



**Engineer Development Office**



# **ENGINEER DEVELOPMENT OFFICE (EDO)**

**412<sup>th</sup> TW/ENT**

*Engaging, Enriching & Inspiring Engineers  
through Education, Development & Outreach*

**March 2006**



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# OVERVIEW

- **EDO Mission**
- **EDO Resources**
- **Education**
- **Development**
- **Outreach**
- **Summary**



2003 New Engineer Training Graduates of Session 1



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# **EDO MISSION (Sound Bite)**

***Engaging, Enriching & Inspiring Engineers***

***through***

***Education, Development & Outreach***



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# EDO RESOURCES



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# **EDO TEAM**

- ***Vacant* - Master Instructor (Education)**
- ***Augie Castillo* - TPS Systems Instructor (Education)**
- **2Lt Loui Hashmi – Technical Education**
- **Ben Castillo – Development/Deputy Chief**
- **Ariele Sparks – Development (PAQ Intern)**
- ***Nathan Cook* – Outreach**
- ***“Woody” Woodall* - Engineering Training Manager (DAU/HRD)**
- ***Cathy Clum* - Engineering Training Manager (Tech/EDO)**
- ***Veronica Valerius* – Network Systems Analyst (Tybrin)**
- ***Lorene Garrett* - EDO Chief**



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# EDO FACILITIES

**Classroom Facility**



**Computer Classroom**



**Control Room Facility**



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# EDUCATION

*Tools and Skills for Effective  
Evaluation*



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# **New Engineer Training (NET)**



## → **Master Instructor**

- **Facilitates course & manages curriculum**

## → **Quality Instructors**

- **AFFTC Technical Experts**
- **Some instruct at AFFTC TPS**
- **Nationally recognized**
- **A few “up-and-comers”**

## → **Quality of Instruction**

- **Instructors attend “Train the Trainer”**







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# **New Engineer Training (NET)**



## **Week 1**

**AF & AFFTC  
Overview**

## **Week 2**

**Avionics & EW  
Overview**

## **Week 3**

**Flight  
Systems  
Overview**

## **Week 4**

**Test Planning  
& Execution  
Overview**

### → **Four Full Weeks (160 hrs)**

- 1 week every month to minimize project impacts
- Students enter training at any point & graduate in 4 months
  - Goal to finish NET within 6 months arrival at TW

### → **Three cycles of NET per year**

- Classes offered continuously 1<sup>st</sup> full week of each month
- NET Attendance: 262 in 2005 from 87 students in 2004
  - 37 NET Graduates in 2005



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# **New Engineer Training (NET)**



## **Week 1**

### **AF & AFFTC Overview**

- AF Overview
- AFFTC Overview/  
Culture
- Mentoring  
& Professionalism
- Facilities Tours
- R&M, Logistics Test,  
Deficiency Reporting
- Mission Planning
- Major Program Briefs
- Project Management
- Technical Library
- OTE

## **Week 2**

### **Avionics & EW Overview**

- Core Avionics
- Nav Systems
- Comm Systems
- Radar
- Data Link
- EO/IR and lab
- Weapons Separation  
and Integration
- Sensor Fusion
- Electronic Warfare

## **Week 3**

### **Flight Systems Overview**

- Subsystems
- Aerodynamics
- Performance
- Flying Qualities
- Structures
- Propulsion
- Human Factors
- Instrumentation

## **Week 4**

### **Test Planning & Execution Overview**

- Test Planning
- Test Reporting
- Safety Training
- Crew Resource  
Management
- Control Room  
Training
- Avionics Lab



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# **New Engineer Training**

## **(NET)**



- **Keynote Speakers (Senior at AFFTC)**
- **Graduation Ceremony/BBQ Luncheon**

**Instills corporate culture & allows leadership to show it puts people first**





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# **New Engineer Training**



## **(NET)**

- **Tours**
- **Program Briefs**



**Avionics Test and Integration Complex**



**Artist's cutaway of the Benefield Anechoic Chamber**



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## **MISSION CONTROL ROOM TRAINING**

- ➔ **Stand-alone (by request)**
- ➔ **Fully-operational mission control room facility**
  - **Standardized**
  - **Realistic training scenario: flight cards, contingencies, failures, instrumentation problems, & decisions**
  - **High-fidelity simulator, full data connectivity**
  - **Real-time pilot-in-the-cockpit to simulate actual flight**
  - **FlightVision (out-the-window) displays showing geographical picture of the flight**
  - **Full communications simulation with Air Traffic Control, pilot, test conductor & discipline engineers (students)**

***INTEGRATED SIMULATION OF ENTIRE MISSION***



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# Crew Resource Management Training

## → Certified USAF CRM trainer

- Initial CRM 3 times/yr during NET
- Supplements 412<sup>th</sup> TW/OG training
  - Initial & refresher training for AFFTC & tenant aircrews





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# Airmanship Training

- ➔ Local Range Orientation Flights
- ➔ FAA Private Pilot Ground School
- ➔ FAA Instrument Ground School
- ➔ FAA Pre-Solo Flight Training
  - ➔ Standard FAA Syllabus & Training Tailored to Flight Test Engineer
- ➔ Engineer Test Demo Flight



***Increases Safety of Flight Test Ops by Exposing New Engineers to Flight Environment***



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# Advanced Technical Short Courses

## → Developed or Sponsored by EDO

- LINK-16
- EO/IR
- MATLAB Basics
- Neural Networks
- Design of Experiments (in work)

## → Schedule

- Offered 2 - 4 times/year
- Based on CTF/home office requirements







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# Advanced Technical Short Courses

## → UAV short course

- In conjunction with TPS
- 3- week course
- Dedicated Mini-UAV
- First offering Spring 2005

## → Technical Workshops

- Discipline-specific
- Developed by in-house Tech Experts
- Monthly

## → Paper Previews

- Friendly peer review prior to conference/symposium
- Lunchtime in EDO classroom
- As required





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# DEVELOPMENT

*Professional and Personal Growth*



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# Leadership Training

## → 4 courses

- Developed by Leadership Training Team
- Based on industry-standard principles
- Tailored to AFFTC experience
  - Functional & positional leaders/Leadership through influence
  - Experiential classroom exercises & targeted readings
- All levels of engineers



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# Leadership Training

- **L-101 Introductory Concepts**
- **L-201 Developing the Leader Within You**
- **L-301 Developing Leaders Around You**
- **L-401 Advanced Concepts**



*Lt Col Dave Smith,  
Leadership Instructor*



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# Strategic Development

## → Mentoring

- Engineering Program
  - Compliments AFMC MDM program
  - Mentors/Mentees personally matched
  - Mentors training/coaching available
- Further develop engineers
  - Personal attention next step after NET
  - Aids retention
  - All levels of engineers

## → AFMC S&E Strategic Workforce Planning IPT

## → AFMC S&E Learning Center



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# Development Opportunities

- **Lunch-N-Learn**
  - Leadership & other topics
  - Presented by Instructors/Guests or Videotape
  
- **Leadership Workshops**
  - Short topics (i.e.. Learning From Experience)
  - Presented by Instructors/Guests
  
- **Communications Module**
  - In development
  
- **HRD Courses**
  - As available



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# OUTREACH

*Strengthening the Pipeline*



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# **K-12**

### → **Targets of Opportunity**

- **Science Fairs**
- **Career Fairs**

### → **Community Partnerships**

- **MSET (Math Science Engineering Technology) Consortium**
  - AV High School District
- **Engineering Academy – Tehachapi, Mojave**
- **Pathways – AVC/Middle School Teachers**
- **NASA – Office of Academic Investments**
- **Math and Science Odyssey - Annual Conference for 8th Graders**

### → **Programs**

- **Classroom Presentations/Modules**
  - SAE Kits
  - Rocketry
- **Team Support**
  - Robotics: High School FIRST Teams
  - LEGO League: Middle School (in work)





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# College

- **Targets of Opportunity**
  - Job Shadow
  - Co-op
  - Intern
  
- **Institutional Partnerships**
  - CSUN (ENV)
  - Fresno (ENV)
  - AVC
  - Harvey Mudd
  
- **Programs**
  - PAQ
  - S&E Co-op Support (in work)
    - Training plan
    - Rotations
    - Social



# SUMMARY

## → Great strides in Education

- **NET Huge Success!**
  - New engineers contribute early
    - Meet customers needs
  - Test standardization
    - Technical Experts consulted
  - Outside customers: UK, WR-ALC, ASC, Holloman, PAX River, contractors
- **Continuous Improvement**
- **Coursework/curriculum review**
- **Addition of courses/workshops**

## → Next Step

- **Growth in technical training**
- **Additions to Development Area**
  - PM Training
- **Growth in Outreach Program**
  - Co-op Program/Enhanced Classroom Presentations

