

AUTOMOTIVE TECHNICAL ACADEMY (ATA)

ATA-T100

Transmission Systems Technology

Curriculum Framework (Version 1.0)

Programme Status: Proposed for Locking

Programme Information

Programme Code:

ATA-T100

Programme Title:

Transmission Systems Technology

Qualification Level:

Professional Diploma

Duration:

48 Weeks

Training Days:

5 Days Per Week

Hours Per Day:

8 Hours

Total Contact Hours:

1,920 Hours

Teaching Philosophy

- **70% Practical = 1,344 Hours**
 - **30% Theory = 576 Hours**
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Entry Requirement

Successful completion of:

ATA-M000 – Automotive Mechanical Engineering Foundation

or

Recognition of Prior Learning (RPL) in accordance with ATA admission policy.

Programme Goal

ATA-T100

To produce competent transmission systems technicians capable of inspecting, servicing, diagnosing, repairing, rebuilding, assembling, testing, and maintaining manual, automatic, automated manual (AMT), continuously variable (CVT), dual-clutch (DCT), transfer case, differential, final drive, and driveline systems using professional workshop practices, precision measurement techniques, and OEM-informed service procedures.

Graduate Competency Profile

Graduates shall be able to:

- Identify the operating principles of manual, automatic, AMT, CVT, and DCT transmissions.
 - Inspect, diagnose, and service clutch systems.
 - Remove and install transmission assemblies safely.
 - Service gear trains, synchronizers, bearings, and shafts.
 - Diagnose hydraulic, mechanical, and electronically controlled transmission faults.
 - Inspect and overhaul torque converters.
 - Service valve bodies and transmission fluid systems.
 - Inspect and service transfer cases and differentials.
 - Measure transmission components using precision instruments.
 - Perform driveline inspection and balancing checks.
 - Apply OEM torque specifications and assembly procedures.
 - Verify repairs through functional testing and road testing.
 - Produce professional inspection and repair reports.
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Programme Structure

Module	Title	Weeks	Hours
T100-01	Transmission Workshop Practice, Safety & Professional Procedures	3	120
T100-02	Manual Transmission Systems & Clutch Technology	7	280
T100-03	Automatic Transmission Systems & Torque Converters	8	320
T100-04	CVT, AMT & Dual-Clutch Transmission (DCT) Systems	6	240
T100-05	Transfer Case, Differential & Final Drive Systems	5	200

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Module	Title	Weeks	Hours
T100-06	Transmission Inspection, Precision Measurement & Overhaul	6	240
T100-07	Hydraulic, Electronic Controls & Diagnostic Procedures	5	200
T100-08	Driveline Systems, Quality Assurance & Performance Verification	4	160
T100-09	Integrated Transmission Workshop Projects	2	80
T100-10	Industrial Attachment, Capstone Project & Final Assessment	2	80
TOTAL		48 Weeks	1,920 Hours

Module 1

Transmission Workshop Practice, Safety & Professional Procedures

Duration: 3 Weeks

Topics

- Workshop safety
- Safe lifting procedures
- Transmission handling equipment
- Transmission fluid safety
- OEM service manuals
- Workshop documentation
- Torque specifications
- Environmental management
- Professional ethics
- Quality assurance principles

Practical Competencies

Students will:

- Safely remove and handle transmission units.
 - Apply workshop safety procedures.
 - Complete professional service documentation.
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Module 2

Manual Transmission Systems & Clutch Technology

Duration: 7 Weeks

Topics

- Manual gearbox construction
- Gear ratios
- Input and output shafts
- Synchronizer assemblies
- Shift mechanisms
- Clutch types
- Flywheel inspection
- Release bearings
- Hydraulic clutch systems
- Clutch adjustment
- Manual transmission servicing

Practical Competencies

Students will:

- Remove and install manual transmissions.
 - Inspect and replace clutch assemblies.
 - Measure gearbox components.
 - Assemble and test manual transmissions.
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Module 3

Automatic Transmission Systems & Torque Converters

Duration: 8 Weeks

Topics

- Automatic transmission architecture
- Planetary gear sets
- Hydraulic circuits
- Valve bodies
- Torque converters
- Oil pumps
- Clutches and bands
- Solenoids

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- Transmission fluid management
- Automatic transmission servicing

Practical Competencies

Students will:

- Strip and assemble automatic transmissions.
 - Inspect valve bodies.
 - Test hydraulic circuits.
 - Diagnose common automatic transmission faults.
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Module 4

CVT, AMT & Dual-Clutch Transmission (DCT) Systems

Duration: 6 Weeks

Topics

- CVT pulley systems
- Steel belts and chains
- AMT architecture
- DCT construction
- Electronic actuation
- Clutch packs
- Control strategies
- Preventive maintenance
- Diagnostics

Practical Competencies

Students will:

- Service CVT components.
 - Inspect DCT clutch assemblies.
 - Perform functional checks on electronically controlled transmission systems.
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Module 5

Transfer Case, Differential & Final Drive Systems

Duration: 5 Weeks

Topics

- Transfer case operation
- Differential types

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- Ring and pinion gears
- Limited-slip differentials
- Final drive ratios
- Axle shafts
- Universal joints
- Constant velocity (CV) joints
- Four-wheel-drive systems

Practical Competencies

Students will:

- Inspect and overhaul differentials.
 - Replace bearings and seals.
 - Set ring and pinion backlash.
 - Verify driveline operation.
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Module 6

Transmission Inspection, Precision Measurement & Overhaul

Duration: 6 Weeks

Topics

- Wear analysis
- Shaft runout
- Bearing preload
- Gear tooth inspection
- End-float measurement
- Seal replacement
- Synchronizer inspection
- Transmission overhaul procedures

Practical Competencies

Students will:

- Measure transmission components accurately.
 - Determine serviceability.
 - Rebuild transmission assemblies to specification.
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Module 7

Hydraulic, Electronic Controls & Diagnostic Procedures

Duration: 5 Weeks

Topics

- Hydraulic pressure testing
- Transmission control modules (TCM)
- Shift solenoids
- Sensors
- Wiring fundamentals
- Scan tool usage
- Live data interpretation
- Diagnostic workflows
- Fault verification

Practical Competencies

Students will:

- Test transmission hydraulic pressure.
- Diagnose electronically controlled transmission faults.
- Interpret scan tool data.
- Verify repairs.

Module 8

Driveline Systems, Quality Assurance & Performance Verification

Duration: 4 Weeks

Topics

- Propeller shafts
- Drive shafts
- Universal joints
- CV joints
- Driveline vibration
- Noise diagnosis
- Road testing
- Quality control
- Customer reporting

Practical Competencies

Students will:

- Inspect driveline systems.

- Diagnose vibration and noise complaints.
 - Conduct post-repair road tests.
 - Prepare professional quality assurance reports.
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Module 9

Integrated Transmission Workshop Projects

Duration: 2 Weeks

Students complete integrated projects including:

- Manual transmission overhaul
 - Automatic transmission servicing
 - Differential overhaul
 - Driveline inspection
 - Hydraulic pressure testing
 - Electronic transmission diagnosis
 - Functional verification
 - Workshop documentation
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Module 10

Industrial Attachment, Capstone Project & Final Assessment

Duration: 2 Weeks

Students complete:

- Supervised industrial attachment
 - Comprehensive transmission repair project
 - Practical trade test
 - Written examination
 - Technical presentation
 - Portfolio defence
 - Exit competency assessment
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Required Laboratories & Workshops

- Transmission Systems Workshop
- Automatic Transmission Laboratory
- Manual Transmission Laboratory
- Differential & Final Drive Laboratory

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- Transmission Hydraulic Testing Laboratory
 - Electronic Transmission Diagnostics Bay
 - Driveline Service Workshop
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Essential Training Equipment

Students should train with:

- Manual transmission training units
 - Automatic transmission training units
 - CVT training assemblies
 - DCT training assemblies
 - Torque converter cutaway models
 - Hydraulic pressure test kits
 - Professional scan tools
 - Transmission jacks
 - Engine/transmission stands
 - Bearing pullers and installers
 - Dial indicators
 - Micrometers
 - Vernier calipers
 - Torque wrenches
 - OEM transmission service manuals
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Assessment Structure

Assessment	Weight
Continuous Practical Assessment	35%
Practical Trade Tests	30%
Written Examination	15%
Capstone Project	15%
Professional Conduct & Industrial Attachment	5%
TOTAL	100%

Career Opportunities

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Graduates may work as:

- Transmission Systems Technician
- Automatic Transmission Technician
- Manual Transmission Specialist
- CVT/DCT Service Technician
- Differential & Driveline Technician
- Fleet Maintenance Technician
- OEM Transmission Service Technician
- Technical Instructor
- Workshop Supervisor
- Independent Transmission Specialist