



Gemmology DU : DUG 2024-2025



Training program - Syllabus

Objectives	<p>The aim of the course is to go beyond traditional gemmology degrees that use simple methods with small instruments. This course offers a specialisation in gemmological expertise, in particular the detection of synthetics and treatments.</p> <p>Training in analytical methods, previously reserved for laboratories, is therefore proposed, as a complement to the classical gemmology diploma the candidate already has.</p> <p>Mastering the bases of laboratory gemmology is demonstrated by using such instruments to undertake an experimental gemmological research project. After final exams, this experimental report will be defended in front of a jury to obtain the University Diploma in Gemmology.</p>
Public/Prerequisite	<p>Gemologists and gemology enthusiasts Hold a diploma in classical gemmology, for example Graduate Gemologist , or diplomas from Gema, or the Federation of European Education in Gemology (FEEG) , or an equivalent title</p>
Career opportunities	<ul style="list-style-type: none"> - Expert or appraiser (auction houses, insurance companies, courts, customs, etc.) - Laboratory gemologist - Broker, specialized buyer
Duration	<p>210 hours - (2 x 3 weeks)</p>
Dates	<p>November 18th to December 6th 2024 – January 13th to february 3d 2025 (cf schedule)</p>
Number of students	<p>11 to 16 trainees</p>
Venue	<p>The course is held at the Faculty of Sciences, Nantes University (UFR Sciences et Techniques) and laboratory sessions at Institut des Matériaux Jean Rouxel à Nantes (IMN-CNRS).</p>
Price	<p>6825,00 € net</p>
Pedagogy	<p>Course with practical advice. Practical laboratory work, with the use of a number of instruments found in gemmology laboratories (e.g. spectrometers, chemical analyses, microscopes) Studies of reference gems from the education and research collection. The diploma is being hybridised, with a part available via a server, notably documents to be studied remotely via the Madoc platform</p>
Pedagogical support	<p>Course director: Dr. Emmanuel Fritsch - Professor of Physics & gemmologist , Institut des Matériaux Jean Rouxel (IMN) Nantes.</p> <p>Dr. Boris Chauviré, DUG and geologist, GeoGems Guérande</p>
Methods of evaluation	<p>Continuous assessment (5 "quizzes", half practical and half theoretical) Final exams : one practical (case study), one theoretical (questions on the courses), and two reports. The bibliographic report is due in week 4, the</p>

	experimental report is defended publicly, at an imposed date several months after the course period.
Administrative follow up	<p>Service Formation Continue et Alternance (FOCAL) U.F.R. Sciences et Techniques 2, rue de la Houssinière BP 92208 44322 Nantes Cedex 3</p> <p>Contact : Sabine DRUBAY 02 51 12 53 92 sabine.drubay@univ-nantes.fr</p> <p>Attendance sheets are signed by the trainees each day. A certificate of completion is given to trainees at the end of the course.</p>
Type of validation	Diplôme Universitaire (University diploma)

Training organization	<p>NANTES UNIVERSITE – Pôle Sciences et technologie Faculté des Sciences & des Techniques Service Formation Continue et Alternance 2 rue de la Houssinière – BP 92208 – 44 322 Nantes Cedex 3 Code APE : 8542Z SIRET : 130 029 747 001 15 Declaration of activity registered under n° 52 44 09582 44 with the Préfet de Région des Pays de la Loire. Legal status : EPSCP</p>
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Teaching units

	Présentiel
Radiation - gem Interaction Spectroscopy notions Spectra under Excel	9H20
Stages of a project / writing a report Bibliography Worksheet Practical advice for writing Which method for which problem	4H00
Chemistry basics	1H20
Electron microscopies (SEM-TEM)	2h40
Sample preparation SEM sample/slide cleaning	5h20 lab
UV-Visible-Near Infrared absorption spectroscopy	2H40 +4 h lab
Origin of color Color description and colorimetry	4H 1H20 + 2h40 lab
Cristallography Practical cristallography: wooden models and rough	6H40 2H40 lab
Vibrational spectroscopies Intro Infrared spectroscopy Raman spectroscopy	8H 5H20 lab
Chemical analysis by energy dispersion (X-ray fluorescence, EDS, etc.) Electron microprobe ICPMS-LA and other mass spectrometries (ion probes, isotopic measurements, etc.)	9H20
Photography and micrography	1H20
Luminescence techniques Spectrofluorometry - origin of luminescence	4H00 +4H lab

Synthetic HPHT/CVD diamonds Diamond morphology Moissanite	8H
Geology of gems Introduction to geology diamond - carbonado, corundum (rubies, sapphires), beryl (emerald) Pegmatites other gems: Garnet, Opal, Jade, etc. Fluid inclusions Lab w gems in their mother rocks	18H + 1H20 lab
Heat treatment Treatment by irradiation	5h20
X-ray diffraction and topography	2H40
Natural color diamonds Color treated diamonds (except HPHT) HPHT treated diamonds	6H40
Natural and induced radioactivity	2H40
Crystal growth	2H40
Pearls: varieties, formation & identification	6H40
B jade	1H20
Practical work, adapted to the experimental subject: SEM (+EDS), Optical spectroscopies : UV-Visible-Near Infrared, infrared absorption, Raman scattering, spectrofluorimetry Classical gemmology, photography of samples	61H
First contact Determination of the reports topics Laboratory/expertise approach Preparation of experimental report Preparation for practical exam	13h20 + 1h20 lab
TOTAL HOURS :	210 H

Teaching staff

University faculty :

- Emmanuel Fritsch - Physics professor, GG hFGA , Institut des Matériaux Jean Rouxel (I.M.N.) Nantes
- Camille Latouche – Associate professor, chemistry. Institut des Matériaux Jean Rouxel (I.M.N.) Nantes

Enseignants issus du monde socio-économique :

- Franck Notari : Director - GGTL- Genève, Suisse.
- Dr. Stefanos Karampelas : Chief gemologist, Head of laboratory section – LFG, Paris
- Dr. Boris Chauviré : General Director in charge of Innovation and Education - Géogems Guérande



Service Formation Continue et Alternance
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