

Means to Facilitate Effective Student Transfer and Mobility

Invited Testimony Prepared for Texas House Higher Education Committee

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Since 2009, the Texas Higher Education Coordinating Board, with funding support from Lumina Foundation for Education, has been working with faculty across the State to enhance the effective transfer of students, and in particular transfer from community colleges to baccalaureate degree programs. To date, the focus of activity has been on disciplines identified as critical needs of the State. The efforts to this point have resulted in statewide voluntary articulation compacts for Mechanical Engineering, Civil Engineering, Electrical Engineering, and Industrial Engineering. Current committee work will result in similar compacts to be sent out in early fall 2012 for Chemical Engineering, Biomedical Engineering, Chemistry, and Biology. On this Friday, 24th February efforts will begin to prepare similar compacts for Mathematics, Business, Computer Information Systems, and Management Information Systems.

Criteria for Transfer and Mobility

Regardless of the discipline, the criteria for effective transfer are quite simple, namely:

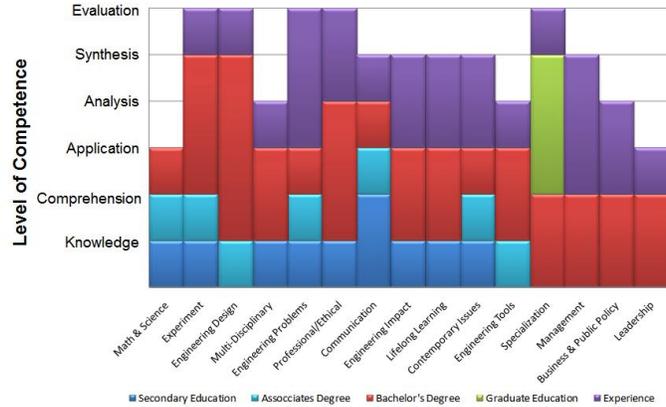
- Critical lower-division courses taught across the State must have the same content and rigor, and must be assessed consistently to demonstrate achievement of that content and rigor;
- Courses successfully completed by a student at one institution should transfer to another institution, and that coursework will be applied to the chosen degree program if it is a part of that degree program; and
- Courses selected must place the student on a path to timely graduation, taking into consideration course prerequisite sequence.

Achievement of these criteria is through faculty-led Tuning Councils under the auspices of the Coordinating Board, with funding support from Lumina Foundation for Education. Specific charges to the Tuning Councils are:

- Develop outcome-based discipline specific body of knowledge profiles with expected levels of competency for each degree level;
- Support the THECB conduct of surveys to obtain input from students and employers;
- Map employability of graduates to positions in the labor market; and

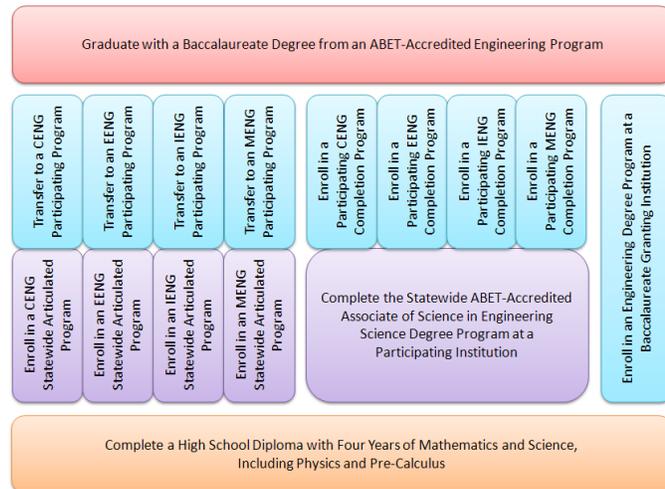
- Identify lower-division coursework at community colleges leading to baccalaureate study at four-year institutions.

One of the first steps in the process is definition of what students must know, understand, and be able to demonstrate after completing a degree in a specific field prior to graduation at different degree levels. In other words, a body of knowledge and skills for an academic discipline in terms of outcomes and levels of achievement of its graduates is developed for the different disciplines. It involves creating a framework that establishes clear learning expectations for students in each subject area while balancing the need among programs to retain their academic autonomy and flexibility. The objective is not to standardize programs offered by different institutions but to better establish the quality and relevance of degrees in various academic disciplines.



The outcomes of the “tuning process” include identification of a set of lower-division courses, up to the level of an associate’s degree, that would provide the necessary academic background to integrate a student seamlessly into participating programs at four-year institutions. A typical set of courses developed for one engineering discipline is presented in Annex II. Consideration of prerequisite chains has been considered in the recommended set of courses.

A critical component of the effort was development of common catalog descriptions and defined student learning outcomes for courses that are a part of the compacts. Without such common content and student learning outcomes, transferability is nearly impossible on a broad basis because students would not necessarily have the expected knowledge. The descriptions and student learning outcomes developed by subject matter experts have been incorporated into the Academic Course Guide Manual.



With the help of faculty who comprised the various Tuning Oversight Councils, Texas now has final voluntary transfer compacts for Civil, Electrical, Industrial, and Mechanical Engineering. “Year Two” of Tuning Texas is well underway, including Biomedical and Chemical Engineering as well as Biology and Chemistry. “Year Three” of Tuning Texas will begin in February 2012 with the 2012 Tuning Oversight Council for Mathematics, Business, and Computer/Management Information Systems. “Year Four” of Tuning Texas will begin in February

2013 with Tuning work on additional high-need and high-demand disciplines. Pathways to achieve a baccalaureate degree have been defined.

A model community college associate's degree program that provides a statewide standard of achievement for students in pre-engineering programs, and that is recognized as an achieved body of knowledge for admission by engineering programs at four-year institutions, is the next natural step to make the migration of community college engineering students into Texas universities for bachelor's degree completion more efficient and more seamless. The curricular content of the Associate of Science Degree in Engineering Science provides students with increased flexibility in selecting an appropriate engineering program at a participating four-year institution, and minimizes the time to completion of the baccalaureate degree for students who choose this pathway. A critical component of the model program is that the degree will be accredited by the Applied Science Accreditation Commission of ABET (ASAC/ABET) at each participating community college to ensure the same standards of achievement as those that exist at ABET-accredited engineering degree programs at four-year institutions. Students completing the program of study and graduating with the associate's degree from a community college will be immediately accepted into a participating four-year institution of their choice (space permitting, meeting GPA requirements, etc.) to complete a baccalaureate engineering degree. This degree program is yet another pathway developed to enhance transferability.

Implementation Timeline

The development implementation timeline for the compacts is presented in Annex I. As evidenced by the timeline, we are approximately two years into the process and nearing the first assessment period. The next critical step in the timeline is establishment of the methods for assessment of achievement of the student learning outcomes. At present, there do not appear to be obstacles that will prevent achievement of the timeline.

Course Assessment

A critical component of the articulation compacts is demonstration that the content of courses stated in the Academic Course Guide Manual has been taught and that the student learning outcomes have been achieved. Achievement of the outcomes is essential if the students are to have the proper foundation to successfully earn a baccalaureate degree in one of the articulated fields. Course content and rigor have always been "the elephant in the room" in regard to student transfer and mobility.

Current planning in regard to assessment includes establishing a statewide assessment steering committee and conducting assessment on a regional basis involving the participating institutions in that region. The general framework of the assessment process will be in the context of course-level assessment that the baccalaureate programs have been conducting for ABET accreditation. The results of all regional assessments conducted from across the state will be consolidated by the steering committee and reported to the Coordinating Board for action. As planning for assessment continues, significant emphasis will be placed on sustainability of the process.

Articulation Compacts

Significant effort continues to be expended on clarifying the language of the compact so as to eliminate misperceptions that may have occurred. One of the biggest areas of concern seems to be admission criteria. There has never been the intention to force admission criteria on an institution, although the compact has been interpreted to imply such. Admission criteria have always been at the discretion of the institution. The current language of the articulation compact is presented in Annex III. Presented in Annex IV is draft language being considered for revision of the compact. The draft language is intended to clarify the intention of the compact and does not represent a change of application. Institutions that commit to the compact are agreeing to:

1. Teach courses identified in the compact to the content as stated in the Academic Course Guide Manual and to achieve the stated student learning outcomes;
2. Upon admission of a student to the university, to accept that course as transfer credit earned by the student;
3. Upon admission of a student to an academic program, to apply the transfer credit earned by that student to satisfaction of program requirements if that course is part of the degree program; and
4. To participate in regional assessment of the courses to ensure consistency of a course across all participating institutions.

Institutions signing the compact are not agreeing to:

1. Standardizing a curriculum;
2. Standardizing admission to a university or to a degree program.

A question that I anticipate from you is: "Why have all public higher education in Texas not signed the compact?" I cannot answer for an institution, but I can tell you the concerns that have been voiced to me, concerns with which I whole heartedly disagree given the work of the Tuning Councils and the wording of the compacts. The first concern is that courses across the state do not have the same content and rigor. That may have been true, and probably was true, before 2009, but it is not true today. Expectations of courses are clearly defined in the ACGM and, as previously stated, participating institutions agree to assess achievement of the defined outcomes every three years. The first assessment cycle will occur during the 2012-2013 academic year and results of that assessment will be reported to the Coordinating Board for action as appropriate. We are working with the Coordinating Board to establish an appropriate assessment methodology in the context of ABET accreditation faced by the four-year programs.

The second concern is in regard to admission criteria. Some institutions have said that the criteria in the compact cannot be accepted, yet, as previously stated, there has never been the intention to subvert an institution's admission policies at the university or program level. Institutions have always been able to set their admission criteria and will continue to do so. The compacts do not force criteria for admission, nor should they. Admission criteria must remain the prerogative of the institution as long as the criteria are applied to all students. Nevertheless, some have interpreted and continue to interpret the language

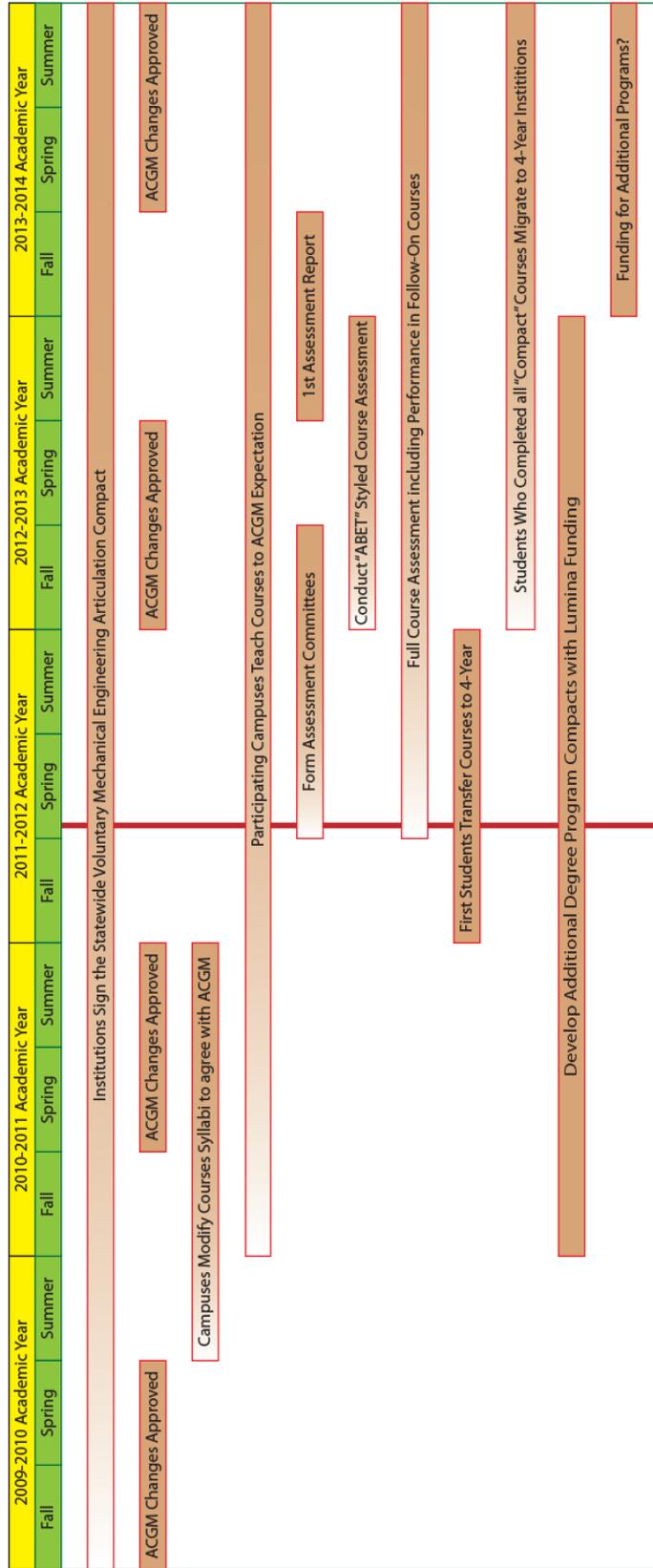
of the compact to imply setting an admission standard. We have continued to work with the wording of the compact to focus the compact on the transferability of courses and the acceptance of the transferred courses to satisfaction of degree requirements if the transferred course is part of a degree. The latest evolution of the compact is attached. Paragraph 2 of the compact identifies admission criteria and paragraph 3 states transfer of credit expectations.



The Resulting Beneficiaries

Students are presented a coherent set of courses placing them on a path to timely completion of an EAC/ABET baccalaureate degree, helping them to better navigate the precipitous path to a degree

Annex I—Timeline



Annex II—Sample Courses and Prerequisite Flowchart

FRESHMAN YEAR

First Semester (Fall)

Course	SCH
MATH 2413 Calculus I	4
CHEM 1311 General Chemistry	3
CHEM 1111 Chemistry I Laboratory	1
ENGR 1201 Introduction to Engineering	2
XXXX #### Texas Core Curriculum Requirement	3
XXXX #### Texas Core Curriculum Requirement	3
Semester Credit Hours	16

Second Semester (Spring)

Course	SCH
MATH 2414 Calculus II	4
PHYS 2325 University Physics I	3
PHYS 2125 University Physics I Laboratory	1
ENGR 1304 Engineering Graphics	3
XXXX #### Texas Core Curriculum Requirement	3
XXXX #### Texas Core Curriculum Requirement	3
Semester Credit Hours	17

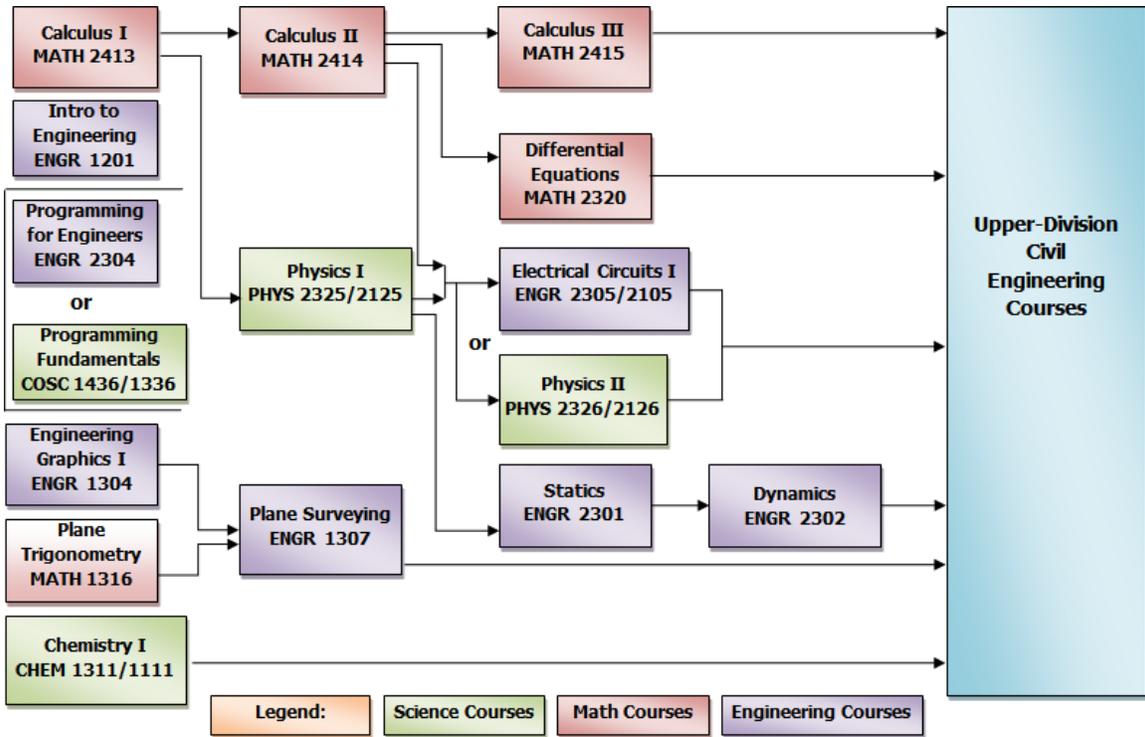
SOPHOMORE YEAR

First Semester (Fall)

Course	SCH
MATH 2415 Multi-Variable Calculus (Calculus III)	4
ENGR 1307 Plane Surveying	3
ENGR 2301 Engineering Mechanics: Statics	3
ENGR 2304 Programming for Engineers or COSC 1436/1336 Programming Fundamentals	3
XXXX #### Texas Core Curriculum Requirement	3
Semester Credit Hours	16

Second Semester (Spring)

Course	SCH
MATH 2320 Differential Equations	3
PHYS 2326/2126 University Physics II/Physics II Lab or ENGR 2305/2105 Electrical Circuits I/Circuits I Lab	4
ENGR 2302 Engineering Mechanics: Dynamics	3
XXXX #### Texas Core Curriculum Requirement	3
XXXX #### Texas Core Curriculum Requirement	3
Semester Credit Hours	16



Annex III—Current Voluntary Articulation Compact

Memorandum of Understanding Regarding Voluntary Course Transfer Agreement Pertaining to Bachelor of Science Degrees in Civil, Electrical, Industrial, and Mechanical Engineering

This voluntary agreement is entered into by and among the signatory institutions of higher education within the State of Texas. Its purpose is to foster enhanced transfer processes for students pursuing a bachelor's degree in various engineering disciplines, and to increase the number and preparedness of students matriculating from a two-year pre-engineering program (PENG) at community colleges into a baccalaureate engineering program (BSENG) at four-year universities. The intention of this transfer compact is not to change the curriculum of a four-year institution. The intention of this compact is to provide guidance to students with respect to what PENG courses offer the best mechanism for obtaining a baccalaureate engineering degree.

This agreement recognizes the following terms and conditions:

- Course Offerings:** When offering any or all of the mathematics, engineering, and science courses specifically listed in Annex A, signatory institutions will offer the course(s) consistent with the indicated course description(s) and student learning outcomes as listed in the Academic Course Guide Manual (ACGM).
- Transfer of Courses:** Students who successfully complete courses shown in Annex A will be able to transfer the course credit hours into the BSENG program at a signatory four-year institution upon successful admission to the institution. The four-year institutions will accept up to the number of semester credit hours for the course that would be achieved at the four-year institution, provided that credit for a given course is a curricular requirement at the four-year institution. However, no course with a grade of less than "C" will be transferred or applied to the baccalaureate engineering degree program.
- Admission:** In order to obtain automatic admission into a BSENG program at any signatory university, a student must have successfully completed all PENG courses for that program as shown in Annex B, at one or more of the signatory institutions. "Successfully completed" means no grade lower than "C" in any PENG course and a cumulative GPA of at least 2.5, or higher if needed for the general admission requirement of the receiving institution. Students not satisfying these criteria will need to be admitted, if at all, through the traditional application process.
- Assessment:** The signatory institutions will assess the effectiveness of this transfer compact on a periodic basis of at least once every three years, including student performance in upper-division courses and the number of students transferring.
- Retention of Agreement:** Each signatory institution and the Texas Higher Education Coordinating Board will maintain a copy of this transfer compact.
- Advertising:** All signatory institutions will make the broad statewide opportunities afforded under this transfer compact known to the students.

Note: Nothing in this compact is intended to cause an institution to offer a degree program or courses.

I hereby agree that my institution will participate in the following Statewide Engineering Transfer Compacts (please select one or more engineering disciplines below by checking the box and initialing to the right):

Civil ____ Electrical ____ Industrial ____ Mechanical ____

Institution Name

President Signature

Date

Annex IV—Proposed Draft Language for the Voluntary Compacts

Memorandum of Understanding Regarding Voluntary Course Transfer Agreement Pertaining to Bachelor of Science Degrees in Civil, Electrical, Industrial, and Mechanical Engineering

This voluntary agreement is entered into by and among the signatory institutions of higher education within the State of Texas. Its purpose is to foster enhanced transfer processes for students pursuing a bachelor's degree in various engineering disciplines, and to increase the number and preparedness of students matriculating from a two-year pre-engineering program (PENG) at community colleges into a baccalaureate engineering program (BSENG) at four-year universities. The intention of this transfer compact is not to change the curriculum of a four-year institution. The intention of this compact is to provide guidance to students with respect to what PENG courses offer the best mechanism for obtaining a baccalaureate engineering degree.

This agreement recognizes the following terms and conditions:

- Course Offerings:** When offering any or all of the mathematics, engineering, and science courses specifically listed in Annex A, signatory institutions will offer the course(s) consistent with the indicated course description(s) and student learning outcomes as listed in the Academic Course Guide Manual (ACGM).
- Admission:** A student will be admitted into a BSENG program at any signatory university if he or she has successfully completed PENG courses for that program as shown in Annex B at one or more of the signatory institutions and satisfies all other admission requirements for the university and engineering program selected, subject to enrollment capacity limitations applicable to all students. "Successfully completed" means the student has earned no grade lower than "C" in any PENG course completed and has earned a cumulative GPA of at least 2.5. Students who do not satisfy these criteria may still be eligible for admission to the university and program, but they should be encouraged to contact an admissions advisor at the university.
- Transfer of Courses:** Students who successfully complete courses shown in Annex A will be able to transfer the course credit hours to a signatory four-year institution upon successful admission to the institution. If the courses completed are part of a degree program to which the student has been admitted, the institution will apply those courses as satisfaction of program requirements, up to the number of credit hours that would be achieved at the four-year institution for a particular course in the degree program. If a course completed is part of a degree program but has fewer credit hours than specified in the program, the institution must determine how to deal with the difference to the overall academic benefit of the student. However, no course with a grade of less than "C" will be transferred or applied to the baccalaureate engineering degree program.
- Assessment:** The signatory institutions will assess the effectiveness of this transfer compact on a periodic basis of at least once every three years, including student performance in upper-division courses and the number of students transferring.
- Retention of Agreement:** Each signatory institution and the Texas Higher Education Coordinating Board will maintain a copy of this transfer compact.
- Advertising:** All signatory institutions will make the broad statewide opportunities afforded under this transfer compact known to the students.

Note: Nothing in this compact is intended to cause an institution to offer a degree program or courses.

I hereby agree that my institution will participate in the following Statewide Engineering Transfer Compacts (please select one or more engineering disciplines below by checking the box and initialing to the right):

Civil _____ Electrical _____ Industrial _____ Mechanical _____

Institution Name

President Signature

Date