# AVIA 3111 ADVANCED FLIGHT MANEUVERS UNIVERSITY OF OKLAHOMA 2019-12-12

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the training course outline, training sylla	abus, and safety procedures and practices for AVIA 3111, Advanced
Flight Maneuvers.	
	Student Signature
	Flight Instructor Signature
	Chief Flight Instructor Signature

# UNIVERSITY OF OKLAHOMA DEPARTMENT OF AVIATION ADVANCED FLIGHT MANUEVERS COURSE

**COURSE OBJECTIVE:** The student will obtain the knowledge, skill, and aeronautical experience necessary to meet the requirements for this course.

<u>COURSE COMPLETION STANDARD</u>: The student will demonstrate through written tests, oral tests, flight tests, and show through appropriate records that the knowledge, skill, and experience requirements necessary to complete this course.

<u>FLIGHT TRAINING COURSE OBJECTIVE</u>: The student will obtain the aeronautical skill and experience necessary to meet the course requirements.

<u>COMPLETION STANDARD</u>: The student must demonstrate through flight tests and school records that the necessary aeronautical skills and experience requirements to complete the course.

**GROUND TRAINING COURSE OBJECTIVE**: The student will obtain the necessary aeronautical knowledge and meet the prerequisites specified in FAR Part 61.

<u>COMPLETION STANDARD</u>: The student has demonstrated through oral and written tests and records that the prerequisites specified in FAR Part 61 have been met and the necessary aeronautical knowledge required to pass the end of course written exam.

<u>AIRPORT</u>: Max Westheimer Airport is the operations base for training in this course. Max Westheimer Airport has a hard surface runway and meets the requirements of 14 CFR, Section 141.38 for day and night operation. Fuel is available from 7:00 A.M. to 10:00 P.M. daily. Maintenance is available from 6:30 A.M. to 3:00 P.M. Monday through Friday and at other times on call. Training will originate at Max Westheimer Airport.

<u>AIRCRAFT</u>: The aircraft to be used in this course of training is the C152-A. VFR airplanes are equipped for day and night VFR as specified in 14 CFR, Section 91.205. Radio equipment will consist of at least one VHF transceiver and at least one VOR receiver. Flight training devices used in this course of training are the ATC-710 and PCATD. They meet the requirements of 14 CFR, Section 141.41.

# UNIVERSITY OF OKLAHOMA DEPARTMENT OF AVIATION ADVANCED FLIGHT MANEUVERS COURSE

<u>FLIGHT INSTRUCTORS</u>: Each flight instructor must hold at least a commercial pilot certificate with an airplane category, single engine land rating and airplane instrument rating. In addition, (s)he must hold a flight instructor certificate with an airplane category rating and a single-engine class rating and have at least a second class medical certificate.

**OFFICE AND CLASSROOM FACILITIES USED FOR AVIATION STUDENTS**: The office and classroom facilities used for the training of aviation students of the University of Oklahoma are described in Appendix D of this Training Course Outline.

<u>COURSE ENROLLMENT</u>: You must hold a private pilot certificate or recreational pilot certificate with at least a third class medical certificate prior to enrolling in the flight portion of the advanced flight maneuvers course.

**LESSON DESCRIPTION AND STAGES OF TRAINING**: Each lesson is fully described within the syllabus, including the objectives, standards, and measurable units of accomplishment and learning for each lesson. You are expected to complete at least one stage approximately every 90 days. The objectives and standards of each stage are described within the syllabus.

**COURSE POLICY**: The course policies for this course of training are outlined in Appendix B of this Training Course Outline.

# UNIVERSITY OF OKLAHOMA DEPARTMENT OF AVIATION ADVANCE FLIGHT MANEUVERS COURSE RULES OF OPERATION

**<u>DISPATCH PROCEDURES</u>** - The provisions of 14 CFR, Section 91.103 will be met prior to aircraft dispatch. For both dual and solo flights the instructor will provide a preflight briefing to the student. The instructor's signature on the syllabus sheet for that lesson constitutes permission to dispatch the aircraft. The student will check the scheduling clipboard to determine which aircraft is assigned for the flight and complete the information on the Aircraft Sign Out Sheet, the Plastic Flight Plan form and the Aircraft Information Sheet in the aircraft checklist binder. A flight plan will be filed with the McAlester Automated Flight Service Station for all cross country flights. For all solo cross country flights the student will also complete a Cross Country Sign Out form (available in the dispatch area). For at least the first four lessons in the private pilot course the instructor will accompany the student while dispatching and preflighting the aircraft. Aircraft keys are kept in a lock box in the dispatch area and will be issued upon completion of the above procedures.

Notification of solo students returning after normal business hours (Monday through Friday after 5:00 PM, or any time on weekends and holidays): The instructor will tell the student to call the OU mobile phone number at 405-919-6319 upon return. If the solo departure is during normal business hours the instructor will place a note in the Chief Flight Instructor's box indicating the student name, aircraft tail number and itinerary of the flight. The Chief Flight Instructor or designated assistant checks this box prior to departure each day. If the solo departure is after normal business hours, the instructor will call the OU mobile phone number with this information.

STARTING PROCEDURES - All aircraft will be started within the ramp area of the Department of Aviation unless otherwise designated by the Chief Flight Instructor or his designee. All starting procedures will comply with the procedures stated in the Pilots Operating Handbook for that aircraft.

**TAXIING PROCEDURES** - Taxi on yellow depicted taxi routes and at a slow and reasonable speed (use 10 miles per hour as a guide). Spacing between aircraft on taxi routes will be a minimum of two ship lengths. During the day, operate the anti-collision lights while taxiing. Use position lights and the landing light at night. To minimize the chance of runway incursion, read back taxi instructions, particularly hold short, position and hold, runway crossing and takeoff clearances. When obtaining complex taxi clearances at unfamiliar airports write down the clearance, have an airport diagram available and request progressive taxi if needed.

FIRE PRECAUTIONS - During fueling operations the aircraft involved will be unoccupied. Fire extinguishers will be present when fueling is in progress. In the event of aircraft fire during engine start or taxiing, follow the emergency procedures in the aircraft POH. If there is any doubt about whether emergency procedures are working to extinguish the fire, evacuate the aircraft immediately.

REDISPATCH PROCEDURES - In the event a student landing is accomplished at an unscheduled destination for any reason, the student is to contact the Aviation Department at (405) 325-7231 (Long Distance instate toll free 1-800-522-0772 ext. 7231), or OU Aviation mobile phone at 405-919-6319 prior to determining any further course of action.

**AIRCRAFT DISCREPANCIES**: Upon noticing a discrepancy the pilot in command will take the following actions:

- Place the plastic "Maintenance Required" sign in the windshield of the aircraft (this sign is in a loose leaf binder in the
- Complete Form OUAVMAIN #2 (copies of this form are in a loose leaf binder in the aircraft). When filling out the "Maintenance Problem" section, be as specific as possible. Provide the top copy to the mechanics in the hangar and place the yellow copy on the Aircraft Sign Out Sheet. If the mechanics are not available, place the top copy of the form in the maintenance in-box in the dispatch section. If the main office is closed, put both copies of the form in the envelope slot in the hangar door.
- Upon returning to the dispatch area, turn the plastic flight plan over so that the words "No Fly" are displayed. Note: If the main office is locked and this can't be done, the "Maintenance Required" sign in the aircraft serves as notification that the aircraft is not airworthy.
- Notify the director, the chief flight instructor or one of the assistant chief flight instructors as soon as possible.

# UNIVERSITY OF OKLAHOMA DEPARTMENT OF AVIATION ADVANCED FLIGHT MANEUVERS COURSE RULES OF OPERATION

APPROVAL FOR RETURN OF AIRCRAFT TO SERVICE: The mechanics will take whatever corrective actions are required to return the aircraft to service. Upon returning the aircraft to service the mechanics will place the "Maintenance Required" sign back in the lose leaf notebook and notify the main office. At that time the plastic flight plan will be turned back over and the yellow copy of OUAVMAIN #2 placed in the mechanics in-box. If the discrepancy can't be corrected immediately, but the mechanics determine the aircraft is still airworthy, this information will be noted in the "Maintenance Performed" section along with any required operating limitations due to the discrepancy. Inoperative equipment will be removed or deactivated and placarded IAW 14 CFR, Section 91.213. The aircraft may then be returned to service and flown within any operating limitations noted.

<u>SECURING AIRCRAFT</u> - The pilot in command is responsible for securing aircraft on the ramp. Only aviation department personnel and contract personnel from the FBO may hangar aircraft. Students may assist in hangaring aircraft under the supervision of these personnel. All university aircraft will be secured with tie-down ropes or chocks while unattended on the Department of Aviation ramp. On cross country flights, the pilot in command will make tie-down arrangements with the local FBO for securing the aircraft. At no time will an aircraft be left unattended without it being secured by wheel chocks or tie-down ropes. When returning aircraft to the ramp in front of the terminal, solo students will not park the aircraft in the first row by the fence.

<u>AIRCRAFT AVOIDANCE</u> - No person may operate an aircraft so close to another aircraft as to create a collision hazard either on the ground or in the air. At all times, the Pilot-in-Command will be responsible for, and actively use "See and Avoid" procedures as described in the AIM, Chapter 7, Section 5 and comply with the right of way rules specified in 14 CFR, Section 91.113.

<u>FUEL RESERVES</u> - At no time will a department aircraft depart on a flight without the minimum fuel required by 14 CFR, Section 91.151 for VFR flights. Solo fuel reserves will be one hour remaining after the full stop landing on both local and cross-country flights. Dual fuel reserves will be 30 minutes daytime, 45 minutes nighttime remaining after full stop either local or cross-country.

MINIMUM ALTITUDES - Minimum altitude for solo maneuver practice with the exception of landing practice is 600' AGL or higher if the minimum altitude applicable in 14 CFR, Section 91.119 is higher than 600' AGL. All simulated emergency landings will be terminated at 500' AGL minimum.

<u>PRACTICE AREAS</u> - The University utilizes several practice areas for flight training. These areas are depicted in Appendix C of this Training Course Outline.

# **WIND LIMITS:**

Solo: Maximum 25 knots - Maximum 10 knots gust spread Dual: Maximum 35 knots - Maximum 15 knots gust spread

Crosswind: Crosswind limits will not exceed those specified by the Pilots Operating Handbook for the aircraft to be flown.

AIRCRAFT CHECKLIST/KEY TURN IN: After completing the flight and securing the aircraft, the student will record the hobbs time on the Aircraft Information Sheet and return the aircraft checklists and keys to the dispatch area. Give the keys to a staff member for return to the lock box and complete the information on the Aircraft Sign Out Sheet. Return the syllabus sheet to the instructor for further processing. Solo students returning after hours when the main office is locked will leave the aircraft checklists and syllabus sheet in the aircraft keys will be placed in the envelope slot in the door to the large hangar. All solo students returning after normal business hours (5:00 PM, Monday through Friday or any time on weekends and holidays) will call the OU mobile phone at 919-6319 to report completion of the flight.

### **ATTENDANCE - TARDINESS:**

Students are expected to attend all scheduled ground and flight training lessons. In the event of sickness or accident, call the Aviation Department at 325-7231. Do not make a determination of attendance due

to weather. If in doubt, call the Aviation Department. Excessive absences or tardiness, are grounds for removal from the course.

### UNIVERSITY OF OKLAHOMA ADVANCED FLIGHT MANEUVERS

# **COURSE OBJECTIVE**

The object of this course is to introduce the student to advanced flight maneuvers. It will also broaden the student's knowledge of aerodynamics and operating aircraft in the flight environment not normally encountered during day-to-day operations. The goal is to make the student more comfortable with aircraft performance throughout the flight regime.

### STAGE COMPLETION STANDARD

At the completion of this course the student will be proficient in all maneuvers in this syllabus. Additionally, the student will have a better understanding of aerodynamics and operation of the aircraft throughout the aircraft's flight regime.

### GROUND LESSON TIME ALLOCATION

LESSON	TIME	QUIZ
1	2.0	
2	2.0	
3	2.0	
4	2.0	
5	2.0	
6	0.5	0.5
TOTAL	10.5	0.5

# FLIGHT LESSON TIME ALLOCATION

LESSON	DUAL	PRE/POST FLIGHT
1	0.7	A/R
2	0.7	A/R
3	0.8	A/R
4	0.8	A/R
5	1.0	A/R
6	1.0	A/R
TOTAL	5.0	

NOTE: The individual lesson times for the ground and flight lessons are for student/instructor use only. However, the totals for each segment, ground and flight, must be met for satisfactory course completion.

A/R = As required



### **LESSON OBJECTIVE:**

This lesson is an introduction to course content, aims and general procedures.

### **CONTENT:**

### **Lesson Introduction**

Discussion of:

G forces

Limit load factors of normal (+3.8, -1.52),

Utility (+4.4, -1.76) & aerobatic (+6.0, -3.0)

Why aerobatics should not be done in normal

or utility airplanes

Probable G forces to be encountered (how the

accelerometer works)

Pilot physiology

### **Introduction:**

1-G stall

720° constant-altitude steep turn (45° or 60° banks)

Chandelle

Wing over

Lazy eight

Aileron Roll

Common Errors

 $Preflight\ check-special\ emphasis\ on\ checks\ for\ structural\ damage$ 

Briefing at the airplane on the parachute and exit from the airplane

### **COMPLETION STANDARDS:**

The lesson is complete when the student shows, to the instructor's satisfaction, an understanding of the presented material.

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### **AFM GROUND LESSON 2**

### LESSON OBJECTIVE:

This lesson introduces new maneuvers and reviews previous ones.

### CONTENT:

### Lesson Review

Chandelles and wing overs

Aileron roll

# **Lesson Introduction**

Loop

Loop followed by an aileron roll

Cloverleaf

Cuban eight

Spin entry & recovery

### **COMPLETION STANDARDS:**

The lesson is complete when the student shows, to the instructor's satisfaction, an understanding of the presented material.

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# **LESSON OBJECTIVE:**

This lesson introduces new maneuvers and reviews previous ones.

# **CONTENT:**

# **Lesson Review**

Aileron roll

Loop Cuban eight

Spin

# **Lesson Introduction**

Spin theory Three-turn spins

Immelmann

Recovery from inverted flight

# **COMPLETION STANDARDS:**

The lesson is complete when the student shows, to the instructor's satisfaction, an understanding of the presented material.

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### LESSON OBJECTIVE:

This lesson introduces new maneuvers and reviews previous ones.

# **CONTENT:**

# **Lesson Review**

Cuban eights

Spins

# **Lesson Introduction**

Discussion Airplane certification Maneuvering and gust envelopes and airspeed Indicator markings Snap rolls Snaps at the top of a loop

# **COMPLETION STANDARDS:**

The lesson is complete when the student shows, to the instructor's satisfaction, an understanding of the presented material.

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# LESSON OBJECTIVE

This lesson introduces new maneuvers and reviews previous ones.

### **CONTENT:**

# **Lesson Review**

Aileron Roll

Loop

Snap Roll

Cuban eights

# **Lesson Introduction**

Discussion

Longitudinal stability, static & dynamic

FAR requirement for stability
Forces and moments on an airplane in flight

Ground effect

Wake turbulence & methods of recovery

Aileron roll, loop, and spin recoveries under the hood

# **COMPLETION STANDARDS:**

The lesson is complete when the student shows, to the instructor's satisfaction, an understanding of the presented material.

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### LESSON OBJECTIVE:

This lesson introduces new maneuvers and reviews previous ones.

### **CONTENT:**

# **Lesson Review (maneuvers as requested by student)**

Aileron Roll

Loop

Cloverleaf

Snap Roll

Cuban eights

Immelmann

Spin

### **Lesson Introduction**

Barrel roll, reviewing the wing over

Effects of spin on aileron use and power (Why the ailerons should be neutral and the throttle closed for the most effective recovery)

Discussion

Four-point roll (optional)

Reverse Cuban eight, eight point roll, and

Reverse cloverleaf (optional)

Wake turbulence and recovery methods

Aileron roll, loop, and spin recoveries under

The hood

### **COMPLETION STANDARDS:**

The lesson is complete when the student shows, to the instructor's satisfaction, an understanding of the presented material.

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### AFM FLIGHT LESSON 1 - DUAL - LOCAL

### LESSON OBJECTIVE:

This lesson introduces new maneuvers.

# **CONTENT:**

Climb to a safe altitude in a clear area. Instructor shows student practice area limits Demonstration and practice of 720° turns (45° & 60° bank)

Demonstration and practice of chandelles (30° initial bank and wing overs  $-60^{\circ}$  and 90° bank)

Demonstration and practice of aileron rolls. Student does At least 2 left rolls and 1 right roll.

Post flight briefing and critique of maneuvers.

# **COMPLETION STANDARDS:**

The lesson is complete when the student shows, to the instructor's satisfaction, an understanding of the maneuvers.

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### AFM FLIGHT LESSON 2 – DUAL - LOCAL

### LESSON OBJECTIVE

This lesson introduces new maneuvers and reviews previous ones.

### **CONTENT:**

### **Practice**

Aileron rolls (left and right) Demonstration and practice Loops with instructor handling throttle Loops with trainee handling throttle Loops followed by aileron rolls with instructor, then student handling throttle Cloverleaf One half Cuban eight Cuban eights

# **Demonstration**

Hands-off spin recovery at 2 turns Hands-off spin recovery at 2 turns, followed by A 3-turn spin & standard recovery Post flight review

# **COMPLETION STANDARDS:**

The lesson is complete when the student shows, to the instructor's satisfaction, an understanding of the maneuvers. The student should also demonstrate the capability to safely perform the maneuvers.

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### AFM FLIGHT LESSON 3 – DUAL - LOCAL

### LESSON OBJECTIVE:

This lesson introduces new maneuvers and reviews previous ones.

### **CONTENT:**

### **Practice**

Aileron rolls (left and right) Loops followed by aileron rolls Cuban eights 3-turn spin in each direction

# **Demonstration and practice**

Immelmann Post flight review

### **COMPLETION STANDARDS:**

The lesson is complete when the student shows, to the instructor's satisfaction, an understanding of the maneuvers. The student should also demonstrate the capability to safely perform the maneuvers.

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### AFM FLIGHT LESSON 4 - DUAL - LOCAL

### LESSON OBJECTIVE:

This lesson introduces new maneuvers and reviews previous ones.

# **CONTENT**:

### **Practice**

Cloverleafs and Cuban eights Spins with over-the-top, under-the-bottom, and normal entries (at least one of each)

# **Demonstration and practice**

Snap rolls Snap roll at the top of a loop Post flight review

# **COMPLETION STANDARDS:**

The lesson is complete when the student shows, to the instructor's satisfaction, an understanding of the maneuvers. The student should also demonstrate the capability to safely perform the maneuvers.

### UNIVERSITY OF OKLAHOMA

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### AFM FLIGHT LESSON 5 – DUAL - LOCAL

### LESSON OBJECTIVE:

This lesson introduces new maneuvers and reviews previous ones.

### **CONTENT:**

### **Practice**

Loop, aileron roll, and snap combination One or more Cuban eights Aileron rolls and loops under the hood (optional) Spin recovery under the hood (optional)

# **Demonstration and practice**

Half-roll recoveries from simulated wake turbulence Demonstration Airplane's longitudinal stability Post flight review

### **COMPLETION STANDARDS:**

The lesson is complete when the student shows, to the instructor's satisfaction, an understanding of the maneuvers. The student should also demonstrate the capability to safely perform the maneuvers.

### UNIVERSITY OF OKLAHOMA

STUDENT NAME	ID#
INSTRUCTOR NAME	CERT#
AIRCRAFT# CRM FLIGHT	STAGE # I LESSON #205
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HOMEWORK COMPLETE: Y / N (% graNote:	ade is normally part of the lesson grade.)
<ol> <li>Circle appropriate status/grade a</li> </ol>	and put number (%) grade on line.
<ol><li>If cancellation state reason.</li></ol>	
REMARKS:	
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### AFM FLIGHT LESSON 6 - DUAL - LOCAL

### LESSON OBJECTIVE:

The student will be evaluated on maneuvers chosen by the instructor/evaluator.

# **CONTENT:**

Maneuvers as selected by the instructor/evaluator

Evaluator should emphasize:

Spins including demonstration of power and pro-And antispin ailerons on rotation rate and recovery

Post flight review

# **COMPLETION STANDARDS:**

The lesson is complete when the student shows, to the instructor's satisfaction, basic mastery of the selected maneuvers.

STUDENT	NAME	Ē				ID#						
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# APPENDIX B UNIVERSITY OF OKLAHOMA **COURSE POLICIES**

- At the discretion of the instructor, students who progress rapidly within a specific stage, may within reasonable variances, 1. continue to the next lesson with less time than is specified in the specific lesson curriculum, provided all content and completion standards are satisfactorily completed. The time stated in the lesson is the approximate minimum time that a student would need to meet the lesson objectives and completion standards; not absolute required times. The lesson time could be slightly more or slightly less. These reduced hours must be included in other lessons to complete the total ground or flight time specified by category in the training course outline in order to satisfactorily complete the course.
- At no time will a student be allowed to continue to the next stage without having successfully completed all of the lessons 2. and the required tests or stage checks related to the completion of the previous stage.
- Any lesson stated as a FTD lesson may be flown in an aircraft, ATC-710 or PCATD. The lesson will include the required 3. pre- and post-flight procedures.
- Flight training for this course will be done in accordance with the F.A.A approved syllabus. Deviations from the syllabus due 4. to student training requirements, weather related factors, or other items as necessary will be allowed as long as the following requirements are met:
  - 1.) A notation will be made in the student training record as to the lesson covered and the reason for the deviation.
  - 2.) The student will complete all syllabus requirements before a graduation certificate is issued.
- 5. To satisfactorily complete the course of training, the student must meet all course objectives and completion standards. The student must have satisfactorily completed all required ground school courses and have completed the minimum flight time stated at the end of the course for each category as well as total flight time.

# APPENDIX C UNIVERSITY OF OKLAHOMA Practice Areas

The University of Oklahoma Department of Aviation has three (3) practice areas used for normal flight training operations on a daily basis. They are designated practice area 'A', 'B', and 'C'.

Practice area 'A is described as an area southwest of Max Westheimer Airport bounded on the north by State Highway 9, on the south by the 35° line of latitude, on the west by the line extending north and south along a similar direction road extending south from the town of Blanchard, and on the east by the line formed by the railroad tracks running southeast from Norman, OK along and near Interstate Highway 35.

Practice area 'B' is described as an area southeast of Max Westheimer Airport bounded on the north by State Highway 9, on the south by State Highway 33, on the west by the railroad tracks extending southeast from Norman, OK, and on the east by an imaginary line extending south from the east side of Lake Thunderbird and ending at State Highway 33.

Practice area 'C' is described as an area west of Max Westheimer Airport bounded on the north by an imaginary line extending west from State Highway 9 southwest of Norman, Ok. to the town of Pocasset, OK., on the south by the 35° line of latitude, on the west by the line extending north and south along a similar direction road extending north from the town of Chickasha, OK. and on the east by the line extending north and south along a similar direction road extending south from the town of Blanchard, OK.

