

Academic Credit Agreement

Old Dominion University

- **BS in Business Administration (Management)**
- **BS in Electrical Engineering Technology**
- **BS in Mechanical Engineering Technology**
- **BS in Occupational & Technical Studies– Industrial Technology**
- **BS in Electrical Engineering**
- **BS Mechanical Engineering**
- **BS Modeling and Simulation Engineering**



Thomas Nelson Community College A.A.S. MECHANICAL ENGINEERING TECHNOLOGY SPECIALIZATION: MARINE ENGINEERING 956-01 2013-2014			The Apprentice School MET - Marine Engineering Program Requirements		Old Dominion University BS Mechanical Engineering Technology	
TNCC GENERAL EDUCATION COURSES			NNAS MET Program Requirements		ODU Course Equivalents	
Course#	Course Title	Credit				Credit
ENG 111	College Composition I	3	E111 (TNCC)		ENGL 110C (Gen Ed Written Communication)	3
ENG 115	Technical Writing	3	C232 (NNAS)		ENGL 231C (Gen Ed Written Communication)	3
---	Humanities Elective	3	E126 or P220 (TNCC)		ENG 112L (Gen Ed Literature) or PH 230E (Gen Ed Philosophy)	3
---	Social Science Elective	3	H121 (TNCC)		PHS 104H (Gen Ed Interpreting the Past)	3
ECO 201	Principles of Economics I	3	E201 (TNCC)		ECO 201S (Gen Ed Human Behavior)	3
MTH 163	Precalculus I	3	M163 (TNCC)		MTH 162M	3
MTH 164	Precalculus II	3	M165 (TNCC)		MTH 163	3
PHY 201	General College Physics I	4	P222 (NNAS) + P221 (NNAS) + P199 (TNCC)		PHYS 111N (Gen Ed Science)	3
PHY 202	General College Physics II	4	P202 (TNCC)		PHYS 112N (Gen Ed Science)	4
HLT/PEd	Health or Physical Education Elective(s)	1	H210 (TNCC) or Apprentice School Athletics (NNAS) or Military			4
SDV 100	College Success Skills	1	S100 (TNCC)		HEALTH 2ELE	1
					UNIV 100	1
Total General Education Course Credits		31			Total General Education Course Credits	

MAJOR AND OTHER COURSES			Total General Education Course Credits	
Course #	Course Title	Credit		
CHM 111	College Chemistry	4	C221 (TNCC)	
CAD 151	Engineering Drawing Fundamentals I	3	D111 (NNAS) + 40 hrs CAD Training (NNAS)	EHEM 121N/CHEM 122N
CAD 241	Parametric Solid Modeling	4	D241 or D211	MET 120
MAR 120	Introduction to Ship Systems ¹	3	N111 (NNAS) + N222 (NNAS)	MET 240
MAR 211	Naval Architecture ¹	3	N236 (NNAS)	
MAR 212	Naval Architecture II ¹	3	N237 (NNAS)	ENGH 110
MEC 113	Materials and Processes of Industry	3	M113 (TNCC)	ENGT 111
MEC 131	Mechanics I-Statics for Engineer Tech	3	M131 (TNCC)	MET 200
MEC 132	Mechanics II-Strength of Materials for Engineer Technology	3	M132 (TNCC)	CET 200
MTH 173	Calculus with Analytic Geometry I	4	M173 (TNCC)	CET 220
---	Elective	3	D243	MAIH 211
N/A ¹			Apprenticeship Completion (NNAS)- OJT & Trades Experience	STEM 221/231 (Course Substitution)
CST 100 ¹	Principles of Public Speaking	3	C243 (NNAS)	MET 225
Total Major and Other Course Credits		39		COMM 101R
Total Minimum Credits		67		

REMAINING ODU GENERAL EDUCATION COURSES (required)		NNAS MET Program Requirements		Total Transfer Credits	
Human Creativity: Fine & Performing Arts ²	Credit				
	3	N/A		ODU Course Equivalents	66
				Refer to ODU Undergraduate Catalog for course options	
					3

The lower division general education Language and Culture requirements will be satisfied by completion of all courses outlined in this program agreement.

Philosophy and Ethics, Information Literacy and Research and Impact of Technology are met through the major.

*Student must earn C or better for course to transfer.

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Additional Old Dominion University Requirements			
EET	350	Fund. of Electrical Tech.	3
EET	355	Electrical Laboratory	1
MET	300	Thermodynamics	3
MET	310	Dynamics	3
MET	320	Design of Machine Elements	3
EET	305	Adv. Technical Analysis	3
MET	330	Fluid Mechanics	3
MET	335W	Fluid Mechanics Laboratory	1
MET	350	Thermal Applications	3
MET 370 & 386		Automation and Controls & Automation and Controls Lab	4
ENMA	480	Ethics and Philosophy in Engineering Applications	3
MET	387	Power and Energy Laboratory	2
MET	434	Intro to Senior Project	1
ENGN	401	Fund. of Engineering Review	1
MET	435W	Senior Design Project (grade of C or better required)	3
Senior Electives		(MET)	12
Minor	Students must select from any minor in either the College of Engineering and Technology or the College of Sciences		12
Total Credits to be Taken at ODU			61
Total Transfer Credits			100
Total Credits for Degree at ODU			161

SUMMARY

All 100/200-level required math, science and engineering technology courses must be completed with a C or better prior to enrollment in any 300-level engineering technology courses.

James H. Hughes 11-11-13
Signature Date

Dr. Jim Hughes
Manager, Trainer
Apprentice School

[Signature] 12/21/13
Signature Date

ODU Department Chair

Everett Jordan 11-11-13
Signature Date

Everett Jordan
Director of Education
Apprentice School

[Signature] 12/11/13
Signature Date

Dr. Brian Payne
Vice Provost, Academic Programs
Old Dominion University

Thomas Nelson Community College A.A.S. ELECTRONICS TECHNOLOGY SPECIALIZATION: ELECTRICAL ENGINEERING TECHNOLOGY 981-04 2013-2014		The Apprentice School EET - Electrical Engineering Tech Program Requirements		Old Dominion University BS Electrical Engineering Technology	
TNCC GENERAL EDUCATION COURSES		NNAS EET Program Requirements		ODU Course Equivalents	
Course#	Course Title	Credit			Credit
ENG 111	College Composition I	3	E111 (TNCC)	ENGL 110C (Gen Ed Written Communication)	3
ENG 112 or ENG 115	College Composition II or Technical Writing	3	C232 (NNAS)	ENGL 231C (Gen Ed Written Communication)	3
---	Humanities Elective	3	E126 or P220 (TNCC)	ENG 121 (Gen Ed Literature) or PHI 230E (Gen Ed Philosophy)	3
---	Social Science Elective	3	H121 (TNCC)	HIS 103H (Gen Ed Interpreting the Past)	3
---	Social Science Elective	3	E201 (TNCC)	EEO 201S (Gen Ed Human Behavior)	3
MTH 163	Precalculus I	3	M163 (TNCC)	MATH 162M	3
MTH 164	Precalculus II	3	M165 (TNCC)	MTH 163	3
MTH 173	Calculus with Analytic Geometry I	4	M173 (TNCC)	MATH 211	3
PHY 201	General College Physics I	4	P222 (NNAS) + P221 (NNAS) + P199 (TNCC)	PHYS 111H (Gen Ed Science)	4
PHY 202	General College Physics II	4	P202 (TNCC)	PHYS 112H (Gen Ed Science)	4
HLT/PEO	Health or Physical Education Elective(s) ¹	1	HLT 210/H210 (TNCC) or Apprentice School Athletics (NNAS) or Military	HLTJ 2ELE	1
SDV 100	College Success Skills	1	S100 (TNCC)	UNIV 100	1
Total General Education Course Credits		35		Total General Education Course Credits	35
MAJOR AND OTHER COURSES					
Course #	Course Title	Credit			Credit
ELE 239	Programmable Controllers	3	X313 + X316 (NNAS)	STEM 242	3
ETR 10A	Electronic Fundamentals with Computer Applications	4	X311 + X312 + X313 (NNAS)	ENGN 1ELE	4
ETR 113	DC and AC Fundamentals I	4		EET 110, EET 205	4
ETR 114	DC and AC Fundamentals II	4		EET 200	4
ETR 148	Amplifiers and Integrated Circuits	4	X314A (NNAS)	EET 210, EET 225	4
ETR 231	Principles of Lasers & Fiber Optics I	3	E231 (TNCC)	ENGN 2ELE	4
ETR 250	Solid State Devices	4	X314B (NNAS)	EET 220, EET 225	3
ETR 261	Microprocessor Application I	4	E262 (TNCC)	ENGN 2ELE	4
ETR 279	Digital Principles, Terminology and Applications	4	E279 (TNCC)	EET 120, EET 125	4
Total Major and Other Course Credits		34			4
Total Minimum Credits		69		Total Minimum Credits	69
ADDITIONAL TRANSFERABLE COURSES					
Course #	Course Title	Credit	Course Equivalents		Credit
MAR 211 ²	Naval Architecture I	3	N236 (NNAS)	ODU Course Equivalents	3
MAR 212 ²	Naval Architecture II	3	N237 (NNAS)	ENGN 110	2
CST 100 ²	Principles of Public Speaking	3	C243 (NNAS)	ENGT 111	2
CHM 111 ²	College Chemistry	4	C221 (TNCC)	COMM 101R	3
				CHEM 121N/CHEM 122H	4
Total Minimum Credits		13		NNAS EET Program Total Transfer Credits	80
REMAINING ODU GENERAL EDUCATION COURSES					
Course #	Course Title	Credit			Credit
	Human Creativity: Fine & Performing Arts ¹	3	N/A	ODU Course Equivalent	3
Total Remaining ODU General Education Credits		3		Refer to ODU Undergraduate Catalog for course options	3

The lower division general education Language and Culture requirements will be satisfied by completion of all courses outlined in this program agreement.

Philosophy and Ethics, Information Literacy and Research and Impact of Technology are met through the major.

*Must earn C or better for course to transfer.

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Additional Old Dominion University Requirements			
EET	300	Advanced Circuit Analysis	3
EET	305	Advanced Technical Analysis	3
EET	310	Digital Electronics	3
EET	315	Digital Electronics Laboratory	2
EET	360	Electrical Power and Machinery	3
EET	365W	Electrical Power and Machinery Laboratory	2
EET	320	Microprocessors and Microcontrollers	3
EET	325	Microprocessor Laboratory	2
EET	330	Linear Electronics	3
EET	312	Wireless Communications	4
EET	335	Linear Electronics Laboratory	2
EET	434	Introduction to Senior Project	1
EET	370T	Energy and the Environment	3
EET	480W	Senior Project (Grade of C or better required)	3
ENMA	480	Ethics and Philosophy in Engineering Applications	3
Senior Electives		(EET)	6
Minor	Students must select from any minor in either the College of Engineering and Technology or the College of Sciences.		12
Total Credits to be Taken at ODU			58
Total Transfer Credits			83
Total Credits to be Taken at ODU			58
Total Credits for Degree at ODU			141

SUMMARY

James M. Hughes 11-11-13
signature Date

Dr. Jim Hughes
Manager, Trainer
Apprentice School

[Signature] 11/11/13
Signature Date

ODU Department Chair

Robert Young 11-11-13
signature Date

Dr. Robert Young
Vice President of Instruction and Student Services
Blue Ridge Community College

[Signature] 11/11/13
Signature Date

Dr. Brian Payne
Vice Provost, Academic Programs
Old Dominion University

Tidewater Community College A.S. ENGINEERING 831 2013-2014		The Apprentice School Electrical Engineering Program Requirements		Old Dominion University BS Electrical Engineering	
TRNC GENERAL EDUCATION COURSES		NNAS Elec Engineering Program Requirements		ODU Course Equivalents	
Course #	Course Title	Credit			Credit
ENG 111	College Composition I	3	EL11 (TRCC)	ENGL 110C (Gen Ed Written Communication)	3
ENG 112	College Composition II	3	C232 (NNAS) [Course Substitution]	ENGL 231C (Gen Ed Written Communication)	3
---	Humanities/Fine Arts Elective	3	ENG 125/E126 (TRCC)	ENGL 112L (Gen Ed Literature)	3
---	Humanities/Fine Arts Elective	3	PHI 220/P220 (TCC)	PHI 230E (Gen Ed Philosophy)	3
---	History Elective	3	HIS 121/M121 (TRCC)	HIS 104H (Gen Ed Interpreting the Past)	3
---	Social Science Elective	3	ECO 201/E201 (TRCC)	ECO 201S (Gen Ed Human Behavior)	3
MATH 173	Calculus with Analytic Geometry I	4	M173 (TRCC)	MATH 211	3
MATH 174	Calculus with Analytic Geometry II	4	M174 (TCC)	MATH 212	4
CHM 111	College Chemistry	4	C221 (TCC)	CHEM 121H/CHEM 122H	4
CHM 112	College Chemistry	4	C222 (TCC)	CHEM 123H/CHEM 124H	4
HLT/PEO	Health or Physical Education Elective(s) ¹	1	HLT 210/H210 (TRCC) or Apprentice School Athletics (NNAS) or Military	HLTH ZELE	2
SDV 101	College Success Skills	1	SDV 109/5100 (TRNC)[Course Substitution]	UNIV 100	1
Total General Education Course Credits		36		Total General Education Course Credits	37
MAJOR AND OTHER COURSES					
Course #	Course Title	Credit			
PHY 241	University Physics I	4	P241 (TCC)	PHY 231R	4
PHY 242	University Physics II	4	P242(TCC)	PHY 232R	4
MATH 277	Vector Calculus	4	M277 (TCC)	MATH 312	4
MATH 279	Ordinary Differential Equations	4	M279(TCC)	MATH 307	4
EGR 110	Engineering Graphics	3	E110(TCC)	ECE 111	3
EGR 120	Introduction to Engineering	2	E120(TCC)	ENGR 110	2
EGR 125	Intro to Engineering Methods (C++)	4	E125(TCC)	ES 150	2
---	Engineering Elective	3	EGR 140/E140 (TCC)	MAE 204 (Nonmajor Elective)	4
---	Engineering Elective	3	EGR 260/E260 (TCC)	ECE 201	3
---	Engineering Elective	4	EGR 270/E270 (TCC)	ECE 241	3
Total Major and Other Course Credits		35			3
Total Minimum Credits		71			33
ADDITIONAL TRANSFER COURSES					
Course #	Course Title	Credit	TRNC	ODU Course Equivalents	
MATH 163 ¹	Precalculus I	3	M163 (TRCC)	MATH 163A	3
MATH 164 ²	Precalculus II	3	M165 (TRCC)	MATH 163	3
CST 100 ¹	Principles of Public Speaking	3	C243 (NNAS)	COMM 101R	3
EGR 261 ¹	Signals and Systems	3	E261 (TCC)	ECE 202	3
EGR 262 ¹	Fundamental Circuits Laboratory	2	E262 (TCC)	ECE 287	2

NNAS Elec Engineering Program

¹ AS Engineering requires HLT/PEO [1]. NNAS Elec Engineering program requires HLT 210 [2].
² Not required by TCC for the AS Engineering, but satisfied by NNAS Elec Engineering program requirements.

NOTE: Completed Virginia community college AS satisfies all lower-level General Education requirements and results in a waiver for the Language and Culture requirement.

The lower division general education Language and Culture, and Human Creativity requirements will be satisfied by completion of all courses outlined in this program agreement.

Information Literacy and Research and Impact of Technology are met through the major.

*Student must earn C or better for course to transfer.

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Additional Old Dominion University Requirements			
ECE	302	Linear Systems	3
ECE	303	Introduction to Electrical Power	3
ECE	313	Electronic Circuits	4
ECE	323	Electromagnetics	3
ECE	332	Mirco. Materials and Processes	3
ECE	381	Introduction to Discrete-time signal processing	3
ECE	304	Probability, Statistics, and Reliability	3
ECE	387	Microelectronics Fabrication Laboratory	3
ECE	485W	Electrical Engineering and Design I	3
ECE	486	Preparatory ECE Senior Design II	2
ECE Technical Elective			12
ENMA	480	Mechanical Engineering Design II	3
ECE	487	Project Design and Management	2
Upper Division General Education			6
Total Credits to be Taken at ODU			53
Total Transfer Credits from Community College			84
Total Credits for Degree at ODU			137

SUMMARY

Jim Hughes 11-11-13
 Signature Date

Dr. Jim Hughes
 Manager, Trainer
 Apprentice School

Shoheli 10/1/13
 Signature Date

ODU Department Chair

Everett Jordan 11-11-13
 Signature Date

Everett Jordan
 Director of Education
 Apprentice School

Brian Payne
 Signature Date

Dr. Brian Payne
 Vice Provost, Academic Programs
 Old Dominion University

Tidewater Community College A.S. ENGINEERING 831 2012-2013		The Apprentice School Mechanical Engineering Program Requirements		Old Dominion University BS Mechanical Engineering	
TNCC GENERAL EDUCATION COURSES		NNAS Mech Engineering Program Requirements		ODU Course Equivalents	
Course#	Course Title	Credit			Credit
ENG 111	College Composition I	3	E111 (TNCC)	ENGL 110C (Gen Ed Written Communication)	3
ENG 112	College Composition II	3	C232 (NNAS) (Course Substitution)	ENGL 231C (Gen Ed Written Communication)	3
---	Humanities/Fine Arts Elective	3	ENG 125/E126 (TNCC)	ENGL 112L (Gen Ed Literature)	3
---	Humanities/Fine Arts Elective	3	PHI 220/P220 (TCC)	PHI 230E (Gen Ed Philosophy)	3
---	History Elective	3	HIS 122/H121 (TNCC)	HIS 104H (Gen Ed Interpreting the Past)	3
---	Social Science Elective	3	E201 (TNCC)	ECD 2015 (Gen Ed Human Behavior)	3
MTH 173	Calculus with Analytic Geometry I	4	M173 (TNCC)	MATH 211	4
MTH 174	Calculus with Analytic Geometry II	4	M174 (TCC)	MATH 212	4
CHM 111	College Chemistry	4	C221 (TCC)	CHEM 121N/CHEM 122H	4
CHM 112	College Chemistry	4	C222 (TCC)	CHEM 123N/CHEM 124H	4
HLT/PED	Health or Physical Education Elective(s) ¹	1	HLT 210/H210 (TNCC) or Apprentice School Athletics (NNAS) or Military	HLTH 2ELE	1
SOV 101	College Success Skills	1	SOV 100/S100 (TNCC)(Course Substitution)	UNIV 100	1
Total General Education Course Credits		36		Total General Education Course Credits	36

MAJOR AND OTHER COURSES		Total Major and Other Course Credits	
Course #	Course Title	Credit	
PHY 241	University Physics I	4	PHY 231N
PHY 242	University Physics II	4	PHY 232H
MTH 277	Vector Calculus	4	MATH 312
MTH 279	Ordinary Differential Equations	4	MATH 307
EGR 110	Engineering Graphics	3	MAE 111
EGR 120	Introduction to Engineering	2	EGRN 110
EGR 125	Intro to Engineering Methods (C++)	4	CS 150
---	Engineering Elective	3	ROME 20A
---	Engineering Elective	3	MAE 205
---	Engineering Elective	3	MAE 210, MAE 225
Total Major and Other Course Credits		34	
Total Minimum Credits		70	

ADDITIONAL TRANSFER COURSES		ODU Course Equivalents	
Course	Credit	Course	Credit
MTH 163 ¹	3	MTH 162M	3
MTH 164 ²	3	MTH 163	3
CST 100 ²	3	COMF 101R	3
CAD 151 ²	3	MET 120	3

¹ AS Engineering requires HLT/PED (1). NNAS Mech Engineering program requires HLT 210 (2).
² Not required by TCC for the AS Engineering, but satisfied by NNAS Mech Engineering program requirements.
 NOTE: Completed Virginia community college AS satisfies all lower-level General Education requirements and results in a waiver for the Language and Culture, and Human Creativity requirements.
 NNAS Mech Engineering Program Requirements #2

The lower division general education Language and Culture, and Human Creativity requirements will be satisfied by completion of all courses outlined in this program agreement.

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Additional Old Dominion University Requirements			
MAE	201	Materials Science	3
MAE	203	Materials Science lab	1
MAE	303	Mechanics of Fluids	3
MAE	305	Mechanical Engineering Lab III	1
MAE	311	Thermodynamics I	3
MAE	340	Computational Methods	3
MAE	312	Thermodynamics II	3
MAE	332	Mechanical Engineering Design	3
MAE	315	Heat and Mass Transfer	3
ENGN	401	Fundamentals Engineering Review	1
MAE	433	Mechanical Engineering Design II	3
MAE	434W	Project Design and Management	3
MAE	436	Dynamic Systems and Control	3
MAE		Option Courses (3)	9
MAE	435	Project Design and Management II	3
Upper Division General Education			6
Total Credits to be Taken at ODU			51
Total Transfer Credits from Community College			82
Total Credits for Degree at ODU			133

SUMMARY

James H. Hughes 11-27-13
Signature Date

Dr. Jim Hughes
Manager, Trainer
Apprentice School

[Signature] 11/13/13
Signature Date

ODU Department Chair

Verett Jordan 11-27-13
Signature Date

Verett Jordan
Director of Education
Apprentice School

[Signature] 11/13/13
Signature Date

Dr. Brian Payne
Vice Provost, Academic Programs
Old Dominion University

Tidewater Community College A.S. ENGINEERING 831 2013-2014		The Apprentice School Modeling and Simulation Program Requirements		Old Dominion University BS Modeling and Simulation Engineering	
TNCC GENERAL EDUCATION COURSES		NNAS Mod & Sim Engineering Program Requirements		ODU Course Equivalents	
Course#	Course Title	Credit			Credit
ENG 111	College Composition I	3	E111 (TNCC)	ENGL 110C (Gen Ed Written Communications)	3
ENG 112	College Composition II	3	C232 (NNAS) (Course Substitution)	ENGL 231C (Gen Ed Written Communications)	3
---	Humanities/Fine Arts Elective	3	ENG 125/E126 (TNCC)	ENGL 112L (Gen Ed Literature)	3
---	Humanities/Fine Arts Elective	3	Humanities Elective	HC 1REQ (Gen Ed Human Creativity)	3
---	History Elective	3	HIS 121/H121 (TNCC)	HIS 104H (Gen Ed Interpreting the Past)	3
---	Social Science Elective	3	E201 (TNCC)	ECO 201S (Gen Ed Human Behavior)	3
MTH 173	Calculus with Analytic Geometry I	4	M173 (TNCC)	MATH 211	4
MTH 174	Calculus with Analytic Geometry II	4	M174 (TCC)	MATH 212	4
CHM 111	College Chemistry	4	C221 (TCC)	CHEM 123M/CHEM 122N	4
CHM 112	College Chemistry	4	C222 (TCC)	CHEM 123M/CHEM 124H	4
HLT/PED	Health or Physical Education Elective(s) ¹	1	HLT 210/H210 (TNCC) or Apprentice School Athletics (NNAS) or Military	HLT 2ELC	1
SDV 101	College Success Skills	1	SDV 100/S100 (TNCC) (Course Substitution)	UNIV 109	1
Total General Education Course Credits		36		Total General Education Course Credits	36

MAJOR AND OTHER COURSES		Total Minimum Credits	
Course #	Course Title	Credit	
PHY 241	University Physics I	4	PHY 231N
PHY 242	University Physics II	4	PHY 232N
MTH 277	Vector Calculus	4	ES 250
MTH 279	Ordinary Differential Equations	4	MATH 280
EGR 110	Engineering Graphics	3	MSIM 111
EGR 120	Introduction to Engineering	2	ENGR 110
EGR 125	Intro to Engineering Methods (C++)	4	CS 150
---	Engineering Elective	3	MSIM 201
---	Engineering Elective	3	MSIM 205/281
---	Engineering Elective	3	ECE 241 (does not satisfy MSIM requirements)
Total Major and Other Course Credits		34	
Total Minimum Credits		70	

ADDITIONAL TRANSFER COURSES		Total Minimum Credits	
Course #	Course Title	Credit	
MTH 163 ²	Precalculus I	3	MTH 163 (TNCC)
MTH 164 ²	Precalculus II	3	MTH 165 (TNCC)
CST 100 ²	Principles of Public Speaking	3	C243 (NNAS)
Total Minimum Credits		9	

NNAS Mod & Sim Engineering Program Requirements

79

¹ AS Engineering requires HLT/PED (1). NNAS M&S Engineering program requires HLT 210 (2).
² Not required by TCC for the AS Engineering, but satisfied by NNAS M&S Engineering program requirements.

The lower division general education Language and Culture requirement will be satisfied by completion of all courses outlined in this program agreement.

Philosophy and Ethics, Information Literacy and Research and Impact of Technology are met through the major.

*Student must earn C or better for any course to transfer.

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SUMMARY

Additional Old Dominion University Requirements			
CS	252	Intro to Unix	1
STAT	330	Probability and Statistics	3
CS	330	Object Oriented Programming and Design	3
CS	381	Discrete Math	3
MSIM	320	Continuous Simulation	3
MSIM	382	Continuous Simulation Laboratory	1
Approved Program Electives (2)			6
MSIM	331	Simulation Software Design	3
MSIM	383	Simulation Software Design Laboratory	1
MSIM	410	Model Engineering	3
MSIM	451	Analysis for Modeling and Simulation	3
MSIM	441	Computer Graphics and Simulation	3
Upper Division General Electives (2)			6
MSIM	487W	Capstone Design I	4
ENMA	401	Project Management	3
Approved MSIM Technical Electives I&II			6
ENMA	480	Ethics and Philosophy in Engineering Applications	3
MSIM	488	Capstone Design II	3
Impact of Technology (Department Requirement)			3
Total Credits to be Taken at ODU			61
Total Transfer Credits from Community College			79
Total Credits for Degree at ODU			140

James N. Hughes 11-11-13
Signature Date

Jim Hughes
Manager, Trainer
Prentice School

Dr. Rick McKenzie 10/1/2013
Signature Date

Dr. Rick McKenzie
Chair
Department of Modeling, Simulation and
Visualization Engineering
Old Dominion University

Everett Jordan 11-11-13
Signature Date

Everett Jordan
Director of Education
Prentice School

Dr. Brian Payne
Signature Date

Dr. Brian Payne
Vice Provost, Academic Programs
Old Dominion University

Thomas Nelson Community College A.S. BUSINESS ADMINISTRATION 213 2013-2014		The Apprentice School Business Administration Program Requirements		Old Dominion University BS Business Administration (Management)	
TNCC GENERAL EDUCATION COURSES		NNAS Bus Admin Program Requirements		ODU Course Equivalents	
Course#	Course Title	Credit			
ENG 111	College Composition I	3	E111 (TNCC)	ENGL 110C (Gen Ed Written Communication)	3
ENG 112	College Composition II	3	E112 (TNCC)	ENGL 211C (Gen Ed Written Communication)	3
CST 100	Principles of Public Speaking	3	C243 (NNAS)	COMM 101H (required by the College of Business and Public Administration)	3
...	Humanities/Fine Arts Elective	3	ENG 125/E126	ENGL 112L (Gen Ed Literature)	3
...	Humanities/Fine Arts Elective	3	Fine Arts elective (TNCC)	HC 110C	3
HIS	History I	3	HIS 121/H121 (TNCC)	HIST 104H (Gen Ed Interpreting the Past)	3
HIS	History II	3	HIS 122/H122 (TNCC)	HIST ELE	3
MTH	Mathematics I	3	MTH 163/M163 (TNCC)	MATH 162M	3
MTH	Mathematics II	3	MTH 270/M270 (TNCC)	MATH 280	3
...	Laboratory Science I	4	P222 (NNAS) + P221 (NNAS) + PHY 199/P199 (TNCC)	PHYS 111N (Gen Ed Science)	3
...	Laboratory Science II	4	PHY 202/P202 (TNCC)	PHYS 112N (Gen Ed Science)	4
HLT/PED	Health or Physical Education Elective(s) ¹	1	HLT 210/H210 (TNCC) or Apprentice School Athletics (NNAS) or Military		4
SDV 100	College Success Skills	1	SDV 100/S100 (TNCC)	HELT 2ELE	1
Total General Education Course Credits		37		Total General Education Course Credits	37

MAJOR AND OTHER COURSES		Total Minimum Credits	
Course #	Course Title	Credit	
ACC 211	Principles of Accounting I	3	ACC1 201
ACC 212	Principles of Accounting II	3	ACC1 202
ECO 201	Principles of Economics I	3	ECO 201S (Gen Ed Human Behavior)
ECO 202	Principles of Economics II	3	ECO 202S (Gen Ed Human Behavior)
BUS 200	Principles of Management	3	BUS 2ELE (Free Elective)
BUS ELE	Elective	3	BUS 2ELE (Free Elective)
...	Elective	3	BUS 2ELE (Free Elective)
...	Elective	3	BUS 2ELE (Free Elective)
...	Elective	3	BUS 2ELE (Free Elective)
Total Major and Other Course Credits		24	
Total Minimum Credits		61	

ADDITIONAL TRANSFER COURSE (required by ODU)		Total General Education Course Credits	
ITE 119	Information Literacy and Research	Credit	
ITE 119	Information Literacy and Research	3	ITE 150G (Gen Ed Information Literacy)
ADDITIONAL TRANSFER COURSES		Credit	
MTH 164 ²		3	MATH 163
Total Major and Other Course Credits		24	
Total Minimum Credits		61	

1 AS Bus Admin requires HLT/PED (1). NNAS Bus Admin program requires HLT 210 (2).
² Not required by TNCC for the AS Bus Admin, but satisfied by NNAS Bus Admin program requirements.
 Note: Completed Virginia community college ASBA satisfies all lower-level General Education requirements and results in a waiver for the Language and Culture requirement.

The lower division general education Language and Culture and the Introduction to Business (BUSN 110) requirements will be satisfied by completion of all courses outlined in this program agreement with the award of the AS in Business Administration from the VCCS.

Student must earn C or better for any course to transfer.

To participate in this articulation agreement please visit Old Dominion University's website to complete The Letter of Intent:

<http://uc.odu.edu/advising/transfer/letterofintent.shtml>

Completion of this articulation agreement alone does not guarantee admission to Old Dominion University. All students must meet the requirements set by the Office of Admissions and the Guaranteed Admissions Agreement (GAA) with the Virginia Community College System. Please visit admissions.odu.edu for more information regarding guaranteed admission to Old Dominion University.

Additional Old Dominion University Requirements			
BNAL	306	Statistical Data Analysis and Management Science	3
ECON	301	Managerial Economics	3
FIN	323	Introductory Financial Management	3
OPMT	303	Operations Management	3
MGMT	340	Human Resources Management	3
FIN	331	Legal Environment of Business	3
IT	360T	Principles of Information Technology	3
MGMT	325	Contemporary Organizations and Management	3
MKTG	311	Marketing Principles and Problems	3
MGMT 300/400 Electives (4)			12
Free	300/400	Elective	3
MGMT	485W	Business Policy and Strategy (Writing Intensive)	3
MGMT	361	International Business Operations	3
MGMT	451	Organizational Behavior	3
PHIL	303E	Business Ethics	3
Upper Division General Education Option D		One 300 or 400 level elective outside the College of Business	3
Total Credits to be Taken at ODU			57
Total Transfer Credits from Community College			67
Total Credits for Degree at ODU			124

James H. Hughes 11-11-13
Signature Date

r. Jim Hughes
Manager, Trainer
Apprentice School

Ali Ardalan 9/18/13
Signature Date

ODU CBPA Associate Dean: Ali Ardalan

Everett Jordan 11-11-13
Signature Date

Everett Jordan
Director of Education
Apprentice School

Brian Payne 10/18/13
Signature Date

Dr. Brian Payne
Vice Provost, Academic Programs
Old Dominion University

Thomas Nelson Community College A.A.S. Technical Studies Specialization: Engineering Technology 718-04 2013-2014		The Apprentice School Technical Studies Program Requirements		Old Dominion University BS OTS - Industrial Technology	
TNCC GENERAL EDUCATION COURSES		NNAS Tech Studies Program Requirements		ODU Course Equivalents	
Course#	Course Title	Credit			Credit
ENG 111	College Composition I	3	E111 (TNCC)	ENGL 110C (Gen Ed Written Communication)	3
PHI 220	Ethics	3	P220 (TNCC)	PHI 230E (Gen Ed Philosophy)	3
--	Social Science Elective	3	ECO 201 (TNCC)	ECON 201S (Gen Ed Human Behavior)	3
--	Social Science Elective	3	HI121 (TNCC)	HIS 104H (Gen Ed Interpreting the Past)	3
MTH 115 or MTH 158	Technical Math or College Algebra	3	M111 (NNAS)		3
HLT/PED	Health or Physical Education Elective(s)	2	H210/HLT 210 (TNCC) or Apprentice School Athletics (NNAS) or Military	HLTH 2ELE	2
SDV 100	College Success Skills	1	SDV 100 (TNCC)	UNIV 100	1
Subtotal - General Education Course Credits in AAS degree		18		Subtotal - General Education Course Credits for Transfer	
					15

MAJOR AND OTHER COURSES					
Course #	Course Title	Credit			Credit
CAD 151	Engineering Drawing Fundamentals I	3	D111(NNAS) + 40 hrs CAD Training (NNAS)	MET 120 (Technical Content)	3
ENG 115	Technical Writing	3	C232 (NNAS)	ENGL 231C (Gen Ed Written Communication)	3
ETR 104 or ELE 150	Electronics Fundamentals w/ Computer Apps or A.C. and D.C. Circuit Fundamentals	3	E150 (TNCC) or X311+X3112(NNAS)	STEM 1ELE or STEM 241 (Technical Content)	3
MTH 116 or MTH 164	Technical Math II or Precalculus II	3	M112 (NNAS)		3
PHY 201	General College Physics I	4	P222 (NNAS) + P221 (NNAS) + P199 (TNCC)	PHYS 111N (Gen Ed Science)	4
MEC 100 or MAR 120	Introduction to Ship Systems	3	M111 (NNAS) + N222 (NNAS)	STEM 1ELE (Technical Content)	3
ITE 115 or CSC 200	Intro to Computer Apps & Concepts or Intro to Computer Science	3	C211(NNAS)	CS 101 (Elective)	3
ITE 140 or IND 181	Spreadsheet Software or World Class Manufacturing	3	I181 (TNCC)	STEM 1ELE (Technical Content)	3
IND 140 or BUS 209	Quality Control or Continuous Quality Improvement	3	B209 (TNCC)	BUSN 2ELE (Business Elective)	3
BUS 200 or BUS 117	Principles of Management or Leadership Development	3	B122+B112 (NNAS)	BUSN 2ELE (Business Elective)	3
--	Elective	3	M113 (TNCC) or X313 (NNAS)	STEM 231 (Technical Content)	3
--	Elective	3	Apprenticeship Completion (NNAS)- OJT & Trades Experience	STEM 367 (Technical Content)	3
--	Elective	3	Apprenticeship Completion (NNAS)- OJT & Trades Experience	STEM 367 (Technical Content)	3
--	Elective	3	Apprenticeship Completion (NNAS)- OJT & Trades Experience	STEM 367 (Technical Content)	3
ND 297	Cooperative Ed in Engineering Tech	3	Apprenticeship Completion (NNAS)- OJT & Trades Experience	STEM 367 (Technical Content)	3
ND 297	Cooperative Ed in Engineering Tech	3	Apprenticeship Completion (NNAS)- OJT & Trades Experience	STEM 367 (Technical Content)	3
Total Major and Other Course Credits		49		Total Major and Other Course Credits	
Total Minimum Credits		67		NNAS Tech Studies Program Total Transfer Credits	
					46
					61

Required Lower Division General Education courses (not included in the AAS degree or NNAS Tech Studies Program)

Thomas Nelson Community College		Old Dominion University	Credits
CST 100, 105, or 110	Public Speaking	COMM 101R	3
MTH 158	Math	MATH 102M (departmental requirement)	3
MTH 146, 157, 240, 241, or 242	Statistics	STAT 130M (departmental requirement)	3
ENG 125, 236, 237, 241, 242, 243, 244, 245, 246, 251, 252, 253, 254, 255, 256, 267, or 268	Literature	ENGL 112L, 114L or FLET 100L	3
ART 100, 111, or 112, CST 130, 141, 142, 151, 152, or 250	Human Creativity	Human Creativity	3
ART 101, 102, 103, 104, 105, 106, 133, 150, 201, 202, HUM 100, 201, 202, 260, MUS 121 or 122 or 125, or CST 231 or 232, ART 113, 114	Human Creativity	Human Creativity	3
PHY 202	Physics II with lab	PHYS 112N	4
PSY 201	Intro to psychology	PSYC 2015 (prerequisite to PSYC 303 required in the major)	3
Subtotal	Total General Education Course Credits	Total General Education Course Credits for transfer	22

Required Lower Division course (not included in the AAS degree or NNAS Tech Studies Program)

Thomas Nelson Community College	ODU Course Equivalents	Credit
ACC 211 Principles of Accounting I	ACCT 201 Principles of Accounting	3

ADDITIONAL TECHNICAL ELECTIVES (if applicable)

NNAS	ODU Course Equivalents	Credit
X311 Applied Theory I: DC Concepts	STEM 1E1E (Technical Content)	6
X312 Applied Theory II: AC Concepts	STEM 1E1E (Technical Content)	3
X313 Applied Theory III: Polyphase Systems and Controls	STEM 1E1E (Technical Content)	3
X314A Electronics I	STEM 1E1E (Technical Content)	3
X314B Electronics II	STEM 1E1E (Technical Content)	3

The lower division general education Language and Culture requirement will be satisfied by completion of all courses outlined in this program agreement, including the additional lower division general education requirements.

Information Literacy and Research and Impact of Technology are met through the major.

*Student must earn C or better for any course to transfer.

To participate in this articulation agreement, please visit Old Dominion University's website to complete The Letter of Intent: <http://uc.odu.edu/advising/transfer/letterofintent.shtml>

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* The following courses may be completed with the VCCS, with C or better, to meet ODU degree requirements for this major. However, all students are required to complete a minimum of 30 credit hours with ODU and 12 of those must be at the 300/400 level in the major to earn the Bachelor of Science degree. These course substitutions will not be used to satisfy requirements in any other ODU degree programs (majors or minors) outside the SEPS/STEM Department:

Additional courses available at TNCC:

- CCS ODU
- US 111 substituted for SEPS 302
- SY 126 substituted for PSYC 303
- MS 100 substituted for HMSV 339
- JS 150 or BUS 200 substituted for MGMT 325
- JS 205 substituted for MGMT 340
- KT 100 substituted for MKGT 311

Additional Old Dominion University Requirements

MKTG	311**	Marketing and Principles and Problems	3
MGMT	325**	Contemporary Organizations and Management	3
SEPS	302**	Workforce Supervision	3
HMSV	339**	Interpersonal Relations	3
MGMT	340**	Human Resources Management	3
STEM	370T	Technology and Society (Writing Intensive)	3
SEPS	400	Instructional System Development	3
PSYC	303**	Industrial/Organizational Psychology	3
Business Electives			9
Upper Division General Education			6
SEPS	402	Industrial Methods in Occupational Studies	3
Total Credits to be Taken at ODU			42

SUMMARY

Total Transfer Credits	86
Total Credits to be Taken at ODU	42
Total Credits for Degree at ODU	128

James H. Hughes 11-11-13
Signature Date

Jim Hughes
Trainer,
Vocational School

Dwight Watson 10/1/13
Signature Date

ODU Department Chair

Errett Jordan 11-11-13
Signature Date

Errett Jordan
Director of Education,
Vocational School

Brian Payne 10/1/13
Signature Date

Dr. Brian Payne
Vice Provost, Academic Programs
Old Dominion University