

Courses 2016



**KRISST** Korea Research  
Institute of  
Standards and Science

## GMA GROUP COURSES 2016



**GMA** will continue offering three (3) group courses in 2016. To begin with a course of Metrology in Chemistry (MiC) in March 2016, two more courses will be ready to receive participants from across the world. A strategic course of MnQ, Metrology and Quality, has been redesigned with enriched list of presentations to be delivered by

professional experts. Speakers will be invited from within and outside KRISST.

**CALL** for applications to the MiC course is being sent out on the **websites** of the global and regional metrology communities such as the BIPM, APMP, COOMET, SIM, AFRIMETS, and GULFMET. The

NMIs and the participants in the previous GMA courses are also on the list of recipients of the announcement.

**MUCH** more than appreciated would be your cooperation for letting it be known widely over your community of metrology, standards and quality.

GMA Group

Courses 2016

### Metrology in Chemistry

(MiC) GMA-GT-2016-01

March 21-April 1, 2016

### Metrology and Quality

(MnQ) GMA-GT-2016-02

April 25-29, 2016

### Electricity and Magnetism

(EM) GMA-GT-2016-03

June 13-24, 2016

For inquiry regarding the GMA courses, please contact:  
Mr. Sangwook Seo  
at  
[swseo@kriss.re.kr](mailto:swseo@kriss.re.kr)

**MnQ course welcomes QS Managers, Heads of metrology laboratories and accreditation bodies, NMI directors, and High-level government officials in charge of policy-making on national measurement system!!!**

# GMA GROUP COURSES 2016



How and where to find programs and opportunities available for human resources development in metrology?

The answer is right below! Dr. Douglas Olson, JCRB Executive Secretary at the BIPM has kindly linked its website to the RMO websites. It allows readers to get easy access to the GMA courses at the webpage of the BIPM or that of any RMO you are surfing on.

From: [douglas.olson@bipm.org](mailto:douglas.olson@bipm.org) [mailto:[douglas.olson@bipm.org](mailto:douglas.olson@bipm.org)]

Sent: Friday, October 16, 2015 5:39 PM

Subject: RMO Training Websites

Dear Colleagues,

The BIPM website now has direct links to RMO websites that list training activities. Many thanks to Janet Miles who created this links for the RMOs. These can be accessed in multiple ways:

1. Meetings pull-down menu, then select external events

<http://www.bipm.org/en/worldwide-metrology/metrology-events.html>

Links to RMO website Training courses are listed in a box on the right side of the page

2. Within the RMO page: Worldwide Metrology pull-down menu, then select Regional Metrology Organizations (RMOs)

<http://www.bipm.org/en/worldwide-metrology/regional/>

Links to RMO website Training courses are listed in a box on the right side of the page.

The same boxes exist within the BIPM/RMO webpages

<http://www.bipm.org/en/worldwide-metrology/regional/afrimets.html>

3. Within committees: About us pull-down menu, then select Our Committees, Select Joint Committees of the BIPM and..., RMO trainings listed under DCMAS Network

<http://cms2.bipm.org/en/committees/jc/>

Be sure to "Refresh" your page the first time it is accessed.

We will link to EURAMET and COOMET RMO websites as soon as they are available.

Best regards,

Douglas Olson  
Executive Secretary to the JCRB  
BIPM  
Pavillon de Breteuil  
F-92312 Sevres France



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# GMA GROUP COURSES 2016



GMA is going to offer three (3) group courses in 2016. It includes two (2) technical courses, covering the subjects of Metrology in Chemistry (MiC) and Metrology in Electricity and Magnetism (EM). Dates and modules to be offered by each course are shown below. It is noteworthy that Metrology and Quality (MnQ) course will be open to a wide scope of audience, ranging from NMI directors, QMS managers to the high-level government officials in charge of making

policies on national measurement system. The MnQ course will deliver participants lectures on the subjects of strategic interest to promote awareness and understanding of the significant role that metrology plays in underpinning sustainable development of a country under the current global economic environment. Each of the two technical courses will be around 10 people. When it comes to the course of MnQ, participants of up to 20 will be accepted.

Three (3) group courses 2016

Two(2) technical courses plus one (1) strategic course

GMA Courses 2016	Subjects/Modules	Dates	Participants
<a href="#">GMA-GT-2016-01</a> <b>MiC</b>	<b>Metrology in Chemistry</b> Organic analysis, Inorganic analysis, Certified Reference Materials, Method Validation, QMS for ISO Guide 17025 & 34, KC-CMC-Traceability, Measurement Uncertainty	Mar 21-Apr 1, 2016 (2 weeks)	<i>Around 10</i>
<a href="#">GMA-GT-2016-02</a> <b>MnQ</b>	<b>Metrology and Quality</b> National standards system (metrology, standardization, legal metrology, conformity assessment), SRD, New SI and Fundamental Constants, QMS for ISO/IEC 17025, Traceability, Measurement Uncertainty, Impact and Evolving Needs of Metrology	Apr 25-29, 2016 (1 week)	<i>Up to 20</i>
<a href="#">GMA-GT-2016-03</a> <b>EM</b>	<b>Metrology for Electricity and Magnetism</b> AC/DC Voltage and Power, Resistance and Impedance, High Voltage and High Current, Magnetic Field High Voltage/Current, and Magnetic Field	Jun 13-24, 2015 (2 weeks)	<i>Around 10</i>

For an effective performance, each laboratory session delivers technical lectures combined with hands-on exercises at laboratories.



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# GROUP COURSES 2016: PROGRAM OVERVIEW



GMA_GT_2016-01-MiC	Subjects/Modules	Time slots allocated (March 21-April 1)
MiC Metrology in Chemistry	<b>Metrology in General</b> Overview of metrology in chemistry, QMS for ISO Guide 17025 & 34, Method Validation	1 day
	ISO Guide 35, Certified Reference Materials, KC-CMC-Traceability	1 day
	Measurement Uncertainty	1 day
MiC	<b>Presentation of Lab Reports</b> by participants <b>Special lecture and presentation</b>	1 day
Technical visit	Visit to selected industries	1 day
Cultural experience	Historic sites and attractions in Seoul	1 day (weekend)
Intensive Laboratory Session (ILS): lectures and hands-on exercises effectively combined		
Module-1 (OA)	<b>Organic Analysis</b>	2 days
Module-2 (IA)	<b>Inorganic Analysis</b>	2 days
Wrap-up	<b>Performance Evaluation Test, Individual lab visits, Course Evaluation, Closing session</b>	1 day

\* NOTE: Orientation & tour in and vicinity of Daejeon offered on Saturday before opening of the course.

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# GROUP COURSES 2016: PROGRAM OVERVIEW



MiC	Metrology in Chemistry	* subject to modifications!
<b>Intensive Laboratory Sessions (ILS) with lectures and exercises combined</b>		
MiC-OA	<b>Organic Analysis (Module -1)</b>	
March 28 (Mon)	(OA-L-1) Overview of Organic Analysis Laboratory (OA-L-2) Practical Approach for Establishing National Standards in Organic Analysis (OA-H-1) Preparation and Verification of Primary Standard Solutions (OA-H-2) Preparation of Real Sample for Isotope Dilution Mass Spectrometry (IDMS) (OA-H-3) Instrumental Analysis of Prepared Samples (Overnight Run)	Lectures (L) Hands-on Exercises (H)
MiC-OA	<b>Organic Analysis (Module -1)</b>	
March 29 (Tue)	(OA-H-4) Data Reduction of Instrumental Analysis Results (OA-L-3) Uncertainty Evaluation of Analytical Results of Primary Standard Solutions (OA-L-4) Uncertainty Evaluation of Analytical Results of Real Sample (OA-L-5) Wrap-up Discussion	
MiC-IA	<b>Inorganic Analysis (Module -2)</b>	
March 30 (Wed)	(IA-L-1) Overview of Inorganic Analysis Laboratory (IA-L-2) Elemental Standard Solutions (IA-H-1) Preparation & Certification of Elemental Standard Solutions	
MiC-IA	<b>Inorganic Analysis (Module -2)</b>	
March 31 (Thu)	(IA-L-3) Introduction to Matrix CRMs and Their Production (IA-L-4) Certification and Uncertainty Evaluation of Matrix CRM by ID-ICPMS (IA-H-2) Matrix CRM Production & ID-ICPMS Certification	
MiC	<b>WRAP-UP and Evaluation Session</b>	
April 1 (Fri)	AM: Performance Evaluation Test, Individual visits to laboratories of further interest PM: Course Evaluation, Closing Session	
April 2 (Sat)	<b>Departure</b> (depending on flight itinerary)	
March 25 (Fri)	<b>Technical visit to industry: SAMSUNG Electronics Innovation Museum (*TBC)</b>	

*Prior to the ILS of MiC course, there will be a three-day session of metrology in general.*

On March 21-23, participants will be given lectures concerning the fundamental issues of metrology. It will comprise matters of QMS requirements by ISO/IEC 17025 and Guide 34, Method Validation, CRM, KC-CMC-traceability, and measurement uncertainty.

\* NOTE: Orientation & tour in and vicinity of Daejeon offered on Saturday before opening of the course.

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# GROUP COURSES 2016: PROGRAM OVERVIEW



The MnQ course has been created for the target audience of QMS managers, heads of metrology laboratories, and directors of NMIs. The course programs have been strategically designed for sharing Korea's experiences in advancing its capabilities of scientific metrology, conformity assessment and legal metrology, and standardization.

The MiG course features its coverage of the key issues of strategic interest to metrology community. It ranges from the QMS requirements and practices, KC-CMNC-traceability, uncertainty in measurement, New SI and

fundamental constants, SRD activities to the impact of metrology and the CIPM MRA and the evolving needs of metrology. Speakers are invited not only from within KRISS but also from outside KRISS including the local metrology community of Korea.

In this sense, it is strongly recommended that the high-level government officials will also come and join the MnQ course. *It might be perfect that at least a couple of participants from one country could be coming along, with one people from the NMI and the other from the government in charge of national measurement system*

GMA_GT_2016-02-MnQ	Subjects/Modules	Time slots allocated (April 25-29, 2016)
<b>MnQ Fundamentals of Metrology and Quality</b>  MnQ course welcomes QS Managers, Chief of Laboratories, Directors of NMIs, and High-level Officials of government in charge of national measurement system!	Korea's Strategy for STI Development and Role of Standards, National Standards System in Korea (* comprising three lectures on Metrology, Conformity Assessment and Legal Metrology, Standardization)	1 day
	Quality Management System (ISO/IEC 17025 Management/Technical Requirements, QMS in Practice at KRISS), KC-CMC-Traceability.	1 day
	New SI and Fundamental Constants, SRD Uncertainty in Measurement.	1 day
	Impact and Evolving Needs of Metrology Lab Tour (Selected laboratories of KRISS)	1 day
	Evaluation of the Course, Technical Visit to Industry	1 day
	Cultural Experience in Seoul	1 day (weekend)



\* NOTE: Orientation & tour in and vicinity of Daejeon offered on Saturday before opening of the course.

# GROUP COURSES 2016: PROGRAM OVERVIEW



MnQ	Fundamentals of Metrology and Quality	* subject to modifications!
<b>Addressing strategic interest on fundamentals to metrology and quality</b>		
<b>MnQ-01</b>	<b>STI &amp; NSS of Korea Today (Module -1)</b>	
April 25 (Mon)	(1-L-1) Korea's Strategy for STI Development and Roles of Standards (1-L-2) National Standards System of Korea - Metrology (1-L-3) Conformity Assessment & Legal Metrology in Korea (1-L-4) Standardization for Korea's Industrial Competitiveness	Lectures (L)
<b>MnQ-02</b>	<b>CIPM MRA and QMS (Module -2)</b>	
April 26 (Tue)	(2-L-1) QMS and the CIPM MRA – Management/Technical Requirements to ISO/IEC 17025 and ISO Guide 34 (2-L-2) QMS in Practice at KRISS (2-L-3) KC-CMC-Traceability	
<b>MnQ-03</b>	<b>Special Lectures (Module -3)</b>	
April 27 (Wed)/AM	(3-SL-1) New SI and Fundamental Constants (3-SL-2) Standard Reference Data (SRD) Activities in Korea (3-SL-3) Presentation of University of Science and Technology (UST)	
<b>MnQ-04</b>	<b>CIPM MRA and QMS (Module -4)</b>	
April 27 (Wed)/PM	(4-L-1) Uncertainty in Measurement	
<b>MnQ-05</b>	<b>Impact and Evolving Needs of Metrology (Module -5)</b>	
April 28 (Thu)	(5-L-1) Economic Impact of Metrology and of the CIPM MRA (* to be confirmed) (5-L-2) Evolving Needs of Metrology in chemistry (food, health, bio, etc.) (5-L-3) Evolving Needs of Metrology in materials (materials, nano, nano-bio, safety, etc.) (6-TV-1) Visiting selected KRISS Laboratories	
<b>MnQ-06</b>	<b>Evaluation, Closing, Technical Visit</b>	
April 29 (Fri)	Evaluation and Closing Technical Visit to Industry (SAMSUNG Electronics * to be confirmed)	Staying overnight in Seoul
April 30 (Sat)	<b>Cultural Experience in Seoul</b>	
Apr 30-May 1	Departure from Korea (depending on the flight itinerary)	

For lectures of the MnQ programs, speakers are invited from within and outside KRISS, and from global metrology community, who are most properly qualified with professional experiences on the subjects.



\* NOTE: Orientation & tour in and vicinity of Daejeon offered on Saturday before opening of the course.

# GROUP COURSES 2016: PROGRAM OVERVIEW



GMA_GT_2016-03-EM	Subjects/Modules	Time slots allocated (June 13-24, 2016)
EM Electricity and Magnetism	Metrology in General (MiG) NSS, QMS, KC-CMC-Traceability,	1 day
	Metrology in General (MiG) Measurement Uncertainty	1 day
Intensive Laboratory Session (ILS): lectures and hands-on exercises effectively combined		
Module-1	DC/AC Voltage and Power	2 days
Technical visit	Visit to selected industries	1 day
Cultural experience	Historic sites and attractions in Seoul	1 day (weekend)
Module-2	Resistance and Impedance	1 day
Module-3	High Voltage and High Current	1 day
Module-4	Magnetic Field	1 day
Wrap-up	Performance Evaluation test, Individual lab visits, Action plan development and presentatoin	1 day
Evaluation and Closing	Course Evaluation, Closing Session	1 day



\* NOTE: Orientation & tour in and vicinity of Daejeon offered on Saturday before opening of the course.

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# GROUP COURSES 2016: PROGRAM OVERVIEW



EM	Metrology in Electricity and Magnetism	<i>* Subject to modifications!</i>
<b>Intensive Laboratory Sessions (ILS) with lectures and practices combined</b>		
EM-01	DC/AC Voltage and Power (Module -1)	
June 15 (Wed)	(1-L-1) DC Voltage Standards and Traceability (I) (1-L-2) Electrical Power and Traceability QHR Standards and Traceability (1-L-3) DC Voltage Standards and Traceability (II) (1-H-1/2) Calibration of DC Voltage/Power	Hands-on Exercises (H)
EM-01	DC/AC Voltage and Power (Module -1)	
June 16 (Thu)	(1-L-4) AC Voltage Standards and Traceability (1-L-5) AC Current Standards and Traceability (1-H-3/4) Calibration of AC Voltage/Current	
June 17 (Fri)	Technical visit to Industries (* SAMSUNG Electronics Innovation Museum: * TBC)	Staying overnight in Seoul
EM-02	Resistance and Impedance (Module -2)	
June 20 (Mon)	(2-L-1) QHR Standards and Traceability (2-L-2) Impedance Standards and Traceability (2-H-5/6) Calibration of Resistance/Impedance	
EM-03	High Voltage and High Current (Module -3)	
June 21 (Tue)	(3-L-1) AC HV Standards and Traceability (3-L-2) AC HC Standards and Traceability (3-H-7/8) Calibration of AC High Voltage/Current	
EM-04	Magnetic Field (Module -4)	
June 22 (Wed)	(4-L-1) Magnetic Field Standards and Traceability (4-L-2) Magnetic Materials and Applications (4-H-9) Generation and Measurement of Magnetic Field (4-H-10) Calibration of High/Low Magnetic Field	
EM	WRAP-UP session	
June 23 (Thu)	Performance Evaluation Test, Individual visits to laboratories of further interest, Development and Presentation of Action plans	
June 24 (Fri)	Evaluation and Closing	
June 25 (Sat)	Departure from Korea (depending on the flight itinerary)	

*Prior to the ILS of MC course* there will be a two-day session of metrology in general. On June 13-14, participants will be given lectures concerning the fundamental issues of metrology. It will comprise matters of QMS requirements by ISO/IEC 17025, KC-CMC-traceability, and uncertainty in measurement.



\* NOTE: Orientation & tour in and vicinity of Daejeon offered on Saturday before opening of the course.

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Since it was launched in December 2012, GMA has been offering HRD programs of metrology at the laboratories of KRISS in Korea. As an effort to further widen the horizon of its services and for the sake of better benefits of our customers, GMA has added a new item to its service portfolio. It is the outreach service that is to be offered on site of our customers. Upon request of customers, GMA is ready to offer services on site of customers abroad. The competitive advantages that

customers could enjoy with our outreach services include its wide coverage of services among others. The GMA programs offered at KRISS are primarily focused on addressing technical capability of the customers. Meanwhile, the outreach services could take a more comprehensive approach, ranging from diagnosis to prescriptions, dealing with not only technical but also strategic issues to which the customers expect to find solutions. Activities of the outreach services therefore consist of fact-finding

survey, lectures, training and technical advice. Furthermore, beneficiaries of the outreach service will not merely remain with a few but spread widely over the national metrology community of the customers. It is envisaged that the outreach service could find the place of its first outreach service in 2016 at one of the member laboratories of GULFMET.

For any inquiry of the outreach service of GMA, please send your inquiry to Mr. Sangwook Seo of GMA at [swseo@kriss.re.kr](mailto:swseo@kriss.re.kr).

## Competitive Advantages of Outreach Services of KRISS GMA

**Comprehensive Approach**

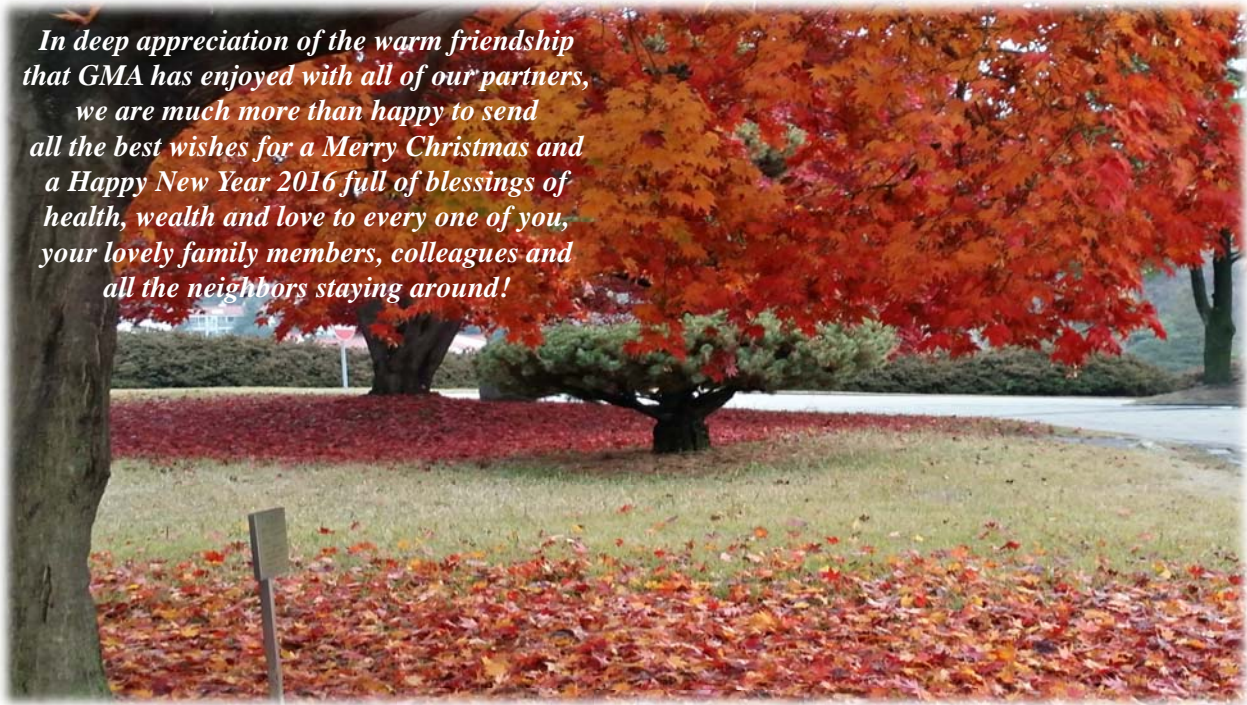
From Diagnosis  
To Prescriptions

**Diverse Services**

Fact-finding Survey  
Lectures and advice  
Technical Training

**Wide Range of Beneficiaries**

Nationwide Community of Metrology  
NMI, Calibration/Testing Labs, Government, etc.



*In deep appreciation of the warm friendship that GMA has enjoyed with all of our partners, we are much more than happy to send all the best wishes for a Merry Christmas and a Happy New Year 2016 full of blessings of health, wealth and love to every one of you, your lovely family members, colleagues and all the neighbors staying around!*