

# **Proposed New Continuing Education and Development Plan for USAF Acquisition Engineers**

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Proposal arose from discussions about the current SYS 482 Chief Engineer Course

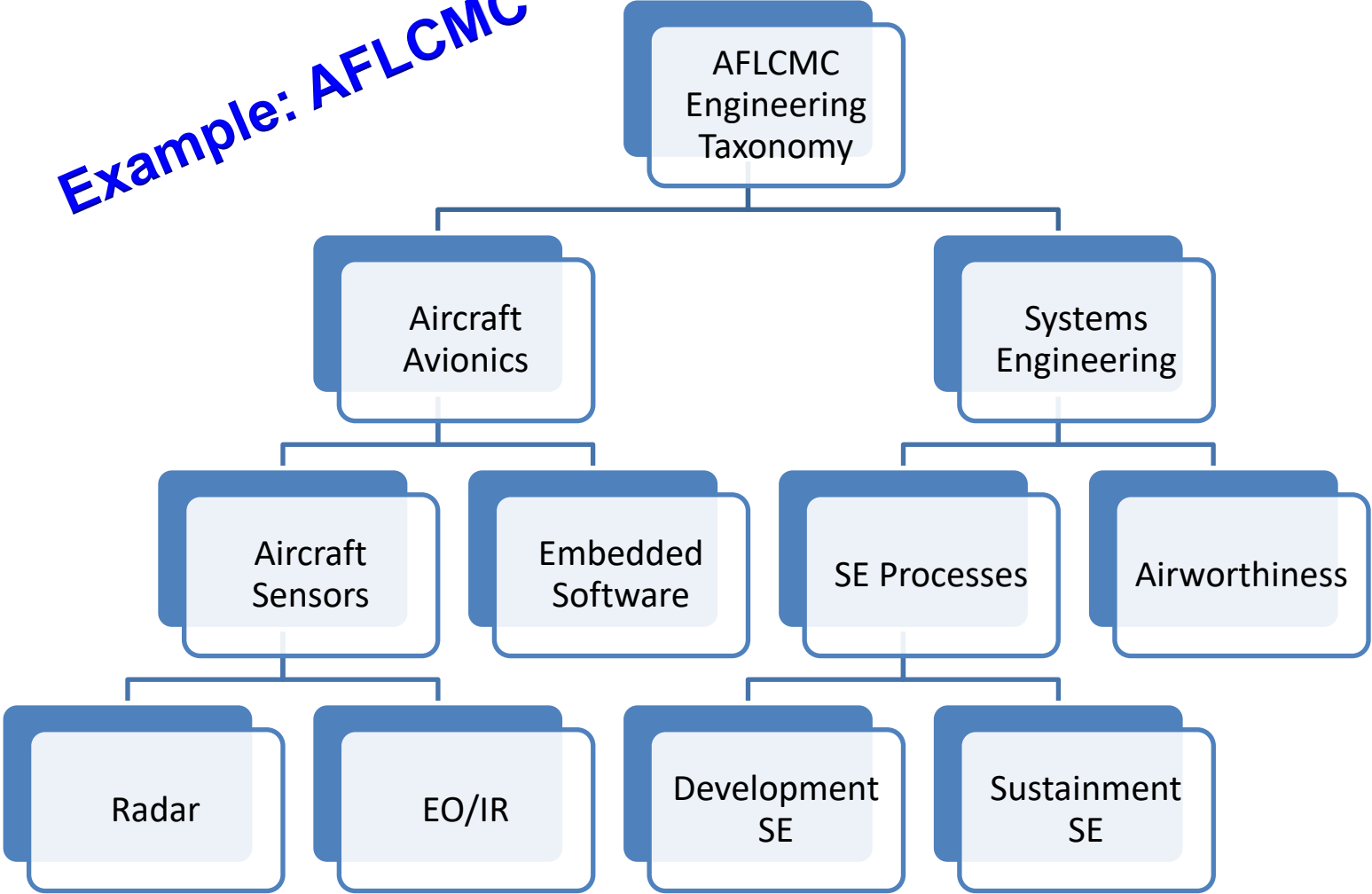
- Original direction on SYS 482 topic requirements for came from the course sponsor, AFLCMC/EZ, Senior Leader for Systems Engineering
- Course is nine months long, over 206 hours of formal instruction
- Feedback is that course is very good, but too long and taxing
- Sponsor also wants to cover a large spectrum of topics that are not presented in a systematic manner elsewhere

*There is no civilian systems engineer career field education and training guide*

# Engineering Taxonomy for Competency Management



**Example: AFLCMC**



**Domains**

**Competency Areas**

**Technical Disciplines**

From Distro A Presentation, Dr. Ken Barker, 30 Aug 2016  
"AFLCMC/EN-EZ Competency Management Fundamentals"

## Chief Engineer Roles and Responsibilities (Module 1)

Lesson 1	CE Role & Responsibilities Overview
Lesson 2	CE/PM/PEO relationship
Lesson 3	OSS&E
Lesson 4	CE Roles Across the System Life Cycle Stages
Lesson 5	CE Leadership Role
Lesson 6	Laws, Policy, and Standards

## Select Topics in Systems Engineering (Module 2)

Lesson 1	Systems Engineering Overview
Lesson 2	Technical / Project Planning
Lesson 3	Concept Definition
Lesson 4	Decision Management and System Analysis Processes
Lesson 5	System Definition
Lesson 6	Risk Management
Lesson 7	Configuration, Information and Interface Management
Lesson 8	System Realization
Lesson 9	Technical Assessment
Lesson 10	System Deployment and Use
Lesson 11	Application of Systems Engineering to Air Force Programs

## DoD/USAF Initiatives / Emphasis areas (Module 3)

Lesson 1	Managing the Technical Baseline
Lesson 2	Digital Enterprise
Lesson 3	Modeling Simulation and Analysis
Lesson 4	Software
Lesson 5	Decision Analysis
Lesson 6	Open System Architecture
Lesson 7	Integrity Programs
Lesson 8	Strategic Development Planning and Experimentation
Lesson 9	Digital Engineering Plan, Leadership, Program Assessment and Capstone Preparation

## Capstone (Module 4)

Lesson 1	Guest Speakers, Case Study
Lesson 2	Module Based Systems Engineering Experience
Lesson 3	Capstone Digital Engineering Presentations
Lesson 4	Capstone Leadership, Program Assessments Presentations
Lesson 5	Comprehensive Assessment, Course Survey

# Dept of the AF “Civilian Career Roadmap”



## Department of the Air Force Civilian Career Roadmap for **Functional Experts/Leaders**

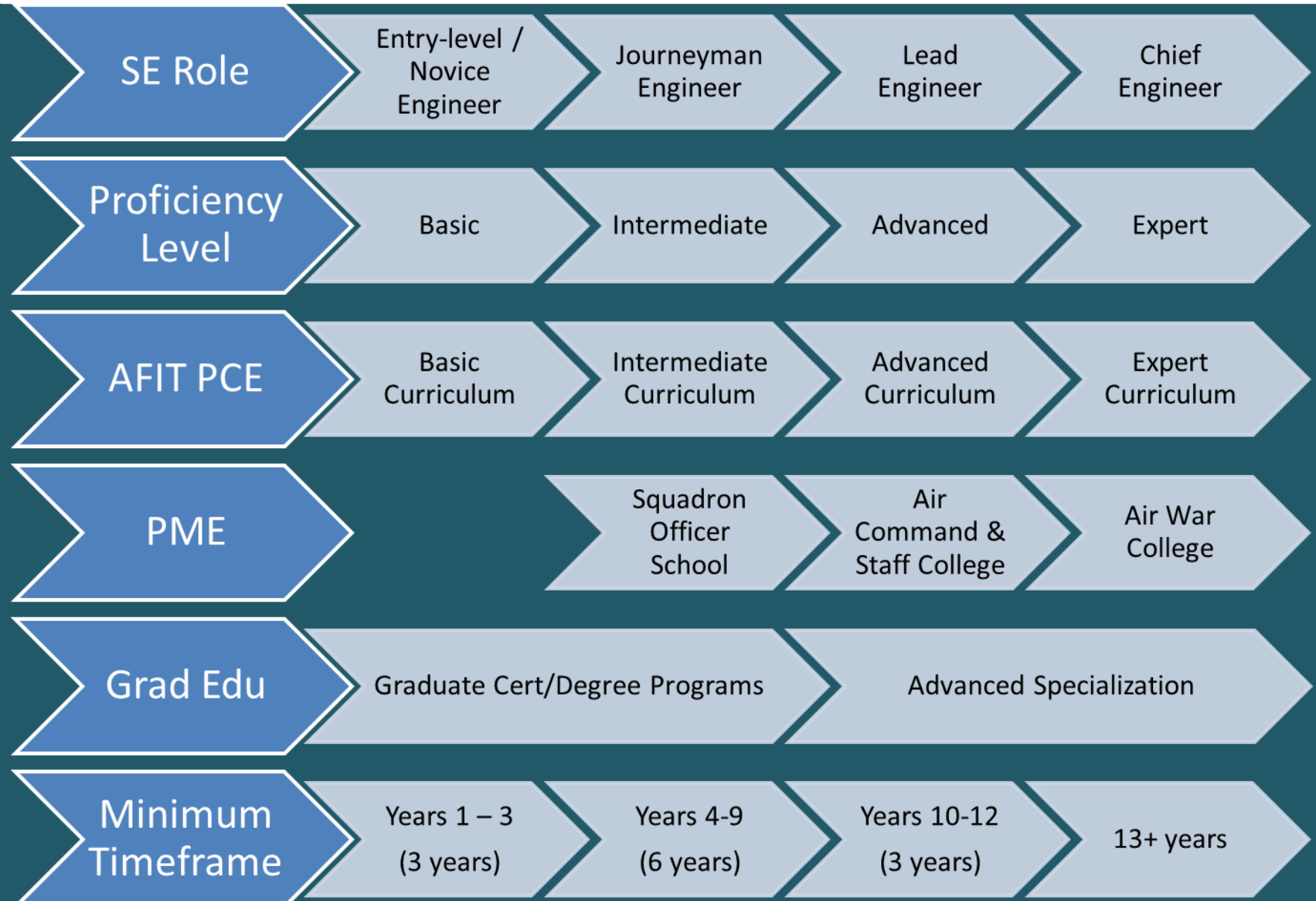
	BASIC (GS 1/equiv)	INTERMEDIATE	ADVANCED/EXPERT (SU/ST)
EXPERIENCE	Develop entry-level technical depth/proficiency and relevant mission knowledge in primary discipline	Further hone technical depth and mission knowledge in primary discipline; seek breadth within functional area of expertise in local area	Gain advanced technical expertise and pursue breadth as relevant within functional area of expertise
	Establish record of sustained high performance	Gain experience at sustained high performance levels and at increasing levels of responsibility, impact, and mission accomplishment	Develop record of superior accomplishments that align to Functional/Technical Qualifications
	Seek technical experience at Flight, Squadron, Delta, or Wing levels in multiple positions to establish depth of knowledge	Seek further technical experience and depth development in primary/related functions at Installation, Group, or MAJCOM/FIELD COM levels (if available in local area)	Gain advanced technical expertise in primary discipline to develop into a recognized functional expert; Seek managerial experience within functional area
EDUCATION & TRAINING	Associate's Degree or Bachelor's Degree (if series requires) in primary functional discipline	Bachelor's Degree in primary functional discipline	Master's or Doctoral Degree in functional area of expertise
	Basic technical training in primary functional discipline	Intermediate technical training in primary functional discipline	Advanced Functional Training in primary functional discipline
	Basic leadership training as applicable to functional field (e.g., DCELP)	Intermediate Leadership Training as applicable to functional field (e.g., OLC, LWI, M&ST)	Senior Leadership Training specific to effectively leading people/organizations within primary functional discipline (e.g., CLC, EIG, LETC, LCI, LS, NISLS, UEL)
	Achieve Required Functional Certification(s) for level, if applicable (e.g. EIT, DAWIA, SPeD, DFMCP, SCWDP, Cyber etc.)	Achieve Required Functional Certification(s) for level, if applicable	Achieve Required Functional Certification(s) for level (if applicable)
LEADERSHIP	Basic Developmental Education (e.g., SOS) is optional and may be obtained via non-resident distance learning*	Intermediate Developmental Education (e.g., ACSC, ACSC On-line Masters, ACSC-SSS, SANDS, SAASS) is optional and may be obtained via non-resident distance learning*	Senior Developmental Education (e.g., CIC) is optional and may be obtained via non-resident distance learning*
	Seek mentors/coaches within functional area	Expand mentor and coaching relationships	Mentor/Coach within functional area of expertise
	Gain experience in leading teams and/or projects within functional area	Gain supervisory and/or additional leadership experience in functional area; Obtain initial/recurring supervisory training, if applicable	Gain leadership/managerial experience within functional area; Obtain recurring leadership/management training
	Assess foundational competencies; develop plan to address gaps within functional area of expertise	Obtain 180/360 degree feedback and address gap areas	Partner with a coach to further hone ability to lead within functional area of expertise
	Establish professional network within functional area	Further expand your professional network within functional area	As a recognized DAF functional expert, build and maintain relationships across DoD within area of expertise
	Join/participate in professional orgs related to technical area of expertise	Serve/lead professional org committees related to technical area of expertise	Serve as tech advisor or Board member for professional organizations related to technical expertise
FOUNDATIONAL COMPETENCIES			
	Developing Self	Developing Ideas	Developing Others
			Developing Organizations

\*Academic prerequisites apply - Details available on MyPERS

\*\*Roadmap represents desired attributes

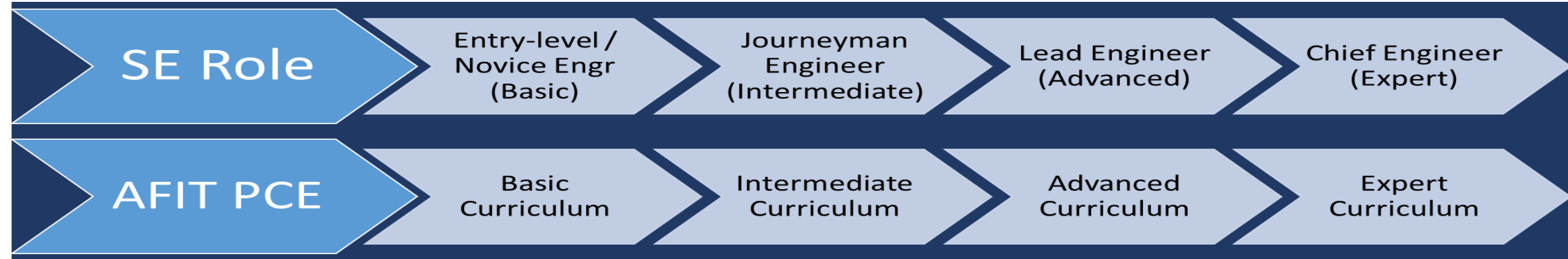
# Our general concept

Following the roadmap;  
link SE Role, PME, PCE,  
Grad Ed, Experience, &  
Proficiency together.



PCE = Professional Continuing Education

PME = Professional Military Education



1. Complete courseware
2. Pass assessment
3. Earn micro-credential

Notional courses in SE technical and technical management processes

Recommended optional education / electives will be provided in addition to these tracks

Basic SE Track Yrs 0-3	Inter. SE Track Yrs 4-9	Advanced SE Track Yrs 10-12	Expert SE Track 13+ yrs
Foundational edu in: <ul style="list-style-type: none"> <li>• Systems Engineering</li> <li>• MBSE, Digital Modeling</li> <li>• Requirements</li> <li>• Risk Management</li> <li>• Data Management</li> <li>• Configuration Mgmt</li> <li>• Test and Evaluation</li> </ul>	Intermediate edu in: <ul style="list-style-type: none"> <li>• Systems Engineering</li> <li>• Environmental, Safety, &amp; Occupational Health</li> <li>• System Safety</li> <li>• Wpn system cyber analysis</li> <li>• Data Architecting (DoDAF)</li> <li>• Program &amp; Tech Protection</li> <li>• Reliability</li> <li>• Agile &amp; DevOp Processes</li> </ul>	Dedicated courses: <ul style="list-style-type: none"> <li>• SYS 382: Advanced Applied Sys Engineering</li> <li>• SYS 392 Advanced SE Specialty Topics</li> </ul>	<ul style="list-style-type: none"> <li>• SYS 492 Chief Engineer Preparatory Course</li> </ul>
MCSE 100 exam	MCSE 200 exam + Practicum project	MCSE 300 exam + Practicum project	New "Lead + Chief Engineer Sequence" <ul style="list-style-type: none"> <li>• SYS 382</li> <li>• SYS 392</li> <li>• SYS 492</li> </ul>

MCSE = Microcredential in Sys Engr



# Thank you!



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<http://www.afit.edu/lc>



# BACKUPS

Keep topics from Modules 1 and 4 for new Chief Engineer Preparatory Course (SYS 492)

## SYS 492: Chief Engineer Preparatory Course

CE Role & Responsibilities Overview

CE/PM/PEO relationship

OSS&E

CE Roles Across the System Life Cycle Stages

CE Leadership Role

Laws, Policy, and Standards

Model-Based Systems Engineering Experience

Capstone: Digital Engineering, Leadership, & Program Assessments Presentations

# Course Revisions



Move Modules 2 and 3 topics to new courses SYS 382 and 392

Notional topics based on the current Modules 2 and 3

## SYS 382: Advanced Applied Systems Engr

Systems Engineering Overview & Review

Technical / Project Planning

Concept Definition

Decision Management and System Analysis Processes

System Definition

Risk Management

Configuration, Information, and Interface Management

System Realization

Technical Assessments

System Deployment and Use

Application of Systems Engineering to Air Force Programs

## SYS 392: Advanced Systems Engineering Specialty Topics

Managing the Technical Baseline

Digital Enterprise

Modeling Simulation and Analysis

Software

Decision Analysis

Open System Architecture

Integrity Programs

Strategic Development Planning and Experimentation

Course Title: WSYS382 - Advanced Applied Systems Engineering

Course Description: This course prepares students to integrate a comprehensive working knowledge of systems engineering concepts, techniques, roles, and responsibilities into their daily interactions with program management, logistics, financial management, contracting, and other functional areas to influence the outcome of a balanced system design within programmatic constraints of cost and schedule that impacts performance.

Course Objectives:

- Analyze common industry and DoD systems engineering frameworks and taxonomies.
- Assess tools and techniques, resources, organizational systems, and decision-making processes for the successful management of projects.
- Apply the 16 DoD systems engineering processes in notional weapon system program office exercises.

Course Title: WSYS392 - Advanced Systems Engineering Specialty Topics

Course Description: This course prepares students to comprehend and integrate specialty technical topics into systems engineering decisions. This includes topics such as digital materiel management and model-based systems engineering, Open Systems Approaches, software development and management methodologies, and data analytics for technical decision making.

Course Objectives:

- Comprehend the application of a model-based approach to systems engineering in a digital environment.
- Comprehend open systems approaches to weapon system development and sustainment.
- Comprehend different software development and management methodologies.
- Apply data analytics techniques to develop and support technical decisions.
- Integrate specialty topics into a holistic systems engineering approach to manage technical baselines.

Course Title: WSYS492 – Chief Engineer Preparatory Course

Course Description: This course prepares highly educated motivated professionals that are at the grade of NH-IV, O-4, and above with comprehensive expert-level education on Chief Engineer roles, responsibilities, authorities, and topics across the life cycle of a DAF weapon system. This helps arm current and future Chief Engineers with the knowledge and skills necessary to support strategic program decisions in executing the mission of the Department of the Air Force.

Course Objectives:

- Comprehend Chief Engineer roles, responsibilities, and authorities throughout the system life cycle.
- Analyze laws, policies, standards, and guidance from the perspective of a Chief Engineer.
- Apply strategic systems engineering concepts to analyze program technical gaps and handling strategies to achieve objectives.
- Analyze personal leadership qualities and apply improvement methodologies.