

**SYLLABUS FOR LIGHT COMMERCIAL DUCT DESIGN CLASS(S)**

**SESSION ONE**

**1: BASIC TERMS**

INDUSTRY TERMS & THEIR MEANING.  
MEASURING STATIC, VELOCITY & TOTAL DUCT PRESSURES  
DUCT SIZING METHODS, PROS & CONS  
DESIGN CONSIDERATIONS  
SYSTEM ACCESSORIES  
DUCT FITTINGS, GOOD & BAD

**TIME 30 MINUTES – 8:30 AM**

**2: FORMULAS & THEIR USES**

WHAT IS STANDARD AIR  
ESTABLISHING REQUIRED CFM  
USING CHARTS  
HOW TO DO A QUICK FIELD LOAD ESTIMATE  
ESTABLISHING CFM, SIZE & VELOCITY USING FORMULAS

**TIME 30 MINUTES – 9:00 AM**

**3: INTRODUCTION TO THE FRICTION CHART**

HOW TO READ THE FRICTION CHART  
TYPES OF CHARTS  
CLASS PARTICIPATION IN PROBLEM SOLVING THROUGH CLASS EXAMPLES  
CORRECTION FACTORS & HOW TO USE THEM PROPERLY  
DISCUSSING EQUIVALENT LENGTHS

**TIME 30 MINUTES – 9:30 AM**

**BREAK 10-15 MINUTES – 9:45 AM**

#### **4: INTRODUCTION TO THE DUCTULATOR**

THE TYPES OF DUCTULATORS  
CALCULATING DUCT SIZES, VELOCITIES  
CALCULATING DUCT CONVERSION TO ROUND  
DUCT CLASSIFICATIONS  
USING THE DUCTULATOR

**TIME 30 MINUTES – 10:15 AM**

#### **5: EQUIVALENT LENGTH**

WHAT IS EQUIVALENT LENGTH & HOW TO USE IT IN CORRELATION WITH YOUR DESIGN  
DUCT CLASSIFICATIONS BY VELOCITIES  
SYSTEM RECOMMENDATIONS  
HOW TO USE THE DUCTULATOR  
CLASS EXAMPLES

**TIME 60 MINUTES – 11:15 AM**

#### **6: THE DUCTULATOR**

USING THE DUCTULATOR  
UNDERSTANDING THE REVERSE SIDE  
EXPLAINING THE CORRECTION CHART  
FITTINGS & THEIR EQUIVALENT LENGTHS  
OPEN CLASS PRACTICE ON USING THE DUCTULATOR AND QUESTIONS

**TIME 60 MINUTES – 12:15 PM**

**END OF SESSION ONE**

## **SESSION TWO**

### **7: AIR DISTRIBUTION**

UNDERSTANDING BASIC TERMS ASSOCIATED WITH AIR DISTRIBUTION PIECES  
DESCRIBING, THROW, DROP, COANDA EFFECT, SPREAD, VELOCITY, STATIC PRESSURE, ETC.  
CLASS EXAMPLES OF SELECTING CEILING DIFFUSERS  
CLASS EXAMPLES OF SELECTING SIDE MOUNTED GRILLO  
CLASS EXAMPLES OF SELECTING RETURN AIR GRILLS  
NOISE RATING (NC) AND UNSTANDING THEIR APPLICATIONS  
HOW TO SELECT THE RIGHT AIR DISTRIBUTION FOR YOUR DESIGN

**TIME 75 MINUTES – 9:15 AM**

### **8: PUTTING IT ALL TOGETHER**

SELECTING THE CORRECT CFM FOR YOUR DESIGN BUILD PROJECT  
SIZING THE DUCT SYSTEM USING THE EQUAL FRICTION METHOD, THE DUCT U LATOR  
SELECTING THE RIGHT AIR DISTRIBUTION PIECES  
ESTABLISHING THE TOTAL ESP (EXTERNAL STATIC PRESSURE)  
CLASS PARTICIPATION IN DESIGNING MULTIPLE SYSTEM EXAMPLES  
REVIEW OF THE EXAMPLES.

**TIME 90 MINUTES – 10:45 AM**

**BREAK 15 MINUTES – 11:00 AM**

### **9: EQUIPMENT SELECTION**

HOW TO SELECT THE EQUIPMENT BASED ON YOUR LOAD CALCULATIONS  
UNDERSTANDING LOCAL DESIGN CONDITIONS, 95 ODT, 80/67 ERAT,  
UNDERSTANDING TOTAL, SENSIBLE BTUH  
USING MANUFACTURES CHARTS TO SELECT THE EQUIPMENT  
MATCHING LOADS, CFM, ESP, BHP, ETC  
CONTACTING YOUR SUPPLIER

**TIME 30 MINUTES – 11:30 AM**

### **10: OPEN REVIEW**

QUESTIONS AND ANSWERS  
OPEN DISCUSSION  
REVIEW OF ANY PERSONAL PROJECTS

**TIME 30 MINUTES – 12:00 PM**

**FILL OUT EVALUATION FORM PLEASE**

### **MATERIALS NEEDED FOR ATTENDEE'S**

PEN, PENCIL  
PAD  
GRAFT PAPER  
CALCULATOR  
STRAIGHT EDGE OR RULER  
SENSE OF HUMOR

### **MATERIALS NEED FOR THE INSTRUCTOR**

GLASS OF WATER  
CUP OF COFFEE  
ASSISTANT FOR HANDOUTS AND INDIVIDUAL'S HELP  
BLACK BOARD, CHALK  
LARGE ERASER  
LASER POINTER

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## LIGHT COMMERCIAL DUCT DESIGN USING THE EQUAL FRICTION METHOD

- THE SUCCESS OF THIS CLASS IS UP TO YOU
- JOIN THE CLASS DISCUSSION ENTHUSIASTICALLY
  - SHARE YOUR EXPERIENCES
- LIMIT YOUR QUESTIONS AS THEY RELATE TO THIS CLASS
  - LET ONE PERSON SPEAK AT A TIME
  - BE PATIENT WITH FELLOW STUDENTS
  - RESPECT THE OTHERS POINT OF VIEW

OUR OBJECTIVE IS TO MAKE THIS CLASS MEETING AS EDUCATIONAL AS POSSIBLE

**THANKS**

**LIGHT COMMERCIAL DUCT DESIGN CLASS EVALUATION SHEET**

PLEASE USE THE FOLLOWING NUMERICAL VALUES AS A GUIDE IN YOUR EVALUATION OF TODAY'S MEETING. AND INCLUDE ANY COMMENTS YOU WISH.

*CIRCLE THE NUMBER THAT BEST FITS YOUR EVALUATION.*

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>POOR</b>	<b>FAIR</b>	<b>GOOD</b>	<b>VERY GOOD</b>	<b>EXCELLENT</b>

THE TIME OF THE CLASS	1	2	3	4	5
THE LOCATION OF THE CLASS	1	2	3	4	5
THE QUALITY OF THE MATERIALS PRESENTED	1	2	3	4	5
THE QUALITY OF THE SUBJECTS PRESENTED (TOPICS)	1	2	3	4	5
WAS THE INFORMATION HELPFUL, IF SO, COMMENT.	1	2	3	4	5
PREFERRED TIME OF THE CLASS	1	2	3	4	5
WOULD YOU BE INTERESTED IN AN INTRO TO PSYCHROMETICS COURSE?	Y		N		

COMMENTS: \_\_\_\_\_  
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## **DESIGNATED INSTRUCTOR'S INFORMATION**

**NAME:** CARL J. BOGAR

**ADDRESS:** 5651 GATEWAY LANE

**CITY:** BROOK PARK **STATE:** OHIO **ZIP:** 44142 **TELEPHONE:** 216-267-5669

**CURRENT OCCUPATION:** SEMI RETIRED

**FIELD OF EXPERTISE:** HVAC

**YEARS OF EXPERIENCE IN THE ABOVE SUBJECT AREA:** 50 +

**YEARS OF TEACHING IN THE ABOVE SUBJECT AREA:** APPROXIMATELY 10

### **INSTRUCTORS QUALIFICATIONS & BIO FOR THIS COURSE APPLICATION:**

- TAUGHT VERY SIMILAR COURSES FROM APPROXIMATELY 2000 TO 2007. CERTIFIED BY O.C.I.L.B. & SPONSERED BY YORK INTERNATIONAL, ACCA & ACCO. CLASSES WERE PRESENTED AT THE AKRON, OHIO SCHOOL DISTRICT, SPECIFIED LOCATIONS FROM WESTERN PA., CLEVELAND, COLUMBUS, CINCINNATI, OHIO & PARTS OF KENTUCKY. STUDENT LEVELS VARIED FROM FOUR TO 50. ATTENDEE'S WERE HVAC CONTRACTORS, ESTIMATORS, SHEET METAL WORKERS, ARCHITECTS,
- E.I.T. (ENGINEERS IN TRAINING), SERVICE TECHNICIANS.
  
- LIFE MEMBER OF A.S.H.R.A.E.
  
- SERVED TWO BUILDING TRADES APPRENTICE SHIPS, ONE AS A SHEET METAL WORKER & ONE AS A PIPE FITTER.
  
- HIGHER LEVEL OF EDUCATION INSTITUTIONS ATTENDED:  
COMMUNITY COLLEGE OF DENVER COLORADO  
COLORADO UNIVERSITY  
UNIVERSITY OF CHICAGO  
UNIVERSITY OF TOLEDO  
CLEVELAND STATE  
TRI C COMMUNITY COLLEGE

- ATTENDED APPROXIMATELY 1000 HOURS OF CONTINUED EDUCATION CLASSES RELATED TO THE HVAC INDUSTRY WHICH INCLUDED HVAC DESIGN, AIR BALANCING, ENERGY CONTROLS, COMPUTER AIDED HVAC DESIGN & OTHERS.
- PROFICIENT AT USING COMPUTER HVAC LOAD ESTIMATING PROGRAMS.
- LAST YEAR, LOAD ESTIMATED AND DESIGNED A PROJECT THAT CONSISTED OF TWO 25-TON SYSTEMS, TWO 20-TON SYSTEMS, ONE 10 & 8.5 TON PACKAGED ROOF TOP UNITS. THE DUCT SYSTEMS WERE ALL DESIGNED USING THE METHOD I WILL BE TEACHING & WAS A \$250,000.00 PROJECT.

### **COURSE / PROGRAM INFORMATION**

HVAC

TECHNOLOGY

**COURSE TITLE:** LIGHT COMMERCIAL DUCT DESIGN

**COURSE CONTACT HOURS**

**SESSION ONE:** FOUR HOURS

**SESSION TWO:** FOUR HOURS

### **MATERIALS NEEDED FOR ATTENDEE'S**

TEXT ARE NOTES TAKEN BY THE STUDENT FROM THE PRESENTATION THAT IS PROJECTED ON SCREEN.

PEN, PENCIL

PAD

GRAFT PAPER

CALCULATOR

STRAIGHT EDGE OR RULER

SENSE OF HUMOR

**COURSE OBJECTIVE:** TO PROVIDE THE STUDENT, NO MATTER WHAT LEVEL THEY ARE AT IN THE H.V.A.C. INDUSTRY A COMPREHENSIVE STUDY, FROM INCEPTION TO COMPLETION ON LIGHT COMMERCIAL DUCT DESIGN USING THE EQUAL FRICTION METHOD.