



COURSE OUTLINE : AT 152
D Credit – Degree Applicable
COURSE ID 010239
Cyclical Review: September 2020

COURSE DISCIPLINE : AT
COURSE NUMBER : 152
COURSE TITLE (FULL) : Introduction to Unmanned Aerial Vehicles
COURSE TITLE (SHORT) : Intr to Unmanned Aerial Vhcle

CATALOG DESCRIPTION

AT 152 is an introductory course to understanding the functions, characteristics, regulations, and applications of unmanned aerial systems and vehicles. The course includes detailed coverage of unmanned aerial systems and their uses in military, commercial, civil, and public settings.

CATALOG NOTES

Note: The student must be able to speak, read and understand the English language per the requirements of Part 61 of the Federal Aviation Regulations as explained in FAA Advisory Circular 60-28B, and the Level 4 requirements of the International Civil Aviation Organization.

Total Lecture Units: 3.00

Total Laboratory Units: 0.00

Total Course Units: 3.00

Total Lecture Hours: 54.00

Total Laboratory Hours: 0.00

Total Laboratory Hours To Be Arranged:0.00

Total Contact Hours: 54.00

Total Out-of-Class Hours: 108.00

Recommended Preparation: ENGL 100 or ESL 141, or equivalent.



ENTRY STANDARDS

	Subject	Number	Title	Description	Include
1	ENGL	100	Writing Workshop	Read, analyze, and evaluate contemporary articles and stories to identify topic, thesis, support, transitions, conclusion, audience, and tone;	Yes
2	ENGL	100	Writing Workshop	read, analyze, and evaluate contemporary articles and stories for the comprehension of difficult content and the identification of main ideas and (topic-based) evidence;	Yes
3	ENGL	100	Writing Workshop	read, analyze, and evaluate student compositions for unity, development, use of evidence, interpretation, coherence, and variety of sentence form;	Yes
4	ENGL	100	Writing Workshop	write a summary of a contemporary article or story with correct citation techniques;	Yes
5	ENGL	100	Writing Workshop	write an argumentative essay that has an introduction, body paragraphs, and a conclusion, demonstrating a basic understanding of essay organization;	Yes
6	ENGL	100	Writing Workshop	write an argumentative essay that addresses the topic, is directed by a thesis statement, uses appropriate textual evidence, develops logical interpretations, and concludes with some compelling observations;	Yes
7	ENGL	100	Writing Workshop	write an argumentative essay that integrates the ideas of others (i.e., authors) through paraphrasing, summarizing, and quoting with correct citation techniques;	Yes
8	ENGL	100	Writing Workshop	write an argumentative essay that generates novel ideas (those that add to the conversation rather than repeating the author's ideas) related to the topic and the readings;	Yes
9	ENGL	100	Writing Workshop	write compositions (e.g., summaries and argumentative essays) that are easy to read and follow, though some errors in grammar, mechanics, spelling, or diction may exist;	Yes
10	ENGL	100	Writing Workshop	proofread and edit essays for content, language, citation, and formatting problems.	Yes



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11	ESL	141	Grammar and Writing IV	<p>compose a 400 to 450-word thesis-based essay which:</p> <p>(a) summarizes and cites appropriately a reading passage provided as a prompt,</p> <p>(b) includes a clear thesis statement,</p> <p>(c) uses evidence to support the thesis,</p> <p>(d) shows clear organization into an introduction, body, and conclusion, and</p> <p>(e) uses appropriate rhetorical modes such as comparison/contrast, cause/effect, and persuasion in order to support a thesis.</p>	Yes
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EXIT STANDARDS

- 1 Identify, examine, and assess the uses of unmanned aerial vehicles (UAV) in military, commercial, civil, and public settings;
- 2 analyze, discuss, and differentiate manned versus unmanned aircraft missions;
- 3 describe components of UAS sensor and communication systems;
- 4 define and design unmanned aerial vehicle (UAV) with airworthiness to accommodate a UAS mission.

STUDENT LEARNING OUTCOMES

- 1 demonstrate knowledge of fundamental airworthiness;
- 2 define, describe, and identify components of UAV government regulation;
- 3 compare manned and unmanned aircraft missions;

COURSE CONTENT WITH INSTRUCTIONAL HOURS

	Description	Lecture	Lab	Total Hours
1	UAV Introduction • Definitions • Commercial uses • Civil uses • Public uses • Military uses • UAS	6	0	6
2	Regulation Governing UAV • Current FAA regulations	6	0	6



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3	<p>Four Forces of Flight</p> <ul style="list-style-type: none"> • Lift • Effect of wing design and type • Weight • Time in air • Thrust • Stability and safety • Drag and parasite drag 	6	0	6
4	<p>UAV Design</p> <ul style="list-style-type: none"> • Fixed Wing • Rotary Wing / VTOL • Micro • Multi-Rotor Components • RC Avionic Principles 	6	0	6
5	<p>Flight Simulation Intro</p> <ul style="list-style-type: none"> • Basic Maneuvers • Experience • Aviation 	8	0	8
6	<p>UAV Design Practice</p> <ul style="list-style-type: none"> • Design and planning of a small Fixed Wing UAV • Research and estimate cost to build • Design and plan UAS for UAV 	8	0	8
7	<p>Operational Risk Management (ORM) considerations</p> <ul style="list-style-type: none"> • Weather • Advanced Planning based on forecast • Routes • Pre-Map Planning /story board if relevant • Pre-Walk of Flight area /safety checks • Operator training proficiency (Simulator use for intended aircraft) • Operator health/fitness for duty 	6	0	6
8	<p>Mission Planning for UAS operations</p> <ul style="list-style-type: none"> • UAS CONOPS • 'Manned' flight planning vs. unmanned flight planning • Endurance • Limited divert options • Tactical LR operations • Datalink/ C2 limitations • Lost link planning • GCS-handovers and Relief on Station 	8	0	8
				54



OUT OF CLASS ASSIGNMENTS

- 1 current event homework.
- 2 reading notes;
- 3 UAV design group project (e.g. helicopter fighter mission design).

METHODS OF EVALUATION

- 1 essay examinations;
- 2 midterm examination;
- 3 final examination.

METHODS OF INSTRUCTION

- Lecture
- Laboratory
- Studio
- Discussion
- Multimedia
- Tutorial
- Independent Study
- Collaboratory Learning
- Demonstration
- Field Activities (Trips)
- Guest Speakers
- Presentations

TEXTBOOKS

Title	Type	Publisher	Edition	Medium	Author	IBSN	Date
Small Unmanned Aircraft Systems Guide	Required	Aviation Supplies & Academics Inc.		Print	Terwillinger, Brent	9781619543942	2017