

Global Metrology Academy Group Course 1 (GMA-GT-2013-01)

Theme: **Metrology in Electricity and Magnetism**

Dates: June 24 (Mon) - July 5 (Fri) 2013

Venue: Korea Research Institute of Standards and Science (KRISS), Daejeon, Korea

Application: by April 30, 2013

Modules	Subjects	Chief Lecturers
MiG	Metrology in general	Dr. Jong Oh CHOI (choijongoh@kriss.re.kr)
EM-01	Voltage and Current	Dr. Kyu-Tae KIM (ktkim@kriss.re.kr)
EM-02	DC Resistance and Impedance	Dr. Wan-Seop KIM (ws2kim@kriss.re.kr)
EM-03	High Voltage, High Current, and Power	Dr. Jae Kap JUNG (jkjung@kriss.re.kr)
EM-04	Magnetic Field	Dr. Po Gyu PARK (pgpark@kriss.re.kr)

	Lectures (L) and Hands-on Practices (H)	Remarks
MiG	Metrology in general	June 24 (Mon)
(DAY 1)	National standards system in Korea QMS: ISO/IEC 17025, why and for what - management & technical requirements Metrological traceability and measurement uncertainty	Four (4) lectures
EM-01	Voltage and Current	June 25 (Tue)-26(Wed)
(DAY 2-3)	(L-3-1) DC voltage standards and traceability (L-3-2) DC current standards and traceability (H-3-1) Calibration of DC voltage and current (L-3-3) AC voltage standards and traceability (L-3-4) AC current standards and traceability (H-3-2) Calibration of AC voltage and current	Four (4) lectures, Two (2) hands-on sessions
EM-02	DC Resistance and Impedance	June 27(Thu)-28 (Fri)
(DAY 4-5)	(L-2-1) QHR standards and traceability (L-2-2) DC resistance standards and traceability (H-2-1) Calibration of DC resistance (L-2-3) Impedance standards and traceability (L-2-4) Capacitance standards and traceability (L-2-5) Inductance standards and traceability (H-2-2) Calibration of impedance	Five (5) lectures, Two (2) hands-on sessions
EM-03	High Voltage, High Current, and Power	July 1 (Mon)-2 (Tue)
(DAY 8-9)	(L-1-1) AC HV standards and traceability (L-1-2) DC HV standards and traceability (H-1-1) Calibration of AC/DC high voltage (L-1-3) AC HC standards and traceability (L-1-4) DC HC standards and traceability (L-1-5) Power standards and traceability (H-1-2) Calibration of AC/DC high current (H-1-3) Calibration of power	Five (5) lectures, Three (3) hands-on sessions
EM-04	Magnetic Field	July 3 (Wed)-4 (Thu)
(DAY 10-11)	(L-4-1) Magnetic field standards and traceability (L-4-2) Precision magnetic field generation and measurement (H-4-1) Generation of magnetic field (H-4-2) Measurement of magnetic field (L-4-3) DC/AC magnetic field standards (L-4-4) Magnetic materials and applications (H-4-3) Calibration of magnetic field (H-4-4) Measurement and analysis of magnetic materials	Four (4) lectures, Four (4) hands-on sessions

Daily Program (* Subject to modification)Language of the course: **English**

June 24 (Mon) Metrology in General		
09:30-10:00	Greetings and Introduction to GMA and the Course 1	Conference room (Admin. Bldg.)
10:00-10:30	Opening ceremony	
10:30-12:00	National Standards System in Korea (90 minutes)	
12:00-13:00	Lunch	KRISS cafeteria (floor 2)
13:00-14:15	QMS (1): ISO/IEC 17025, why and for what - management requirements (75 minutes)	
14:15-14:30	Tea break	
14:30-15:45	QMS (2): ISO/IEC 17025, why and for what - technical requirements (75 minutes)	
15:45-16:00	Tea break	
16:00-17:30	Metrological traceability and measurement uncertainty (90 minutes)	

June 25 (Tue) Metrology in Electricity and Magnetism (Module 1: Voltage and Current)		
09:30-11:00	Lecture (L-1-1): DC voltage standards and traceability (90 minutes)	
11:00-12:30	Lecture (L-1-2): DC current standards and traceability (90 minutes)	
12:30-13:30	Lunch	KRISS cafeteria (floor 2)
13:30-17:30	Hands-on session (H-1-1): Calibration of DC voltage and current (240 minutes)	

June 26 (Tue) Metrology in Electricity and Magnetism (Module 1: Voltage and Current)		
09:30-11:00	Lecture (L-1-3): AC voltage standards and traceability (90 minutes)	
11:00-12:30	Lecture (L-1-4): AC current standards and traceability (90 minutes)	
12:30-13:30	Lunch	KRISS cafeteria (floor 2)
13:30-17:30	Hands-on session (H-1-2): Calibration of AC voltage and current (240 minutes)	

June 27 (Thu) Metrology in Electricity and Magnetism (Module 2: DC Resistance and Impedance)		
09:30-11:00	Lecture (L-2-1): QHR standards and traceability (90 minutes)	
11:00-12:30	Lecture (L-2-2): DC resistance standards and traceability (90 minutes)	
12:30-13:30	Lunch	KRISS cafeteria (floor 2)
13:30-17:30	Hands-on session (H-2-1): Calibration of DC resistance (240 minutes)	

June 28 (Fri) Metrology in Electricity and Magnetism (Module 2: DC Resistance and Impedance)		
09:30-10:30	Lecture (L-2-3): Impedance standards and traceability (60 minutes)	
10:30-11:30	Lecture (L-2-4): Capacitance standards and traceability (60 minutes)	
11:30-12:30	Lecture (L-2-5): Inductance standards and traceability (60 minutes)	
12:30-13:30	Lunch	KRISS cafeteria (floor 2)
13:30-17:30	Hands-on session (H-2-2): Calibration of impedance (240 minutes)	

June 29 (Sat)	Cultural experience in and vicinity of Daejeon	
10:00-17:00	Transportation offered by KRISS (guided by GMA)	
June 30 (Sun)	Free	
July 1 (Mon)	Metrology in Electricity and Magnetism (Module 3: High Voltage. High Current, Power)	
09:30-11:00	Lecture (L-3-1): AC HV standards and traceability (90 minutes)	
11:00-12:30	Lecture (L-3-2): DC HV standards and traceability (90 minutes)	
12:30-13:30	Lunch	KRISS cafeteria (floor 2)
13:30-17:30	Hands-on session (H-3-1): Calibration of AC/DC high voltage (240 minutes)	
July 2 (Tue)	Metrology in Electricity and Magnetism (Module 1: High Voltage. High Current, Power)	
09:30-10:30	Lecture (L-3-3): AC HC standards and traceability (60 minutes)	
10:30-11:30	Lecture (L-3-4): DC HC standards and traceability (60 minutes)	
11:30-12:30	Lecture (L-3-5): Power standards and traceability (60 minutes)	
12:30-13:30	Lunch	KRISS cafeteria (floor 2)
13:30-15:30	Hands-on session (H-3-2): Calibration of AC/DC high current (120 minutes)	
15:30-17:30	Hands-on session (H-3-3): Calibration of power (120 minutes)	
July 3 (Wed)	Metrology in Electricity and Magnetism (Module 4: Magnetic Field)	
09:30-10:30	Lecture (L-4-1): Magnetic field standards and traceability (60 minutes)	
10:30-12:30	Lecture (L-4-2): Precision magnetic field generation and measurement (120 minutes)	
12:30-13:30	Lunch	KRISS cafeteria (floor 2)
13:30-15:30	Hands-on session (H-4-1): Generation of magnetic field (120 minutes)	
15:30-17:30	Hands-on session (H-4-2): Measurement of magnetic field (120 minutes)	
July 4 (Thu)	Metrology in Electricity and Magnetism (Module 4: Magnetic Field)	
09:30-11:00	Lecture (L-4-3): DC/AC magnetic field standards (90 minutes)	
11:00-12:30	Lecture (L-4-4): Magnetic materials and applications (90 minutes)	
12:30-13:30	Lunch	KRISS cafeteria (floor 2)
13:30-15:30	Hands-on session (H-4-3): Calibration of magnetic field (120 minutes)	
15:30-17:30	Hands-on session (H-4-4): Measurement and analysis of magnetic materials (120 minutes)	
July 5 (Fri)	Evaluation and closing	
09:30-11:00	Evaluation of the course (written & oral: 90 minutes)	Conference room (Admin. Bldg.)
11:00-11:30	Tea break	
11:30-12:00	Closing ceremony (30 minutes)	
12:00-13:00	Lunch	KRISS cafeteria (floor 2)
P.M.	Free (or visiting laboratories for more discussion)	
July 6 (Sat)	Departure	

** Participants are supposed to take the airport limousine bus bound for Incheon airport.
Transportation to the bus stop in Daejeon will be provided by KRISS (GMA).*

Qualification and Requirements for Applications

□ Qualification

1. Applicants should be the employees of the national metrology institute (NMI) at the time of application.
2. Applicants should be officially nominated by the employer, whose official seal and signature should be put on the application form.
3. Applicants should have experience and basic knowledge of the workshop theme: metrology in electricity and magnetism.
4. For the sake of effectiveness, applicants are required to have a good command of English and to be younger than 50.
5. Applicants should be healthy both physically and mentally enough to go through the whole programs of the workshop.

□ Requirements: applications are valid with the following requirements submitted to KRISS **by April 30, 2013.**

1. An official nomination by the employer with the official seal and the signature of the top management of the employer.
2. A copy of the curriculum vitae of the applicant, describing the academic background and professional experience in detail.
3. A copy of passport as valid for more than one year as of the date of arrival at Korea (around June 22, 2013).
4. Plan of sharing the results of workshop for their institution and the nation
5. Laboratory report and action plan: Selected participants are supposed to submit their laboratory reports and action plans according to the template to be provided later on.

□ Number of participants: each course will be operated with up to 20 participants.

Financial Arrangements

- Participants and their employers are responsible for paying for the tuition, airline tickets, accommodations and meals.
- For participants from the developing world, KRISS will provide free accommodations and lunches for ten (10) working days of the workshop. ☞ Lunches for ten (10) working days are offered free to ALL participants.
- Subject to the availability of fund, additional financial assistance might be discussed for a limited number of people from developing countries.

1. Tuition fee & banking information	① Amount: US\$500/US\$1,000 per person (* lunches included for ten working days) ☞ Two different categories of the tuition fees are applicable according to the economic performance of the candidate's country.
	② Selected participants are supposed to remit the tuition fee by bank transfer to the official bank account of KRISS. ☞ Payment should be made by May 31 (Fri), 2013 ☞ Please make sure that all the handling and banking charges and charges raised both to the remitter and beneficiary should be met by the remitter, so that the net amount of tuition fee could be received by KRISS.
	③ Official bank account of KRISS - Bank name: Kook-Min Bank (Branch: Yuseong Branch) - Swift code: CZNBKRSE - Account number: 461-01-0194-494 - Account holder's name: Korea Research Institute of Standards and Science (KRISS) - Bank address: 1F, #468-3, Bongmyeong-dong, Yuseong-gu, Daejeon, Republic of Korea
2. Living expenses	④ Participants are responsible for paying living expenses in Korea including accommodations and meals.
	⑤ It is likely that participants will stay at Hotel Toyoko Inn at Daejeon. (www.toyoko-inn.com/e_hotel/00234/index.html) ☞ The room rate (around US\$60 per night per room) includes breakfast, tax, and service charge.
	⑥ For participants from developing countries, accommodations throughout the workshop will be provided by KRISS.
	⑦ Lunches for ten (10) working days will be offered free to ALL participants. ☞ Please note that expenses for all other meals shall be paid by the participants. ☞ Participants are advised to bring some pocket money of their own for incidental expenses.
3. Airline tickets	⑧ Participants and their employers are responsible for purchasing the airline tickets for the participants.
4. Local Transportation	⑨ The KRISS travel agent will pick up the participants upon their arrival at the Incheon (ICN) international airport of Seoul. ☞ Participants are requested to advise the workshop coordinator of their flight itinerary to and from Korea ASAP.
	⑩ The KRISS travel agent will help the participants to take the airport limousine bus bound for Daejeon. ☞ The bus tickets (around US\$20 one way) are to be bought by the participants.
	☞ Upon arrival at the bus stop in Daejeon, participants will be met by GMA of KRISS to move to the hotel.

Contact Points

For further information about participation in the workshop, please contact:

Coordinator	Sangwook SEO Senior Project Manager, Global Metrology Academy (GMA), KRISS	swseo@kriss.re.kr
Supervisor	Dr. Gyeong-Hee NAM Head, Global Metrology Academy (GMA), KRISS	ghnam@kriss.re.kr