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GEOELEC

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List of European universities offering training and education in the field of geothermal energy

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TRAINING AND EDUCATION

1 Introduction

There is an increasing demand of geothermal experts due to the growing geothermal energy sector world-wide, but also a high lack of specialists in many fields of expertise. The complexity of geothermal technology requires a wide range of experts on different levels of skills, multidisciplinary expertise and a good interaction of the several disciplines. Basic training in geothermal exploration, exploitation and utilization is available in most of the European countries, but still inadequate to supply the high skilled workforce needed in the geothermal sector. *Table 1* shows an estimate of the needs in education and training with regard to deep geothermal energy and with a strong focus on electricity production.

EDUCATION AND TRAINING NEEDS – European Union Member States and Associated Countries			
Qualification	*European Workforce 2012*	*Estimated Education & Training Needs 2012-2020 (new positions + replacements)*	*Estimated Education & Training Needs 2020-2030 (new positions + replacements)*
GEOTHERMAL ENERGY			
TOTAL	*2500*	*21 000 + 1000*	*35000 + 1450*
Researchers	*500*	*5000 +200*	*5000 + 250*
Engineers	*1100*	*8000 +400*	*15000 + 600*
Technicians	*900*	*8000 + 400*	*15000 + 600*

Table 1: Education and training needs in the European Union Member States and Associated countries (SET Plan on Education & Training Initiatives Assessment Report for Geothermal energy, E. Schill, February 2013).

Actually, only a limited number of specific university degree programs are available. Many of them offer geothermal specialisation block courses integrated in programs of Geosciences and Georesources, Civil Engineering, Process and Environmental Engineering, Mechanical Engineering, Sustainable Energy and others. But most of them are only short-time courses, often on voluntary basis, covering basic skills.

Non-university academic institutions, mostly research institutes**,** offer graduate and postgraduate education courses and PhD programs in close cooperation with the universities, such as:

BRGM France	http://www.brgm.fr
LIAG Germany	http://www.liag-hannover.de
TNO Netherlands	http://www.tno.nl
GFZ Germany	http://www.gfz-potsdam.de
CNR-IGG Italy	http://www.igg.cnr.it
INGV Italy	http://www.ingv.it
ISOR	http://www.geothermal.is
Orkustofnun Iceland	http://www.nea.is

Only few European universities hold chairs in Geothermal Energy and offer specific BSc and/or MSc degree courses. Actually, nine chairs of Geothermal Energy exist European-wide: five in Germany, one in the Netherlands and three in Switzerland (November 2013).

Germany (5)

- **RWTH Aachen University & E.ON Energy Research Center**
  Institute of Applied Geophysics and Geothermal Energy
  1 endowed Professorship in Applied Geophysics and Geothermal Energy (GGE)
- **Technical University Clausthal Institute of Petroleum Engineering**
  1 endowed Professorship in Geothermal Engineering & Integrated Energy Systems
- **Technical University Darmstadt**
  1 full Professorship in Applied Geothermal Science and Technology
- **KIT Karlsruhe Institute of Technology, Institute of Applied Geosciences**
  1 full Professorship in Geothermics
- **Technical University Munich / GFZ-Potsdam**
  1 advertised Professorship in Geothermal Energy

Netherlands (1 part-time)

Technical University Delft & GFZ-Potsdam/Germany, Faculty of Civil Engineering & Geosciences CITG, Endowed part-time Professorship in Geothermal Engineering

Switzerland (3 advertised)

- **Swiss Federal Institute of Technology (ETH Zürich):** 2 advertised professorships:
  Geological Institut, Professor of Deep Geothermal Energy and Geological Reservoirs
  Department of Mechanical and Process Engineering , Professor of Geoenergy and Process Technologies
- **University of Neuchâtel :** 1 advertised professorship
  Centre for Hydrogeology and Geothermics (CHYN), Professor of Geothermics.

The following list provides an overview about geothermal education at university level by continent and country. Due to the dynamic development in this field, the list limits to the country, the institution, the name of courses and degrees. For actual information please follow the links.

2 Universities holding chairs in Geothermal Energy

GERMANY

RWTH Aachen University, Technical University of Delft and ETH Zurich,
Institute for Applied Geophysics and Geothermal Energy E.ON Energy Research Center
Name of courses / degrees: Joint Master's in Applied Geophysics (MSc)
Topics:
TDU: Introduction to Reflection Seismics (1 ECTS), Petroleum Geology (3 ECTS), Matlab / Programming (2 ECTS), Geologic Interpretations of Seismic Data, Including Practical (3 ECTS), Electromagnetic Exploration Methods (6 ECTS), Advanced Reflection Seismology and Seismic Imaging (6 ECTS), Sedimentary Systems (3 ECTS), Geophysics Special Subjects (6 ECTS), Seismic Resolution (4 ECTS)
ETH: Reflection Seismology Processing (Practical) (6 ECTS), Groundwater II (6 ECTS), Modelling for Applied Geophysics (3 ECTS), Inverse Theory for Applied Geophysics (3 ECTS), Geophysical Field Work & Processing: Methods (2 ECTS), Geophysical Field Work & Processing: Preparation (2 ECTS), Geophysical Field Work & Processing: Fieldwork (5 ECTS), Soil Mechanics for Geophysics (4 ECTS), Case Studies in Engineering and Environmental Geophysics (4 ECTS)
RWTH: Geophysics Special Methods: NMR (3 ECTS), Geophysics Special Methods: Spectral IP (3 ECTS), Geophysical Logging and Log Interpretation (5 ECTS), Geothermics (5 ECTS), Hydrogeophysics (3 ECTS), Data Analysis in Geoscience (3 ECTS), Mineral Exploration (3 ECTS), Petroleum System Modelling (6 ECTS), Engineering Geophysics (3 ECTS)
http://www.idealeague.org/geophysics/

Technical University Clausthal, Institute for Applied Geophysics and Geothermal Energy
Name of courses / degrees: Petroleum Engineering (BSc, MSc)
Topics: Hydrogeology (3 ECTS), Introduction to Geosciences (14 ECTS), Structure of the crust (6 ECTS), Petrology and Geochemistry (6 ECTS)
http://www.ite.tu-clausthal.de/en/studies/degree-programmes/

University of Technology Darmstadt, Institute of Applied Geosciences (IAG)
Name of courses / degrees: Applied Geosciences (Geothermal Energy, Hydrogeology, Engineering Geology and Environmental Management) (MSc)
Topics: Shallow Systems (3 CP), Deep Systems (4 CP), Analytical and Numerical Simulations in Geothermal Systems (4 CP), Deep Drilling Technology for Geothermal Systems (4 CP), Hydraulics and Well Design (4 CP), Field Course, Laboratory Course and Excursions (2 CP)
http://www.geo.tu-darmstadt.de/iag/index.de.jsp

Karlsruhe Institute of Technology, Divisionof Geothermal Energy of the Instituteof Applied Geosciences
Name of courses / degrees: Applied Geosciences (BSc, MSc)
Topics: Physics (13 ECTS), Dynamics of the Earth I (7 ECTS), Dynamics of the Earth II (7 ECTS), Basics of Geology (6 ECTS), Basics of Geophysics (4 ECTS), Basics of Geochemistry (4 ECTS), Basics of Hydrogeology (6 ECTS), Basics of Engineering Geology (4 ECTS), Basics of Analysis of Geo Data (6 ECTS), Basics of Energy resources (3 ECTS), Geothermal Energy I (5 ECTS), Geothermal Energy II (5 ECTS), Geothermal Energy III (5 ECTS)

http://www.agw.kit.edu/english/251.php

University of Ludwig Maximilians Munich and University of Technology Munich
Name of courses / degrees: Geosciences (BSc)
Topics: Applied Geophysics I (4 ECTS), Thermodynamics (3 ECTS), Tectonics (3 ECTS), Introduction to Engineering Geology (6 ECTS), Introduction to Hydrogeology (6 ECTS), Methods of Engineering Geology (4 ECTS), Environmental Geochemistry (4 ECTS), Geochemistry (6 ECTS), Global Geophysics I (6 ECTS)
Name of courses / degrees: Geophysics(MSc)
Topics: Basic Geophysics, Tools, Advanced Geophysics, Independent Scientific Research, Advanced Geodynamics, Advanced Seismology, Advanced Paleo- and Geomagnetism, Geochemistry and Geomaterials, Applied and Industrial Geophysics, ESPACE (Earth Oriented Space Science), 4 semesters (120 ECTS)
http://www.geophysik.uni-muenchen.de/teaching/degreeProgrammes/masterstudiengang-geophysics
http://www.en.geologie.geowissenschaften.uni-muenchen.de/index.html

Technical University of Munich
Name of courses / degrees: Engineering Geology and Hydrogeology (MSc)
Topics: Geoscientific Introduction to Applied Geology (1), Rock Mechanics and Rock Engineering (5), Soil Mechanics and Introduction to Engineering (6), Flow and Transport (10), Rock Mechanical Laboratory (Practice) and Hydrogeological Fluid Laboratory (Practice) (13), Regional Geology (2), Slope Movement (4), Hydrogeological Methods (9), Soil Mechanics Laboratory Training and Hydrochemical Laboratory Training (14), Landslide Mapping (1), Technical Petrology (4), Applied Quaternary Sciences (5), Hydrogeological Case Studies (8), Statistics and Geostatistics (9), Cross-disciplinary Qualifications (3), Geological Engineering Project Work (7), Geothermal (11), Mineral Resources I (2), Numerical Methods I Basics (6), Numerical Methods II Codes (7), Hydrochemistry (10), Technical Hydrogeology (11), Advanced Groundwater Modeling (12)
http://www.geo.tum.de/lehre/lehre.htm" target="_blank

NETHERLANDS

Delft University of Technology, Faculty of Engineering and Geosciences
Name of courses / degrees: MSc in Applied Geophysics in collaboration with RWTH Aachen University and ETH Zurich

Topics: Introduction to Reflection Seismics, Petroleum Geology, Matlab/Programming, Geologic Interpretation of Seismic Data, Electromagnetic Exploration Methods, Advanced Reflection Seismology and Seismic Imaging, Sedimentary Systems, Geophysics Special Subjects and Seismic Resolution.
http://www.idealeague.org/geophysics/docs/brochure.pdf
http://www.citg.tudelft.nl/en/research/research-portfolio/

SWITZERLAND

University of Neuchâtel, Center for Hydrogeology and Geothermics (CHYN)
Name of courses / degrees: Master in Hydrogeology and Geothermics in cooperation with the Swiss Federal Institute of Technology (EPF-L) and the University of Lausanne (MSc, PhD)
Topics:
Study program: General Hydrogeology, Flow and Transport Processes, Hydrochemistry and Microbiology, Introduction to Geothermics, Statistical Analysis and Modelling, Numerical Simulations, Applied Geology
Hydrogeology option: Operational Hydrogeology, Integrated Management of Water Resources, Contaminant Hydrogeology
Geothermics option: Reservoir Modelling, Geothermal Exploration and Engineering, Hydrogeochemistry,
Research Projects and Field Courses: Field Camps, Excursions and Study Trip, Master Thesis
4 semesters (120 ECTS)
http://www2.unine.ch/sciences/lang/en/formations/Hydrogeologie_et_geothermie
http://www2.unine.ch/files/content/sites/sciences/files/brochures/MSc_hydro_geo_ENG.pdf

ETH Zurich, Institute of Geophysics
Name of courses: MSc degree in Applied Geophysics, in collaboration with RWTH Aachen University and Delft University of Technology. Different courses are taught in each institution, ETH Zurich offers courses in Reflection Seismology Processing, Groundwater, Modeling for Applied Geophysics, Inverse Theory for Applied Geophysics, Geophysical Field Work & Processing: Methods, Geophysical Field Work & Processing: Preparation, Geophysical Field Work & Processing: Fieldwork, Soil Mechanics for Geophysics, Case Studies in Engineering and Environmental Geophysics.
http://www.idealeague.org/geophysics/

3 Universities offering courses in fields related to geothermal exploration, exploitation and utilization

CROATIA

University of Zagreb, Faculty of Civil Engineering
Name of courses / degrees: Geotechnical Engineering (BSc, MSc)
Topics: Geotechnical Engineering (6 ECTS), Hydrogeology and Engineering Geology (3 ECTS), Underground Constructions (6 ECTS), Site Investigations (6 ECTS), Rock Mechanics (6 ECTS)
http://www.grad.unizg.hr/en

FRANCE

University of Strasbourg, School and Observatory of Earth Science, is holding the project LabEx G-EAU-THERMIE PROFONDE in cooperation with Groupe Electricité de Strasbourg and Groupement Européen d'Intérêt Économique
Name of courses / degrees: Module Géothermie : Méthodes géologiques d'exploration en géothermie
http://labex-geothermie.unistra.fr/article223.html?lang=fr

University of Lorraine, École Nationale Supérieure Géologie
Name of courses / degrees: Georesources engineering (MSc)
Topics: Subterranean Reservoirs of Energy: Hydrodynamics, Geology, Modelling
http://ensg.univ-lorraine.fr/index.php?id=35#c1167

GERMANY

Technical University of Berlin, Faculty of Applied Geosciences
Name of courses / degrees: course on Geothermal Energy Systems in the MSc program "Geotechnologies"
Topics: 1) Exploration with Reservoir Definition and Exploration Methods, 2) Development with Drilling into the interesting Reservoirs, 3) Reservoir Engineering incl. Enhancing Methods and Reservoirs in Operation, 4) Process Engineering with Direct Use and Conversion of Earth's Heat into Chill or Power, Economics and Environmental Impact.
http://lsf.zuv.tu-berlin.de/qisserver/servlet/de.his.servlet.RequestDispatcherServlet;jsessionid=F3CF6E85C9FC694DF6562B1925A5AD87.worker2_lsfapp?state=wtree&search=1&trex=step&root120132=22579|22835|22711|22152&P.vx=kurz

University of Applied Sciences Bochum/International Geothermal Center Bochum (GZB)
Name of courses / degrees: Construction Engineering / Geothermal Energy Systems (MSc)
Topics: Geothermics and Geohydraulics, Groundwater Hydraulics and Exploration (9 ECTS*), Heat and Fluid Mechanics, Thermodynamics, Fluid Mechanics (7 ECTS), Shallow Drilling Engineering (4 ECTS), Deep Drilling Engineering (6 ECTS), Geothermal Plant Construction and Heat Mining (6 ECTS), Borehole Geophysics (6 ECTS), Reservoir Engineering (6 ECTS), Hydrochemistry and Geochemistry (6

ECTS), Rock Mechanics (6 ECTS)
http://www.geothermie-zentrum.de/lehre/masterstudiengang-bochum.html

University of Bonn
Name of courses / degrees: Geosciences (BSc)
Topics: Geological Processes and Lithogenesis (10 ECTS), Introduction to Geophysics (6 ECTS), Applied Geosciences (8 ECTS), Hydrogeology (7 ECTS), Quantification of Rock-Forming Processes (8 ECTS) Hydro-and Environmental Geology (6 ECTS)
http://www.steinmann.uni-bonn.de/studium-geowissenschaften/geow.-bsc.-studiengang

University of Bremen, Department of Geosciences
Name of courses / degrees: Geosciences (BSc, MSc)
Topics: BSc: Hydrogeology/Engineering geology (18 ECTS), MSc: Hydrogeology (15 ECTS), Applied Geophysics (15 ECTS)
http://www.geo.uni-bremen.de/page.php?pageid=84&langid=EN

Albert-Ludwigs University, Faculty of Geosciences
Name of courses / degrees: Geosciences (BSc)
Topics: Processes of the Earth (10 ECTS), Geochemics I (3 ECTS), Structural Geology and Tectonics (4 ECTS), Energy Resources and Geothermal Energy (3 ECTS), Pressure and Deformation of Rocks (2 ECTS), Hydrogeology (2 ECTS), Geochemistry of Natural Water I (2 ECTS), Geochemical Material Cycles (1 ECTS)
http://portal.uni-freiburg.de/geowissenschaften

Albert-Ludwigs University, Geosciences, Centre for Renewable Energy
Name of courses / degrees: Renewable Energy Management (MSc)
Topics: Introduction to Geothermal Energy and its Technologies
http://www.zee-uni-freiburg.de/index.php?id=26

Leibniz University of Hannover
Name of courses / degrees: Geosciences (BSc, MSc)
Topics: System of the Earth I (8 ECTS), Structural Geology (7 ECTS), Geophysics (3 ECTS), Geochemistry (5 ECTS), Methods of Applied Geophysics (5 ECTS), Geochemical Analysis 1+2 (10 ECTS), Plate Tectonics and Continental Deformation (6 ECTS), Hydrogeology (3 ECTS), Geographic, Informationsystems GIS (4 ECTS), Project Management (4 ECTS), Hydrogeology / Water Economics (7 ECTS), Engineering Geology (6 ECTS)
http://www.geowissenschaften.uni-hannover.de" target="_blank

University of Technology Hamburg-Harburg (TUHH)
Name of courses / degrees: Energy and Environmental Engineering (BSc, MSc)
Topics: Thermodynamics I (5 ECTS), Thermodynamics II (5 ECTS), Thermodynamics III (5 ESTS), Basics of Electrical Engineering I (4 ECTS), Basics of Electrical Engineering II (4 ECTS), Fluid Dynamics I (5 ECTS), Fundaments of Reciprocating Engines and Turbomachinery (3 ECTS), Gas-Steam Power Plant (4 ECTS), Heat and Mass Transfer I (5 ECTS), Heat and Mass Transfer II (4 ECTS), Steam Generators (4 ECTS)
Topics: Compulsory Technical Courses
Fluid Dynamics II (5 ECTS), Apparatus Engineering - Heat Exchanger- High Pressure Technique (4

ECTS), Fluid Process Engineering (5 ECTS)
Elective Technical Courses - Energy Engineering
Steam Turbines (4 ECTS), Thermal Engineering (4 ECTS), Combined Heat and Power (3 ECTS), Air Conditioning (4 ECTS), Electricity Generation from Renewable Sources (6),Alternative Energy Systems (2 ECTS)
Elective Technical Courses - Environmental Engineering:
Thermal Waste Treatment (4 ECTS), Special Areas in Energy and Environmental Engineering I (2 ECTS), Special Areas in Energy and Environmental Engineering II (3 ECTS)
http://www.tu-harburg.de/alt/tuhh/education/students/examination-regulations/bsc-eut.html

University of Friedrich-Schiller Jena, Institute for Geosciences
Name of courses / degrees: Geosciences (BSc)
Topics: Basic Course Mechanics, Heat (8), Experimental Physics I (8), Geophysical fields and methods (Part I) (3), Experimental Physics II (8), Hydrogeology (Part I) (3), Geophysical - Practices (6), Hydrogeology (Part II) (3), Tectonics (5), Geothermal and Geothermal Energy (3) Borehole Geophysics and Groundwater Exploration (6), Tectonics and Seismology (6)
http://www.uni-jena.de/unijenamedia/Downloads/studium/grundstaendig/bachelor/BSc_Geowissenschaften-p-21798.pdf

University of Leipzig, Institute for Geophysics and Geology
Name of courses / degrees: Geosciences, Environmental Dynamics and Georisks (MSc)
Topics: Endogenous Georisks, Applied Environmental Geophysics
http://www.geo.uni-leipzig.de/

Johannes Gutenberg University Mainz, Institute for Geosciences and University of Applied Sciences Bingen, Institute for Geothermal Resource Management
Name of courses / degrees: Geosciences (BSc, MSc)
Topics: 4 days course, 1 field trip on deep geothermal for graduate students.
http://www.igem-energie.de/index.html

University of Potsdam
Name of courses / degrees: Geosciences (Geothermal part of studies) (BSc, MSc)
Topics: Geosciences I+II (12 ECTS), Experimental Physics (6 ECTS), Materials of the Earth I (6 ECTS), Basics of Structural Geology (6 ECTS), Numerical Methods (6 ECTS), Advanced Petrology and Geochemistry I (6 ECTS), Hydrogeology (6 ECTS)
http://www.geo.uni-potsdam.de/950.html" target="_blank

HUNGARY

University of Miskolc, Faculty of Earth Science
Name of courses / degrees: Post Graduate Diploma in Geothermal Energy Technology / Postgraduate Certificate in Geothermal Energy Technology (PGCertGeothermTech)

Topics: Renewable Energy (5), Advanced Geology (6), Advanced Geophysics (6), Fluid Dynamics (6), Hydrogeology (5), Drilling Well Design (6), Geothermal Reservoir (5), Geothermal Water Production

(5), Geoinformatics (5), Geothermal Chemistry (5), Geothermal Heat-Transfer Systems (5), Geothermal Heat-Transfer Systems (5), Geothermal Power Production (5), Geothermal Direct Uses (5), Geothermal Heat Pump (5), Geothermal Environmental Impacts (5), Geothermal Environmental Impacts (5)
http://www.kfgi.uni-miskolc.hu/index_en.html

University of Miskolc, Faculty of Earth Science
Name of courses / degrees: MSc Petroleum and Natural Gas Institute, MSc Hydrogeological Engineering, BSc Earth Science and Engineering, PhD
Topics: incl. courses about geothermal energy: Geothermal Energy Production and Utilization, Heat Transfer at Geothermal Wells, Renewable Energy, Flow Dynamics, Risk and Safety in Pipe-line Systems, Pipe-line Risk Analysis
http://www.mfk.uni-miskolc.hu/2_b.html

ICELAND

RES The School for Renewable Energy Science
Name of courses/degrees: M.Sc. specialization on Geothermal Energy
http://www.res.is/graduateschool/page/geothermal

University of Iceland, Faculty of Industrial Engineering, Mechanical Engineering and Computer Science
Name of courses/degrees: Mechanical Engineering B.Sc., M.Sc., PhD specializations on geothermal energy, geothermal reservoir physics and engineering, geothermal power plants, geothermal wells
Topics: Reservoir Engineering (7.5 ECTS), Geothermal Power Plants (7.5 ECTS), Geothermal Drilling (7.5 ECTS), Direct Geothermal Utilization (7.5 ECTS)
https://ugla.hi.is/kennsluskra/index.php?tab=nam&chapter=namskeidalisti&kennsluar=2013&heiti=geothermal&lysing=geothermal

UNU United Nations University Geothermal Training Program
Name of courses / degrees: 6 months Geothermal Training Program, UNU certificate, diploma can be extended to MSc or PhD degrees in geothermal sciences in cooperation with the University of Iceland
Topics: 1) introductory lectures, 2) specialised training, 3) research project30 ECTS units
http://www.unugtp.is

Reykjavik University REYST - Reykjavik Energy Graduate School of Sustainability System, University of Iceland and Reykjavik Energy
Name of courses / degrees: Engineering, Earth Sciences (MSc, PhD) through the University of Iceland and Reykjavik University

Topics: Earth sciences: Well Logging and Geothermal and Groundwater Reservoir Management
Engineering: Energy Carriers and Energy Storage, Measurements and System Analysis in Geothermal Power Plants
Optional courses offered in cooperation with University of Iceland and Reykjavik University

Geosciences: Seminar in Aqueous Geochemistry, Groundwater Hydrology, Dynamics of the Earth's Crust, Geophysical Inversion Measurements And Models in Geodynamics, Seismology, Geothermal Resources, Aquatic Geochemistry
Engineering: Space and District Heating, Geothermal Power Development, Advanced Fluid Mechanics, Advanced Heat Transfer, Numerical Solutions in Fluid Mechanics and Heat Transfer
http://www.en.ru.is/ise

Reykjavik University, School of Science and Engineering
Name of courses / degrees: Mechanical - and Energy Engineering (BSc)
Topics: Thermodynamics (6 ECTS), Fluid Mechanics and Heat Transfer (6 ECTS)
Thermodynamics II (6 ECTS), Overview of Sustainable Energy Systems (6 ECTS), Heating, Ventilation and Air Conditioning (6 ECTS), Thermo and Hydraulics Lab (6 ECTS)
http://en.ru.is/sse/" target="_blank

Keilir Atlantic Center of Excellence, Reykjanesbær in association with University of Iceland, Reykjavík energy and HS-Orka
Name of courses / degrees: Geothermal power plant technician
Topics: Steam conditioning supply: Wells, total wellhead equipment, steam separator, control equipment, Reinjection: The reinjection of geothermal hot water, the equipment, plumbing, total wellhead and control equipment, Steam Turbines, Geothermal Storage Tanks, Geothermal Power Plants: the fundamental organization: Machine elements, thermal- and fluid dynamics, Heat transfer: Heat Exchangers, Condition monitoring and maintenance, Geophysics, GeoReservoirs Reinjection and Inventory planning.
http://en.keilir.net/en/moya/page/geothermal-power-plant-technician_1
http://en.keilir.net/kit

ITALY

Many universities in Italy offer geothermal programs and courses, bachelor and master programs. The University of Pisa and the University of Roma3 offer specialization courses for geothermal resource exploration.

University of Pisa, Department of Geosciences
Name of courses / degrees: BSc and MSc in Geology, Course on Geothermal
Topics: basic principles and types of geothermal systems, techniques of geothermal exploration, geological aspects related to the use and exploitation of geothermal fluids
http://www.dst.unipi.it/scienzegeo/index.php?option=com_content&view=article&id=129:geotermia&catid=34:magistrale&Itemid=37
University of Pisa, Department of Earth Science, Department of Engineering, Department of Physics
http://www.unipi.it

University of Roma3
Name of courses / degrees: Course on Geothermal , Degree in Geology of the Territory and of the Resources.
Topics: Introductory concepts, classification of geothermal resources, geothermal exploration, regional geothermal, use of geothermal resources.

https://uniroma3.esse3.cineca.it/OffertaDidatticaPDSORD.do?cds_id=198375&aa_ord_id=2010&pds_id=10001
https://uniroma3.esse3.cineca.it/ProgrammaCorso.do;jsessionid=0020772CB759E567F4DE8A42463B222E.jvm_uniroma3_esse3web03?CDS_ID=198375&AA_OFF_ID=2013&AD_ID=30105054&AA_ORD_ID=2010&PDS_ID=10001&FAT_PART_COD=N0&DOM_PART_COD=N0
http://host.uniroma3.it/dipartimenti/geologia/geo_index.php?lang=en

The following universities cover geothermal topics in courses related to Earth Sciences disciplines (geology, hydrogeology, geophysics, geochemistry and rock mechanics). Engineering Departments offer courses with reference to power production and H&C plant design.

University of Camerino
Name of courses / degrees: course on Energy Resourses and Risk, MSc degree in Geoenvironmental Resources and Risks
Topics: see **http://www.unicam.it/geologia/teaching/allegati/guide_LM74_2013-14.pdf**

University of Milano, Department of Energy
Name of courses / degrees: Geothermics
Topics: design, manufacturing and operational assistance of ORC power plants for renewable energy sources utilization (solar, geothermal, biomass), analysis of advanced power generation systems from geothermal energy
http://www.energia.polimi.it/english/index.php?
http://www.polimi.it/index.php?id=3517&tx_wfqbe_pi1[id]=260&L=1

University of Bologna, Department of Civil, Chemical, Environmental and Materials Engineering
Name of courses / degrees: Geoengineering and Natural Resources focusing on Mines and Quarries, Geothermal and Excavations with courses in simulation of hydrocarbon and geothermal reservoirs.
http://www.eng.unibo.it/PortaleEn/Academic+programmes/Teachings/dettaglio.htm?AnnoAccademico=2013&IdComponenteAF=377650&CodDocente=030601&CodMateria=34757

Politecnico di Torino
http://www.diseg.polito.it/la_ricerca/aree_tematiche/meccanica_delle_rocce_stabilita_dei_pendii_e_gallerie/geotermia

Seconda Università degli Studi di Napoli, Department of Industrial Engineering and Information
http://www.dii.unina2.it/

University of Bari, Earth and Geoenvironmental Science Department
http://www.geo.uniba.it

University of Trieste, Department of Geocience
http://www. units.it/

University of Florence, Department of Earth Sciences, Department of Mechanical and Industrial Technology
http://www.unifi.it/

University of Padova, Department of Geosciences
http://www.unipd.it/international-area/node/78

University of Rome, La Sapienza, Department of Earth Sciences
http://en.uniroma1.it/study-us/degree-programmes

MACEDONIA

St. Ciril and Methodious, Faculty of Mecganical Engineering, Department on Thermal Energy
Name of courses / degrees: Energy and Ecology (Bachelor of Engineering, Master of Engineering)
Topics: Non-Conventional Energy Sources (Solar, Geothermal, Biomass and Wind) (5 ECTS)
Name of courses: Applied Thermal Engineering(Bachelor of Engineering, Master of Engineering)
Topics: Renewable Energy Sources (Solar, Geothermal, Biomass and Wind) (5 ECTS)
Name of courses: Thermal Engineering (MSc)
Topics: Non-Conventional Thermal Power Plant (Solar, Geothermal and Biomass) - one year fulltime course (6 ECTS)
Name of courses / degrees: Courses: Power Engineering and Ecology (MSc)
Topics: Non-Conventional Thermal Power Plant (Solar, Geothermal and Biomass) - one year full time course (5 ECTS)
Name of courses / degrees: Non-Conventional Energy Sources (MSc)
Topics: Non-Conventional Energy Sources (Solar, Geothermal and Biomass), Geothermal Heat Pumps (ECTS 5)
http://www.mf.ukim.edu.mk

POLAND

AGH - University of Science and Technology, Faculty of Geology, Geophysics and Environment Protection, Department of Energy Resources
Name of courses / degrees: Environmental Engineering, Specialization: Renewable Energy (incl. Geothermal Energy) BSc: Geothermal Energy
MSc: Geothermal Energy
http://www.agh.edu.pl/en/wydzial-geologii-geofizyki-iochrony-srodowiska/

Wroclaw University of Technology, Faculty of Mechanical and Power Engineering, Power Engineering
Name of courses / degrees: Power Engineering - Specialization in Renewable Sources of Energy (MSc)
Topics: Geothermal Power Engineering (1 ECTS)
http://www.portal.pwr.wroc.pl/345888,242.dhtml?s=346060

ROMANIA

University of Oradea, Faculty of Energy Engineering and Industrial Management
Name of courses / degrees: Engineering of Renewable Energy Systems (BSc), Renewable Energy (MSc)
Topics: Specialization on Geothermal Energy
BSc: course on geothermal energy has 4 ECTS out of the total 240 ECST for the 4 years program.
MSc: 2 years, 120 ECTS, of which 8 are for the course on "Technologies for geothermal energy utilization".
http://iemi.uoradea.ro/

TURKEY

Middle East Technical University, Ankara
Name of courses / degrees: Mechanical Engineering/Petroleum and Natural Gas Engineering
Topics: Geothermal engineering, Thermodynamics, Reservoir rock and Fluid properties, Drilling, Well Logging, Drilling fluid Engineering, Well Stimulation, Transport Phenomena in Geosystems, Thermal Recovery methods and Fluid Mechanics.
http://www.metu.edu.tr/

DokuzEylul University, Izmir
Name of courses / degrees: undergraduate and MSc programs in Geophysical Engineering as well as Geological Engineering, master‘s programs in Geothermal Energy, Economic Geology and Applied Geology
Topics: Thermal water and geothermal energy, Geophysical applications in Geothermal sites, Geothermal fluid and environment, Drilling Geothermal Wells, Geothermal Energy Technology, Geothermal Well Logs, Material Selection for Geothermal Applications, Geothermal Resources and utilization, Reservoir Engineering, Geothermal Hydrogeochemistry, Geothermal Hydrogeology, Reservoir monitoring and well tests, Urban design in Geothermal Fields, Paleogeothermal Systems, Well Logging of Geothermal Systems, Investigation of Marine Geothermal Areas
http://www.deu.edu.tr/ders-katalog/eng/eng-c1.html

IV International

IGA International Geothermal Associations Academy
Name of course(s)/degree(s): 1-week or 2-week specializations courses, IGA certification
Topics: Drilling technologies for geothermal wells, District heating systems, Geothermal heat pump technologies, Power plant technologies, Reservoir Engineering& Reservoir Modeling, Hydrochemistry/Geochemistry, Numeric modeling for heat and fluid transfer, Project management and financing, Regulatory framework conditions, 3 level drilling course (Enhanced) Geothermal Response Tests, Geothermal heat pump technology, Power plant technologies, Reservoir development and reservoir monitoring
http://www.geothermal-energy.org/iga_academy.html

For further international geothermal training courses see IGA website**: www.geothermal-energy.org**