Universitetet
i Stavanger

Diploma

Madhan XXX
date of birth XXX

is on the 7 September 2017 awarded the degree

Master of Science

Programme: Master's Degree Programme in Petroleum Engineering

Thesis:
A Literature Review and Transport Modelling of Nanoparticles for Enhanced Oil Recovery

The diploma is issued on 27 November 2017.

dean

faculty director

Valid original diploma has the logo of the university as a watermark in the paper

General information about the degree
Master of Science is awarded in accordance with the Regulations on Degrees and Titles Protected by Law of 16 December 2005 (No. 1574).

Admission requirements for specialization in Natural Gas Technology:
Bachelor degree in Petroleum Engineering or in Petroleum Geology with 20 ECTS in Petroleum Engineering courses and a total of 30 ECTS in mathematics and statistics courses.
Applicants with a bachelor degree in other engineering specializations with 30 ECTS in Petroleum Engineering courses or applicants with a bachelor degree in mathematics or physics with 20 ECTS in reservoir technology or in natural gas technology courses may also be concidered

The nominal length of study for the degree is 2 years and it comprises 120 ECTS credits. One completed year of study has nominally 60 ECTS credits.

Master of Science is a qualification that is part of second cycle/level 7 in the Norwegian Qualifications Framework for Lifelong Learning, approved by the Ministry of Education and Research on 15.12.2011.

Program Content, Structure and Composition
The master program is 120 ECTS, of which 30 ECTS are compulsory courses, securing a broad basis in in petroleum engineering. Courses particular for the different specializations and elective courses, 60 ECTS, constitute the in depth knowledge in each specialization. The remaining 30 ECTS is a master thesis.

The master thesis is compulsory for all candidates and is part of the technical specialization in Petroleum Engineering. The thesis work should preferably be related to topics of interest to the society, to industry, to the research community or be of general or special interest.

During the master program, candidates may spend one semester abroad, at a foreign university or academic institution, to specialize in selected topics or simply to gain an international perspective.

The university keeps close contact with industry through educational and research projects of different orientations.

The main working methods in the master program are: Lectures/group work/presentations/field trips/etc.

Learning outcomes
Candidates who complete the education program should achieve the following learning outcomes, defined in terms of knowledge, skills and general competencies:

Knowledge:
- A master's degree candidate in petroleum engineering will have advanced knowledge within the subject area and special insight into a particular area.
- The candidate will have in-depth knowledge of scientific theories and methods connected to the subject area, be able to apply knowledge to new areas within the subject area and be able to analyze professional issues related to history, tradition, distinct nature and place in society of the subject area.

Skills:
- The candidate will be able to analyze existing theories, methods and interpretations within the subject area, and work independently on practical and theoretical issues.
- The candidate will be able to use relevant methods for research and professional development independently.
- The candidate will be able to conduct research or development project under supervision, and in accordance with current research and ethical norms.

General competence :

- The candidate will be able to analyze relevant professional, research and ethical issues, and apply their own knowledge and skills to new areas to carry out advanced assignments and projects.
- The candidate will be able to communicate information relating to extensive independent work and master the expressions and terminology related to the subject area.
- The candidate will be able to communicate with specialists and the public on professional issues, analyses and conclusions within the subject area and contribute to innovation and innovation processes.

Transcript of Records

Universitetet i Stavanger

University of Stavanger

Name: **Madhan**

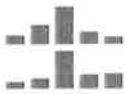
Date of birth: 1992-

Degree: Master of Science

Received: 2017-09-07

Study programme: Master's Degree Programme in Petroleum Engineering

Specialization: Natural Gas Engineering

Course		Semester	Credits	Grade	Grade distribution [1] A B C D E
PET505	Directional Drilling and Flowing Well Engineering	2015 autumn	10	A	
PET510	Computational Reservoir and Well Modeling	2015 autumn	10	A	
TN501	HSE-course for master students	2015 autumn	-	Passed	
PET540	Natural Gas Reservoir and Production Engineering	2016 spring	10	B	
PET545	Gas Value Chain and Production	2016 spring	10	A	
PET550	Natural Gas Processing and Transportation	2016 spring	10	B	
PET500	PVT of Petroleum Reservoirs and Fluids	2016 autumn	10	B	
PET630	Natural Gas Production Project Course	2016 autumn	10	B	
PET635	Natural Gas Conversion	2016 autumn	10	A	
PET645	Measurement and Control in Petroleum Engineering	2016 autumn	10	B	
PETMAS	Master Thesis *A Literature Review and Transport Modelling of Nanoparticles for Enhanced Oil Recovery*	2017 spring	30	A	

Total: 120.0

Stavanger, 27 November 2017

institution's representative

1) For an explanation of the grade distribution, see the last page.

Name: **Madhan**
Degree: Master of Science
Study programme: Master's Degree Programme in Petroleum Engineering
Specialization: Natural Gas Engineering

Date of birth: 1992-
Received: 2017-09-07

Credit system and grading

The academic year normally runs from mid-August to mid-June and lasts for 10 months. Courses are measured in "studiepoeng", considered equivalent to the European Credit Transfer System standard (ECTS credits). The full-time workload for one academic year is 1500 - 1800 hours of study / 60 "studiepoeng".

The Norwegian grading system consists of two grading scales: one scale with the grades pass or fail and one graded scale from A to E for pass and F for fail. The graded scale has the following qualitative descriptions:

A	Excellent	An excellent performance, clearly outstanding. The candidate demonstrates excellent judgement and a very high degree of independent thinking.
B	Very good	A very good performance. The candidate demonstrates sound judgement and a high degree of independent thinking.
C	Good	A good performance in most areas. The candidate demonstrates a reasonable degree of judgement and independent thinking in the most important areas.
D	Satisfactory	A satisfactory performance, but with significant shortcomings. The candidate demonstrates a limited degree of judgement and independent thinking.
E	Sufficient	A performance that meets the minimum criteria, but no more. The candidate demonstrates a very limited degree of judgement and independent thinking.
F	Fail	A performance that does not meet the minimum academic criteria. The candidate demonstrates an absence of both judgement and independent thinking.

The assessment is criterion referenced.

Grade distribution

The distribution of grades is shown by the percentage for courses using the graded scale A – F. Fail (F) is not included in the distribution. All results from the last five years are included in the calculation. The distribution is also shown for courses that have been active for less than five years. There has to be at least 10 approved results during the period.

Diploma Supplement

University of Stavanger

Universitetet i Stavanger

This Diploma Supplement model was developed by the European Commission, Council of Europe and UNESCO/CEPES. The purpose of the supplement is to provide sufficient independent data to improve the international 'transparency' and fair academic and professional recognition of qualification (diplomas, degrees, certificates etc.). It is designed to provide a description of the nature, level, context, content and status of the studies that were pursued and successfully completed by the individual named on the original qualification to which this supplement is appended. It should be free from any value judgements, equivalence statements or suggestions about recognition. Information in all eight sections should be provided. Where information is not provided, an explanation should give the reason why.

1 INFORMATION IDENTIFYING THE HOLDER OF THE QUALIFICATION

1.1 Family name(s):
1.2 Given name(s): Madhan
1.3 Date of birth *(day/month/year)*: -1992
1.4 Student identification number or code:

2 INFORMATION IDENTIFYING THE QUALIFICATION

2.1 Name of qualification and (if applicable) title conferred (in original language):
Master of Science
The title master is protected by law in Norway.

2.2 Main field(s) of study for the qualification:
Natural Gas Engineering
Petroleum Engineering

2.3 Name and status of awarding institution (in original language)
Universitetet i Stavanger, a public university. The quality assurance system was evaluated and approved by the Norwegian Agency for Quality Assurance in Education in 2009.

2.4 Name and status of institution administering studies
See section 2.3

2.5 Language(s) of instruction/examination
English

3 INFORMATION ON THE LEVEL OF THE QUALIFICATION

3.1 Level of qualification
Second Cycle/Level 7, Norwegian Qualifications Framework for Lifelong Learning

3.2 Official length of the programme
2 years in full-time mode (120 ECTS credits).

3.3 Access requirements

3-years bachelor's degree in Petroleum Engineering or equalent

4 INFORMATION ON THE CONTENTS AND RESULTS GAINED

4.1 Mode of study
Full-time study.

4.2 Programme requirements
Candidates who complete this education programme are expected to achieve the following learning outcomes, defined in terms of knowledge, skills and general competencies.

Knowledge:

- A master's degree candidate in petroleum engineering will have advanced knowledge within the subject area and specialised insight into a particular area.
- The candidate will have in-depth knowledge of scientific theories and methods connected to the subject area, be able to apply knowledge to new areas within the subject area and be able to analyse professional issues on the basis of the history, tradition, distinct nature and place in society of the subject area.

Skills:

- The candidate will be able to analyse existing theories, methods and interpretations within the subject area, and work independently on practical and theoretical issues.
- The candidate will be able to use relevant methods for research and professional development independently.
- The candidate will be able to independently carry out a specialised research or development project under supervision, and in accordance with current research and ethical norms.

General competencies:

- The candidate will be able to analyse relevant professional, research and ethical issues, and apply their own knowledge and skills to new areas to carry out advanced assignments and projects.
- The candidate will be able to communicate information relating to extensive independent work and master the expressions and terminology related to the subject area.
- The candidate will be able to communicate with specialists and the general public on professional issues, analyses and conclusions within the subject area and contribute to innovation and innovation processes.

4.3 Programme details:

Name: Madhan Nur Agista

Course		Semester	Credits	Grade	Grade distribution A B C D E
PET505	Directional Drilling and Flowing Well Engineering	2015 autumn	10	A	
PET510	Computational Reservoir and Well Modeling	2015 autumn	10	A	
TN501	HSE-course for master students	2015 autumn	-	Passed	
PET540	Natural Gas Reservoir and Production Engineering	2016 spring	10	B	
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PET550	Natural Gas Processing and Transportation	2016 spring	10	B	
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PET630	Natural Gas Production Project Course	2016 autumn	10	B	
PET635	Natural Gas Conversion	2016 autumn	10	A	
PET645	Measurement and Control in Petroleum Engineering	2016 autumn	10	B	
PETMAS	Master Thesis *A Literature Review and Transport Modelling of Nanoparticles for Enhanced Oil Recovery*	2017 spring	30	A	

Total: 120.0

Credit system and grading

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Grade distribution

The distribution of grades is shown by the percentage for courses using the graded scale A – F. Fail (F) is not included in the distribution. All results from the last five years are included in the calculation. The distribution is also shown for courses that have been active for less than five years. There has to be at least 10 approved results during the period.

4.4 Grading scheme and, if available, grade distribution guidance:
See section 4.3

4.5 Overall classification of the qualification (in original language):
Not applicable

5 INFORMATION ON THE FUNCTION OF THE QUALIFICATION

5.1 Access to further study:
The Master of Science degree qualifies students to apply for a Ph.D.-programme.

5.2 Professional status:
Graduates are employed in various firms/companies and governmental institutions as leading/senior staff/personnel.

6 ADDITIONAL INFORMATION

6.1 Additional information:
The Faculty of Science and Technology offers master's degrees in Science and Engineering.

6.2 Further information sources:
University of Stavanger, http://www.uis.no
Norwegian Agency For Quality Assurance, http://www.nokut.no/en

7 CERTIFICATION OF THE SUPPLEMENT

7.1 Date: 27 November 2017
Date of original qualification: 7 September 2017

7.2 Signature: _____

Ida Charlotte Helleland

7.3 Capacity: institution's representative

7.4 Official stamp

8. INFORMATION ON THE NATIONAL HIGHER EDUCATION SYSTEM

Higher education in Norway

The Ministry of Education and Research has the overall responsibility for higher education in Norway. Higher education is offered by four types of higher education institutions: university *(universitet)*, specialized university institution *(vitenskapelig høyskole)*, accredited university college *(akkreditert høyskole)*, and university college with accredited study programmes *(høyskole med akkrediterte studier)*. The differences between the types of higher education institutions are related to their self-accrediting authority.

All public and private higher education in Norway is subject to the Act Relating to Universities and University Colleges (Lov 2005-04-01 nr 15)[1]. An institution's right to award specific degrees and the prescribed lengths of study are codified in Regulations on Degrees and Titles protected by Law (FOR 2005-12-16 nr 1574). The awarding of master's degrees is regulated by the Regulations on requirements for awarding a master's degree (FOR 2005-12-01 nr 1392).

Since 2002 Norway has adhered to the objectives of the Bologna Process in the European Higher Education Area. Most of the elements have been implemented through the reform of the Norwegian higher education system carried out in 2003. Central to the reform has been a transition from the former degree system to the bachelor's, master's and doctoral degree structure, with a few exceptions.

Norwegian higher education qualifications make up the levels from 6 to 8 of the Norwegian Qualifications Framework for Lifelong Learning (NQF) from 2011, which is the national overarching qualifications framework[2]. It describes the levels of qualifications as defined by the total learning outcomes in terms of the knowledge, skills and general competence that graduates at various levels should have achieved[3]. NQF was referenced to the European Qualifications Framework (EQF) in 2014.

Quality assurance and accreditation of institutions and programmes

The Norwegian Agency for Quality Assurance in Education (NOKUT) is an autonomous governmental agency which provides external supervision and control of the quality of Norwegian higher education, as well as of all tertiary vocational education[4]. NOKUT accredits new study programmes, controls the existing ones, and provides a cyclic evaluation of the institutions' quality assurance systems for educational provision.

An accredited higher education institution is granted the right to offer educational provision, without having to apply to NOKUT for specific programme accreditation, in accordance with the authority that its institutional category implies. Universities may without external accreditation establish study programmes at all levels. Accredited university colleges have to apply for the accreditation of programmes at master and doctoral levels. In those fields where specialized university institutions and accredited university colleges have the right to award doctorates or corresponding degrees, they may themselves decide which study programmes and disciplines the institution shall provide.

University colleges without institutional accreditation must apply to NOKUT for accreditation of study programmes at all levels.

Lists of all accredited institutions, as well as of all accredited study programmes at the university colleges without institutional accreditation are available on www.nokut.no

[1] In brackets are written the official codes of each act, published in Norwegian in the online database Lovdata, www.lovdata.no
[2] National generic learning outcomes descriptions' levels for the bachelor's, master's and doctoral degrees were defined by the Instructions on the Norwegian Qualifications Framework for Higher Education in 2009.
[3] Learning outcomes for a specific NQF level show the minimum of what each learner should know, understand and be able to do after completing a learning process.
[4] Tertiary vocational education (TVE), level 5 in the NQF (EQF), is provided by *fagskoler*, which are considered as tertiary vocational education institutions. TVE is based on upper secondary education and training or equivalent competence. Courses have duration of from 6 months to 2 years. All provisions must be accredited by NOKUT.

Admission requirements and progression

The Higher Education Entrance Qualification is the successful completion of Norwegian upper secondary education with some specified courses. The Certificate of Upper Secondary Education and Training *(Vitnemål for videregående opplæring)* is based on 13 years of schooling. Admission may also be gained by means of other qualifications recognized as being on a par with the Higher Education Entrance Qualification, such as recognition of prior learning and work experience. Some fields of study have additional entrance requirements.

Degrees and qualifications

All Norwegian higher education institutions use a system of credits *(studiepoeng)* for measuring study activities, considered equivalent to the European Credit Transfer and Accumulation System (ECTS). 60 ECTS credits *(studiepoeng)* are allocated to the workload of a full year of academic study, equivalent to 1500-1800 hours of study. 30 ECTS credits are normally allocated to one semester's full-time study. The academic year normally lasts for 10 months and runs from August to June.

NQF (EQF) Level 6: Bachelor (1st cycle)
The bachelor's degree is awarded after three years of full-time study (180 ECTS). Some bachelor's degrees, in the field of music and performing arts, consist of four-year bachelor's programmes (240 ECTS). Teacher education for primary and lower secondary school, years 1-7 and years 5-10 is a four-year professional programme (240 ECTS).

University college graduate *(høyskolekandidat)* is a two-year degree (120 ECTS), a short cycle degree within the first cycle. Holders of this degree may in some cases continue their studies in a bachelor programme and thus obtain a bachelor's degree.

NQF (EQF) Level 7: Master (2nd cycle)
The master's degree is normally obtained after two years of study (120 ECTS), following the completion of a bachelor's degree. A master's degree programme includes independent work (normally a thesis) of between 30 and 60 ECTS. Some experience-based master's degrees have a scope of 90 or 120 ECTS (including independent work of at least 20 ECTS).

One-tier (integrated/long-term) master's degree is a five-year study programme (300 ECTS) which results in a master's degree, with no intermediate bachelor's degree. An exception is the Master of Architecture programme at the Oslo School of Architecture and Design, which has a scope of 330 ECTS.

In the fields of medicine, psychology and theology, professionally oriented degrees/qualifications of six years' duration (360 ECTS) are awarded; in the field of veterinary science - after 5 ½-6 years. They have retained the title *candidata/candidatus* from the former degree system.

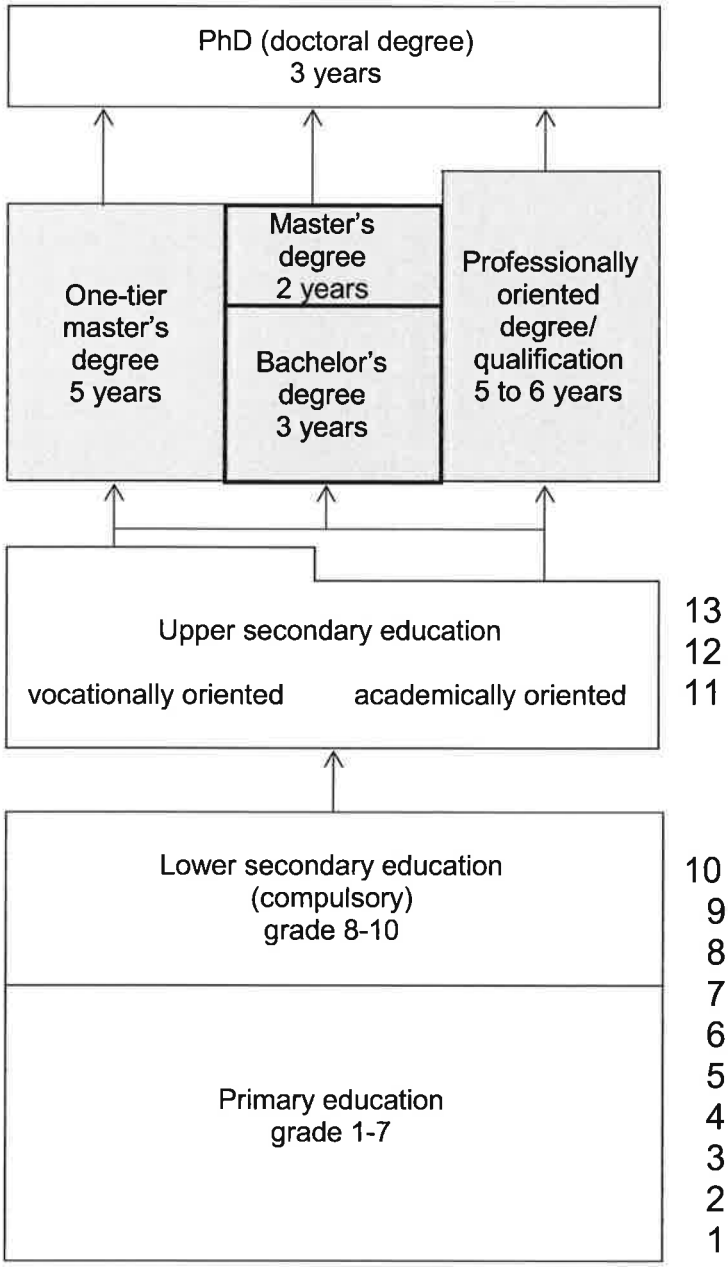
NQF (EQF) Level 8: Doctoral degree/PhD (3rd cycle)
Doctoral degree, PhD *(philosophiae doctor, ph.d.),* is awarded after three years of study, following the completion of a master's degree or a five to six-year professionally oriented degree/qualification.

Doctor philosophiae *(dr. philos.)* is conferred on graduates who have qualified for a doctoral degree on their own, without formal research training.

Diploma, artistic research fellowships programme *(kunstnerisk utviklingsprogram)* is a three-year programme in the field of creative and performing arts. It is offered as a parallel to other research-oriented provisions organized as academic PhD programmes.

Descriptions of the educational qualifications can be found in the Norwegian Qualifications Framework for Lifelong Learning at www.nokut.no/NKR.

General structure of the Norwegian educational system



Higher education degrees and qualifications not included in the chart*:

- Master's degree in Architecture from Oslo School of Architecture and Design: 5 ½ years
- Experienced-based master's degree: 1 ½ or 2 years
- Bachelor's degree of 4 years' duration (music)
- Primary and lower secondary teacher education programmes for years 1-7 and years 5-10: 4 years
- University college graduate degree: 2 years

* In addition, Norway has a system of **tertiary vocational education** ***(fagskole)***, which is not considered higher education. It is based on upper secondary education and training or equivalent competence. Course duration is from six months to 2 years. Holders of some 1 and 2 year *fagskole*-qualifications can after individual assessment continue their studies in some bachelor programs, for example in the fields of engineering and marketing.