

**SYLLABUS
DCRC TRAINING PROGRAM**

I. PRINCIPLES OF FLIGHT

Purpose: To acquaint students with basic aeronautical theory of flight.

Material: DCRC training program handout.

Opening: Instructor introduces self and asks student to introduce selves with indication of experience and/or interest in aviation and RC.

Instructor covers the following subjects using program material.

A. Lift

1. Forces on airplane
2. Mr. Bernoulli and low pressure
3. Relative wind
4. Angle of attack

B. STABILITY

1. Gravity vs. lift
2. Thrust vs. drag

C. CONTROL SURFACES

1. Aileron
2. Elevator
3. Rudder

D. FLIGHT AXIES

1. Roll
2. Pitch
3. Yaw

E. LIFT AND BANK

F. AIRFOILS

II. RADIO CONTROLLED MODELS

Purpose: Provide students with a general idea of the types of planes and equipment used for RC trainers.

Material: RC trainer and functioning radio system. Catalogue of RC materials (planes, engines, etc). DCRC training program.

Instructor to explain different equipment and materials with advantages and drawbacks associated therewith.

A. TYPES OF TRAINERS AVAILABLE

1. ARF
2. Kits
3. Power
 - a. Electric
 - b. Internal combustion

B. MODEL MATERIALS

- 1. Woods**
 - a. Balsa**
 - b. Plywood**
 - c. Hardwoods**

- 2. Glues**
 - a. CAs**
 - b. Epoxy**
 - c. Ambroids**
 - d. Specialty**

- 3. Covering**
 - a. Plastic**
 - b. Fabric**
 - c. Wood**
 - d. Tools**

- 3. Power**
 - a. Internal combustion**
 - b. Electric**
 - c. Unpowered**

- 4. Electronics**
 - a. Receiver**
 - c. Battery**
 - d. Servos**
 - e. Switches and jacks**

B. SELECTION AND ACQUISITION OF MATERIALS AND EQUIPMENT

Purpose: To have the students select the plane, engine and other equipment needed to fabricate a flyable RC trainer.

Material: Catalogues and other cost data sources, paper and calculator.

Instructor provides any required guidance to students in making appropriate selections.

- 1. Develop plan for funding project**
- 2. Select plane to acquire**
- 3. Select engine**
- 4. List other items needed**
- 5. Obtain other items**

III. CONSTRUCTION

Purpose: To produce a flyable RC plane.

Material: Kit or ARF plane, engine, glues, knives, tools and accessories needed to assemble the airplane.

The instructor provides supervision of the construction phase with emphasis on safe work habits, explains the use of tools and assembly techniques.

SPECIAL NOTE TO INSTRUCTORS:

Up to the point construction starts, the number of students in attendance is of no concern. During construction the number of students active at any one time has to be limited. This writer has experienced as many as five students working on one plane at the same time and found the situation unproductive. It is suggested that a limit of three builders at one time per airplane be considered. Some form of working in teams might work but for everyone to understand all of the phases of construction might require a division of workers and watchers at any given moment. A second consideration is location of a place suitable to building the airplane(s).

1. Reading of instructions
2. Assemble wing, fuselage and tail.
3. Attach landing gear
4. Attach control surfaces
5. Install radio and servos
6. Install control linkage
7. Fuel proofing
8. Add fuel tank
9. Use of Loctite™
10. Balance and center of gravity

III. LEARNING TO FLY

THIS ACTIVITY TAKES PLACE AT THE DCRC MODEL AIRPARK LOCATED IN GERMANTOWN. Learning to fly may involve different instructors and the student will be responsible for transportation to the flying site.

A. HAVE A THROUGH KNOWLEDGE OF SAFETY CONSIDERATIONS

1. (Flight training syllabus?)

B. ARRIVE PREPARED

1. Charge batteries (written handout)
2. Bring necessary equipment
 - a. Fuel
 - b. Starting equipment (not fingers)
 - c. Tools
 - d. Spare parts

C. PREFLIGHT

- 1. Adhere to frequency control system**
- 2. Check control throws and directions**
- 3. Range check radio**
- 4. Double check battery(s) condition**

D. LISTEN TO THE INSTRUCTORS

- 1. Draw on the experience of others**
- 2. Learn different things from different instructors**

IV. TAKING CARE OF YOUR EQUIPMENT

A. AFTER FLYING

- 1. Remove unused fuel**
- 2. Run residual fuel out of engine**
- 3. Clean airplane**

B. TRANSPORTATION AND STORAGE

- 1. Secure equipment when transporting**
- 2. Have a safe storage area at home**

V. FINDING AND FIXING PROBLEMS (TBD)

A. Engine (chart handout)

B. Controls

C. Servos

D. Radio & battery

E. Structural