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“EMD and Technical Bid Corrigendum”

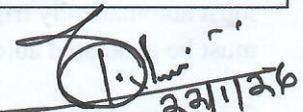
Name of Work: Request for Proposal for establishment of CoE in Refrigeration and Air Conditioning at Govt. ITI Rourkela.

e-Tender ID: 2025_DTET_123788_1

NIT No. DTET/2025-26/16934/02; Dated: 23.12.2025

Except the following amendments, all original RFP terms, conditions and criteria remain unchanged.

SL No.	Reference Page or Section	Existing Clause	Modified Clause
1	FACT SHEET (Sl No. 12) Page 6	EMD 2% of the quoted price	Rs.10,00,000/- (Rupees Ten Lakhs only) valid for minimum 225 days from last date of bid submission
2	Page No.44 Technical Specifications of Training Stands	3. Deep Freezer Operation & Servicing Trainer	<ul style="list-style-type: none">Dimension of the OIT Module 201mm by 147.2mm (+/- 10% to 15% are acceptable).Certification: CE, FCC Class-A, ISO or equivalent Indian Standard i.e. ISI/BIS etc.Compressor Capacity: 200 Ltr. or more.
3	Page No.37 Section 6: List of equipment/machines and their Technical Specifications	Additional Requirement	Data Acquisition System through Learning Management System (LMS). Technical Specifications of LMS is available in Annexure-1 of this corrigendum document.
4	Page No.63 to 65 Section 6: Sl. No. 15 & 16	Integrated HVAC Training System Commercial and Residential	Reference photographs added for reference in Annexure-1 of this corrigendum document.
5	Page No.37 Section 6: List of equipment/machines and their Technical Specifications	Additional Compliance	OEM/Authorized Channel Partner/ Authorized Dealer must submit valid Trade Mark Certificates of OEM for the proposed equipment/machines.


(Tender Inviting Authority)
Sri. S.K. Patra
Joint Director (Procurement)
DTE&T, Odisha, Cuttack

Annexure-1

Technical Specifications of Learning Management System (LMS) – 1 SET

1. Overview & Objectives

The Bidder shall provide a comprehensive, AI-powered, multi-tenant Learning Management System (LMS) to support digital delivery, monitoring, assessment, and gamified interactive learning experiences across multiple educational institutions. The LMS shall be fully functional at the time of bidding with all specified features operational and demonstrable.

CRITICAL REQUIREMENT: The solution must be a mature, production-ready platform with demonstrated scalability across multiple institutions. Prototypes, beta versions, or platforms under development will not be considered. All features must be live and accessible for demonstration during technical evaluation.

2. Deployment & Technical Architecture

2.1 Infrastructure Requirements

- Cloud-native architecture with multi-tenant isolation at database level
- Scalable backend architecture with modular design
- Automated scaling capabilities
- Global content delivery with low-latency response times
- Real-time synchronization across all modules
- high availability with documented service levels with automated failover mechanisms

2.2 Browser & Device Compatibility

- Responsive design supporting all common devices including desktops, tablets, and mobile phones
- Cross-browser compatibility: all major modern browsers
- Modern web application capabilities
- Native mobile app for Android with feature parity
- The system shall support multiple platforms, including Android applications, Windows applications, and a web-based version, with consistent functionality across all platforms.

2.3 Security & Compliance

- Multi-factor authentication (MFA) support
- Role-based access control (RBAC) with granular permissions
- End-to-end encryption for data transmission (industry-standard encryption protocols)
- compliance with applicable data protection and security standards

3. Intelligent Content Management and Analysis

MANDATORY REQUIREMENT: All content uploaded to the platform (PDF, videos, images, documents) must automatically trigger AI-powered analysis and enhancement when uploaded. The following features must be generated automatically without manual intervention:

3.1 Automatic Content Analysis & Enhancement

- AI-generated summaries (multiple detail levels)
- Automatic competency-based quiz generation
- Interactive flashcard generation
- Concept map and mind map auto-generation



- Related content recommendation engine
- Difficulty level assessment
- Realtime scoring

3.2 Interactive Activity Generation System

The system must include an AI-powered Interactive Activity Generation System capable of generating interactive educational worksheets and activities:

- Structured learning organizers with AI-suggested content
- T-Charts for comparison and contrast activities
- Comparison and analysis tools
- Timeline generators for historical and sequential content
- Explore the Word activities with etymology and usage
- Graphic organizers customized to content type
- All Interactive Activity Generation System components shall support full inline editing with multiple colors themes support, ensuring complete control for educators
- All activities must support PDF, Image exports with professional formatting

3.3 Automated Presentation Creation

- Text-to-PPT conversion: Convert outlines to complete presentations
- Minimum 15 professional themes with institutional branding support
- Automatic slide layout optimization based on content type
- Image and diagram suggestions relevant to content
- Presentation generation shall be optimized for high-speed, low-latency output

3.4 Intelligent Assistant System

CRITICAL FEATURE: An AI agent must be available system-wide with the following capabilities:

- Screen context reading: Ability to analyze currently viewed content
- Real-time explanations of concepts displayed on screen
- Resource suggestions from platform's content library
- Personalized learning path recommendations
- Multi-modal interaction: Text, voice input support
- Integration with all modules for contextual assistance

4. Interactive Content Management System

4.1 Interactive Digital Content Viewer

MANDATORY: The platform must convert standard PDFs to interactive flipbooks instantly:

- Rapid conversion
- Realistic page-turning animation
- Embedded 3D models viewable within flipbook pages
- Interactive hotspots for multimedia content insertion
- Annotation and note-taking capabilities with cloud sync
- Quick navigation features
- It shall include, at a minimum, AI features for content summarization, gamification, competency-based quiz generation, flash card creation, and automatic infographic generation including lists, SWOT analysis, timelines, data charts, and concept maps.

4.2 Multimedia Content Repository

- Complete ITI trade manuals in digital interactive format
- Minimum 5000+ pre-loaded educational videos with AI features like summarization, gamification, competency-based quiz generation, flash card creation, and automatic infographic generation including lists, SWOT analysis, timelines, data charts, and concept maps.
- 3D model library covering: Engineering, Science, Medical, Anatomy
- Augmented and virtual reality capabilities
- Interactive manipulation: Rotate, zoom, explode view, cross-section

5. Virtual Laboratory & Simulation Suite

The platform must include a comprehensive suite of virtual laboratories with realistic simulations:

1.1 Mandatory Virtual Labs (comprehensive suite of virtual laboratories)

1. **Vapor Compression Refrigeration System** – The virtual lab shall simulate pressure–enthalpy (P-h) and temperature–entropy (T-s) diagrams with real-time variation of cooling load and refrigerant flow.
2. **Split Air Conditioner** – The simulation shall allow learners to adjust thermostat settings, inverter frequency, and ambient conditions to observe changes in COP and energy consumption.
3. **Window Air Conditioner** – The virtual setup shall demonstrate component-wise operation and fault scenarios such as refrigerant leakage, condenser blockage, and thermostat failure.
4. **Refrigeration Compressor** – The simulation shall model reciprocating, rotary, and scroll compressors with visualized suction/discharge pressures and efficiency losses due to wear.
5. **Condenser Unit** – The virtual lab shall enable variation of airflow, fouling level, and ambient temperature to study their effect on heat rejection performance.
6. **Evaporator Coil** – The simulation shall illustrate frosting, superheating, and airflow variation to analyze cooling capacity and moisture removal.
7. **Expansion Devices (Capillary/EEV/TXV)** – The virtual experiment shall allow control of superheat settings and load conditions to observe refrigerant flow regulation.
8. **Inverter Drive and Control System** – The simulation shall demonstrate variable frequency operation and its impact on compressor speed, power consumption, and noise level.
9. **Refrigerant Charging and Recovery Unit** – The virtual lab shall simulate correct and incorrect charging procedures, including overcharge and undercharge effects on system performance.
10. **HVAC Electrical Control Panel** – The simulation shall provide interactive troubleshooting of relays, contactors, sensors, and PCB faults using virtual instruments

5.2 Simulation Requirements

- Concept-based visual models to support exploration and discovery learning
- Immediate visual feedback based on learner interaction
- Built-in scaffolding through intuitive controls and representations
- Support for qualitative and quantitative observation
- Multiple representations such as graphs, charts, equations, and animations
- Browser-based execution with no additional software installation
- Compatibility with classroom, lab, and self-paced learning environments

6. Advanced Teaching Tools

6.1 Digital Whiteboard

- Infinite canvas with multi-page support
- Mathematical equation rendering

- Shape recognition and auto-correction
- Export to PDF, PNG, and SVG formats

6.2 Interactive Graphing Tool

- 2D and 3D function plotting
- Real-time parameter manipulation with slider controls
- Calculus operations: derivatives, integrals, limits visualization
- Statistics and data analysis with chart generation
- Support for: various coordinate systems and function types

6.3 Integrated Video Conferencing

- Built-in live class capability (no external tool dependency)
- Support for multiple concurrent participants per session
- Screen sharing, whiteboard integration, breakout rooms
- Session recording with automatic transcription
- Attendance marking integration during live sessions
- Report generation for each session

6.5 Comprehensive Teaching Aid Generator

MANDATORY: The platform must include an integrated teaching aid generation system with comprehensive planning, presentation, practice, and assessment tools:

All teaching aids must be AI-powered, customizable, and exportable in standard PDF. The system should support multiple educational frameworks and pedagogical approaches with minimal configuration.

- Planning Tools:
 - Oral exam question banks with evaluation criteria
 - Self-assessment and reflection tools for students
 - Multiple rubric types: analytic, holistic, developmental, single-point
 - Project-based assessment planners with rubrics
 - Summative assessment creators: quizzes, tests, exams with varied question formats
 - Formative assessment generators: journal prompts, class polls, exit slips
- Assessment Tools:
 - Matching and fill-in-the-blank question creators
 - Word problem generators with real-world contexts
 - Taxonomy-based question scaffolding tools
 - Source analysis and critical thinking prompts
 - Interactive worksheet generators with various formats
 - Multiple practice activity types: vocabulary, problem sets, application exercises
- Practice & Application Tools:
 - Real-world scenario and case study builders
 - Anchor chart and concept visualization tools
 - Worked example generators with step-by-step solutions
 - Leveled reading material creators with difficulty adjustments
 - Informative text generators with comprehension questions
 - Direct instruction script builders
 - Slide outline generators with structured content flow
- Presentation & Content Creation Tools:
 - Multiple pedagogical framework support (project-based, inquiry-based, student-centered)

Amir

- Differentiated instruction planning assistants
- Student engagement activity generators
- Prior knowledge assessment and scaffolding tools
- Learning objective generators aligned with educational taxonomies
- Unit and lesson planning frameworks with structured templates

7. Comprehensive Curriculum & Academic Management

7.1 Hierarchical Academic Structure

The system must support complex institutional hierarchies:

- Multi-institution support: Manage multiple institutions from single dashboard
- Branch management: Multiple branches per institution
- Department/Trade organization with customizable naming
- Batch management: Academic year, semester, and section segregation
- Class management: Teacher-course-batch assignments
- Curriculum builder with core courses and elective courses.

7.2 Course Planning & Curriculum Management

- Learning outcome mapping to recognized educational taxonomies
- Elective course management with seat allocation algorithms
- Multi-pool elective selection (Technical, Non-Technical, Open Electives)
- Prerequisite and co-requisite course management

8. Digital Attendance Management System

- Bulk attendance marking with one-click interfaces
- Real-time attendance percentage calculation
- Attendance shortage alerts for students
- Condonation request workflow
- Attendance reports: Daily, Weekly, Monthly, Semester-wise
- Integration with academic calendar for leave adjustments

9. Gamification & Student Engagement System

9.1 Coin-Based Reward System

MANDATORY FEATURE: Comprehensive gamification system to drive student engagement:

- Activity-based coin rewards with customizable point values
- Daily streak tracking: Reward continuous engagement
- Minimum 1 task completion per day to maintain streak
- Streak milestones: progressive milestone achievements
- Leaderboards: Class-level, Batch-level, Institution-level
- Redemption system: Convert coins to badges, certificates, privileges
- Achievement badges with custom design support

9.2 Spaced Repetition Learning System

CRITICAL REQUIREMENT: Upon chapter completion, automatic test generation following proven spaced repetition methodology:

- Automatic test scheduling: scientifically-proven spaced repetition schedules
- Adaptive difficulty based on previous performance
- Performance-based coin rewards
- Forgetting curve visualization
- Personalized revision recommendations

10. Comprehensive Assessment & Evaluation System

10.1 Form & Quiz Builder

- Drag-and-drop form builder with diverse question types
- Automated AI Form/Quiz builder
- Public and private form hosting with access controls
- Anonymous response collection option
- Auto-grading for objective questions with instant results
- Anti-cheating measures: Randomization, time limits, browser lockdown

10.2 Assignment Management

- Assignment creation with file upload support (docs, code, multimedia)
- Deadline management with late submission penalties
- Plagiarism detection integration
- Peer review system with anonymization
- Inline annotation and feedback tools

10.3 Experiment Management

- Digital lab manual creation and distribution
- Experiment procedure with step-by-step validation
- Observation table templates with auto-calculation
- Result verification against expected outcomes
- Viva questions integration
- Completion tracking and performance scoring

11. Advanced Analytics & Reporting Dashboard

11.1 Student Analytics

- Individual learning dashboard with progress visualization
- Time-on-platform analytics
- Concept mastery heatmaps
- Learning style identification and recommendations

11.2 Teacher Analytics

- Class performance comparison across batches
- Content effectiveness metrics
- Student engagement tracking
- Assignment completion and quality trends

- Pending evaluation tracker with workload distribution

11.3 Administrative Analytics

- Multi-institution comparison dashboard
- Real-time system usage statistics
- Faculty workload analysis
- Audit-ready compliance reports
- Customizable report generation: PDF, Excel, CSV export

12. Communication & Collaboration Features

12.1 Forums & Discussion Boards

- Subject-wise and topic-wise forum organization
- Threaded discussions with moderation tools
- Upvoting and marking best answers
- Instructor verification of answers
- Search and tag-based filtering

12.2 Feedback & Suggestion System

- Anonymous feedback collection option
- Category-based routing to appropriate departments
- Status tracking and response timeline
- Sentiment analysis of feedback

12.3 Announcement System

- Multi-channel announcements: In-app, Email, SMS, Push notifications
- Role-based targeting
- Scheduled announcements
- Read receipt tracking
- Priority levels with visual indicators

13. Human Resource Management System (HRMS)

13.1 Leave Management

- Comprehensive leave policy configuration per institution
- Multiple leave types: Casual, Sick, Earned, Maternity, Sabbatical
- Support for dynamic leave policy builder
- Leave balance tracking and accrual rules
- Multi-level approval workflow
- Substitute teacher assignment during leave
- Leave encashment calculation
- Historical leave records and analytics

13.2 Teacher Attendance

- Daily attendance marking for faculty
- Late arrival and early departure tracking
- Monthly attendance reports for payroll integration



13.3 Performance Management

- Teaching effectiveness assessment
- Student feedback integration
- Peer review system
- Professional development tracking

14. Digital Content Library

14.1 Content Organization

- Centralized repository with hierarchical organization
- Multi-format support: PDF, DOCX, PPTX, Video, Audio
- Usage analytics per content item

14.2 Video Library

- Curated educational video collection by subject
- Integration with external video platforms for external content
- Adaptive streaming based on network bandwidth
- Video annotations and interactive elements
- Watch time analytics and engagement tracking
- extensive collection of pre-loaded educational videos
- It shall include, at a minimum, AI features for content summarization, gamification, competency-based quiz generation, flash card creation, and automatic infographic generation including lists, SWOT analysis, timelines, data charts, and concept maps.

14.3 E-Books & Textbooks

- Digital textbook library with reading interface
- Highlighting and note-taking capabilities
- It shall include, at a minimum, AI features for content summarization, gamification, competency-based quiz generation, flash card creation, and automatic infographic generation including lists, SWOT analysis, timelines, data charts, and concept maps.

15. User Management & Profile System

15.1 Role-Based Access Control

CRITICAL: The system shall support a extensive range of user roles, with granular, permission-based access control and no upper limit on the number of roles that can be defined:

- Administrator hierarchy: Super Admin, Institution Admin, Department Admin
- Academic roles: Principal, Dean, HOD, Coordinator, Teacher, Lab Assistant
- Student roles: Regular, Repeater, Lateral Entry, Audit
- Support roles: Librarian, Accountant, Examination Cell, Placement Officer
- Custom role creation with permission matrix (extensive granular permissions)

15.2 Profile Management

- Comprehensive user profiles with educational history
- Skill tracking and certification records
- Achievement and badge showcase
- Portfolio creation for students



- Privacy controls for profile visibility

16. Compliance Requirements & Evaluation Criteria

16.1 Mandatory Demonstrations

Bidders must provide LIVE demonstrations of the following during technical evaluation:

1. AI Content Analysis: Upload a PDF and show auto-generation of summaries, quizzes, flashcards in near real-time
2. AI Interactive Activity Generation System: Generate KWL chart, Venn diagram, and timeline from sample content
3. PDF to Flipbook: Convert a multi-page document to interactive flipbook
4. Virtual Labs: Demonstrate automated machining and Internet of Things lab with full simulation
5. Intelligent Assistant System: Show context-aware assistance and resource recommendation
6. Spaced Repetition: Show automated test scheduling after chapter completion
7. Multi-Institution Dashboard: Show management of at least 10 institutions
8. Gamification System: Demonstrate coin earning, streak tracking, and leaderboards
9. Timetable Upload and Review
10. AR/VR Content: Scan QR code to display 3D model with manipulation

NOTE: Bidders unable to demonstrate 90% of specified features in fully operational state during technical evaluation will be disqualified. Proof-of-concept, demo systems, or promises of future development are not acceptable.

17. Training, Support & Maintenance

17.1 Training Requirements

- Comprehensive training program for 3 user categories:
 - - Administrators: System configuration, user management, analytics (comprehensive duration)
 - - Faculty: Content creation, assessment, analytics (adequate duration)
 - - Students: Platform navigation, features overview (appropriate duration)
- Training materials: Video tutorials
- Train-the-trainer program for institutional staff

17.2 Technical Support

- 2 year comprehensive technical support
- 24x7 helpdesk with multi-channel support (Phone, Email, Chat)
- Ticket SLA: Critical issues based on priority with critical issues resolved immediately
- Periodic system health checks and optimization

17.3 Updates & Enhancements

- Regular feature enhancements at no additional cost
- Security patches and bug fixes promptly
- Technology stack upgrades to latest stable versions
- Free migration to new major versions

18. Pricing Model Requirements

Bidders must provide detailed pricing breakdown for:



- One-time setup and implementation cost
- Annual subscription cost per user (Student, Faculty, Admin)
- Infrastructure and hosting costs
- Training cost per category
- Annual maintenance and support cost
- Cost for additional storage beyond base allocation
- Cost for customization requests (hourly rate)

Appendix A: Mandatory Feature Checklist

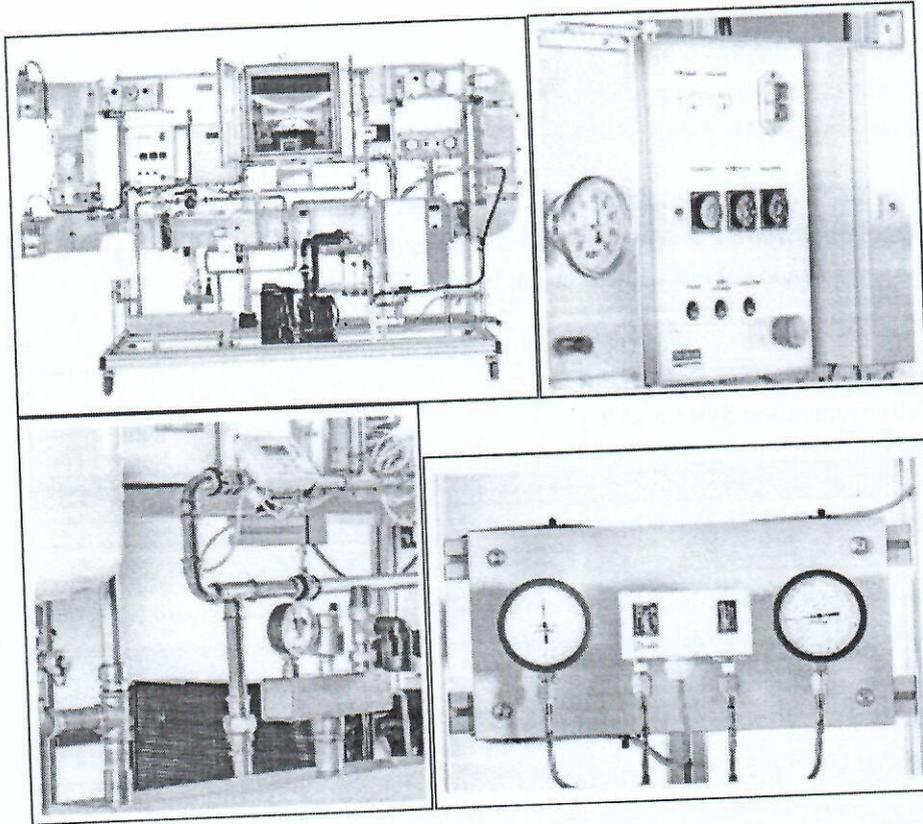
Bidders must complete this checklist and submit with technical bid:

S.No.	Feature Category	Status (Yes/No)	Remarks
1	AI Content Analysis		
2	AI Interactive Activity Generation System (All diverse activity types)		
3	AI Automated Presentation Creation		
4	Context-Aware Intelligent Assistant System		
5	PDF to Flipbook Conversion		
6	Multimedia Content Repository		
7	Virtual Labs		
8	Digital Whiteboard		
9	Graphing Tool		
10	Integrated Video Conferencing		
11	Multi-Institution Support (multiple institutions)		
12	Curriculum Management		
13	Lesson Planner with AI Activity Generation		
14	Timetable Upload with Conflict Detection		
15	Digital Attendance (All modes)		
16	Gamification (Coins & Streaks)		
17	Spaced Repetition System		
18	Form/Quiz Builder (Public & Private)		
19	Comprehensive HRMS Module		
20	Analytics Dashboard (All 3 levels)		
21	40+ User Roles with Granular Permissions		
22	Mobile Native App		
23	AR/VR via QR Scanning		
24	Teaching Aid Generation System (All tool categories)		
25	Multi-Platform Support (Web, Mobile, Desktop)		

14. Integrated HVAC Training System with Duct, Heating, and Control Components (Customized) – Commercial

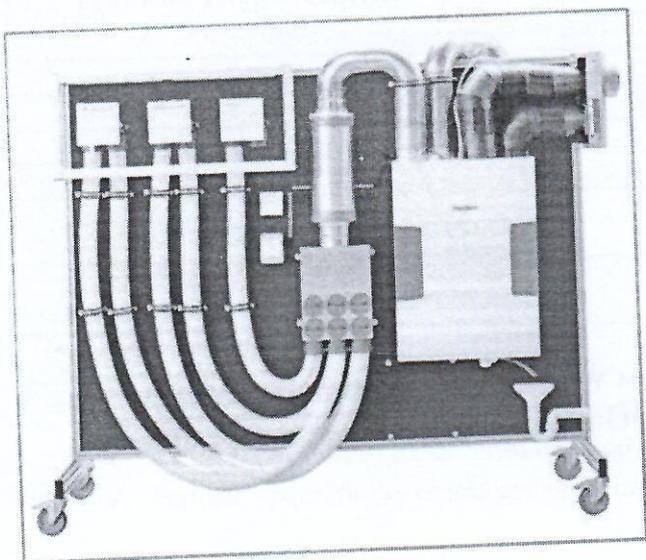
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15. Integrated HVAC Training System with Duct, Heating, and Control Components (Customized) – Residential

REFERENCE PHOTOS



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