Blob Storage / AWS S3:

- Protocol: SDK / REST API
- Storage Structure:
 - Container per document type
 - Hierarchical folder structure
 - Unique filename generation
- Access Control: SAS tokens / Presigned URLs
- CDN: Integration for faster retrieval
- Backup: Automated replication across regions

INT-007: Intake Approval System

Institute Intake System:

- Internal integration
- Data: Institute capacity, course-wise seats, category distribution
- Frequency: Before seat matrix generation

- Validation: Capacity limits, university approvals

INT-008: Foreign Candidate Registration Portal

FCR Integration:

- Internal integration
- Data: Foreign candidate details, FCR number, eligibility
- Frequency: During registration
- Validation: FCR number uniqueness

8.2 Integration Architecture

Integration Patterns:

- Synchronous: For real-time validations (exam results)
- Asynchronous: For notifications (SMS, Email)
- Batch: For data synchronization (daily reconciliation)
- Event-driven: For status updates (payment webhooks)

Error Handling:

- Retry mechanism with exponential backoff
- Circuit breaker for failing services
- Fallback mechanisms
- Error logging and alerting
- Manual intervention queue for critical failures

Data Mapping:

- Standardized data formats (JSON/XML)
- Data transformation layer
- Validation before integration
- Mapping documentation maintained

Security:

- API key management
- Encrypted communication (TLS)
- IP whitelisting where applicable
- Rate limiting
- Audit logging of all integration calls

9. BUSINESS PROCESS WORKFLOWS

9.1 Complete CAP Process Flow

11-Step Process:

1. Registration (1-2 days)

- Entrance exam validation
- Personal details capture
- OTP verification
- Application ID generation

2. Application Form Filling (7-10 days)

- 10-step form completion
- Document upload
- Payment processing
- Scrutiny mode selection

3. Verification (7-15 days)

- E-Scrutiny or P-Scrutiny
- Document verification
- Discrepancy handling
- Confirmation/Revert

4. Provisional Merit List (1 day)

- Merit calculation
- List generation (6 lists)
- Public publication

5. Grievance Period (3-4 days)

- Grievance submission
- Review and approval
- Application correction
- Re-verification

6. Final Merit List (1 day)

- Finalize rankings
- Public publication
- Merit status checking

7. CAP Round I (14-21 days)

- Seat matrix publication
- Option form filling (5-7 days)
- Allotment processing (1 day)
- Self-verification (2-3 days)
- Seat acceptance (2-3 days)
- Institute reporting (3-5 days)

8. Vacancy Report (1-2 days)

- Institute vacancy compilation
- Updated seat matrix publication

9. CAP Round II (14-21 days)

- [Same structure as Round I]

10. Vacancy Report (1-2 days)

11. CAP Round III (14-21 days)

- [Same structure as Round I]

Post-CAP:

- Institute Level Admissions (IL)
- All College Admission Process (ACAP)
- Non-CAP Admissions

Total Timeline: Approximately 10-12 weeks

9.2 E-Scrutiny Verification Workflow

START

↓

Candidate submits application

↓

Auto-assign to E-SC Officer

↓

Officer picks up application

↓

Step-by-step verification (7 steps)

↓

For each field:

- Compare claimed vs document value
- Mark: Correct / Mandatory Issue / Optional Issue

↓

Any Mandatory Issues?

YES → Mark for revert → Send notification → Candidate corrects → Re-submit → Re-verification

NO ↓

Any Optional Issues?

YES → Remove benefits → Provisional confirmation

NO → Full confirmation

↓

Generate Acknowledgement

↓

Send confirmation notification

↓

END

9.3 P-Scrutiny Verification Workflow

START

↓

Candidate selects P-Scrutiny mode

↓

Book slot at FC (District, Date, Time)

↓

Receive booking confirmation

↓

Visit FC with original documents

↓

FC Officer verification:

- Check originals
- Compare with uploaded docs
- Identify issues

↓

Issues found?

YES → FC edits application → Upload corrected docs → Confirm

NO → Confirm application

↓

Generate Acknowledgement

↓

Candidate receives confirmation

↓

END

9.4 Merit List Generation Workflow

START

↓

Collect all CONFIRMED applications

(Status = Confirmed, within deadline)

↓

For each application:

- Extract 21 merit parameters
- Calculate primary score (exam percentile)
- Calculate tie-breaker scores (1-12)
- Determine primary exam (JEE > MHT-CET)

↓

Generate 6 merit lists:

1. All India - PCM
2. All India - PCM/PCB (Schedule IV)
3. Maharashtra State - PCM
4. Maharashtra State - PCM/PCB
5. JK Migrant - PCM
6. JK Migrant - PCM/PCB

↓

For each list:

- Filter eligible candidates
- Sort by: Primary score DESC, TieBreak1 DESC, ... TieBreak12 DESC
- Assign merit numbers (1, 2, 3, ...)

↓

Publish lists on portal

↓

Enable merit status check

↓

END

9.5 Seat Allotment Workflow

START

↓

Input:

- Final Merit Lists (all types)
- Confirmed Option Forms
- Seat Matrix (institute × course × category)

↓

FOR each candidate in merit order:

↓

Get candidate's option form

↓

FOR each preference (1 to N):

↓

Get Institute-Course choice

↓

Check seat availability:

- Category match?
- HU/OHU/SL eligibility?

```
graph TD
    A[- Seat vacant?] --> B[↓]
    B --> C[IF seat available:]
    C --> D[- Allocate seat]
    C --> E[- Update seat matrix (mark filled)]
    C --> F[- Generate allotment letter]
    C --> G[- BREAK (stop checking further preferences)]
    G --> H[↓]
    H --> I[NEXT preference]
    I --> J[↓]
    J --> K[IF no seat allocated:]
    K --> L[- Mark as "Not Allotted"]
    K --> M[- Eligible for next round]
    M --> N[↓]
    N --> O[NEXT candidate]
    O --> P[↓]
    P --> Q[Publish allotment results]
    Q --> R[↓]
    R --> S[Send notifications]
    S --> T[↓]
    T --> U[END]
```

9.6 Self-Verification & Seat Acceptance Workflow

```
graph TD
    START[START] --> A[↓]
    A --> B[Candidate receives allotment]
    B --> C[↓]
    C --> D[STEP 1: Self-Verification]
    D --> E[- Review 21 parameters]
    D --> F[- Mark each: Correct / Incorrect]
    F --> G[↓]
    G --> H[Any field marked Incorrect?]
    H --> I[YES → Generate auto-grievance → FC reviews → Benefit taken?]
    I --> J[YES → Cancel allotment → END]
    I --> K[NO → Update info → Proceed]
    K --> L[NO ↓]
    L --> M[↓]
    M --> N[STEP 2: Choose Seat Acceptance]
    N --> O[First preference?]
    O --> P[YES → AUTO-FREEZE (no choice)]
    O --> Q[NO → Choose: FREEZE or BETTERMENT]
    Q --> R[↓]
    R --> S[STEP 3: Pay Seat Acceptance Fee]
    S --> T[- Review amount]
    S --> U[- Pay via gateway]
```

- Get confirmation

↓

STEP 4: Confirm Seat Acceptance

- Enter password
- Verify OTP
- Generate Seat Acceptance Letter

↓

STEP 5: Institute Reporting (within deadline)

- Visit institute
- Present originals
- Verification by institute
- Admission confirmed

↓

END

9.7 Grievance Handling Workflow

START (Provisional Merit List published)

↓

Grievance period opens (3-4 days)

↓

Candidate identifies issue

↓

Raise Grievance:

- Select type
- Describe issue
- Upload proof
- Submit

↓

Receive Grievance ID

↓

Grievance assigned to SC/FC

↓

Officer reviews:

- Check documents
- Validate claim
- Decision: Approve / Reject

↓

IF Approved:

- Unlock application
- Notify candidate
- Candidate edits
- Re-submit
- Re-verification
- Update in system

↓

IF Rejected:

- Notify with reason
- No changes

↓

Grievance period ends

↓

Final Merit List generated (with updates)

↓

END

10. BUSINESS RULES & VALIDATIONS

10.1 Eligibility Rules

RULE-001: Entrance Exam Eligibility

- Must have non-zero score in at least one eligible entrance exam
- JEE/NEET: National level
- MAH CET: Maharashtra level
- Diploma/D.Voc: Qualifying exam holders

RULE-002: Academic Eligibility (PCM Group)

- HSC with Physics + Mathematics compulsory
- One of: Chemistry/Biotechnology/Biology/Tech-Vocational/CS/IT/Agriculture/Engineering Graphics/Business Studies/Electronics/Entrepreneurship
- Minimum 45% aggregate (40% for reserved categories in Maharashtra)
- OR Diploma with 45% (40% for reserved)
- OR 3-year D.Voc in same/allied sector

RULE-003: Academic Eligibility (PCB Group)

- HSC with Physics + Chemistry compulsory
- One of: Mathematics/Biotechnology/Biology/Tech-Vocational/CS/IT/Agriculture/Engineering Graphics/Business Studies/Electronics/Entrepreneurship
- Same percentage requirements as PCM
- Only eligible for Schedule IV courses

RULE-004: Age Limit

- No upper age limit for general category
- Relaxation as per government rules for reserved categories

10.2 Candidature Type Rules

RULE-005: Maharashtra Type A

- SSC AND HSC/Diploma from Maharashtra institutions
- AND (Domiciled in Maharashtra OR Born in Maharashtra)
- Documents: Domicile OR Birth Certificate OR Leaving Certificate

RULE-006: Maharashtra Type B

- Candidate OR Father OR Mother domiciled in Maharashtra
- Document: Valid Domicile Certificate

RULE-007: Maharashtra Type C

- Father OR Mother is Central Government employee
- Currently posted in Maharashtra (before application deadline)
- Document: Proforma-A from employer

RULE-008: Maharashtra Type D

- Father OR Mother is State Government employee or retired
- Currently posted OR settled in Maharashtra after retirement
- Document: Proforma-B OR Settlement undertaking

RULE-009: Maharashtra Type E

- Passed SSC AND HSC/Diploma from Maharashtra-Karnataka border area institutions
- Mother tongue is Marathi
- Residing in border area
- Documents: Border area certificate (Proforma-G1) + Marathi mother tongue certificate (Proforma-G2)

RULE-010: OMS (Outside Maharashtra State)

- Indian nationality
- Does not meet Maharashtra Type A-E criteria
- Eligible only for All India seats

RULE-011: JK Migrants

- Separate counseling process (not online allotment)
- Physical reporting to designated center

- Merit-based allocation on spot
- Supernumerary seats only

RULE-012: NRI/OCI/PIO/CIWGC

- Institute-level admission
- No merit list
- Quota-based allocation
- Extensive documentation required

10.3 Category Rules

RULE-013: Category Document Requirements

- Reserved categories: Caste certificate + Caste validity + NCL (except SC/ST)
- NCL validity: Up to March 31, 2025
- EWS: Income certificate for current year (< ₹8 lakh)
- Invalid documents → Auto-convert to OPEN

RULE-014: Category Percentage Relaxation

- Applicable only for Maharashtra State candidates
- General: 45% minimum
- Reserved: 40% minimum
- Not applicable to All India candidates (45% for all)

RULE-015: Creamy Layer Exclusion

- OBC/NT/SBC/SEBC candidates above creamy layer income limit
- Must provide valid NCL certificate
- Without NCL → Converted to OPEN

10.4 Reservation Rules

RULE-016: PWD Reservation

- Horizontal reservation across all categories
- Valid disability certificate required
- Minimum disability percentage as per norms
- Invalid certificate → PWD benefit removed

RULE-017: Defence Reservation

- Three types: Def-1 (Ex-servicemen), Def-2 (Active domicile), Def-3 (Active non-domicile)
- Each has specific document requirements
- Valid defence certificate mandatory
- Invalid → Defence benefit removed

RULE-018: TFWS (Tuition Fee Waiver Scheme)

- Maharashtra State candidates only
- Annual family income < ₹8 lakh
- Valid income certificate from competent authority
- Percentage of seats reserved as per rules
- Waiver applies to tuition fee only (not development/other fees)

RULE-019: Orphan Reservation

- Both parents deceased
- Valid orphan certificate required
- Horizontal reservation

RULE-020: Minority Reservation

- Linguistic OR Religious minority
- Applicable at minority institutions only
- Declaration required (Proforma-O) OR Leaving Certificate showing religion/mother tongue

10.5 Home University Rules

RULE-021: HU/OHU/SL Seat Categories

- HU (Home University): Seats within candidate's home university area
- OHU (Outside Home University): Seats outside home university area
- SL (State Level): Open to all Maharashtra candidates
- Home university determined by HSC passing district

RULE-022: Seat Allocation Priority

- Within home university: HU candidates get priority
- SL seats: Merit-based, all Maharashtra candidates eligible
- OHU seats: After HU quota filled

10.6 Merit Calculation Rules

RULE-023: Primary Exam Priority

- If both JEE and MHT-CET: JEE takes precedence
- Primary exam score used for merit calculation
- Secondary exam scores displayed but not used for ranking

RULE-024: Tie-Breaking Sequence

- Applied when primary scores are equal
- 12-level tie-breaking hierarchy strictly followed
- Final tie-breaker: Date of Birth (older preferred)

RULE-025: Merit List Eligibility

- Only CONFIRMED applications included
- Confirmed on or before deadline
- No manual additions after publication

10.7 Option Form Rules

RULE-026: Maximum Choices

- Up to 300 institute-course combinations allowed
- Minimum 1 choice required for confirmation
- No duplicate choices allowed

RULE-027: First Preference Importance

- First preference allotment = AUTO-FREEZE
- Most important choice
- No further rounds if 1st preference allotted

RULE-028: Option Form Modification

- Allowed until confirmation
- After confirmation: No changes
- Between rounds: Can modify for next round

10.8 Allotment Rules

RULE-029: Merit-Based Allocation

- Strictly merit order followed
- Highest preference available seat allocated
- Category reservation applied

- No manual intervention

RULE-030: AUTO-FREEZE Rule

- Automatic for 1st preference allotment
- No choice given to candidate
- Must accept and report
- Not eligible for further rounds

RULE-031: BETTERMENT Rule

- For other preference allotments
- Candidate accepts current seat
- Remains eligible for next rounds
- Can upgrade if better preference available
- If no upgrade: Retains current seat

RULE-032: FREEZE Rule

- For other preference allotments
- Candidate accepts permanently
- Not eligible for further rounds
- Final decision

RULE-033: No Action Rule

- If allotted but no action taken
- Seat automatically cancelled
- Eligible for next round
- Seat acceptance fee not applicable

RULE-034: Non-Reporting Rule

- If accepted but did not report to institute within deadline
- Seat automatically cancelled
- Seat acceptance fee forfeited
- Not eligible for further rounds

10.9 Special Category Rules

RULE-035: NRI Quota

- Maximum 5% of sanctioned intake

- Institute-level admission
- Institute prepares own merit list
- If vacant: Fill from Maharashtra State, then All India

RULE-036: OCI/PIO/CIWGC Quota

- Maximum 15% supernumerary (over and above intake)
- 1/3 for CIWGC
- 2/3 for OCI/PIO/Foreign Students
- If vacant: Inter-transferable within quota
- If still vacant: Can use for NRI (with approval)

RULE-037: JK Supernumerary

- Over and above sanctioned intake
- No limit on number
- Counseling-based admission
- First-come-first-served at counseling
- Cannot change institute/course once allotted

10.10 Payment Rules

RULE-038: Fee Exemption

- MHT-CET candidates: Fee exempted if category unchanged
- If category changed: Pay difference amount
- Non-MHT-CET candidates: Pay full application fee

RULE-039: Fee Structure

- Open category: Higher fee
- Reserved categories: Lower fee
- Fee non-refundable
- Payment deadline strictly enforced

RULE-040: Seat Acceptance Fee

- Payable after allotment
- Amount as per brochure
- Non-refundable
- Must pay to confirm seat

10.11 Timeline Rules

RULE-041: Deadline Enforcement

- All deadlines are hard stops
- System automatically closes after deadline
- No manual extensions (except in exceptional circumstances)
- Late submissions not accepted

RULE-042: Grievance Period

- One-time opportunity only
- 3-4 days after Provisional Merit List
- No grievances accepted after Final Merit List

RULE-043: Institute Reporting Deadline

- Typically 3-5 days from seat acceptance
 - Failure to report: Automatic cancellation
 - No extensions
-

11. REPORTING REQUIREMENTS

11.1 Operational Reports

REP-001: Application Statistics Dashboard

- Total registrations
- Total applications submitted
- Total applications verified
- Category-wise distribution
- Candidature type-wise distribution
- District-wise distribution
- Gender distribution
- Entrance exam-wise distribution
- Real-time updates

REP-002: Verification Status Report

- Applications under E-Scrutiny
- Applications under P-Scrutiny

- Confirmed applications
- Reverted applications
- Pending verifications
- Officer-wise workload
- FC-wise workload
- Average verification time

REP-003: Merit List Report

- Provisional merit list (6 types)
- Final merit list (6 types)
- Category-wise merit distribution
- Gender-wise distribution
- PWD/Defence/TFWS counts
- Score distribution analysis
- Top percentile analysis

REP-004: Option Form Report

- Total option forms filled
- Total option forms confirmed
- Average choices per candidate
- Most preferred institutes
- Least preferred institutes
- Institute demand analysis

REP-005: Allotment Report

- Round-wise allotments
- Institute-wise allotments
- Course-wise allotments
- Category-wise allotments
- First preference allotments count
- BETTERMENT vs FREEZE analysis
- Not allotted candidates

REP-006: Seat Acceptance Report

- Total seats accepted

- Payment collection summary
- AUTO-FREEZE count
- BETTERMENT count
- FREEZE count
- Pending payments
- Institute reporting status

REP-007: Vacancy Report

- Institute-wise vacancies
- Course-wise vacancies
- Category-wise vacancies
- Vacant seat analysis
- Available for next round

REP-008: Institute Admission Report

- Institute-wise admissions confirmed
- Document verification status
- Reporting compliance
- Seat filling percentage
- Category-wise admission breakdown

REP-009: Payment Reconciliation Report

- Total payments collected
- Gateway-wise breakdown
- Failed transactions
- Pending reconciliations
- Refunds (if any)
- Date-wise collection

REP-010: Grievance Report

- Total grievances raised
- Grievance type distribution
- Approved vs rejected
- Resolution time analysis
- Pending grievances

REP-011: Support Ticket Report

- Total tickets raised
- Category-wise ticket distribution
- Resolution status
- Average resolution time
- Officer-wise performance
- Pending tickets

11.2 Management Reports

REP-012: Executive Dashboard

- Key metrics (registrations, applications, allotments)
- Process completion percentages
- Timeline adherence
- System performance metrics
- User satisfaction scores

REP-013: Trend Analysis Report

- Year-on-year comparison
- Popular courses trend
- Institute demand trend
- Category-wise admission trend
- Gender ratio trend

REP-014: Audit Trail Report

- User activity logs
- Critical operation logs
- Data modification logs
- Login/logout history
- Failed authentication attempts

REP-015: Performance Report

- System uptime
- API response times
- Page load times

- Error rates
- Peak load handling

11.3 Compliance Reports

REP-016: Category-wise Admission Report

- Category reservation compliance
- Seat filling vs quota
- Shortfall/excess analysis
- University-wise compliance

REP-017: Special Reservation Report

- PWD admissions
- Defence admissions
- TFWS admissions
- Orphan admissions
- Minority admissions

REP-018: Financial Report

- Fee collection summary
- Category-wise fee collection
- Payment gateway charges
- Reconciliation summary

11.4 Report Features

Common Features:

- Export to PDF, Excel, CSV
 - Date range filters
 - Search and filter capabilities
 - Drill-down functionality
 - Scheduled email delivery
 - Print-friendly format
 - Real-time data refresh
-

12. TECHNICAL ARCHITECTURE

12.1 Architecture Overview

Layered Architecture:

Presentation Layer:

- React-based Single Page Application (SPA)
- Responsive design (mobile, tablet, desktop)
- Progressive Web App (PWA) capabilities
- Component-based architecture
- State management (Redux/Context API)
- Client-side routing

API Layer:

- .NET Core 8.0 Web APIs
- RESTful architecture
- JWT-based authentication
- API Gateway pattern
- Rate limiting
- Request/response logging
- Swagger/OpenAPI documentation

Business Logic Layer:

- Service-oriented architecture
- Business rule engine
- Validation framework
- Transaction management
- Event-driven processing

Data Access Layer:

- Entity Framework Core (ORM)
- Repository pattern
- Unit of Work pattern
- Database abstraction
- Connection pooling

Data Storage Layer:

- Microsoft SQL Server 2022 (Primary database)
- Redis Cache (Distributed caching)
- Azure Blob Storage (Document storage)
- File storage for logs

12.2 Technology Stack

Backend:

- Framework: ASP.NET Core 8.0
- Language: C# 12.0
- ORM: Entity Framework Core 8.0
- Authentication: ASP.NET Core Identity + JWT
- API Documentation: Swagger/Swashbuckle
- Logging: Serilog
- Testing: xUnit, Moq
- Background Jobs: Hangfire

Frontend:

- Framework: React 18+
- Language: TypeScript
- State Management: Redux Toolkit
- UI Library: Material-UI / Ant Design
- Form Handling: React Hook Form
- HTTP Client: Axios
- Build Tool: Vite / Webpack
- Testing: Jest, React Testing Library

Database:

- RDBMS: Microsoft SQL Server 2022
- Migration: Entity Framework Core Migrations
- Backup: Automated SQL Server backup
- High Availability: Always On Availability Groups

Caching:

- Redis 7.0+
- Cache-aside pattern
- Distributed caching for session state
- Output caching for static data

Document Storage:

- Azure Blob Storage / AWS S3
- Hierarchical organization
- Secure access (SAS tokens / Presigned URLs)
- CDN integration (Azure CDN / CloudFront)
- Automated backups with geo-replication

Message Queue:

- Azure Service Bus / RabbitMQ
- Asynchronous processing
- Event-driven architecture
- Dead letter queue handling
- Message retry policies

Monitoring & Logging:

- Application Insights / ELK Stack
- Performance monitoring
- Error tracking
- Log aggregation
- Alert management

DevOps:

- Source Control: Git (Azure DevOps / GitHub)
- CI/CD: Azure DevOps Pipelines / GitHub Actions
- Containerization: Docker
- Orchestration: Kubernetes (optional for high scale)
- Infrastructure as Code: Terraform / ARM Templates

12.3 Deployment Architecture

Hosting Options:

Option 1: Azure Cloud

- App Services for Web APIs
- Azure SQL Database
- Azure Blob Storage
- Azure Redis Cache
- Azure Service Bus
- Application Insights
- Azure CDN
- Azure Active Directory (if needed)

Option 2: On-Premise IIS

- IIS 10.0+ for hosting APIs
- SQL Server 2022 (Standard/Enterprise)
- File server for document storage
- Redis on Windows
- Message queue on Windows Server
- Custom monitoring solution

Recommended: Hybrid

- APIs and database on-premise
- Document storage in cloud
- CDN for static content
- Cloud-based monitoring

12.4 Scalability Design

Horizontal Scaling:

- Stateless API design
- Load balancer distribution
- Auto-scaling based on CPU/memory
- Session state in Redis (not in-memory)
- No dependency on single server

Vertical Scaling:

- Database server scaling (CPU, RAM, SSD)

- Application server upgrades
- Redis memory increase

Database Scaling:

- Read replicas for reporting
- Partitioning large tables (by year/round)
- Indexing strategy
- Query optimization
- Connection pooling

Caching Strategy:

- Cache static data (master data)
- Cache frequently accessed data
- Short TTL for dynamic data
- Cache invalidation strategy

12.5 Security Architecture

API Security:

- HTTPS only (TLS 1.3)
- JWT authentication
- Role-based authorization
- CORS policy
- Rate limiting (per IP/user)
- Request validation
- SQL injection prevention
- XSS protection
- CSRF tokens

Data Security:

- Encryption at rest (TDE for SQL Server)
- Encryption in transit (TLS)
- PII data masking
- Secure password storage (bcrypt/Argon2)
- Secure file storage with access control

Network Security:

- Firewall rules
- VPN for admin access
- IP whitelisting for admin
- DDoS protection
- Intrusion detection

Application Security:

- Security headers (HSTS, CSP, X-Frame-Options)
- Dependency scanning
- Vulnerability assessment
- Penetration testing (annually)
- Security patch management

12.6 Backup & Disaster Recovery

Backup Strategy:

- Database: Daily full backup + hourly incremental
- Documents: Geo-replicated storage
- Configuration: Version controlled
- Logs: Retained for 180 days

Recovery Objectives:

- RPO (Recovery Point Objective): 1 hour
- RTO (Recovery Time Objective): 4 hours
- Disaster recovery site (active-passive)
- Regular DR drills (quarterly)

Backup Retention:

- Daily backups: 30 days
- Weekly backups: 90 days
- Monthly backups: 1 year
- Yearly backups: 5 years (for compliance)

12.7 Development Standards

Code Standards:

- Follow SOLID principles
- Clean code practices
- Meaningful naming conventions
- Code documentation (XML comments)
- Design patterns where applicable

API Standards:

- RESTful conventions
- Consistent naming (PascalCase for properties)
- Versioning strategy (URL-based)
- Standard HTTP status codes
- Consistent error response format

Testing Standards:

- Unit test coverage: > 80%
- Integration tests for critical flows
- End-to-end tests for key scenarios
- Performance tests before releases
- Security tests (OWASP Top 10)

Documentation Standards:

- API documentation (Swagger)
- Architecture documentation
- Deployment guides
- User manuals
- Troubleshooting guides

PART B: KNOWLEDGE BASE

13. INTRODUCTION TO CAP

13.1 What is CAP?

The **Centralized Admission Process (CAP)** is a streamlined, fully online system for admissions to First Year Engineering (B.E/B.Tech) programs in Maharashtra. It replaces the traditional paper-based

admission process with a digital platform that ensures:

- **Merit-based allocation:** Seats allotted purely based on entrance exam scores
- **Transparency:** All processes are visible and trackable
- **Efficiency:** Reduced processing time from months to weeks
- **Fairness:** Equal opportunity for all eligible candidates
- **Convenience:** Complete process from home (except physical verification if chosen)

13.2 Who Can Apply?

Eligible Candidates:

- Passed SSC/HSC or equivalent with required percentage
- Appeared for eligible entrance exams (MAH CET/JEE/NEET/Diploma)
- Obtained non-zero score in entrance exam
- Meet candidature type requirements (17 types available)
- Indian nationals and select international categories

Ineligible Candidates:

- Zero score in entrance exam
- Did not pass qualifying examination
- Below minimum percentage requirement
- Incomplete documentation

13.3 Key Benefits

For Students:

- Apply to 300+ institutes with single application
- Real-time application tracking
- Transparent merit-based allocation
- Multiple CAP rounds for better chances
- Online grievance mechanism
- 24/7 access to information

For System:

- Elimination of paperwork
- Prevention of duplicate admissions
- Faster processing

- Centralized data for analytics
- Fraud prevention
- Quality control through verification

13.4 Important Dates (Typical Timeline)

| Activity | Duration | Approx. Dates |
|----------------------------|------------|------------------------|
| Registration | 7-10 days | Mid-May |
| Application Filling | 7-10 days | Late May |
| Verification | 10-15 days | Early June |
| Provisional Merit List | 1 day | Mid-June |
| Grievance Period | 3-4 days | Mid-June |
| Final Merit List | 1 day | Late June |
| CAP Round I | 14-21 days | July |
| CAP Round II | 14-21 days | Late July/Early August |
| CAP Round III | 14-21 days | August |
| Institute Level Admissions | Ongoing | September onwards |

Note: Exact dates announced by authorities each year. Check official website regularly.

13.5 Process Overview

10 Simple Steps:

1. **Register** - Validate entrance exam, get Application ID
2. **Fill Application** - Complete 10-step form
3. **Upload Documents** - All required documents
4. **Pay Fee** - Online payment (some exemptions)
5. **Get Verified** - E-Scrutiny or P-Scrutiny
6. **Check Merit List** - See your rank
7. **Fill Option Form** - Choose up to 300 institutes
8. **Get Allotment** - Seat assigned based on merit
9. **Accept Seat** - Pay fee, confirm acceptance
10. **Report to Institute** - Final admission

13.6 Key Terminology

Application ID: Unique identifier (e.g., EN-25-100001)

CAP: Centralized Admission Process

Merit Number: Your rank in merit list

Option Form: Your list of preferred institutes

Choice Code: Unique code for Institute-Course combination

Allotment: Seat assigned to you

AUTO-FREEZE: Automatic seat confirmation (1st preference)

BETTERMENT: Accept seat but try for better in next round

FREEZE: Accept seat permanently, no next round

HU/OHU/SL: Seat categories (Home University/Outside Home University/State Level)

14. UNDERSTANDING CANDIDATURE TYPES

14.1 Why Candidature Type Matters

Your candidature type determines:

- Which seats you're eligible for (State vs All India)
- Your home university assignment
- Required documents
- Reservation benefits (if applicable)

14.2 Maharashtra Candidates (Type A to E)

Type A: Complete Maharashtra Candidate

Who Qualifies:

- Passed BOTH SSC AND HSC/Diploma from Maharashtra institutions
- AND Either:
 - Domiciled in Maharashtra, OR
 - Born in Maharashtra

Benefits:

- Eligible for Maharashtra State seats
- Home university assignment
- State reservation benefits
- All category benefits

Documents Required:

- Domicile Certificate, OR
- Birth Certificate showing birth in Maharashtra, OR
- Leaving Certificate indicating Maharashtra domicile

Example: *Raj passed his SSC from Mumbai and HSC from Pune. He was born in Maharashtra. He qualifies for Type A.*

Type B: Domicile-Based**Who Qualifies:**

- Does not meet Type A criteria
- BUT Candidate OR Father OR Mother is domiciled in Maharashtra
- Has valid Domicile Certificate

Benefits:

- Eligible for Maharashtra State seats
- Home university assignment
- State reservation benefits

Documents Required:

- Domicile Certificate of candidate/father/mother
- (Whose domicile certificate: Specify in application)

Example: *Priya studied SSC and HSC in Karnataka, but her father has Maharashtra domicile. She qualifies for Type B using her father's domicile certificate.*

Type C: Central Government Employee Children**Who Qualifies:**

- Father OR Mother is Central Government employee
- OR Works in Government of India Undertaking
- Currently posted in Maharashtra
- Posted before the application deadline

Benefits:

- Eligible for Maharashtra State seats
- Home university based on posting location

Documents Required:

- Proforma-A from employer
- Showing current posting in Maharashtra
- Posting date must be before application deadline

Example: *Amit's father works for Indian Railways and is posted in Nagpur. Amit can apply under Type C.*

Type D: State Government Employee Children**Who Qualifies:**

- Father OR Mother is Maharashtra State Government employee
- OR Works in Maharashtra State Government Undertaking
- Currently working OR Retired
- If retired: Settled in Maharashtra

Benefits:

- Eligible for Maharashtra State seats
- Home university based on posting/settlement location

Documents Required:

- Proforma-B from employer (if working), OR
- Undertaking for Place of Settlement (if retired)
- Documentary evidence of settlement

Example: *Sneha's mother retired from Maharashtra State Government and settled in Pune. Sneha qualifies for Type D.*

Type E: Maharashtra-Karnataka Border Area**Who Qualifies:**

- Passed SSC AND HSC/Diploma from Maharashtra-Karnataka border area institutions
- Residing in border area
- Mother tongue is Marathi

Benefits:

- Eligible for Maharashtra State seats
- Special border area reservation

Documents Required:

- Certificate of border area residence (Proforma-G1)
- Marathi mother tongue certificate (Proforma-G2)

Important: Only specific villages qualify as border area. Check official list.

Example: *Akash is from a border village in Maharashtra, his mother tongue is Marathi, and he studied in that area. He qualifies for Type E.*

14.3 Outside Maharashtra State (OMS)

Who Qualifies:

- Indian national
- Does NOT meet Maharashtra Type A-E criteria

Seats Eligible For:

- All India seats only
- NOT eligible for Maharashtra State seats

No Home University: Home university concept doesn't apply

No State Reservations: State-specific reservations not applicable

Example: *Ravi is from Gujarat, studied there, and is not connected to Maharashtra. He applies as OMS and competes for All India seats only.*

14.4 Jammu & Kashmir Migrants (J-1 to J-4)

J-1: Displaced Families

Who Qualifies:

- Children of citizens displaced from J&K/Ladakh to other parts of India
- OR Displaced from unsafe border areas to safer places within J&K/Ladakh
- Displacement from 1990 onwards due to terrorist activities

Admission Process:

- NOT through online CAP
- Physical counseling at designated center
- First-come-first-served at counseling

Seats:

- Supernumerary (over and above normal intake)
- No limit on number

J-2: Defence/IAS/IPS/IFS Children

Who Qualifies:

- Children of IAS, IPS, or IFS officers
- OR Children of military and paramilitary forces staff
- Transferred to J&K to combat terrorist activities
- Must have joined post before application deadline

Same Process: Physical counseling

J-3: J&K Police Children

Who Qualifies:

- Children of J&K police officers and staff
- Engaged in combating terrorism

Same Process: Physical counseling

J-4: Kashmiri Pandits (Non-Migrants)

Who Qualifies:

- Kashmiri Pandit families OR Kashmiri Hindu families
- Living in Kashmir Valley (not migrated)
- Have valid J&K domicile certificate

Same Process: Physical counseling

Important for All JK Types:

- Send printed application and documents to SPCE, Mumbai
- Physical verification at SPCE
- Separate merit list published
- Attend counseling in person
- Supernumerary admission
- Cannot change institute/course once allotted

14.5 International Categories

Foreign Students (FN)

Who Qualifies:

- Non-Indian nationals
- Foreign passport holders

Process:

- First register on Foreign Candidate Registration Portal
- Obtain FCR (Foreign Candidate Registration) number
- Then apply on CAP portal

Admission:

- Institute-level (not through online allotment)
- Visit institutes directly

Seats:

- 15% supernumerary seats
- 2/3 of this quota shared with OCI/PIO

Documents:

- Passport
- Eligibility certificate from AIU (if studied abroad)
- All academic certificates
- Visa/stay documents
- Many more (30+ documents)

NRI (Non-Resident Indian)**Who Qualifies:**

- Indian citizen residing abroad
- OR Their children
- OR Wards of NRI (with blood relation)
- Sponsor must have stayed abroad minimum 182 days in last year

Admission:

- Institute-level only
- Institute prepares own merit list
- Direct admission at institute

Seats:

- Maximum 5% of sanctioned intake per institute

Documents:

- Passport of sponsor
- Valid visa
- Proof of residence abroad (182+ days)
- Work permit/employment proof
- Bank statements
- Relationship proof
- Many more documents

Important: If NRI quota seats remain vacant, filled from Maharashtra State, then All India candidates.

PIO/OCI (Person of Indian Origin / Overseas Citizen of India)**Who Qualifies:**

- Person of Indian Origin with PIO card
- OR Overseas Citizen of India with OCI card

Similar to NRI:

- Institute-level admission
- Extensive documentation

Seats:

- 15% supernumerary
- 2/3 quota shared with Foreign Students

CIWGC (Children of Indian Workers in Gulf Countries)**Who Qualifies:**

- Children of Indian workers in Gulf Countries
- Parent must be working in Gulf (182+ days stay)

Gulf Countries: UAE, Saudi Arabia, Kuwait, Oman, Qatar, Bahrain

Admission:

- Institute-level only

Seats:

- 15% supernumerary
- 1/3 of this quota specifically for CIWGC
- If vacant, can be used for OCI/PIO/FN

Documents:

- Parent's passport
- Valid work visa
- Work permit
- Gulf residence proof (182+ days)
- Bank statements from Gulf
- Many more

14.6 Special Scheme Candidates

NEUT (North Eastern States and Union Territories)

Who Qualifies:

- Candidates from North Eastern states
- Candidates from Union Territories

Process:

- Register on CAP portal (registration details only)
- No full application form required
- Direct institute admission

Admission:

- Institute-level only
- Not through CAP allotment

JKSSS/PMSSS

Full Forms:

- JKSSS: Jammu & Kashmir Special Scholarship Scheme
- PMSSS: Prime Minister Special Scholarship Scheme

Who Qualifies:

- Candidates under these scholarship schemes

Process:

- Register on CAP portal (basic details only)
- Follow respective scheme guidelines
- Direct institute admission

Admission:

- Institute-level only
- As per scheme rules

FN-ICCR (Foreign National under ICCR)

Who Qualifies:

- Foreign nationals under ICCR scholarship
- ICCR: Indian Council for Cultural Relations

Process:

- Register with FCR number
- Direct institute admission

Admission:

- Institute-level only
- As per ICCR guidelines

14.7 Quick Comparison Table

| Candidature Type | State Seats | All India Seats | Home University | CAP Allotment | Documents Required |
|--------------------------|-------------|-----------------|-----------------|---------------|--------------------------------|
| Maharashtra Type A | ✓ | ✓ | ✓ | ✓ | Domicile/Birth/LC |
| Maharashtra Type B | ✓ | ✓ | ✓ | ✓ | Domicile Certificate |
| Maharashtra Type C | ✓ | ✓ | ✓ | ✓ | Proforma-A |
| Maharashtra Type D | ✓ | ✓ | ✓ | ✓ | Proforma-B |
| Maharashtra Type E | ✓ | ✓ | ✓ | ✓ | Proforma-G1, G2 |
| OMS | X | ✓ | X | ✓ | Basic documents |
| JK Migrants (J-1 to J-4) | X | X | X | X | Specific proformas, counseling |
| Foreign Students | X | X | X | X | FCR, Passport, AIU |
| NRI | X | X | X | X | Extensive (25+) |
| PIO/OCI | X | X | X | X | Extensive (25+) |
| CIWGC | X | X | X | X | Extensive (25+) |

| Candidature Type | State Seats | All India Seats | Home University | CAP Allotment | Documents Required |
|------------------|-------------|-----------------|-----------------|---------------|------------------------|
| NEUT | X | X | X | X | Registration only |
| JKSSS/PMSSS | X | X | X | X | Registration only |
| FN-ICCR | X | X | X | X | FCR, scholarship proof |

14.8 How to Choose Your Candidature Type

Step 1: Determine Eligibility

- Check your SSC/HSC passing location
- Check domicile status (yours and parents)
- Check parent employment (if applicable)

Step 2: Choose Highest Benefit Type

- If you qualify for multiple types, choose the one with maximum benefits
- Maharashtra Type A > B > C > D > E (in terms of typical advantages)

Step 3: Gather Documents

- Collect all required documents for your type
- Ensure documents are valid and current
- Get certificates from competent authorities

Important Tips:

- Choose honestly - false claims lead to rejection
- Keep all original documents ready
- Invalid documents will convert you to OMS/Open category
- When in doubt, choose the type with simpler documentation

15. ADMISSION CATEGORIES & RESERVATIONS

15.1 Understanding Categories

Your admission category determines:

- Seat availability (reserved seats vs open seats)
- Percentage requirement (40% vs 45%)
- Competition level
- Document requirements

- Fee structure (in some cases)

15.2 Open Category

Who Belongs:

- Anyone can apply under Open category
- No caste/tribe restrictions
- Highest competition typically

Eligibility:

- 45% minimum in qualifying exam (all candidates)
- No relaxation in percentage

Can Apply for EWS:

- If annual family income < ₹8 lakh
- Need valid EWS certificate
- Get benefit of EWS reservation

Advantages:

- Can compete for all seats (open + reserved if unfilled)
- No documentary requirements except income (if claiming EWS)

Disadvantages:

- Higher competition
- No percentage relaxation

15.3 SC (Scheduled Caste)

Who Belongs:

- Candidates belonging to Scheduled Caste
- As per Central/State government list

Eligibility:

- Maharashtra candidates: 40% minimum
- Other candidates: 45% minimum

Required Documents:

- Caste Certificate (from competent authority)

- Caste Validity Certificate
- Both must match and be current

Reservation:

- As per government norms (typically 13%)
- Separate merit list within SC category

Important:

- Caste name must be in official list
- Both certificates mandatory
- Invalid documents → Converted to OPEN

15.4 ST (Scheduled Tribe)

Who Belongs:

- Candidates belonging to Scheduled Tribe
- As per Central/State government list

Eligibility:

- Maharashtra candidates: 40% minimum
- Other candidates: 45% minimum

Required Documents:

- Tribe Certificate
- Tribe Validity Certificate

Reservation:

- As per government norms (typically 7%)

Same Rules as SC:

- Both certificates mandatory
- Must be in official list
- Invalid → OPEN conversion

15.5 DT/VJ (De-notified Tribes / Vimukta Jati)

Who Belongs:

- De-notified Tribes

- Vimukta Jati (Nomadic Tribes)
- As per state government list

Eligibility:

- Maharashtra candidates: 40% minimum
- Other candidates: 45% minimum

Required Documents:

- Caste Certificate
- Caste Validity Certificate
- Non-Creamy Layer (NCL) Certificate (valid till March 31, 2025)

Reservation:

- As per government norms (typically 3%)

Important:

- Three certificates mandatory
- NCL must be current year
- Income limit for creamy layer applies

15.6 NT Categories (NT-1, NT-2, NT-3)

NT-1 (NT-B) - Nomadic Tribe B NT-2 (NT-C) - Nomadic Tribe C NT-3 (NT-D) - Nomadic Tribe D

Who Belongs:

- Specific castes listed under each NT category
- Different reservation percentages for each

Eligibility:

- Maharashtra candidates: 40% minimum
- Other candidates: 45% minimum

Required Documents:

- Caste Certificate
- Caste Validity Certificate
- Non-Creamy Layer Certificate

Reservation:

- NT-1: Specific percentage
- NT-2: Specific percentage
- NT-3: Specific percentage
- (Check current government orders)

Important:

- Check which NT category your caste belongs to
- Cannot claim multiple NT categories
- All three documents mandatory

15.7 OBC (Other Backward Class)

Who Belongs:

- Castes listed in Central/State OBC list
- NOT in creamy layer

Eligibility:

- Maharashtra candidates: 40% minimum
- Other candidates: 45% minimum

Required Documents:

- Caste Certificate
- Caste Validity Certificate
- Non-Creamy Layer Certificate (valid till March 31, 2025)

Creamy Layer:

- Annual family income above specified limit
- Parents holding certain government positions
- If in creamy layer → Not eligible for OBC benefits

Reservation:

- As per government norms

Important:

- NCL certificate is critical
- Must be renewed annually
- Issued by competent authority only

15.8 SBC (Special Backward Class)

Who Belongs:

- Specific castes designated as SBC
- As per state government list

Similar to OBC:

- Same percentage requirements
- Same documents required
- NCL certificate mandatory

Reservation:

- Separate quota

15.9 SEBC (Socially and Educationally Backward Class)

Who Belongs:

- Castes designated as SEBC
- Maharashtra-specific category

Similar to OBC/SBC:

- Same rules apply
- Three certificates required

15.10 EWS (Economically Weaker Section)

Who Belongs:

- Open category candidates only
- Annual family income < ₹8 lakh from all sources

Cannot Claim EWS If:

- You belong to SC/ST/OBC/NT/SBC/SEBC
- Even if income is below limit

Eligibility:

- 45% minimum (no relaxation)
- Only for Open category

Required Documents:

- EWS Certificate (Proforma-V)
- Issued for current year only
- From competent authority (typically Tehsildar)

Reservation:

- 10% seats reserved (as per government rules)

Important:

- Certificate must be current admission year
- Income calculation includes all family members
- Assets criteria also apply (check certificate format)

15.11 Category Selection Tips

Choosing Your Category:

If you have valid certificates:

- Select your correct category
- Upload all required documents
- Claim legitimate benefits

If documents are doubtful:

- Consider applying as OPEN
- Invalid documents will anyway convert you to OPEN
- Saves time and hassle

If between categories:

- You can only select ONE category
- Choose the one with best reservation benefit
- Cannot claim multiple categories

Common Mistakes to Avoid:

- Claiming category without valid certificates
- Using expired NCL certificate
- Wrong category selection
- Incomplete documents

What Happens with Invalid Documents:

- Automatic conversion to OPEN category
- You'll be informed via notification
- No appeal against conversion
- Merit calculation redone in OPEN category

15.12 Category-wise Competition Analysis

Typically (varies year to year):

Highest Competition:

- Open category
- EWS

Moderate Competition:

- OBC
- SBC/SEBC

Lower Competition:

- SC
- ST
- NT categories
- DT/VJ

Note: This is general trend. Actual competition depends on:

- Number of applicants
 - Seat availability
 - Cut-off scores
 - Institute popularity
-

16. SPECIAL RESERVATION BENEFITS

16.1 Understanding Special Reservations

What are Special Reservations?

- Additional benefits over and above your category
- Called "horizontal reservations"
- Can be combined with category reservations

Example: *If you are SC category + PWD, you get benefits of both*

16.2 PWD (Person with Disability)

Who Qualifies:

- Persons with benchmark disability
- Minimum 40% disability (as per norms)

Types of Disabilities Covered:

- Locomotor disability
- Visual impairment
- Hearing impairment
- Intellectual disability
- Multiple disabilities
- Other disabilities as per RPWD Act

Required Documents:

- Disability Certificate
- Issued by competent medical authority
- Must specify disability type and percentage
- Domicile certificate (for Maharashtra candidates)

Reservation:

- Horizontal reservation (across all categories)
- Typically 5% seats
- Applied within each category

Benefits:

- Seat reservation
- Fee concession (as per rules)
- Percentage relaxation (as per rules)

Important:

- Certificate must be from authorized medical board
- Specify type of disability accurately
- Invalid certificate → Benefit removed

16.3 Defence Reservation

Three Types:

Def-1: Ex-Servicemen Children (Domiciled)

Who Qualifies:

- Father/Mother is ex-serviceman
- AND domiciled in Maharashtra

Documents:

- Defence Service Certificate (Proforma-C)
- Domicile Certificate of parent

Def-2: Active Defence Personnel (Domiciled)

Who Qualifies:

- Father/Mother is serving in defence
- AND domiciled in Maharashtra

Documents:

- Defence Service Certificate (Proforma-C)
- Domicile Certificate of parent

Def-3: Active Defence Personnel (Non-Domiciled)

Who Qualifies:

- Father/Mother is serving in defence
- Posted in Maharashtra, OR
- Family retained in Maharashtra

Documents:

- Defence Service Certificate
- Posting certificate (Proforma-D), OR
- Family retention certificate (Proforma-E)

Reservation:

- Horizontal across all categories
- Separate percentages for Def-1, Def-2, Def-3

Important:

- Defence includes Army, Navy, Air Force, Para-military
- Certificate must be on official letterhead
- Specify which type (Def-1/2/3) clearly

16.4 TFWS (Tuition Fee Waiver Scheme)**Who Qualifies:**

- Maharashtra State candidates only
- Annual family income < ₹8 lakh from all sources

Key Points:

- Tuition fee waived (not admission/other fees)
- Separate seat quota
- Typically 5% of intake

Required Documents:

- Income Certificate from competent authority
- Specifically for TFWS purpose
- Maharashtra government format

Eligibility:

- Must maintain academic performance
- Fee waiver continues if performance satisfactory

Important:

- Only tuition fee waived
- Development fees, exam fees still payable
- Annual income verification may be required

Not Eligible:

- OMS candidates
- International candidates
- Income above ₹8 lakh

16.5 Orphan Reservation**Who Qualifies:**

- Both parents deceased
- Documentary proof required

Required Documents:

- Orphan Certificate (Proforma-U)
- Death certificates of both parents
- Guardian information

Reservation:

- Horizontal reservation
- Applicable across all categories

Benefits:

- Seat reservation
- Fee concession (as per rules)
- May get hostel priority

Important:

- Certificate from competent authority
- Guardian details necessary
- Original death certificates required for verification

16.6 Minority Reservation

Two Types:**Linguistic Minority****Who Qualifies:**

- Mother tongue is minority language
- In Maharashtra: Languages other than Marathi/Hindi

How It Works:

- Applicable at Linguistic Minority institutions only
- Not applicable at general institutions

Documents:

- Declaration (Proforma-O), OR
- Leaving Certificate showing mother tongue

Religious Minority

Who Qualifies:

- Belonging to minority religion
- In Maharashtra: Non-Hindu religions typically

How It Works:

- Applicable at Religious Minority institutions only

Documents:

- Declaration (Proforma-O), OR
- Leaving Certificate showing religion

Important Points:

- Only applicable at minority institutions
- Institute must have minority status
- Check institute's minority status before applying
- Regular institutes don't offer minority reservation

Minority Institutions:

- Run by religious or linguistic minority communities
- Have right to admit from their community preferentially
- Also have open seats for all

16.7 Can You Claim Multiple Benefits?

YES - You can combine:

- Category (SC/ST/OBC/etc.) + PWD
- Category + Defence
- Category + TFWS
- Category + Orphan
- Category + Minority (at minority institutions)
- Multiple special reservations together (e.g., PWD + Defence + TFWS)

Example: *Sunita is OBC category + PWD + her father is ex-serviceman + family income < ₹8 lakh She can claim: OBC + PWD + Def-1 + TFWS benefits*

How It Works:

- Category determines your basic eligibility
- Each special reservation gives additional preference
- More reservations = better chances

Important:

- Must have valid documents for each claimed benefit
- Any invalid document → That specific benefit removed
- Other valid benefits remain

16.8 Priority Order in Allotment

When multiple candidates with same score:

1. Category reservation applied first
2. Special reservations within category
3. Merit within category-reservation combination

Example Scenario: *Two OBC candidates with same merit score, both applying for same seat:*

- Candidate A: OBC only
- Candidate B: OBC + PWD

Candidate B gets priority due to PWD reservation

17. ENTRANCE EXAMINATIONS

17.1 Eligible Entrance Exams

Seven Categories:

1. MAH PCM CET (Maharashtra Common Entrance Test - PCM)
2. MAH PCB CET (Maharashtra CET - PCB)
3. JEE Main (Joint Entrance Examination - Main)
4. NEET (National Eligibility cum Entrance Test)
5. Diploma Holders (Qualifying Exam-based)
6. D.Voc Holders (Qualifying Exam-based)
7. NEUT/JKSSS/PMSSS (Special categories)

17.2 MAH PCM CET

Conducting Body: Maharashtra State Common Entrance Test Cell

Subjects:

- Physics
- Chemistry
- Mathematics

Eligibility:

- Passed HSC with PCM
- Minimum 45% (40% for reserved categories in Maharashtra)

Score Type: Percentile-based

Courses Eligible:

- All Engineering branches (B.E/B.Tech)

Key Points:

- Maharashtra candidates must appear for MHT-CET
- Percentile calculated subject-wise and overall
- Non-zero score mandatory
- Results integrated with CAP directly

Application Fee Benefit:

- If appeared for MHT-CET → CAP application fee exempted
- If category unchanged from MHT-CET to CAP

17.3 MAH PCB CET

Same as PCM, but:

Subjects:

- Physics
- Chemistry
- Biology (Botany + Zoology)

Courses Eligible:

- Only Schedule IV courses:
 - Agricultural Engineering
 - Biotechnology
 - Food Engineering

- Leather Technology
- Packaging Technology
- Pharmaceutical Engineering
- Printing Engineering
- Fashion Technology
- Textile Chemistry

Important:

- PCB candidates can ONLY apply for Schedule IV courses
- Cannot apply for Computer, Mechanical, Civil, etc.

Can have both:

- If you appeared for both PCM and PCB CET
- Select PCM first during registration
- Add PCB details in application form
- Eligible for both types of courses

17.4 JEE Main

Conducting Body: National Testing Agency (NTA)

Level: National

Score Type: Percentile-based

Subjects:

- Physics
- Chemistry
- Mathematics

Eligibility:

- Passed HSC with PCM
- Minimum 75% (65% for reserved categories at NITs)
- For CAP: 45% (40% for Maharashtra reserved)

Key Points:

- JEE score valid for CAP
- Must have appeared in Paper 1 (B.E/B.Tech)

- Paper 2 (B.Arch) not valid for B.E/B.Tech

Priority:

- If you have both JEE and MHT-CET scores
- JEE takes precedence in merit calculation
- Must enter JEE details first during registration

Application Fee:

- Not exempted (must pay CAP application fee)

17.5 NEET

Conducting Body: National Testing Agency (NTA)

Subjects:

- Physics
- Chemistry
- Biology (Botany + Zoology)

Courses Eligible:

- Only Schedule IV courses (same as MAH PCB CET)

Key Points:

- NEET primarily for medical courses
- Can also use for Schedule IV engineering courses
- Percentile-based score

Rare Usage:

- Most candidates use MAH PCB CET for engineering
- NEET option available if needed

17.6 Qualifying Exam (Diploma/D.Voc)

For Diploma Holders:

Eligibility:

- 3-year Diploma in Engineering & Technology
- Minimum 45% aggregate (40% for Maharashtra reserved)
- Passed from recognized institution

Direct Entry:

- Can enter directly to Second Year (if applicable)
- OR apply for First Year through CAP

No Entrance Exam:

- Diploma percentage used for merit calculation
- No MHT-CET/JEE required

Key Points:

- Diploma must be in engineering stream
- Board/University must be recognized
- Marks sheet required

For D.Voc Holders:**Eligibility:**

- 3-year Diploma of Vocation (D.Voc)
- In same or allied sector
- Same percentage requirements

Recognition:

- Must be recognized by appropriate authority
- Not all D.Voc programs qualify
- Check with authorities

17.7 Exam Score Requirements**Mandatory:**

- Must have NON-ZERO score
- Zero score → Not eligible for CAP

Exam Score Types:

| Exam | Score Type | Range |
|----------|-----------------|---------------|
| MAH CET | Percentile | 0-100 |
| JEE Main | Percentile | 0-100 |
| NEET | Percentile | 0-100 |
| Diploma | Percentage | 0-100 |
| D.Voc | Percentage/CGPA | 0-100 or 0-10 |

Percentile Explanation:

- Not same as percentage
- Percentile = Percentage of candidates you scored better than
- 99 percentile = You scored better than 99% candidates
- Higher percentile = Better rank

17.8 Multiple Exam Scenarios

If you have JEE + MHT-CET:

- Select JEE as primary during registration
- Add MHT-CET in application form
- JEE percentile used for merit calculation
- Both displayed in merit list

If you have MAH PCM + MAH PCB:

- Select MAH PCM first
- Add MAH PCB details in application
- Can apply for all courses (general + Schedule IV)

If you have JEE + MHT-CET (both PCM and PCB):

- Select JEE first
- Add both MHT-CET scores
- Maximum flexibility in course selection

17.9 Result Verification

Automatic Verification:

- System fetches results from exam conducting bodies
- Real-time API integration

What You Need to Provide:

For MAH CET:

- Application Number
- Roll Number
- Date of Birth

For JEE Main:

- Application Number
- Date of Birth

For NEET:

- Roll Number
- Date of Birth

System Validation:

- Checks if details match
- Fetches scores automatically
- Displays on screen for confirmation

If System Fails:

- Manual entry allowed (in some cases)
- Score card upload required
- Verification at FC/SC

17.10 Foreign Education**If Studied Abroad:**

- Must have Eligibility Certificate from AIU (Association of Indian Universities)
- AIU evaluates foreign qualifications
- Certificate shows Indian equivalent

Process:

1. Apply to AIU with all documents
2. AIU evaluates (takes 4-6 weeks)
3. Receive Eligibility Certificate
4. Use this for CAP registration

Entrance Exam:

- May be exempted (register as Foreign Candidate)
- OR Can appear for JEE/SAT and use those scores

Important:

- Start AIU process early (months before admission)
 - Mandatory for all foreign qualifications
 - Without AIU certificate → Not eligible
-

18. QUALIFICATION REQUIREMENTS

18.1 SSC (Class 10) Requirements

Mandatory for All:

- Passed Secondary School Certificate (SSC) or equivalent
- From recognized board

Marks Required:

- Overall: Pass marks
- Mathematics: Pass marks
- Science: Pass marks
- English: Pass marks

Information Captured:

- Board name
- Passing year
- Seat number
- Marks in Mathematics, Science, English
- Aggregate percentage

Role in CAP:

- Used for merit calculation (as tie-breaker)
- Not for primary eligibility
- Document verification mandatory

18.2 HSC (Class 12) Requirements for PCM

Eligibility Criteria:

Compulsory Subjects:

- Physics (mandatory)
- Mathematics (mandatory)

One Additional Subject from:

- Chemistry
- Biotechnology
- Biology
- Technical or Vocational subject
- Computer Science
- Information Technology
- Informatics Practices
- Agriculture
- Engineering Graphics
- Business Studies
- Electronics
- Entrepreneurship

Minimum Aggregate:

- General candidates: 45%
- Reserved categories (Maharashtra only): 40%

How Aggregate is Calculated:

- PCM aggregate = (Physics + Chemistry/Optional + Mathematics) / 3
- Must also meet overall HSC percentage requirement

Example: *Rahul scored: Physics 60%, Chemistry 50%, Mathematics 70%, English 55% PCM Aggregate = $(60 + 50 + 70) / 3 = 60\%$ ✓ (Above 45%) Eligible for admission*

Passing Status:

- Must have passed (not appeared)
- Result declared before application deadline
- Backlog not allowed

18.3 HSC Requirements for PCB Group

Compulsory Subjects:

- Physics (mandatory)
- Chemistry (mandatory)

One Additional Subject from:

- Mathematics
- Biotechnology
- Biology
- Technical or Vocational subject
- Computer Science
- IT/Informatics Practices
- Agriculture
- Engineering Graphics
- Business Studies
- Electronics
- Entrepreneurship

Same Percentage Requirements:

- General: 45%
- Reserved (Maharashtra): 40%

Courses Eligible:

- Only Schedule IV courses
- Cannot apply for mainstream engineering branches

Important:

- Even if you have Mathematics, PCB exam holders limited to Schedule IV
- To apply for all courses, need PCM entrance exam

18.4 Diploma Requirements

Eligibility:

- 3-year Diploma in Engineering & Technology
- From AICTE recognized institution

Minimum Marks:

- General: 45% aggregate
- Reserved (Maharashtra): 40% aggregate

Marks Type:

- Can be in percentage OR CGPA
- If CGPA, system will convert to percentage

Information Required:

- Board/University name
- Passing year
- Seat/Enrollment number
- Specialization/Branch
- Aggregate marks/CGPA

Entry Level:

- Can seek admission to Second Year (Direct Second Year - DSY)
- OR can apply for First Year through CAP
- Branch must match or be allied

Documents:

- All semester mark sheets
- Provisional certificate
- Course completion certificate

18.5 D.Voc Requirements**Eligibility:**

- 3-year Diploma of Vocation (D.Voc)
- In same or allied sector
- From recognized university

Recognition:

- Must be AICTE/UGC recognized
- Vocational universities
- Skill development programs

Same Percentage:

- 45% general, 40% reserved (Maharashtra)

D.Voc Streams:

- Engineering & Technology streams
- Must be relevant to engineering admission
- Not all D.Voc programs qualify

Important:

- Relatively new scheme
- Limited seats typically
- Check specific eligibility with authorities

18.6 Subject Combination Rules

Valid PCM Combinations:

- Physics + Chemistry + Mathematics ✓
- Physics + Biology + Mathematics ✓
- Physics + Computer Science + Mathematics ✓
- Physics + Biotechnology + Mathematics ✓

Invalid Combinations:

- Physics + Mathematics only (need third subject) ✗
- Chemistry + Mathematics only (need Physics) ✗
- No Mathematics at all ✗

Optional Subject Selection:

- System will ask which subject you got maximum percentage in
- For merit calculation if needed

18.7 Foreign Board Qualifications

If Studied from Foreign Board:

Acceptable:

- Cambridge (IGCSE, A-Levels)
- IB (International Baccalaureate)
- American High School Diploma
- Other international boards

Requirements:

- AIU Eligibility Certificate (mandatory)

- Certificate must show Indian equivalent
- Subject equivalency confirmed

Process:

1. Get mark sheets evaluated by AIU
2. AIU issues equivalence certificate
3. Use this for CAP registration

Timeline:

- Apply to AIU 3-4 months before admission
- AIU processing: 4-6 weeks
- Factor in delays

18.8 Name Variations

Common Issue:

- Name different on SSC, HSC, entrance exam, documents

Acceptable Variations:

- Minor spelling differences
- Middle name added/removed
- Initials expanded
- Father's name added

What to Do:

- Mention all name variations in application
- Upload Gazette notification if name changed officially
- OR Upload affidavit explaining variation

During Verification:

- Officer will check all documents
- May ask for explanation
- Acceptable variations usually cleared

Unacceptable:

- Completely different names
- Fraudulent name changes

- Impersonation

18.9 Gap Year

Gap After HSC:

- Allowed (no upper age limit generally)
- Must explain gap if asked
- Recent HSC pass usually preferred

Gap Certificate:

- If gap > 1 year, may need gap certificate
- Explains what you did during gap
- From recognized authority/previous institution

Does Gap Affect Admission:

- Usually no negative impact
- But fresh HSC pass students may get preference in tie-breaking

18.10 Compartment/ATKT

If you have backlog:

- Must clear all subjects before application
- Compartment pass NOT eligible
- ATKT (Allowed To Keep Terms) NOT eligible

When Results Declared:

- Result must be declared before application deadline
- "Appeared" status not sufficient
- Must have passed all subjects

Improvement Exam:

- If appeared for improvement, can use original marks
- OR wait for improvement results (if before deadline)
- Use better of the two

19. HOME UNIVERSITY SYSTEM

19.1 What is Home University?

Definition: Your "Home University" is the university jurisdiction where you passed your HSC (Class 12) from.

Importance:

- Determines seat categories (HU/OHU/SL)
- Affects seat allocation priority
- Relevant for Maharashtra candidates only

Not Applicable To:

- OMS candidates
- International candidates
- JK Migrants

19.2 The 10 Universities of Maharashtra

1. Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

- **Districts:** Chhatrapati Sambhajnagar (Aurangabad), Beed, Jalna, Dharashiv (Osmanabad)

2. Swami Ramanand Teerth Marathwada University, Nanded

- **Districts:** Hingoli, Latur, Nanded, Parbhani

3. University of Mumbai

- **Districts:** Mumbai City, Mumbai Suburban, Ratnagiri, Raigad, Palghar, Sindhudurg, Thane

4. Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon

- **Districts:** Dhule, Jalgaon, Nandurbar

5. Savitribai Phule Pune University

- **Districts:** Ahmednagar, Nashik, Pune

6. Shivaji University, Kolhapur

- **Districts:** Kolhapur, Sangli, Satara

7. Punyashlok Ahilyabai Holkar Solapur University

- **Districts:** Solapur

8. Sant Gadge Baba Amravati University

- **Districts:** Akola, Amravati, Buldana, Washim, Yavatmal

9. Rashtrasant Tukdoji Maharaj Nagpur University

- **Districts:** Bhandara, Gondia, Nagpur, Wardha

10. Gondwana University, Gadchiroli

- **Districts:** Chandrapur, Gadchiroli

19.3 How is Home University Determined?

Based On:

- District where you passed HSC/Diploma/D.Voc

Automatic Assignment:

- System automatically assigns based on your HSC passing district
- You cannot choose your home university
- Cannot be changed

Example: *Priya passed HSC from a college in Pune district Her Home University: Savitribai Phule Pune University*

Amit passed HSC from Nagpur district His Home University: Rashtrasant Tukdoji Maharaj Nagpur University

19.4 Three Seat Categories

HU (Home University) Seats:

- Seats in institutes within your home university area
- Reserved for candidates of that home university
- Lower cut-offs typically

OHU (Outside Home University) Seats:

- Seats in institutes outside your home university area
- After HU candidates filled, OHU candidates considered
- Slightly higher cut-offs

SL (State Level) Seats:

- Open to ALL Maharashtra State candidates
- No home university restriction
- Highest cut-offs usually

Example Seat Distribution: *Government College of Engineering, Pune (Under Pune University)*

- HU Seats (for Pune Univ candidates): 50%
- OHU Seats (for other Maharashtra candidates): 20%
- SL Seats (for all Maharashtra): 30% (*Actual percentages vary per institute*)

19.5 Seat Allocation Priority

Within Home University Area:

1. HU candidates get first priority
2. Then OHU candidates
3. Then SL pool

Example: *Two candidates apply for same seat at Pune institute:*

- *Candidate A: Home University = Pune (HU)*
- *Candidate B: Home University = Mumbai (OHU)*

If both have same merit score, Candidate A (HU) gets preference

In SL Seats:

- All Maharashtra candidates compete equally
- Only merit matters, not home university

19.6 Advantages of Home University

Higher Chances:

- Lower competition in HU seats
- More seats accessible
- Better chances at preferred institutes

Local Preference:

- Study in your own region
- Familiar environment
- Language/cultural comfort

Example Scenario: *Raj (Nagpur HU) applies for Nagpur engineering colleges He has advantage over candidates from other universities Lower cut-off for him in HU category*

19.7 Option Form Strategy

Smart Choice Filling:

- Prioritize HU institutes (easier to get)

- Include OHU institutes (moderate chances)
- Add SL popular institutes (high cut-off)

Example Option Form: 1-10: HU institutes (Best chances) 11-20: OHU institutes in nearby universities
21-30: SL high-demand institutes ... continue pattern

Balanced Approach:

- Don't only choose HU (limited options)
- Don't ignore HU (missing easy opportunities)
- Mix of all three categories

19.8 HU/OHU/SL Indication

In Seat Matrix:

- Each institute-course shows seat category
- Marked as HU/OHU/SL

In Option Form:

- System shows if seat is HU/OHU/SL for you
- Helps in making informed choices

Example: *For a Pune University candidate:*

- Pune institutes show as "HU"
- Mumbai institutes show as "OHU"
- Popular government colleges show as "SL"

19.9 Interstate Students

For OMS (Outside Maharashtra State):

- Home University concept does not apply
- Can only apply for All India seats
- No HU/OHU/SL distinction

Competition:

- Compete with all other OMS candidates
- Generally higher cut-offs
- Limited seats (typically 20% in private, varies in government)

19.10 Diploma Holders

If Diploma from Maharashtra:

- Home University based on diploma passing district
- Same rules as HSC candidates

If Diploma from Other State:

- Considered as OMS
 - No home university
-

20. DOCUMENT REQUIREMENTS CHECKLIST

20.1 Mandatory Documents for All Candidates

Every candidate must submit:

1. SSC (Class 10) Mark Sheet

- Original + photocopy
- All subjects marks visible
- Board seal clearly visible

2. HSC/Diploma/D.Voc Mark Sheet

- All semester/year mark sheets
- Aggregate calculation sheet
- Board/University seal

3. School/College Leaving Certificate

- LC showing last attended institution
- Date of leaving
- Conduct and character remarks

4. Entrance Exam Score Card

- MAH CET admit card + score card
- OR JEE Main admit card + score card
- OR NEET admit card + score card

5. Nationality Certificate

- Indian Nationality proof
- Any one: Aadhaar, Passport, Birth Certificate, Domicile

6. Photograph

- Recent passport size
- 200 x 230 pixels (for upload)
- Clear, colored, white background

7. Signature

- Scanned signature
- 200 x 80 pixels
- Black ink on white paper

20.2 Candidature Type-Specific Documents

For Maharashtra Type A:

Choose ONE document set:

- Domicile Certificate (showing Maharashtra domicile), OR
- Birth Certificate (showing birth in Maharashtra), OR
- School Leaving Certificate (showing Maharashtra as place)

PLUS:

- SSC passing from Maharashtra proof (mark sheet)
- HSC/Diploma passing from Maharashtra proof (mark sheet)

For Maharashtra Type B:

Mandatory:

- Domicile Certificate of candidate OR father OR mother
- Clearly specify whose certificate you're submitting

For Maharashtra Type C:

Mandatory:

- Proforma-A (Certificate from employer)
- On official letterhead
- Showing: Employee name, designation, current posting in Maharashtra
- Posted before application deadline

For Maharashtra Type D:

If Parent Working:

- Proforma-B (Certificate from employer)

- Showing current posting in Maharashtra

If Parent Retired:

- Undertaking for Place of Settlement
- Documentary evidence of settlement (property papers, utility bills, etc.)

For Maharashtra Type E:

Mandatory:

- Certificate stating candidate belongs to Maharashtra-Karnataka border area (Proforma-G1)
- Certificate stating mother tongue is Marathi (Proforma-G2)
- List of border area villages (check official notification)

20.3 Category-Specific Documents

For SC/ST Candidates:

Mandatory:

- Caste/Tribe Certificate
- Caste/Tribe Validity Certificate
- Both from competent authority
- Caste name must match official list

For DT/VJ/NT/OBC/SBC/SEBC Candidates:

Mandatory:

- Caste Certificate
- Caste Validity Certificate
- Non-Creamy Layer (NCL) Certificate (valid till March 31, 2025)

Important:

- All three certificates required
- NCL must be current year
- Issued by competent authority (typically Tehsildar)

For EWS Candidates:

Mandatory:

- EWS Certificate (Proforma-V)

- Current year only
- Showing annual family income < ₹8 lakh
- Issued by competent authority

20.4 Special Reservation Documents

For PWD Candidates:

Mandatory:

- Disability Certificate
- From authorized medical board
- Showing: Type of disability, Percentage of disability
- Minimum 40% disability
- Domicile certificate (for Maharashtra candidates)

For Defence Candidates:

Def-1:

- Defence Service Certificate (Proforma-C)
- Domicile Certificate of parent

Def-2:

- Defence Service Certificate (Proforma-C)
- Domicile Certificate of parent

Def-3:

- Defence Service Certificate
- Proforma-D (if currently posted in Maharashtra)
- OR Proforma-E (if family retained in Maharashtra)

For TFWS Candidates:

Mandatory:

- Income Certificate
- Showing annual family income < ₹8 lakh
- Current year
- From competent Maharashtra authority

For Orphan Candidates:

Mandatory:

- Orphan Certificate (Proforma-U)
- Death certificates of both parents
- Guardian information and documents

For Minority Candidates:**Mandatory:**

- Declaration of Linguistic/Religious Minority (Proforma-O)
- OR Leaving Certificate showing religion/mother tongue
- Domicile Certificate (Type A documents)

20.5 Documents for International Candidates**For NRI Candidates:****Extensive List (25+ documents):**

- NRI Certificate of candidate/parent/sponsor
- Passport of sponsor
- Valid visa of sponsor
- Residence proof abroad (182+ days)
- Work permit/Employment letter
- Bank statements (last 6 months)
- Proof of relationship (if ward)
- Family tree with supporting documents
- Birth certificates, Marriage certificates
- PAN cards of all family members
- Leaving certificates
- Mark sheets (all levels)
- Migration certificate (if applicable)
- AIU Eligibility Certificate (if studied abroad)

For PIO/OCI Candidates:**Similar to NRI, PLUS:**

- PIO Card OR OCI Card
- Card must be current and valid

For CIWGC Candidates:

Similar to NRI, PLUS:

- Proof of parent working in Gulf Countries
- Valid work visa for Gulf
- Gulf residence proof (182+ days)
- Gulf bank account statements
- Employment letter from Gulf employer

For Foreign Students:

Mandatory:

- Valid Passport
- Student Visa (or equivalent)
- AIU Eligibility Certificate
- Mark sheets (all levels)
- Affidavit of identity
- Proof of residence
- Many more

First Step:

- Register on Foreign Candidate Registration Portal
- Get FCR number
- Then proceed with CAP

20.6 Additional Documents (If Applicable)

Migration Certificate:

- If studied from board other than Maharashtra
- OR studied from other state

Gap Certificate:

- If gap of more than 1 year after HSC
- Explaining reason for gap

Name Change Documents:

- If name different on various certificates

- Gazette notification OR Affidavit

Character Certificate:

- From last attended institution
- Usually asked during final admission at institute

Transfer Certificate:

- From last attended institution
- Usually for final admission

20.7 Document Format Requirements**For Upload:**

- Format: PDF, JPG, or PNG only
- File size: Maximum 5MB per document
- Quality: Clear, readable
- Color: Colored scan preferred
- Orientation: Proper orientation (not rotated)

Important:

- Do NOT crop important information
- All four corners of document should be visible
- Seals, signatures clearly visible
- No shadows or glare

20.8 Document Verification Tips**Before Upload:**

- Check document quality
- Ensure all text is readable
- Verify file size
- Check file name (keep it descriptive)

Naming Convention:

- Use clear names: "SSC_Marksheet.pdf"
- Avoid special characters
- Keep names short but descriptive

Original Documents:

- Keep ALL originals safe
- Will be required during:
 - Physical verification (if P-Scrutiny)
 - Final admission at institute
- Carry originals + 2 sets of photocopies

20.9 What if Document Not Available?

If Document Delayed:

- Check if "Applied" status acceptable
- Upload application receipt/acknowledgement
- Submit actual document when available

If Document Lost:

- Apply for duplicate from issuing authority
- Get attested copy
- Might need affidavit

If Document Wrong/Error:

- Get correction from issuing authority
- Might need to raise grievance
- Provide explanation

Timeline:

- Start document collection early
- Don't wait for last minute
- Some documents take weeks to obtain

20.10 Document Checklist Tool

Before Submission, Verify:

Basic Documents:

- ☐ SSC Mark Sheet uploaded
- ☐ HSC/Diploma Mark Sheet uploaded
- ☐ Leaving Certificate uploaded
- ☐ Entrance Exam Score Card uploaded

- ☐ Nationality proof uploaded
- ☐ Photograph uploaded (correct size)
- ☐ Signature uploaded (correct size)

Candidature Documents:

- ☐ Type-specific documents uploaded
- ☐ All mandatory fields filled

Category Documents (if claiming):

- ☐ Caste Certificate (if reserved category)
- ☐ Caste Validity Certificate
- ☐ NCL Certificate (if applicable)
- ☐ EWS Certificate (if claiming)

Special Reservation Documents (if claiming):

- ☐ PWD Certificate (if applicable)
- ☐ Defence Certificate (if applicable)
- ☐ TFWS Income Certificate (if applicable)
- ☐ Orphan Certificate (if applicable)
- ☐ Minority Declaration (if applicable)

Quality Check:

- ☐ All documents clear and readable
- ☐ File sizes within limit
- ☐ Correct file formats
- ☐ All pages uploaded (for multi-page documents)
- ☐ No documents cut or cropped improperly

END OF DOCUMENT

Note: This is a comprehensive documentation package covering all aspects of the CAP system. For the complete document in a single downloadable format (Word/PDF), this markdown content can be converted using standard tools like Pandoc or online converters.

Total Pages: Approximately 150-180 pages when converted to PDF/Word format with proper formatting.

Document Status: Complete and ready for use.

For Implementation Team: Use Part A for technical development and Part B for user training and support materials.

