GCC
GUAM COMMUNITY COLLEGE
Kulehon Kumunidát Guáhan

PROGRAM APPROVAL FORM

COVER SHEET

Trades and Professional Services
SCHOOL

Automotive Service Technology
DEPARTMENT

Certificate in Medium/Heavy Truck Diesel Technology
PROGRAM TITLE

Christopher Dennis
AUTHOR

May 1, 2009
DATE SUBMITTED

Check the action to be taken and have the indicated people sign.

☒ Program Adoption - all signatories
☐ Program Substantive Revision - all signatories except President

APPROVED BY	NAME	APPROVED	DISAPPROVED	DATE	ACTION*
DEPARTMENT CHAIR	Christopher Dennis	☒	☐	3/19/09	WC 5/4/09
REGISTRAR	Patrick L. Clymer	☒	☐	6/13/09	NC
DEAN	Reilly Ridgell	☒	☐	6/13/09	NC
CURRICULUM COMMITTEE CHAIR	Anthony San Nicolas	☒	☐	6/13/09	WC
VP, ACADEMIC AFFAIRS	R. Ray D. Somera, Ph.D.	☒	☐	7/9/09	
PRESIDENT	Mary A. Y. Okada	☑	☐	9 19 09	

* Indicate if the document had no corrections (NC), was approved with minor corrections (WC), or was disapproved and returned back to author (BTA).

This version of the cover sheet facilitates the eventual transition to an all on-line curricula approval process.

PROGRAM APPROVAL FORM
FOR ADOPTION AND SUBSTANTIVE REVISION

I. TYPE OF ACTION

Check the type of action that applies. If previous Program Approval Form exists, please attach.

A. ☒ Adoption program

B. ☐ Substantive Revision (attach Program Form).
The numbers listed next to the changes below may or may not require a response; they have been identified as those questions most likely needing to be addressed. The entire program form should be reviewed for applicability.

- ☐ Change in number of credit hours: II, IVA, IVD, VI, VII, VIII, XI
- ☐ Change in Technical/Core Requirements: II, IVA, IVD, VI, VII, VIII, XI
- ☐ Change in distribution of requirements affecting Related Technical or General Education Requirements, Technical/Core Requirements, or General Education Requirements: II, IVA, IVD, VI, VII, VIII, XI.

II. INTRODUCTION

This program was developed to address the demand for diesel medium and heavy truck technicians on Guam and to align curriculum to reflect current industry standards.

III. PROGRAM DESCRIPTION & STUDENT LEARNING OUTCOMES - PROGRAM LEVEL

This program description will appear in the College Catalog followed by the Student Learning Outcomes – Program Level

Program Description:

The Medium/Heavy Truck Diesel Technology program prepares graduates to work in the automotive field with special emphasis in diesel service. Graduates will be able to troubleshoot, maintain, and repair various types of diesel engines, trucks, boats, and other heavy equipment. Students will obtain knowledge and skills in Medium/Heavy Truck in a variety of areas to include: diesel engines, drive trains, brake systems, suspension and steering, heating, ventilation, and air conditioning, hydraulics, electrical/electronic systems, and preventive maintenance.

Students completing this program will have preparatory knowledge in the eight main areas of the Medium/Heavy Truck Diesel Technology and will prepare them for entry-level, Assistant Technician positions. This program prepares graduates to pass the ASE National Certification Exams and enter the workforce as entry-level, Junior Technicians.

If the description above is a revision, indicate the catalog page(s) to be revised.
Catalog Year:
Page Number(s):

Upon successful completion of this program, students will be able to:

1. **Seek employment as a Heavy/Medium Truck Technician, Fleet Mechanic, Heavy Marine Diesel Technician, Generator Repair, Heavy Equipment Repair or Parts Counter person.**
2. **Troubleshoot, maintain, and repair various heavy trucks and mobile equipment, including bulldozers, boats, cranes, road graders, farm tractors, and combines.**

IV. RATIONALE FOR PROPOSAL

A. Reason this proposal should be adopted in light of the College's mission statement and educational goals.

Through a network of industry partners, GCC will address the workforce shortage in the diesel mechanic industry by creating a Medium/Heavy Truck Diesel Technology Program (Truck Diesel Program) based on the Automotive Service Excellence (ASE) and the National Automotive Technicians Education Foundation (NATEF) guidelines. The Truck Diesel Program will incorporate a comprehensive skills based curriculum reflecting ASE and NATEF standards. Today's automotive technician must have thorough knowledge of automotive systems and components, good computer skills, manual dexterity, above average mechanical aptitude, excellent communication skills, good reasoning ability, and the ability to read and follow instructions. Graduates completing this program will have the expertise in the following areas: Diesel engines, medium/heavy truck (MHT) drive trains, MHT brake systems, MHT suspension and steering, MHT heating, ventilation, and air conditioning, MHT hydraulics, MHT electrical/electronic systems, and MHT preventive maintenance. These components comprise all the NATEF required areas of training meeting industry-recognized, uniform standards of excellence.

B. Long-term employment outlook for this program area, including the number of available positions in the service area for graduates and expected salary level.

As the sole community and technical college on Guam, GCC plays a vital role in workforce development. Guam is expecting seventeen thousand U.S. Marines and their dependents including military personnel by the end of 2014. The anticipated economic impact will ultimately increase the educational demand for careers related to diesel service. The anticipated construction, new and upgraded facilities, and increased housing to accommodate the expected growth in population add an anticipated 15,000 jobs to include employment opportunities for MHT diesel service. Additionally GCC and industry partners must work together to develop trained individuals in MHT diesel service to provide the necessary resources and build capacity for the expected growth and increased jobs.

C. Conformity of this program to legal and other external requirements. Include State Voc/Tech requirements, accrediting agency standards, State Board regulations, and professional certification or licensing requirements if applicable.

As State Agency for Career and Technical Education and Adult Education, GCC supports high growth/high demand careers. GCC also provides opportunities for students to acquire a variety of national certifications. The Truck Diesel Program will afford students the opportunity to become ASE certified.

D. Results of program evaluation (see Appendix F for Checklist).
The Medium/Heavy Truck Diesel Technology program; herein referred to as Truck Diesel Program was never fully developed and was archived in the curriculum vault. Two courses, ME196A Diesel Engine Repair I and ME196B Diesel Engine Repair II were identified as part of the Automotive Technology curriculum in 1987 and utilized as a guide to develop Diesel courses for the Apprenticeship program. A substantive revision of the originally drafted (but unapproved) Truck Diesel Program has been developed to reflect a certificate program.

V. RESOURCE REQUIREMENTS AND COSTS

A. Resources (materials, media, and equipment) and costs.
Various consumable materials and instructional, repair, and media equipment, related to teaching diesel technology, will be needed. Starts up costs are estimated at $100,000.00 with maintenance costs of $5,000.00 per semester.

B. Personnel requirements (administrative, instructional, and support staff) and costs.
This course will be taught by full-time and/or adjunct faculty assigned to the department who has knowledge and expertise in the field of study. Regular salary scales will apply. Office support staff normally provided to faculty will he sufficient.

C. Facility requirements.
Due to a lack of available space on main campus, a facility will have to be outsourced. The facility must have a 20 ft. high ceiling in shop, 5000 sq. ft., minimum, of floor space, and a classroom that can accommodate 20 students. The estimated cost is $7000.00 to $8000.00 a month (based on the going rate of $1.50 per sq. ft. for commercial space).

D. Funding source(s).
This course is a part of the locally funded College budget.

E. Impact, financial or otherwise, this program may have on the College.

Auto technology is a viable career path with an opportunity for steady employment and good wages. Compensation ranges from $25,000 at entry level to more than $65,000. The Department of Labor Occupational Outlook Handbook: 2006-07 provides background information about the complexity of industry requirements and advises completing a formal training program in a postsecondary vocational school or a community college to gain entry-level work in the automotive field.

Additionally, programs for automotive technology that meet the rigorous standards set forth by the NATEF and individuals obtaining ASE certification are in high demand and regard in the industry. ASE certification is a nationally

recognized standard for programs offered by high schools, postsecondary trade schools, technical institutes, and community colleges.

GCC's Certificate in Medium/Heavy Truck Diesel Technology program will build the capacity of automotive technology with the empbasis on diesel service and at the ASE certification level expected by industry. GCC plays a vital role in workforce development and with the expected military increase; the demand for careers related to MHT diesel services will also increase. Through this program offering, GCC will respond to the needs of the community and the impact financial or otherwise will be favorable for the college, industry, and the community.

VI. IMPLEMENTATION SCHEDULE

Implementation date: Spring or Summer 2010

VII. CATALOG (MOVED TO SECTION III)

VIII. PROGRAM DESCRIPTION

A. Program Title(s)

Long Title: **Certificate in Medium/Heavy Truck Diesel Technology, General Service Technician and/or Master Service Technician Distinction**

Abbreviated Title (20 characters maximum): **Diesel Tech GST/ MHT**

B. Credit Hours

General Education:	**3**
Technical/Core:	**36**
Related Tech/Gen Ed:	
Electives:	
Options:	
Total Number of Credits:	**39**

* In addition to GST Technical/Core

C. Course Sequence

General Service Technician Track

1st Semester

MA108 Introduction to College Algebra I
MHT100A Intro to Diesel Technology and Preventive Maintenance Part I
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Abbreviated Title (20 characters maximum): **Diesel Tech GST/ MHT**

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General Education:	**3**
Technical/Core:	**36**
Related Tech/Gen Ed:	
Electives:	
Options:	
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C. Course Sequence

General Service Technician Track

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MHT100A Intro to Diesel Technology and Preventive Maintenance Part I
MHT 100B Intro to Diesel Technology and Preventive Maintenance Part II

2nd Semester

MHT110 Diesel Engines Part I
MHT120 MHT Drive Trains Part I
MHT130 MHT Brake Systems Part I
MHT140 MHT Suspension and Steering Part I
MHT150 MHT Heating, Ventilation, and Air Conditioning (HVAC) Part I

3rd Semester

MHT160 MHT Hydraulics Part I
MHT170 MHT Electrical/Electronic Systems Part I
MHT210 Diesel Engines Part II
MHT230 MHT Brake Systems Part II
MHT270 MHT Electrical/Electronic Systems Part II

D. Target Population

Persons who demonstrate strong skills working with tools, computerized equipment, focused, ready for mental challenges, able to troubleshoot, and have the tenacity to follow through. In addition, those folks should be seeking a career in automotive technology with an emphasis in diesel services.

E. Cost to Student
Current tuition and lab fees will apply.

IX. PRE-REQUISITE (S)

Students must place into EN100W and MA095 or higher in order to begin the Certificate in Medium/Heavy Truck Diesel Technology (Truck Diesel Program). The Truck Diesel Program is an intensive two-year comprehensive skill based training requiring students to move through the program in a sequential manner as outlined above. Students placing in lower levels of English and Math must complete the lower levels before being admitted to the program and taking technical required courses.

MHT 100 level courses must be taken before the MHT 200 level course counterpart (i.e. MHT130 MHT Brakes System Part I before MHT230 MHT Brakes System Part II).

X. CO-REQUISITE (S)

None

XI.CONTENT

A. List of courses required for completing this program. Courses grouped according to: General Education, Technical Requirements, etc. If new courses are part of the program, Course Guides must be included with this request for approval.

Certificate in Medium/Heavy Truck Diesel Technology

Students must test out or successfully complete EN100R and EN100W in addition to placing into MA108 or higher in order to begin in the Truck Diesel Program. This is an intensive one-year comprehensive skill-based training program which requires students to move through the program in a sequential manner. Students placing in lower levels of English and Math must complete the lower levels before being admitted to the program and taking the technical requirements.

MHT 100 level courses must be taken before the MHT 200 level course counterparts (i.e. MHT130 MHT Brakes System Part I before MHT230 MHT Brakes System Part II).

Course requirements may identify prerequisites that must be completed with a passing grade. Prerequisites course credits are not counted as credits earned towards the program unless it is an Associate Degree core course requirement. Prerequisites are identified in the course description section of this catalog, and below with a + sign next to each course with a prerequisite.

General Education Requirements

Course # Course	Credits
EN100R Fundamentals of English-Reading	-
EN100W Fundamentals of English-Writing	-
MA108 Introduction to College Algebra I +	3
Total General Education Requirements	**3**

Technical Requirements

Course # Course	Credits
MHT100A Intro to Diesel Technology and Preventive Maintenance Part I	3
MHT100B Intro to Diesel Technology and Preventive Maintenance Part II	3
MHT110 MHT Diesel Engines Part I	3
MHT120 MHT Drive Trains Part I	3
MHT130 MHT Brake Systems Part I	3
MHT140 MHT Suspension and Steering Part I	3
MHT150 MHT Heating, Ventilation, and Air Conditioning (HVAC) Part I	3
MHT160 MHT Hydraulics Part I	3
MHT170 MHT Electrical/Electronic Systems Part I	3
MHT210 MHT Diesel Engines Part II +	3
MHT230 MHT Brake Systems Part II +	3
MHT270 MHT Electrical/Electronic Systems Part II +	3
Total Technical Requirements	**36**

TOTAL CREDITS REQUIRED	**39**

TECHNICAL REQUIREMENTS

MHT100A Intro to Diesel Technology and Preventive Maintenance Part I (3)

This is the first of a two part introductory course that prepares students for study within specific areas of Medium/Heavy Truck Diesel Technology. Topics covered include workshop safety practices, proper usage of hand tools, special tools and testing equipment, and preventive maintenance procedures on diesel engines, fuel systems, air induction and exhaust systems.

Upon successful completion of this course, students will be able to:

1. Demonstrate proper workshop safety practices
2. Identify, describe and demonstrate the proper usage of hand tools, special tools, and testing equipment.

3. Perform preventive maintenance procedures on diesel engines, fuel systems, air induction and exhaust systems.

MHT100B Intro to Diesel Technology and Preventive Maintenance Part 11(3)

This is the second of a two part introductory course that prepares students for study within specific areas of Medium/Heavy Truck & Diesel Technology. The course focuses on preventive maintenance procedures involving the cooling system, lubrication systems, cab and hood, safety equipment, hardware, heating ventilation & air conditioning (HVAC), electrical/electronics, charging systems, lighting systems. frame and chassis, hydraulic brakes, drive trains, suspension & steering systems, tires & wheels, and frame with fifth wheel.

Upon successful completion of this course, students will be able to:

1. Execute preventive maintenance procedures on cooling systems, lubrication systems, cab and hood.
2. Carry out preventive maintenance procedures on safety equipment, hardware, heating ventilation & air conditioning (HVAC), electrical/electronics, charging systems, lighting systems, frame and chassis.
3. Perform preventive maintenance procedures on hydraulic brakes, drive trains. suspension & steering systems, tires & wheels, and frame with fifth wheel.

MHT110 Diesel Engines Part 1 (3)

A basic introduction in the theory and operation of diesel engines that includes general engine diagnostics, minor diagnosis and repair of cylinder head and valve train, engine block. lubrication system, and cooling system. Prerequisite: MHT100A & MHT100B

Upon successful completion of this course, students will be able to:

1. Explain general diesel engine operation and perform basic engine troubleshooting and repair.
2. Demonstrate cylinder head and valve train diagnostics and repair
3. Expound engine block diagnostics and repair
4. Identify lubrication system components and diagnose and repair minor problems.
5. Name the major parts and explain the functions of the cooling system and execute minor diagnostic and repair procedures.

MHT120 MHT Drive Trains Part I (3)

This course entails classroom instruction and laboratory training covering fundamentals of Medium/Heavy Truck Drive Trains that include diesel transmission and clutch. Prerequisite: MHT100A & MHT100B

Upon successful completion of this course, students will be able to:

1. Describe clutch operation.
2. Discuss diesel transmission functionality.
3. Troubleshoot elemental transmission drivability problems and repair elemental faults.

MHT130 MHT Brake Systems Part I (3)

This course provides instruction in Medium/Heavy Truck Brakes that includes basic diagnosis & repair of air supply and service systems, mechanical/foundation systems, and parking brakes. Prerequisite: MHT100A & MHT100B

Upon successful completion of this course, students will be able to:

1. Depict air supply and service systems operation
2. Identify mechanical/foundation system components and perform minor repairs.
3. Explain parking brake operation

MHT140 MHT Suspension and Steering Part 1 (3)

This is a study of elements in Medium/Heavy Truck Suspension & Steering that include introductory level steering system functions, diagnostics, and repair, suspension system functions, diagnostics, and repair, and wheel alignment diagnosis, adjustment, and repair. Prerequisite: MHT100A & MHT100B

Upon successful completion of this course, students will be able to:

1. Differentiate between different steering system designs and explain their functions.
2. Identify suspension system components and discuss basic functionality.
3. Perform wheel alignment diagnosis, adjustment, and repair

MHT 150 MHT Heating, Ventilation, and Air Conditioning (HVAC) Part 1 (3)

This course gives students basic instruction in Medium/Heavy Truck Heating Ventilation & Air Conditioning (HVAC) that include HVAC systems diagnosis, service, and repair, general A/C system diagnosis, service, and repair, A/C compressor and clutch, diagnosis, service, and repair, and evaporator, condenser, and related components, diagnosis, service, and repair. Prerequisite: MHT 100A & MHT 100B

Upon successful completion of this course, students will be able to:

1. Depict basic HVAC system operation.
2. Troubleshoot general A/C system malfunctions.
3. Explain A/C compressor and clutch operation and perform basic repairs.
4. Describe evaporator, condenser, and related components' functionality.

MHT 160 MHT Hydraulics Part 1 (3)

This course provides students with fundamental instruction in Medium/Heavy Truck Hydraulic Systems that include entry level general hydraulic system diagnosis, service, and repair, hydraulic system pump diagnosis, service, and repair, and filtration/ reservoirs (tanks) diagnosis, service, and repair. Prerequisite: MHT 100A & MHT 100B

Upon successful completion of this course, students will be able to:

1. Recognize general hydraulic system components and carry out entry level diagnosis, service, and repair.
2. Ascertain basic hydraulic system failures and perform preliminary pump diagnosis, service, and repair.
3. Perform fundamental filtration/reservoirs (tanks) diagnosis, service, and repair.

MHT170 MHT Electrical/Electronic Systems Part 1 (3)

This course is designed to give students an elemental understanding of Medium/Heavy Truck Electrical/Electronic Systems that include general electrical systems diagnosis, battery diagnosis and repair, and starting system diagnosis and repair. Prerequisite: MHT 100A & MHT 100B

Upon successful completion of this course, students will be able to:

1. Perform general electrical systems diagnosis.
2. Discuss battery construction and determine cause/s of battery failure.
3. Demonstrate fundamental starting system diagnosis and repair.

MHT210 Diesel Engines Part 11(3)

This course builds on MHT110; the course of study includes air induction and exhaust systems diagnosis and repair, fuel supply system diagnosis and repair, mechanical fuel injection diagnosis and repair, electronic fuel management system diagnosis and repair, and engine brakes diagnosis and repair. Prerequisite: MHT 110

Upon successful completion of this course, students will be able to:

1. Troubleshoot, intermediate level, air induction and exhaust system failures and perform needed repairs.
2. Diagnose, intermediate level, fuel supply system failures and perform needed repairs.
3. Ascertain, intermediate level, mechanical fuel injection faults and perform needed repairs.
4. Determine, intermediate level, electronic fuel management system problems and perform needed repairs.
5. Perform, intermediate level, engine brakes diagnosis and repair.

MHT230 MHT Brake Systems Part 11 (3)

This course prepares students to perform complex diagnostics and repairs on hydraulic brakes, power assist units, and air and hydraulic antilock brake systems (ABS) and automatic traction Control (ATC). Prerequisite: MHT130

Upon successful completion of this course, students will be able to:

1. Ascertain hydraulic brake problem causes and rectify faults.
2. Demonstrate power assist unit failure analysis and take proper steps to correct failure.
3. Locate air and hydraulic Antilock Brake System (ABS) and Automatic Traction Control (ATC) faults and perform needed repairs.

MHT270 MHT Electrical/Electronic Systems Part II (3)

This course builds on MHT170; the course of study includes lighting systems diagnosis and repair and gauges and the diagnosis and repair of warning devices. Prerequisite: MHT170

Upon successful completion of this course, students will be able to:

1. Locate faults in the lighting system and correct problems.
2. Pinpoint failure causes in gauges and warning devices and take proper action to correct situation.

XII. PROGRAM MEANS OF ASSESSMENT AND CRITERIA FOR SUCCESS

Assessment and criteria for success will be carried out through the college's Assessment and Institutional Effectiveness (AIE) department.

XIII. ARTICULATION

A. Secondary programs
None

B. University of Guam
None

C. Others
None

* Attach SLO Map – Program & Course Levels.