ISHM 2019 CLASS SCHEDULE

Class Level
Fundamental = F
Intermediate = I
Advanced = A

Classroom Lectures

Presentation Class Session

Period	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	2.5	2.6	3.1	3.2	3.3
	Tuesday, May 14th				***Wednesday, May 15th***						***Thursday, May 16th***		
	11:10 AM to 12:00 PM	1:20 PM to 2:10 PM	2:20 PM to 3:10 PM	4:10 PM to 5:00 PM	8:00 AM to 8:50 AM	9:00 AM to 9:50 AM	10:50 AM to 11:40 AM	1:20 PM to 2:10 PM	2:20 PM to 3:10 PM	4:10 PM to 5:00 PM	8:00 AM to 8:50 AM	9:00 AM to 9:50 AM	10:50 AM to 11:40 AM
Room #	5020.1	7300.1	8210.1	7330.1	2285.1	3140.1	2150.1	5265.1	5090.1	3270.1	2360.1	2130.1	8110.1
1	BTU Analysis Using a Gas Chromatograph (I)	Overview of GPA 2172/API 14.5 Revision (I)	Cone Meters for Liquid and Gas Measurement (I)	Fluid Volume Calculations (New) (I)	Measurement of Cryogenic LNG (I)	On-line Flow Computers for Liquid Custody Transfer (I)	Evaporation Loss Measurement from Storage Tanks (I)	Sample Conditioning & Contaminant Removal for Water Vapor Determination (I)	Determination of H2S and Total Sulfur in Natural Gas (I)	SCADA and Field Data Capture in the Cloud (I)	Statistical Control of Meter Factors - A Simplified Approach (I)	Effects of Petroleum Properties on Pipeline Measurement (I)	Multiphase Flow Measurement (A)
	6010.1	5065.1	5115.1	5320.1	8040.1	3170.1	6110.1	4100.1	2450.1	3120.1	5190.1	2310.1	4055.1
2	Causes and Cures of Regulator Instability (F)	An Optical Hydrocarbon Analyzer for On-Line Hydrocarbon Gas Speciation and Measurement (F)	Hydrocarbon Dew Point Effects on Gas Flow Measurement (I)	Moisture Measurement Using Laser Spectroscopy (I)	DOT Qualification Training for Measurement and Control Technicians (F)	Testing, Maintenance and Operation of Electronic Flow Computers for the Gas Industry (I)	Selection, Sizing and Operation of Control Valves for Gases and Liquids (I)	Operation and Problems Associated with Prover Detector Switches (I)	Offshore Liquid FPSO Measurement Systems (I)	Identifying and Eliminating Effects of Induced Signals on Measurement System Electronics (I)	Water Vapor Effects on Natural Gas Quality and Natural Gas Measurement (A)	Measurement of Petroleum on board Marine Vessels (A)	Flow Calibrating Ultrasonic Gas Meters (I)
	7180.1	1310.1	4080.1	3115.1	1050.1	1040.1	1010.1	1170.1	2490.1	1200.1	8120.1	5140.1	4230.1
3	API MPMS Chapter 22.2 Testing Protocol for Differential Pressure Flow Measurement Devices (A)	Thermometry in Gas Measurement (I)	LACT Unit Proving - The Role of the Witness (I)	Production Equipment Effects on Gas Measurement (I)	Coping with Changing Flow Requirements at Existing Meter Stations (F)	Compressibility of Natural Gas (I)	Basics of High Pressure Measuring and Regulating Station Design (F)	Fundamentals of Gas Turbine Meters (A)	Advanced Diagnostic Measurements and Verification with Coriolis Flow meters (A)	Mass Meters for Gas Measurement (A)	Odorization in Natural Gas (F)	Energy Measurement Using Ultrasonic Meters and Gas Chromatography (I)	The "Not So Small" Small Volume Prover (I)
	7320.1	5030.1	8340.1	5195.1	5500.1	5500.2	4050.1	2440.1	2440.2	2260.1	2080.1	2080.2	3200.1
9	Revision of AGA 9 Gas Ultrasonic Meter Standard (A)	BTU Determination of Natural Gas Using a Portable Chromatograph (I)	Conventional Measurement in Unconventional Plays (A)	Laboratory Gas Analysis Validation Methods (I)	Challenges in Allocation Measurement Panel (Hour 1 of 2) (I)	Challenges in Allocation Measurement Panel (Hour 2 of 2) (I)	Effective Use of Deadweight Testers (F)	Operation of Liquid Ultrasonic Flow Meters (Panel) (Hour 1 of 2) (I)	Operation of Liquid Ultrasonic Flow Meters (Panel) (Hour 2 of 2) (I)	Mass Meters for Liquid Measurement (A)	Crude Oil Gathering -Gauging Testing and Truck Measurement Alternatives (Hour 1 of 2) (New) (A)	Crude Oil Gathering - Gauging Testing and Truck Measurement Alternatives (Hour 2 of 2) (New) (A)	Data Validation - Requirements of an EGM Editor (I)
	1351.1	3230.1	8200.1	1420.1	3050.1	5330.1	4180.1	3125.1	8300.1	5560.1	8330.1	8140.1	2210.1
10	Impact of Federal and State Air Permiting Regulations on Measurement (A)	OPC Fundamentals (F)	Gas Meter Selection (I)	Condition-Based Monitoring of Natural Gas Ultrasonic Measurement Facilities (A)	Basic Applications for Flow Computers and Telemetry Systems (F)	Reducing Measurement Uncertainty in Process Gas Quality Measurements (I)	Proving Liquid Ultrasonic Meters (I)	Ethernet for SCADA Systems (F)	Measuring Natural Gas at Natural Gas Vehicle (NGV) Refueling Stations (I)	Online Color Measurement of Refined Products & Condensate (F)	Orifice Meter Tube Fabrication Shop Inspection Program (I)	Program for Training a Gas Measurement Technician (F)	Leak Detection on Petroleum Pipelines (I)
	2460.1	2550.1	2550.2	8230.1	3220.1	2570.1	4170.1	8350.1	8260.1	5160.1	7040.1	1355.1	3250.1
11	Application in Liquid Measurement Using Clamp-On Ultrasonic Technology (I)	LNG Measurement by Static and Dynamic Methodologies Panel (Hour 1 of 2) (I)	LNG Measurement by Static and Dynamic Methodologies Panel (Hour 2 of 2) (I)	Measurement Policies and Procedures – Development and Implementation Considerations (I)	Manufactured Meter Pulses – An Explanation (I)	Using Control Charts to Predict Failures of Measurement Devices (I)	Improving Flow Measurements with Improved Calibration & Data Handling Procedures (I)	Establishing a Development Program for Hydrocarbon Measurement Staff (I)	Contributors to Historical Advances in Natural Gas Measurement (I)	Field and Laboratory Testing of Sediment and Water in Crude Oil (I)	Auditing Gas Measurement and Accounting Systems (I)	Measurement and Regulation Operation of a LDC (F)	Wireless Economics 101 (F)
	7190.1	8280.1	4190.1	2510.1	1390.1	5540.1	4200.1	4210.1	1195.1	2470.1	1430.1	4260.1	2500.1
14	The Measurement Data Handling Process-Now and in the Future (I)	Cyber Security (I)	Preparing a Prover for Waterdraw Calibration (I)	Master meter prover certifications per API MPMS 4.9.3 (A)	Effects of Atmospheric Pressure on Gas Measurement (I)	Determination of Trace Oxygen in Natural Gas (I)	The Uncertainty of a Waterdraw Calibration vs. Gravimetric Calibration on Small Volume Provers (I)	Roles and Responsibilities of Witnessing a Prover Calibration (I)	Low Pressure Gas Measurement (F)	Volumetric Measurement of Liquefied Petroleum Gas (F)	Thermal Mass Flow Meters for Greenhouse Gas Measurement (F)	Orifice Meter Diagnostic Systems (New) (I)	LPG Terminal Operations and Measurement (F)
	2600.1	1400.1	5085.1	8065.1	2220.1	4220.1	3155.1	7120.1	7120.2	1320.1	5550.1	1210.1	3060.1
15	Liquid Tank Level - Interface Measurement (New) (F)	Gas Ultrasonic Diagnostics (F)	Refined Product Sampling Systems (I)	Interface Detection in Liquid Pipelines (I)	Liquid Measurement Field Surveys (I)	Methods for Certifying Measurement Equipment (I)	Spread Spectrum Radio Technology for Gas Measurement (I)	Update on API, AGA, GPA and ASTM Standards - Measurement Activities (Hour 1 of 2) (I)	Update on API, AGA, GPA and ASTM Standards - Measurement Activities (Hour 2 of 2) (I)	Wet Gas Measurement (A)	Uncertainties within Centrifuge Methods and Mitigations (I)	Measurement Station Inspection Documentation Program and Guide (F)	Basic Electronics for the Field Technician (F)
	7350.1	2020.1	5350.1	5310.1	3150.1	5120.1	8290.1	2410.1	2590.1	1090.1	2202.1	2230.1	5345.1
16	API 11.3.4 Micsellaneous Hydrocarbon Properties - Ethanol Density and VCF (New) (I)	Application of Turbine Meters in Liquid Measurement (F)	Flare Measurement Practices (F)	Fundamentals of Sampling Natural Gas for BTU Determination (F)	Real-Time Electronic Gas Measurement (I)	DOT Requirements for the Transportation of Sample Containers (F)	Understanding Hazardous Area Classifications (I)	Viscosity and its Application in Liquid Hydrocarbon Measurement (I)	Loading of Crude into Rail Tank Cars (I)	Effects and Control of Pulsation in Gas Measurement (I)	Helical Turbine Meters for Liquid Measurement (F)	Liquid Measurement Station Design (I)	Considerations in Sampling Wet, High Pressure, or Supercritical Natural Gas (I)
	2110.1	2540.1	4090.1	5370.1	2250.1	2520.1	8240.1	3240.1	2580.1	2330.1	1440.1	5235.1	2340.1
17	Displacement Meters for Liquid Measurement (F)	Fundamentals in Ethanol Blending (F)	Liquid Flow Provers (I)	Sampling Challenges Associated With Unconventional Gas Sources (A)	Mass Measurement of Natural Gas Liquid Mixtures (I)	Equipment and Techniques used in Real Time Component Volume Calculations for Natural Gas Liquid Measurement (I)	Benefits around Timely Analysis of Measurement Data (I)	Simplifying Real-time and Historical (EFM) Data Collection for the Oil & Gas Industry (I)	Ultrasonic Meters and Measurement Accuracy in Leak Detection (I)	Orifice Meters for Liquid Measurement (F)	Meter Factor Transferability for Coriolis Mass Flow Meters (I)	On-line Water Measurement Devices in Liquid Service (I)	Pycnometer Installation, Operation and Calibration (I)
	2420.1	5080.1	3180.1	2010.1	2380.1	2380.2	3010.1	1330.1	2270.1	4110.1	5060.1	7110.1	6090.1
18	Proving Liquid Meters with Microprocessor Based Pulse Outputs (F)	Crude Quality - What is Involved and Why It's Important (F)	Transient Lightning Protection for Electronic Measurement Devices (I)	Application of Densitometers to Liquid Measurement (F)	Troubleshooting Liquid Pipeline Losses and Gain (Hour 1 of 2) (I)	Troubleshooting Liquid Pipeline Losses and Gain (Hour 2 of 2) (I)	Advanced Application of Liquid Flow Computers (A)	Flow Conditioning for Fluid Flow Measurement (I)	Measurement Accuracy and Sources of Error in Tank Gauging (F)	Operational Experience with Small Volume Provers (I)	Chromatographic Analysis of Natural Gas Liquids (F)	Estimating Measurement Uncertainty for Gas Flow Meters (A)	Over Pressure Protection Methods (F)
	1340.1	5260.1	5170.1	5180.1	4140.1	7340.1	1360.1	2030.1	3020.1	7360.1	7030.1	5050.1	4020.1
19	Contaminant Accumulation Effect on Gas Ultrasonic Flow Meters (I)	Sampling and Conditioning of Natural Gas Containing Entrained Liquids (I)	Fundamentals of Gas Chromatography (F)	Design Considerations for Analyzer Enclosure Systems (I)	Theory and Application of Pulse Interpolation to Prover Systems (A)	Data Averaging (New) (I)	Flare Measurement Using Advanced Ultrasonic Technology (I)	Automated Truck Loading Systems (I)	Application of Flow Computers for Gas Measurement and Control (I)	Fundamentals of Downstream Terminal Stock Accounting and Inventory (New) (F)	Auditing Electronic Gas Measurement per API Chapter 21.1 (I)	Chromatograph Maintenance and Troubleshooting (I)	Calibration of Liquid Provers (I)
	3160.1	2205.1	1070.1	5040.1	2240.1	2290.1	2190.1	1250.1	3080.1	1060.1	5070.1	5070.2	5130.1
20	Smart Transmitter Selection, Calibration and Installation (I)	Installation and Operation of Densitometers (I)	Determination of Leakage and Unaccounted for Gas (I)	Chromatograph Applications and Problems from the User's Standpoint (I)	Marine Crude Oil Terminal Measurement Systems (I)	Measurement Methods for Liquid Storage Tanks (F)	Fundamentals of Liquid Turbine Meters (F)	Orifice Fittings and Meter Tubes (F)	Communication Systems for Gas Measurement Data (I)	Design of Distribution Metering and Regulating Stations (A)	Crude Oil Sampling for Custody Transfer Panel (Hour 1 of 2) (F)	Crude Oil Sampling for Custody Transfer Panel (Hour 2 of 2) (F)	Energy Measurement using Flow Computers and Chromatography (I)
	1140.1	1150.1	1160.1	1100.1	7370.1	7390.1	2530.1	8220.1	4060.1	7380.1	4130.1	4130.2	5100.1
A	Fundamentals of Gas Measurement I (F)	Fundamentals of Gas Measurement II (F)	Fundamentals of Gas Measurement III (F)	Effects of Abnormal Conditions on Accuracy of Orifice Measurement (F)	Allocation Measurement 101- Fundamentals of Allocations (New) (I)	Overview of Revised API Chapter 5.6 Liquid Coriolis Meters (New) (Panel) (F)	New Technologies in S&W Measurement (F)	Measurement Scene Investigations (I)	Guide to Troubleshooting Problems with Liquid Meters and Provers (I)	Overview of the new API Standard Chapter 9.4 Continous Density Measurement (New) (Panel) (F)	Proving Coriolis Flow Meters Panel (Hour 1 of 2) (I)	Proving Coriolis Flow Meters Panel (Hour 2 of 2) (I)	Determination of Water Vapor Content in Natural Gas (I)
	5590.1	8310.1	8310.2	8170.1	4160.1	5010.1	1190.1	5110.1	5110.2	5280.1	1101.1	2075.1	2400.1
B	Proper Handling & Maintenance of Natural Gas Calibration Cylinders (F)	New Ideas in Measurement (Hour 1 of 2) (F)	New Ideas in Measurement (Hour 2 of 2) (F)	The Role of BLM in Oil and Gas Measurement (I)	Witnessing Orifice Meter Verification / Calibration (I)	Auditing Gas Laboratories (I)	Installation and Operation Errors in Gas Measurement (I)	Determination of Hydrocarbon Dew Point in Natural Gas (Hour 1 of 2) (I)	Determination of Hydrocarbon Dew Point in Natural Gas (Hour 2 of 2) (I)	Techniques of Gas Composite Sampling (F)	Effects of Abnormal Conditions on Accuracy of Orifice Measurement (Repeat Class) (I)	Crude Oil Blending (I)	Ultrasonic Meters for Liquid Measurement (I)
	8320.1	2050.1	3210.1	2350.1	7111.1	4250.1	7400.1	3280.1	7050.1	2430.1	8250.1	5510.1	4095.1
D	Measurement Economics (I)	Calculation of Liquid Petroleum Quantities (I)	The Evolution of Data Collection for Gas Measurement (I)	Resolving Liquid Measurement Differences (I)	Estimating Measurement Uncertainty for Gas Flow Meters (Repeat Class) (A)	Understanding Liquid Meter Provings and Proving Reports (F)	Review of OIML/MID Type Approval Certification (New) (F)	RF (Radio Frequency) Fundamentals of IoT (A)	Auditing Liquid Measurement (A)	Operational Experience with Liquid Coriolis Meters (F)	Measurement Management Systems (A)	Introduction to Uncertainty in Measurement (I)	Liquid Meter Proving Techniques (I)
	2160.1	2170.1	2180.1	8360.1	2161.1	2171.1	2181.1	4070.1	4150.1	2090.1	3070.1	5570.1	1270.1
E	Fundamentals of Liquid Measurement I - Physical Properties (F)	Fundamentals of Liquid Measurement II - Static (F)	Fundamentals of Liquid Measurement III - Dynamic (F)	Engineering Ethics (I)	Fundamentals of Liquid Measurement I - Physical Properties (Repeat Class) (F)	Fundamentals of Liquid Measurement II - Static (Repeat Class) (F)	Fundamentals of Liquid Measurement III - Dynamic (Repeat Class) (F)	In-Situ (On-Site) Gas Meter Proving (I)	Verification / Calibration of Devices Used in Liquid Measurement (F)	Design, Operation and Maintenance of LACT Units (I)	SCADA Systems (F)	Introduction to Gas Quality Using Spectroscopy (I)	Orifice Meters - Operation and Maintenance (F)
	TWO HOUR CLASS			LIQUID FUNDAMENTALS SERIES			GAS FUNDAMENTALS CLASS			NEW CLASS FOR 2019			

Hands-On Classes

Hands-On Class Session

Period	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	2.5	2.6	3.1	3.2	3.3
	Tuesday, May 14th				***Wednesday, May 15th***						***Thursday, May 16th***		
Room #													
	963.1	967.1	968.1	964.1	929.3	929.4	919.1	969.1	963.3	915.1	929.1	929.2	970.1
7	TechnipFMC - TechnipFMC-Invalco BS&W Monitor	Schneider-Electric - Foxboro Production Vortex Meters	Honeywell - EC-350 Series Volume Correctors	TechnipFMC - Technic/FMC Liquid Turbine Meter Diagnostics	Omni - Omni Flow Computers (Hour 1 of 2) (Repeat Class)	Omni - Omni Flow Computers (Hour 2 of 2) (Repeat Class)	Siemens - Siemens Clamp-on Ultrasonic meter	Honeywell - Cloudlink Cat M1	TechnipFMC - TechnipFMC-Invalco BS&W Monitor	TechnipFMC - FMC Liquid Ultrasonic Meters	Omni - Omni Flow Computers (Hour 1 of 2)	Omni - Omni Flow Computers (Hour 2 of 2)	Honeywell - Low Power MI Wireless
	948.1	927.1	927.2	937.1	916.1	916.2	940.1	952.1	952.2	917.1	942.1	942.2	934.3
8	MTS - Automatic Tank Gauging Magnetostrictive Technology	Thermo Scientific - Auto XP Gas Flow Computer (Hour 1 of 2)	Thermo Scientific - Auto XP Gas Flow Computer (Hour 2 of 2)	Ametek - Ametek Dead Weight Tester	Daniel - Daniel Ultrasonic Meters (Hour 1 of 2)	Daniel - Daniel Ultrasonic Meters (Hour 2 of 2)	YZ Systems - YZ Natural Gas Sampler O&M	Flow-Cal Measurement Applications - ProveIT and PycIT (Hour 1 of 2)	Flow-Cal Measurement Applications - ProveIT and PycIT (Hour 2 of 2)	Flexim - Flexim Clamp On Ultrasonic Meters	Spectrasensors - Tunable Diode Laser Moisture Analyzers (Hour 1 of 2)	Spectrasensors - Tunable Diode Laser Moisture Analyzers (Hour 2 of 2)	Rosemount - Rosemount Smart Transmitters
	935.1	925.1	925.2	941.1	945.1	945.2	955.1	956.1	956.2	959.1	918.1	918.2	928.1
12	OleumTech - Oleum Wireless Communications	Emerson - FB1000/2000 Gas Flow Computer (Hour 1 of 2)	Emerson - FB1000/2000 Gas Flow Computer (Hour 2 of 2)	PGI - PGI Interceptor Composite Sampler O&M	Emerson - ROC800L Liquid Flow Computer (Hour 1 of 2)	Emerson - ROC800L Liquid Flow Computer (Hour 2 of 2)	Schneider Electric - Accutech Wireless Instrumentation	Flow MD - Flow MD Small Volume Provers (Hour 1 of 2)	Flow MD - Flow MD Small Volume Provers (Hour 2 of 2)	Flow MD and Coastal Flow - Witnessing prover calibrations (Gravimetric Method)	SICK, Inc. - SICK Gas Ultrasonic Meters (Hour 1 of 2)	SICK, Inc. - SICK Gas Ultrasonic Meters (Hour 2 of 2)	Emerson - Flow Computers/RTU Wireless Wellhead Automation
	966.1	946.1	946.2	924.1	920.1	923.1	951.1	961.1	961.2	944.1	962.1	962.2	936.1
W	Emerson - Rosemount Tank Gauging	Flow-Cal Measurement Applications - Flow-Cal Measurement Software (Hour 1 of 2)	Flow-Cal Measurement Applications - Flow-Cal Measurement Software (Hour 2 of 2)	Micro Motion - Micro Motion Liquid Coriolis Meters	Micro Motion - Micro Motion Gas Coriolis Meters	TechnipFMC - FMC Liquid Positive Displacement Meters	TechnipFMC - Coriolis Meters	SICK, Inc. - FLOWSIC500 Ultrasonic Meter (Hour 1 of 2)	SICK, Inc. - FLOWSIC500 Ultrasonic Meter (Hour 2 of 2)	Fisher - Control Valves	TechnipFMC - ACCULOAD Family Preset Controller (Hour 1 of 2)	TechnipFMC - ACCULOAD Family Preset Controller (Hour 2 of 2)	Brodie International - Positive Displacement Meters
	914.1	953.1	953.2	934.1	954.1	954.2	947.1	931.1	931.2	912.1	911.1	911.2	938.1
X	Dresser Meters And Instruments - Dresser Rotary Meters	Spirit IT - Spirit IT Flow Computers (Hour 1 of 2)	Spirit IT - Spirit IT Flow Computers (Hour 2 of 2)	Rosemount - Rosemount Smart Transmitters	Schneider Electric - Realflo Software For Scadapack Flow Computers (Hour 1 of 2)	Schneider Electric - Realflo Software For Scadapack Flow Computers (Hour 2 of 2)	Fisher Controls - High Pressure Regulators	Rosemount Analytical (Daniel) - Gas Chromatograph Configuration (Hour 1 of 2)	Rosemount Analytical (Daniel) - Gas Chromatograph Configuration (Hour 2 of 2)	Daniel - Senior Orifice Fitting Operations & Maintenance	Daniel - Daniel Orifice Fitting & Tube Inspection (Hour 1 of 2)	Daniel - Daniel Orifice Fitting & Tube Inspection (Hour 2 of 2)	YZ Systems - YZ Odorization
	939.1	926.1	926.2	950.1	949.1	949.2	930.1	933.1	933.2	943.1	5290.1	1380.1	922.1
Y	Cameron - Cameron Crude Oil Sampling	ABB Totalflow - ABB Gas Flow Computers (Hour 1 of 2)	ABB Totalflow - ABB Gas Flow Computers (Hour 2 of 2)	Cameron - Maintenance Block & Bleed / 4-Way Valves	Mooney - Pilot Operated Regulators (Hour 1 of 2)	Mooney - Pilot Operated Regulators (Hour 2 of 2)	Flow-Cal Measurement Applications - TestIT Meter Testing Software	ABB Totalflow - Advanced Flow Computers - WinCCU Data Collection & Management Software (Hour 1 of 2)	ABB Totalflow - Advanced Flow Computers - WinCCU Data Collection & Management Software (Hour 2 of 2)	A+ Corporation - Sample Probe Installation	Techniques of Gas Spot Sampling (Lecture)	New Differential Meters in Natural Gas (Lecture)	Daniel - Daniel Liquid Turbine Meters
		TWO HOUR HANDS-ON CLASSES			TWO HOUR HANDS-ON CLASSES		TWO HOUR HANDS-ON CLASSES				TWO HOUR HANDS-ON CLASSES		

***** LAPTOP COMPUTERS RECCOMENDED - STUDENT SHOULD BRING A LAPTOP *****

4 and 5 — **Gas Fundamentals Track (Requires Additional Registration Fee)**