ME OF THE UNIVERSITY
B THE FACE OF THE ENT
Northwestern University
633 Clark Street
Evanston, IL 60208
United States

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Name: Liu,Mohan Student ID: 2790852

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# Official Graduate Transcript

|                    |       | TENIN UNIVERSI   |                    |                | VEOTE        | DOIDA N        |           |  |   | MERSH             |                                |              |               |
|--------------------|-------|--|--------------------|----------------|--------------|----------------|-----------|--|---|-------------------|--------------------------------|--------------|---------------|
| Print Date:        |       | 02/26/2019   |                    |                |              |                | Course    |  | Description A COLUMN                                    | Attempted         | Earned                         | Grade        | Points        |
|                    |       |  |                    |                |              |                | CHEM      | 442-2  | Quantum Chem  | 1.000             | 1.000                          | B+           | 3.300         |
|                    |       |  |                    |                |              |                | MAT SCI   | 361-0  | Crystallography & Diffraction                           | 1.000             | 1.000                          | A A          | 4.000         |
|                    |       | Beginning of The Graduate                                | e School Reco      | rd 🗸 🗀         |              |                | MAT_SCI   | 499-0  | Projects Dillaction                                     | 1.000             | 1.000                          |              | 3.700         |
| Program:           |       | 2013 Fall (09/24/2013-<br>Materials Science and Eng: PhD | 12/13/2013)        |                |              |                | Program:  | VERS   | 2015 Spring (03/30/20<br>Materials Science and Eng: PhD | 015- 06/12/2015)  |                                |              |               |
|                    |       |  |                    |                |              |                | 0         |  | HVVESTERN UN  | NERSIL            | Y • 1\(\)                      |              |               |
| Course             |       | Description  | Attempted          | Earned         | <u>Grade</u> | <u>Points</u>  | Course    |  | Description   | Attempted         | Earned                         | <u>Grade</u> | Points        |
| MAT_SCI            | 401-0 | Chem & Stat Thermodyn of Mat                             | 1.000              | 1.000          | Α            | 4.000          | MAT_SCI   | 590-0  | Research  | 3.000             | 0.000                          | K            | 0.000         |
| MAT_SCI            | 451-0 | Advanced Physics of Materials                            |                    | 1.000          | Α            | 4.000          |           |  | 2015 Cummon (06/00/0                                    | 015 00/00/0015    | $\square \square \square \lor$ |              |               |
| MAT_SCI            | 458-0 | Computational Materials Sci                              | 1.000              | 1.000          | A            | 4.000          | Drogram:  |  | 2015 Summer (06/22/2<br>Materials Science and Eng: PhD  | (013- 06/26/2013) |                                |              |               |
| MAT_SCI            | 519-0 | RCR Training   | 0.000              | 0.000          | S            | 0.000          | Program:  | 11   | Waterials Science and Eng. Find                         |                   |                                |              |               |
|                    |       | 2014 Winter (01/06/2014                                  | 4- 03/21/2014)     |                |              |                | Course    |  | Description   | Attempted         | Earned                         | Grade        | Points        |
| Program:           | Y •   | Materials Science and Eng: PhD                           |                    |                |              |                | MAT SCI   | 590-0  | Research  | 4.000             | 0.000                          | $\mathbf{K}$ | 0.000         |
| NODEL              |       |  |                    |                | 2/12         |                |           | \ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \                              |   |                   | 7 N 10                         |              | /COTER        |
| Course             |       | <u>Description</u>                                       | Attempted          | Earned         | Grade        | <u>Points</u>  |           |  | 2015 Fall (09/21/201                                    | 5- 12/12/2015)    |                                |              |               |
| MAT_SCI            | 404-0 | Imperfections in Materials                               | 1.000              | 1.000          | A-           | 3.700          | Program:  | · '\   | Materials Science and Eng: PhD                          |                   |                                |              |               |
| MAT_SCI            | 408-0 | Phase Transformations in Mats                            | 1.000              | 1.000          | Α            | 4.000          |           |  |   |                   |                                |              |               |
| MAT_SCI            | 460-0 | Electron Microscopy                                      | 1.000              | 1.000          | C+           | 2.300          | Course    |  | Description   | <u>Attempted</u>  | Earned                         | <u>Grade</u> | <u>Points</u> |
| MAT_SCI            | 590-0 | Research   |                    | 0.000          | K            | 0.000          | TGS       | 500-0  | Advanced Doctoral Study                                 | 0.000             | 0.000                          |              | 0.000         |
| VI                 | FRSI. | 2014 Spring (03/31/2014                                  | 4- 06/13/2014)     |                |              |                |           |  | 2016 Winter (01/04/20                                   | 16- 03/19/2016)   |                                |              |               |
| Program:           |       | Materials Science and Eng: PhD                           |                    |                |              |                | Program:  | CT I   | Materials Science and Eng: PhD                          |                   |                                |              |               |
| Course             |       | Description  | Attempted          | Earned         | Grade        | Points         |           |  |   |                   |                                |              |               |
|                    | 382-0 |  |                    |                |              |                | Course    |  | <u>Description</u>                                      | Attempted         | Earned                         | <u>Grade</u> | <u>Points</u> |
| MAT_SCI<br>MAT_SCI | 405-0 | Electrochem En Mats & Devices Physics of Solids          | 1.000              | 1.000<br>1.000 | A            | 4.000<br>4.000 | TGS       | 500-0  | Advanced Doctoral Study                                 | 0.000             | 0.000                          |              | 0.000         |
| MAT_SCI            | 406-0 | Symmetry & Mech Prop of Mat                              | 1.000              | 1.000          | B+           | 3.300          |           |  |   | 240 00(4/0040)    |                                |              |               |
|                    |       |  |                    |                |              |                | Program:  | 2016 Spring (03/29/2016- 06/11/201<br>Materials Science and Eng: PhD |   | 116- 06/11/2016)  |                                |              |               |
| Duranam I (        | ORTH  | 2014 Summer (06/23/201                                   | 14- 08/29/2014)    |                |              |                | i logiam. |  | iviaterials ocience and Eng. 1 hb                       |                   |                                |              |               |
| Program:           |       | Materials Science and Eng: PhD                           |                    |                |              |                | Course    |  | Description   | Attempted         | Earned                         | Grade        | Points        |
| Course             |       | Description  | Attempted          | Earned         | Grade        | Points         | TGS       | 500-0  | Advanced Doctoral Study                                 | 0.000             | 0.000                          |              | 0.000         |
| Course<br>MAT_SCI  | 590-0 | Research   | Attempted<br>3.000 | 0.000          | NR           | 0.000          | - 1       |  |   |                   |                                |              | N I O D       |
| WIAT_001           | 330-0 | VESTERA  | 3.000              | 0.000          | • 1          | 0.000          | <b>1</b>  |  | 2016 Summer (06/20/2                                    | 2016- 08/28/2016) | UNIVE                          |              |               |
|                    |       | 2014 Fall (09/23/2014-                                   | 12/12/2014)        |                |              |                | Program:  |  | Materials Science and Eng: PhD                          |                   |                                |              |               |
| Program:           | JAAEG | Materials Science and Eng: PhD                           |                    |                |              |                | 0         |  | HIVESTERN UN  | NEWOII.           | Y -   \                        |              |               |
| /EQTEE             |       | IIVEDOITY . NIOD   |                    | TEDN           |              | DOITY . N      | Course    |  | Description   | Attempted         | Earned                         | Grade        | <u>Points</u> |
| Course             |       | Description  | Attempted          | Earned         | <u>Grade</u> | <u>Points</u>  | TGS       | 500-0  | Advanced Doctoral Study                                 | 0.000             | 0.000                          |              | 0.000         |
| MAT_SCI            | 340-0 | Ceramic Procesng   | 1.000              | 1.000          | RTA-\//E     | 3.700          |           |  | 2016 Fall (09/20/201                                    | 6- 12/10/2016)    |                                |              |               |
| MAT_SCI            | 391-0 | Process Design   | 1.000              | 1.000          | AVVL         | 4.000          | Program:  |  | Materials Science and Eng: PhD                          | 4 O.L.41 A.C.     |                                |              |               |
| MAT_SCI            | 411-0 | Phase Transfrm Crytalline Mats                           | 1.000              | 1.000          | RSIATY •     | 4.000          | NESTERA   |  | /FRSITY • NORT  |                   |                                |              |               |
|                    |       | 2015 Winter (01/05/2015                                  | 5- 03/20/2015)     |                |              |                | Course    |  | Description   | Attempted         | Earned                         | Grade        | Points        |
| Program:           | Y • N | Materials Science and Eng: PhD                           |                    |                |              |                | TGS       | 500-0  | Advanced Doctoral Study                                 | 0.000             | 0.000                          | -RSHY        | 0.000         |
|                    |       |  |                    |                |              |                |           | 000  | Endou Douloral Clady                                    |                   | 0.444 L                        |              | 7.557         |

NORTHWESTERN UNIVERSITY • Office of the Registrar

EXPLANATORY LEGEND PRINTED ON BACK

BROWN STAINS INDICATE UNAUTHORIZED ALTERATIONS



Jacqualyn F. Casazza University Registrar Northwestern University 633 Clark Street Evanston, IL 60208 United States

NORTHWESTERN UNIVERSITY • NORTHWESTERN UNIVERSITY • NORTHWESTERN UNIVERSITY • NORTHWESTERN UNIVERSITY •

Name: Liu,Mohan Student ID: 2790852

Description

5/13/2016

Advanced Doctoral Study

Materials Science and Eng: PhD

Materials Science and Eng: PhD

Materials Science and Eng: PhD Christopher M. Wolverton

Frederich Schneider

Non-Course Milestone:

Christopher M. Wolverton, Sossina Mariam Haile, Michael J. Bedzyk

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**Grade** 

Points 0.000

# Official Graduate Transcript

| Program:                              | KIN UIN       | 2017 Winter (01/03/2017<br>Materials Science and Eng: PhD | 7- 03/18/2017) |           |         |               |   |
|---------------------------------------|---------------|---|----------------|-----------|---------|---------------|---|
| i iogram.                             | ORTH          | naterials ocience and Eng. 1 hb                           |                |           |         |               | Course  |
| Course                                |               | Description   | Attempted      | Earned    | Grade   | Points        | TGS 500-0                                     |
| TGS                                   | 500-0         | Advanced Doctoral Study                                   | 0.000          | 0.000     | KSTTY • | 0.000         |   |
| Program:                              |               | 2017 Spring (03/27/2017<br>Materials Science and Eng: PhD |                | RSITY     |         | RTHWEST       | PhD Candidacy<br>Program:<br>Milestone Title: |
| Course                                |               | <u>Description</u>  | Attempted      | Earned    | Grade   | Points        |   |
| EECS                                  | 336-0         | Design &Analysis of Algorithms                            | 1.000          | 1.000     | B+      | 3.300         | Prospectus Committee<br>Program:              |
| TGS                                   | 500-0         | Advanced Doctoral Study                                   | 0.000          | 0.000     |         | 0.000         | Milestone Title:                              |
|                                       |               | IVVESTERN UNIVE   |                |           |         |               |   |
| A.LIAII                               | TDOI          | 2017 Summer (06/19/201                                    | 7- 08/26/2017) |           |         |               |   |
| Program:                              | EUOIA         | Materials Science and Eng: PhD                            |                |           |         |               | Prospectus Advisor<br>Program:                |
| Course                                |               | Description   | Attempted      | Earned    | Grade   | Points        | Milestone Title:                              |
| TGS                                   | 500-0         | Advanced Doctoral Study                                   | 0.000          | 0.000     |         | 0.000         |   |
|                                       |               | HERN UNIVERSI   |                |           |         |               |   |
| Program:                              | RN UN         | 2017 Fall (09/19/2017-<br>Materials Science and Eng: PhD  | 12/09/2017)    |           |         |               |   |
| Course                                |               | Description   | Attempted      | Earned    | Grade   | <u>Points</u> |   |
| TGS                                   | 500-0         | Advanced Doctoral Study                                   | 0.000          | 0.000     |         | 0.000         |   |
|                                       |               | Thavarious Bostoral Stady                                 |                | 0.000     |         |               |   |
| Program:                              | N             | 2018 Winter (01/08/2018<br>Materials Science and Eng: PhD | 3- 03/24/2018) |           |         |               |   |
| Course                                |               | Description   | Attempted      | Earned    | Grade   | Points        |   |
| TGS                                   | 500-0         | Advanced Doctoral Study                                   | 0.000          | 0.000     |         | 0.000         |   |
| Program:                              | AN UN<br>ORTH | 2018 Spring (04/03/2018<br>Materials Science and Eng: PhD | 8- 06/16/2018) |           |         |               |   |
| , , , , , , , , , , , , , , , , , , , |               |   |                | II-II\ /F |         |               |   |
| Course                                | EMOLI         | Description   | Attempted      | Earned    | Grade   | <u>Points</u> |   |
| TGS                                   | 500-0         | Advanced Doctoral Study                                   | 0.000          | 0.000     |         | 0.000         |   |
| Program:                              |               | 2018 Summer (06/25/201<br>Materials Science and Eng: PhD  | 8- 09/02/2018) |           |         |               |   |
| Course                                |               | Description   | Attempted      | Earned    | Grade   | Points        |   |
| TGS                                   | 500-0         | Advanced Doctoral Study                                   | 0.000          | 0.000     |         | 0.000         |   |
|                                       |               | W/FSTERN UNIVE  |                |           |         |               |   |
| Program:                              | ERSIN         | 2018 Fall (09/27/2018-<br>Materials Science and Eng: PhD  | 12/15/2018)    |           |         |               |   |
| Course                                |               | Description //=\T=\                                       | Attempted      | Earned    | Grade   | Points -      |   |
| TGS                                   | 500-0         | Advanced Doctoral Study                                   | 0.000          | 0.000     |         | 0.000         |   |
|                                       |               | 2019 Winter (01/07/2019                                   | a_ 03/23/2010\ |           |         |               |   |
| Donata                                | >             | Astaniala Osianaa and Eng. Dis                            | - 03/23/2019)  |           |         |               |   |

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Jacqualyn F. Casazza University Registrar

Materials Science and Eng. PhD

## NORTHWESTERN UNIVERSITY

# Evanston, Illinois

#### **ACCREDITATION**

Northwestern University is accredited by the Higher Learning Commission (<a href="https://www.hlcommission.org">www.hlcommission.org</a>). Other professional, college, school, and departmental accreditations are listed here:

http://www.registrar.northwestern.edu/academic\_records/index.html Northwestern University's CEEB code is 001739.

#### OFFICE OF RECORD

The Office of the Registrar, 633 Clark Street, Evanston, Illinois 60208, (847) 491-5234, fax: (847) 491-8458, <a href="www.registrar.northwestern.edu">www.registrar.northwestern.edu</a>, issues transcripts of records for the following schools in the University. Such transcripts are a complete and chronological listing of all courses attempted in any of the schools listed.

Bienen School of Music
Dental School (closed 2001)
The Graduate School
McCormick School of Engineering and

McCormick School of Engineering and Applied Science Weinberg College of Arts and Applied Science Medill School of Journalism, M Graduate Nursing School (closed 1990) Marketing Communications

Graduate Nursing School (closed 1990) Physician Assistant Program

Kellogg School of Management School of Communication (formerly Speech) School of Education and Social Policy Weinberg College of Arts and Sciences Medill School of Journalism, Media, Integrated

Prosthetics-Orthotics (Master's program only)

The Office of the Dean/Director of each school/program listed below issues transcripts of records for these units. These transcripts must be requested separately and in addition to any transcripts from other Northwestern schools.

Northwestern Pritzker School of Law (312) 503-8464, <a href="www.law.northwestern.edu">www.law.northwestern.edu</a> Northwestern University in Qatar 974-4454-5072, <a href="www.qatar.northwestern.edu">www.qatar.northwestern.edu</a> School of Professional Studies (312) 503-1369 <a href="www.ps.northwestern.edu">www.ps.northwestern.edu</a> Physical Therapy (312) 908-8160 <a href="www.feinberg.northwestern.edu/">www.feinberg.northwestern.edu/</a> Prosthetics-Orthotics (certificates) (312) 503-5700 <a href="www.nupoc.northwestern.edu/">www.nupoc.northwestern.edu/</a>

## ACADEMIC CALENDARS

Northwestern University offers programs on numerous calendars. Unless listed specifically below, the calendar on this transcript is a quarter system consisting of three quarters lasting approximately 10 weeks and one summer session lasting 10-11 weeks. Terms may include shorter sessions. The Executive MBA Program through the Kellogg School of Management is an exception with class meetings on designated weekends during terms corresponding to the quarter calendar.

Northwestern University in Qatar operates on a traditional semester calendar consisting of two terms each lasting 16 weeks and one summer term.

The Physician Assistant Program operates on a trimester calendar consisting of three terms each lasting 16 weeks.

The Physical Therapy Program operates on a semester calendar consisting of three terms each lasting 16 weeks.

The Prosthetics-Orthotics master's program uses a course unit system in which a 1 in the earned and attempted column = 1-unit course. For the purpose of transfer credit, one unit should be considered to be the equivalent of four quarter hours or 2 2/3 semester hours.

#### CREDIT

For quarter-based programs, in September 1969 NU began using a course unit system in which a 1 in the earned and attempted column = 1-unit course. For the purpose of transfer credit, one unit should be considered to be the equivalent of **four quarter hours or 2 2/3** semester hours.

Prior to 2006 the Summer Session was based on a semester system and credits taken in that context should be considered to be the equivalent of four quarter hours or three semester bours.

For an explanation of credits earned in quarter-based programs prior to 1969: http://www.registrar.northwestern.edu/academic records/index.html

The Physician Assistant program uses a trimester hour credit measure in which each credit hour corresponds to an hour of meeting time for each week of a 16-week trimester.

The Physical Therapy program uses a semester hour credit measure in which each credit hour corresponds to an hour of meeting time for each week of a 16-week semester.

The Prosthetics-Orthotics master's program uses a course unit system in which a 1 in the earned and attempted column = 1 course. For the purpose of transfer credit, one course should be considered to be the equivalent of four quarter hours or 2 2/3 semester hours.

Northwestern University in Qatar uses a course unit system in which a 1 in the earned and attempted column = 1-unit course. For the purposes of transfer credit, one unit should be considered to be the equivalent of four semester hours.

## **GRADE POINT AVERAGE (GPA)**

All courses attempted are recorded on the transcript and used in the GPA calculation. GPA is computed by taking the total grade points divided by the attempted units. NR, T, TR, P, N, K, S, U, and W grades are not included in GPA calculations.

Northwestern University does not calculate major GPAs nor does it rank its students.

## **EXPLANATION OF GRADE POINTS AND GRADES**

For grade categories and years not represented below visit: www.registrar.northwestern.edu/academic records/index.html

Note: GPAs are not calculated on official graduate and professional transcripts.

#### ABC GRADING SCALE

| _ | DO CITADII      | 10 OUNEE |                   |
|---|-----------------|----------|-------------------|
|   | Grade<br>Points | Grade    | Description       |
|   | 4.0             | Α        | Excellent         |
|   | 3.7             | A-       |                   |
|   | 3.3             | B+       |                   |
|   | 3.0             | В        | Good              |
|   | 2.7             | B-       |                   |
|   | 2.3             | C+       |                   |
|   | 2.0             | С        | Satisfactory      |
|   | 1.7             | C-       |                   |
|   | 1.0             | D        | Poor but passing  |
|   | 0.0             | F        | Fail              |
|   | 0.0             | X        | Missed final exam |
|   | 0.0             | Υ        | Work incomplete   |

## BY SCHOOL, WHEN THE GRADE RUBRIC ABOVE IS APPLICABLE

| Undergraduate Programs                          | September 1982 - present |
|---|--------------------------|
| Bienen School of Music (graduate programs)      | January 2005 – present   |
| School of Communication (graduate programs)     | September 2005 - present |
| School of Education and Social Policy (graduate | March 2005 - present     |
| programs – D grade not used)                    |                          |
| The Graduate School (D grade not used)          | September 2004 - present |
| Medill School of Journalism, Media, Integrated  | October 1986 - present   |
| Marketing Communications (graduate programs     |                          |
| <ul><li>– D grade not used)</li></ul>           |                          |
| McCormick School of Engineering and Applied     | September 1996 - present |
| Science (graduate programs)                     |                          |

#### GRADE POINTS AND GRADES USED BY KELLOGG SCHOOL

## OF MANAGEMENT (non-executive MBA Programs)

| _ | Grade<br>Points | Grade  | Description                          |
|---|-----------------|--------|--------------------------------------|
|   | 4.0             | Α      | Excellent                            |
|   | 3.0             | В      | Good                                 |
|   | 2.0             | С      | Satisfactory                         |
|   | 1.0             | D      | Poor but passing                     |
|   | 0.0             | F      | Fail                                 |
|   | 0.0<br>0.0      | X<br>Y | Missed final exam<br>Work incomplete |
|   |                 | -      |                                      |

## TRANSCRIPT NOTATIONS AND ABBREVIATIONS CURRENTLY IN USE

| HP | High Pass  |
|----|--|
| K  | Indicates work in progress°  |
| LP | Low Pass   |
| N  | No grade, no credit°   |
| NR | No grade Reported by Instructor  |
| Р  | Pass with credit°  |
| S  | Satisfactory (non-credit course)   |
| Т  | Transfer grade <sup>o</sup> (Spring Quarter 1969-70, full academic credit)   |
| TR | Transfer grade° (Qatar Campus)   |
| U  | Unsatisfactory (non-credit course)   |
| V  | Visitor (auditor)  |
| W  | Withdrew - with permission   |
| X  | Absent from final examination°°  |
| Υ  | Incomplete - Additional work required°°  |
| ٥  | Not included in either the quarterly or the cumulative grade point average   |
| 00 | Carries zero grade points and included in calculation of GPA. Both the quarterly and cumulative GPA are changed if a final grade is reported |

#### TRANSCRIPT SYMBOLS

| *  | Grades received by special report |  |  |  |  |  |  |
|----|-----------------------------------|--|--|--|--|--|--|
| #  | Duplication                       |  |  |  |  |  |  |
| ## | Not applicable toward degree      |  |  |  |  |  |  |

For transcript notations and symbols not described here:

http://www.registrar.northwestern.edu/academic\_records/index.html

#### DEGREES AWARDED

For a complete list of degrees awarded:

www.registrar.northwestern.edu/academic records/index.html

#### TRANSFER CREDIT

Undergraduate records document articulated transfer credit by listing the institution of record and a T grade for each approved course. Grades for work transferred from another institution are not recorded. If such grades are needed the student must request a transcript directly from the awarding institution.

## **STATUS**

Students should be regarded as in good academic standing unless otherwise noted. Each unit devises a probation/suspension/withdrawal policy, as well as academic eligibility to repence an absence.

## COURSE NUMBERING SYSTEM

| A/100 level | Courses primarily for freshmen and sophomores, usually without college prerequisite.   |  |  |  |  |  |
|-------------|--|--|--|--|--|--|
| B/200 level | Courses primarily for sophomores and juniors, usually with the<br>prerequisite of an A/100 level course in the same or a related<br>department.                  |  |  |  |  |  |
| C/300 level | Courses primarily for upperclassmen and graduates, often with the<br>prerequisites of an A/100 and/or B/200 level course in the same or a<br>related department. |  |  |  |  |  |
| D/400 level | Courses or seminars primarily for graduates, in which the major part of the work is not research.  |  |  |  |  |  |
| E/500 level | Courses for graduates only; seminars in which the work is primarily research, or special research by the individual student under faculty direction.             |  |  |  |  |  |

## COURSE SUBJECTS AND DESCRIPTIONS

For more details: www.northwestern.edu/caesar/

This Transcript Key was last updated in September 2016.