Oregon TECH

Analysis of Paths Forward and Proposed Next Steps for General Education Reform at Oregon Tech

December 31, 2018

(corrected January 9, 2019)

Seth Anthony

Interim Director, Office of Academic Excellence

Contents

Executive Summary 3

Acknowledgements and Disclaimer 4

Step 1 Already Completed: Adoption of new ESLOs and processes 5

Step 2: Adoption of ESLO-aligned course requirements 5

- Models Analyzed 6
- Core Transfer Map analysis 9
- Curriculum Map analysis 12
- Staffing analysis 21
- Transfer Impact analysis 26
- Registrar's Office Impacts 32

Step 3: ESSE pilot process 34

- ESSE committee 35

Step 4: Formalization of Program Integration 37

Implementation Timeline 38

- January 2019 38
- Early Winter 2019: Short term policy questions 38
- Winter 2019 and forward: Implementation logistics 39
- Departmental and other impacts 41

Executive Summary

Continuing down the path of general education reform, Oregon Tech currently faces the most visible and arguably the most challenging element of implementing the general recommendations of the General Education Review Task Force (GERTF) report of Spring 2016. Through recommendations generated by the General Education Review Ad-Hoc Committee (GERAC) in Summer 2018, the set of requirements proposed by GERTF have been refined and simplified. This model would align Oregon Tech's foundational general education requirements with its six ESLO's, providing consistent support for student attainment of these outcomes, and a framework for continuous improvement.

This report provides analysis of the GERAC model with respect to several key constraints:

- **Core Transfer Map analysis**: Clear alignment with the new statewide transfer structure mandated under HB2998, with minor concerns around the Diverse Perspectives pathway and more significant concerns around the Quantitative Literacy pathway
- **Curriculum Map analysis**: Significant pressures on many curriculum maps, many of which can be resolved by adding a few select courses to course lists. Remaining pressures primarily surround the Quantitative Literacy pathway.
- **Staffing analysis**: With course adjustments suggested by the curriculum map analysis and with ongoing work in redevelopment of technical communication courses, the model can be staffed with 1-2 new faculty lines to support the Ethical Reasoning pathway (adding to the 1 current faculty member in this area).
- **Transfer analysis**: Changes made by GERAC reduce the typical impact on transfer students (credit hour "loss") from ~5 credits to ~1 credit, with the median student seeing 0 net impact on transfer course applicability.

Major implementation steps include:

- Formal resolution of key remaining policy questions by GEAC.
- Review of curriculum maps by all bachelor's degree programs.
- Consideration of potential model refinements, particularly surrounding the Quantitative Literacy pathway.
- Finalization of course lists for requirements within the model and solicitation of course approval materials from general education departments.
- Work within the registrar's office, particularly to update Oregon Tech's transfer course database.

This report also recommends subsequent steps after this work to:

- Pilot the interdisciplinary junior-level Essential Studies Synthesis Experience (ESSE) under the guidance of an ESSE committee, and
- Using the existing ESLO assessment process to move towards formalization of program-integration after initial implementation in curriculum maps.

With clear endorsement from GEAC, the Provost, and the President in January 2019, a timeline leading to catalog implementation in Fall 2020 is achievable.

Acknowledgements and Disclaimer

This report reflects work and discussions carried out primarily over the Fall 2018 term, as charged by the Provost, to analyze the recommendations of the General Education Reform Ad-Hoc Committee (GERAC) and propose any further needed refinements and steps forward. In this work, I have endeavored to adhere in spirit and content to the excellent work done both by GERAC, and previously by GEAC and the General Education Reform Task Force (GERTF), while remaining sensitive to the charge to identify feasible paths forward, which has prompted recommendations of modifications to models and policies thoughtfully developed by each of these groups.

Although I have endeavored to make this work as collaborative and transparent as practical, it is necessarily imperfect as funneled through one single person, and should not be taken as reflection of a broad consensus.

In this work, I aim to thoughtfully present ideas for consideration based on my best judgements and reflections on the many perspectives that I have heard from; however, in the best spirit of shared governance, this work should be reviewed, analyzed, questioned, and built upon by both faculty and administration collaboratively as we seek to advance general education reform and the quality of an Oregon Tech education.

I am indebted to all of those who have contributed to these conversations over the past months and who have offered feedback and pushback in a multitude of directions from a diversity of perspectives. I am particularly grateful to the staff of the Registrar's Office (Wendy Ivie, Ashlie Pence, Lisa Shoults, Heather Smith) and the Institutional Research Office (Farooq Sultan, Anna Clark) for assistance in conducting the transfer and staffing studies described in this report.

Step 1: Already Completed: Adoption of new ESLOs and processes

Before discussing the impacts of bringing a new general education model into curriculum maps, it should be noted that significant portions of the GERTF recommendations have already been implemented, even before the formal release of the GERTF report in Spring 2016. These effectively constitute "Step 1" of implementation of general education reform, already completed:

- Winter 2015: Oregon Tech adopts a new set of 6 ESLO's, drawing upon experience from over a decade of institution-level outcomes assessment.
- Fall 2015: With ESLO committees formally constituted as standing committees, Oregon Tech enters into a new six-year assessment cycle distributing work more equitably and thoughtfully to enable quality data collection and reflection leading to improvement.
- Winter 2016: Oregon Tech creates the Office of Academic Excellence, with explicit staff support in the form of an Executive Assistant in addition to a Director, in order to provide leadership, connectivity, and administrative support to efforts in curriculum, assessment, and faculty development.

In many ways, this curriculum work is simply the next step in advancing the goals of ensuring that Oregon Tech's graduates are distinctive and achieve proficiency at Oregon Tech's institution-wide Essential Student Learning Outcomes. If Step 1 provides the scaffolding in the form of administrative and leadership structures, Step 2, in aligning general education requirements to ESLOs, builds in the ground floor of the structure, while future steps build in the upper levels of a unified, vertically-integrated curriculum designed to support student success.

Step 2: Adoption of ESLO-aligned course requirements

Arguably the most visible manifestation of general education reform is the explicit curricular requirements – particularly those typically thought of as foundational general education requirements (as distinct from disciplinary course requirements). This is also the most challenging, as it touches every department and every bachelor's degree curriculum map at Oregon Tech in interrelated ways.

In order to elucidate a path forward, this section analyses both the original GERTF model and the GERAC model with respect to four key constraints:

- **Core Transfer Map analysis**: How does the model integrate with statewide mandates on transfer structures (the new Core Transfer Map developed under HB 2998)?
- **Curriculum Map analysis**: How does the model fit into existing curriculum maps?
- **Staffing analysis**: What (additional) resources would be needed to fully staff this model?
- **Transfer analysis**: What impact would this model have on transfer students?

Models Analyzed

Before entering into an analysis of the impacts of each model, a straightforward articulation of how each was described for analysis is listed below:

GERTF model

The following is, in list form, a formulation of the non-program-integrated components of the GERTF model, as described on pages 18-22 of the GERTF report:

- Communication – WRI 121, 122, SPE 111 (3 credits each, 9 credits total)
- Communication – Essential Practice (3 credits)
- Diverse Perspectives – Foundation (3 credits)
- Diverse Perspectives – Essential Practice (3 credits)
- Ethical Reasoning – Foundation (3 credits, with "program-integrated option")
- Ethical Reasoning – Essential Practice (3 credits)
- Inquiry & Analysis – Humanities – Foundation (3 credits)
- Inquiry & Analysis – Humanities – Essential Practice (3 credits)
- Inquiry & Analysis – Social Science – Foundation (3 credits)
- Inquiry & Analysis – Natural Science – Foundation (4 credits)
- Inquiry & Analysis – Sciences – Essential Practice (3-4 credits)
- Teamwork – SPE 221 (3 credits)
- Quantitative Literacy – Foundation (3 credits)
- Quantitative Literacy – Essential Practice (3 credits)
- Essential Studies Synthesis Experience (ESSE, 3 credits)

* Under the GERTF model, one course may be "double-dipped" at the Essential Practice level (that is, used to satisfy two requirements at once). Thus, the 18 credits of Essential Practice requirements can be fulfilled in 15 credits of coursework.

GERAC model

While GERAC leadership has been clear in communicating that that they did not view the schematic model offered in the October 2018 GERAC recommendations as the only way that outcome-aligned pathways without vertical integration could be implemented, the model presented is a relatively straightforward modification of that model. It additionally has the merit of mapping neatly, in many places (except in the QL-Finance block), onto existing general education requirements, making transition in curriculum maps more straightforward.

Below are the requirements of that schematic model in list form:

- Inquiry & Analysis – Humanities (6 credits)
- Inquiry & Analysis – Social Sciences (9 credits)
- Inquiry & Analysis – Natural Science (8 credits)
- Ethical Reasoning – Essential Practice (3 credits)
- Communication – WRI 121, 122, SPE 111 (3 credits each)
- Advanced Communication (3 credits)
- Teamwork – SPE 221 (3 credits)

- Quantitative Literacy – Statistics (4 credits)
- Quantitative Literacy – "Finance" (3 credits)
- Diverse Perspectives – Social Science (3 credits)
- Diverse Perspectives – Communication (3 credits)

Differences between GERTF and GERAC models

The key differences between the GERTF and GERAC models reflect the recommendation not to proceed with vertical integration at the present time. These alterations, particularly the removal of the Essential Practice level from both the Diverse Perspectives and Inquiry & Analysis outcome pathways facilitates integration in curriculum maps, support advising simplicity and clarity, support student scheduling and departmental staffing flexibility, and support far greater transfer flexibility (described in far more detail in the transfer analysis below). The primary counterexample to this is the changes in the Diverse Perspectives pathway, which trade one constraint (level) for another (disciplinary/departmental).

The removal of vertical integration within these requirements does come at the cost of some of the models pedagogical effectiveness. In conversations about this change, the author has often encountered the sentiment that vertical integration is a worthwhile goal, and still is a principle that should inform student advising, but poses a great number of practical challenges relative to the educational benefit.

Changes by outcome pathway are summarized below:

- Communication –
  - WRI 121, 122, and SPE 111 requirements remain unchanged.
  - The previous Essential Practice level in the Ethical Reasoning pathway (3 credit) becomes the "Advanced Communication" for this pathway. (This label is the author's and should be revisited.)
- Teamwork –
  - The single course required for this outcome (SPE221, a relabeling of SPE321) remains unchanged.
- Diverse Perspectives –
  - The two courses required for the Diverse Perspectives pathway in the GERTF model (Foundational and Essential Practice) are reapportioned by department (1 to social sciences, 1 to communication).
    - Pros: Helps to maintain continuity of course demand and staffing in the short term.
    - Cons: Constrains both student course flexibility and transfer flexibility. The author recommends re-consideration of this departmental reapportionment after initial implementation.
    - One option, discussed below, proposes that the Diverse Perspectives – Social Sciences block be broadened to "Diverse Perspectives – Social Sciences or Humanities." This should be reviewed by the Diverse Perspectives ESLO committee and the HSS department.
- Ethical Reasoning –
  - Foundational requirement of "HUM 125 or PHIL 105 or Program-Integrated option" is removed, consistent both with GERAC's recommendation that vertical integration

    - The previous Essential Practice level in the Ethical Reasoning pathway (3 credit) becomes the requirement for this pathway.
- Inquiry & Analysis –
    - Consistent with GERAC's recommendation that vertical integration not be pursued at this time, the distinct "Foundation" and "Essential Practice" levels within this outcome pathway are removed. The three disciplinary subcategories within Inquiry & Analysis (Humanities, Social Sciences, Natural Sciences) are undifferentiated.
    - The Inquiry & Analysis – Sciences – Essential Practice requirement (3 credits) is expanded from being 1 course from a discipline "outside of areas that traditionally support the major" to 1 natural science course and 1 social science course. In almost all curriculum maps, this increase in general education requirements does not result in a credit hour add, because a required course in an area supporting the major fulfills the new requirement (e.g. a engineering major already requires a number of natural science courses; a management major already requires a number of social science courses).
    - An additional Inquiry & Analysis – Social Science class is added, both to balance course load with the current general education model and to serve as a potential future slot that can be repurposed for a ESSE requirement.
- Quantitative Literacy –
    - The two blocks required remain unchanged, but are relabeled – Quantitative Literacy – Foundation becomes Quantitative Literacy – Statistics; Quantitative Literacy – Essential Practice becomes Quantitative Literacy – Finance.
        - Note: The "Finance" label for the second block emerged informally through GERAC's work; based on subsequent input, it is clear that "Finance" is an inappropriate name for a block that can include courses such as ECO201 and 202; the name for this block should be reexamined through collaborative discussion between the Quantitative Literacy ESLO committee and the Management Department.

Core Transfer Map analysis

In Summer 2017, HB 2998 was enacted into law, mandating that Oregon's public colleges and universities collectively adopt a common statewide foundational curriculum of at least 30 credits that would be guaranteed to be awarded and applied consistently statewide.

During the 2017-2018 academic year, a working group convened by HECC collaboratively developed this foundational curriculum, now branded as the Oregon Core Transfer Map (CTM). Under the legislation, every community college will notate completion of the Core Transfer Map on transcripts, and every public university will identify at least 30 credits of general education requirements (or equivalent) that will be deemed to be met if a student transfers in with the CTM completed. Further details can be found at: https://www.oregon.gov/highered/plan-pay-for-college/Pages/transfer.aspx

It should also be noted that the categories within the CTM are based on statewide general education outcomes work begun around 2007, and which are used as the basis for general education course approval at Oregon community colleges, including within the existing AAOT (Associate of Arts – Oregon Transfer) and OTM (Oregon Transfer Module). Further details can about these outcomes be found at: https://www.oregon.gov/highered/policy-collaboration/Documents/Transfer-Credit/2998/06-2998_Gen_Ed_OutcomesCriteria_2010.pdf

The following page provides a potential crosswalk between the Core Transfer Map and the current, GERTF, and GERAC general education models (this is reproduced from the October 2018 preliminary analysis of the GERAC recommendations).

In considering the value of a crosswalk, it should be noted that there is no requirement in state law that each element of the Core Transfer Map be connected neatly to a corresponding general education requirement – the legislation merely requires that universities identify the 30 credits of general education requirements that would be deemed to be met by the CTM.

However, two arguments for seeking an element-by-element alignment exist:

- When an alignment is possible, the element-to-element equivalencies can be used to develop course-to-requirement transfer rules that are of value even for students who don't complete entirety of the Core Transfer Map.
- When such alignment is broken, it can result in students being subject to distinctly different preparatory experiences depending on whether they completed the CTM or not, where the intent of consistent transfer rules is typically to help ensure that all students receive a generally comparable level of preparation for further coursework.

CTM to Oregon Tech General Education Crosswalk

Core Transfer Map	Oregon Tech Current General Education Req'ts	GERTF Model ***Poorly Aligned Elements Underlined***	GERAC Model ***Poorly Aligned Elements Underlined***
Writing-WR 121 (3-4 Cr.)	**Writing 121** (3 credits)	Communication – Foundation – WRI121 (3 credits)	Communication – Foundation – WRI121 (3 credits)
Arts & Letters – 2 courses (6-8 Cr.)	**2 Humanities courses** (6-8 credits)	Inquiry & Analysis – Humanities – Foundation (3 credits); *Inquiry & Analysis – Humanities – Essential Practice (3 credits)*	Inquiry & Analysis – Humanities (6 credits)
Social Science – 2 courses (6-8 Cr.)	**2 Social Science courses** (6-8 credits)	Inquiry & Analysis – Social Science – Foundation (3 credits); *Inquiry & Analysis – Science – Essential Practice (3 credits)*	Inquiry & Analysis – Social Science (6 credits)
Natural Science – 2 courses w/labs (8-10 Cr.)	**2 Science/ Mathematics courses** (8-10 credits)	Inquiry & Analysis – Natural Science – Foundation (4 credits); *Inquiry & Analysis – Science – Essential Practice (3 credits)*	Inquiry & Analysis – Natural Science (8 credits)
Math – 1 course (4-5 Cr.)	**1 Science/ Mathematics course** (4 credits)	*Math Course – if required by in program (4 credits)* *or* *Quantitative Literacy – Foundation (4 credits of statistics; MATH 243 or 361)*	*Math Course – if required by program (4 credits)* *or* *Quantitative Literacy – Statistics (4 credits)*
1 course (3 cr.) must also satisfy AAOT Cultural Literacy Requirement	Meets **Intercultural Studies** recommendation	Diverse Perspectives – Foundation (3 credits)	*Diverse Perspectives – Social Science (3 credits)*
Courses must total minimum of 30 credits, can be filled by an elective credit if needed	Additional credits taken to reach 30 in the Foundational Curriculum will be applied to the general education category associated with them.		

Remaining concerns with GERAC model and Core Transfer Maps

- Removing the distinct Essential Practice level from the general education model, and explicitly calling out 2 courses in each of the Inquiry & Analysis subject areas removes the single largest stumbling block to compatibility with HB2998.

- Because the GERAC Essential Studies model explicitly delineates that one Diverse Perspectives course must be taken from Social Science and one must be taken from Humanities, it is unclear how an external course that fulfills the CTM "Arts and Letters" (Humanities) block and the "Cultural Literacy" requirement would be received under this model. An alternative option, presented below, proposes that the GERAC "Diverse Perspectives – Social Science" block be broadened to allow Social Science or Humanities courses meeting the Diverse Perspectives criteria to apply.

- While the other blocks of the CTM ("Communication," "Arts and Letters," "Social Sciences," "Natural Sciences," and "Cultural Literacy" map fairly neatly onto Essential Studies requirements, the Math block of the CTM does not. This block would therefore have to be either a specific course that fulfills either a programmatic math requirement or the Quantitative Literacy statistics requirement. (This is a concern under the GERTF model that remains under the GERAC model.) Possible options to address this:

    - If the CTM is taken to count for the QL-Statistics requirement, then Oregon Tech runs the risk of the outcome being insufficiently supported by courses students' transfer in (for example, MATH111 from a community college could be used to complete this block of the CTM.)
    - The 4 credits associated with the math block to a different 4 credits of general education requirements that are in far less direct alignment. This compromises the intellectual integrity of the crosswalk, but is not entirely without predecent in current Oregon Tech practice (for example, SPE321 is currently waived for students who complete an AAOT, even if they had no comparable course).
    - Incorporation of an explicit mathematics requirement ("MATH 111 or higher") into general education requirements would potentially enhance the clarity of alignment with both the CTM requirements. See further discussion of this option below.

- Allowing for a course to "double-dip" to meet multiple requirements (particularly Diverse Perspectives) could enhance the alignment between the CTM and OIT requirements. However, this could introduce additional complications into degree audits, and, if Diverse Perspectives was only present in our general education requirements as a "double-dip" requirement, it would be challenging to find 30 credits of Oregon Tech gen ed to which the CTM would apply.

Curriculum Map analysis

Tentative Course Lists

In order to analyze how the GERAC requirements would apply in each curriculum map (and for staffing analysis, below), it is necessary to articulate which courses apply for various requirements within the model. Although GEAC has developed a process for formal course approval, including submission of materials documenting how a course supports a given outcome and review by ESLO committees, not all potential courses have been submitted for review, and GEAC has not formally given approval to final course lists.

During spring 2018, the lists of existing Oregon Tech courses were reviewed with general education department chairs. This revealed a number of courses in addition to those previously reviewed by ESLO committees that would likely be appropriate for each list; the inclusion or exclusion of any particular course on these lists should not be taken as any sort of final judgment on whether it should or should not appear.

Additionally, this list includes primarily those courses that were taught during the 2016-2017 or 2017-2018 academic years.

(Notes on course lists: Underlined course have already reviewed for outcome alignment by the ESLO committee. **Bolded courses are currently required by one or more majors in a way that meets general education requirements.** Superscripts appear when courses are on multiple lists – the superscript identifies which "other" list a course appears on.)

- Inquiry & Analysis – Humanities:

  ART 205, **ART 215**, ART 220, **ART 226**, ART 282, HUM 105^{DP}, **HUM 125ER**, HUM 147^{DP}, HUM 148^{DP}, HUM 149^{DP}, HUM 235, HUM 245^{DP}, HUM 335^{DP}, HUM 366, LIS 305, LIT 104, LIT 105, LIT 106, LIT 225, LIT 253, LIT 254, LIT 255, LIT 266, LIT 305^{DP}, LIT 315, LIT 325, LIT 335^{DP}, LIT 456, PHIL 105ER, PHIL 205, **PHIL 305ER**, PHIL 325ER, **PHIL 331ER**, PHIL 335, **PHIL 342ER**, PHIL 405

- Inquiry & Analysis – Natural Science:

  BIO 101, BIO 102, **BIO 103**, BIO 105, BIO 111, BIO 211, BIO 212, BIO 232, **BIO 233**, **CHE 101/104**, CHE 201/204, CHE 202/205, **CHE 221**, **CHE 222**, ENV 111, GEOG 105, GEOL 201, **PHY 221**, **PHY 222**, PHY 223

- Inquiry & Analysis – Social Science:

  ANTH 102, ANTH 103, **ANTH 335, ANTH 452^{DP}**, **ECO 201**, **ECO 202^{QL}**, GEOG 106, GEOG 108, HIST 101, HIST 102, HIST 103, HIST 201, HIST 202, HIST 203, HIST 245, HIST 275, **HIST 335**, **HIST 356**, **HIST 357,** HIST 452, HIST 468, PSCI 201, **PSY 201**, PSY 202, PSY 203^{DP}, PSY 308, PSY 321^{DP}, PSY 322^{DP}, PSY 330^{DP}, PSY 331^{DP}, PSY 336, PSY 341, SOC 201^{DP}, **SOC 204^{DP}**, SOC 205, **SOC 225**, SOC 235

- Diverse Perspectives – Communication:

  COM 205, COM 225, COM 325, COM 347

- Diverse Perspectives – Social Science:

  ANTH 452[IA], **HIST 452**, PSY 203[IA], PSY 321[IA], PSY 322[IA], PSY 330[IA], PSY 331[IA], **PSY 347***, PSY 358, PSY 371, PSY 372, SOC 201[IA], **SOC 204**[IA]

- Diverse Perspectives - Humanities (not in the GERAC model, but included here to list all courses already reviewed by ESLO committees):

  HUM 105[IA], HUM 147[IA], HUM 148[IA], HUM 149[IA], HUM 245[IA], HUM 335[IA], LIT 305[IA], LIT 335[IA]

- Advanced Communication:

  SPE 314, **WRI 227**, **WRI 327**, **WRI 350**, **WRI 410**

- Ethical Reasoning:

  PHIL 105, **HUM 125**[IA], **PHIL 305**[IA], PHIL 325[IA], **PHIL 331**[IA], **PHIL 342**[IA]

- Quantitative Literacy – Statistics:

  MATH 243, **MATH 361**, **MATH 465***

- Quantitative Literacy – "Finance":

  ACC 325*, BUS 331, **ECO 201**[IA], **ECO 202**[IA], **MATH 371**, **MGT 345**

* During curriculum mapping, it became apparent that inclusion of several on lists would yield improvements without compromising the general intent of the category; they have therefore been tentatively listed here.

A note on double-dipping: Although the GERAC model expressed a preference for no "double-dipping" (the ability of a course to simultaneously satisfy multiple requirements) or "double-tagging" (the ability of a course to satisfy two different requirements) is allowed. In curriculum map analysis, it became clear that some courses would need to be able to flexibly count in different slots (be "double-tagged") in order to optimize integration of the. In particular, the following double-tags appear important for efficiency:

- ECO 201/202 – IA-SS and QL-F
- SOC 204 – IA-SS and DP-SS
- ANTH 452/HIST 452 – IA-SS and DP-SS

Credit Hour Pressures

The table on the subsequent page lists all Oregon Tech bachelor's degree programs (including Cybersecurity, which is in the approval process but has had it curriculum map approved by CPC), listing the credit pressures resulting from changing to the GERTF or GERAC model from current requirements.

Program	*Credit pressure under…* GERTF model (no efficiencies)	GERTF model (all efficiencies)	GERAC model
Communication Studies	4	-2	-1
EMS Community Care	15	9	-1
EMS Critical Care	15	9	-1
Population Health Management	4	-2	-1
Dental Hygiene	6	0	0
Manufacturing Eng Tech	3	-3	0
Applied Psychology	3	-3	1
Medical Laboratory Science	10	4	3
Civil Engineering	9	3	3
Dental Hygiene (Completion)	12	6	3
Environmental Sciences	9	3	3
Geomatics - GIS	6	0	3
Geomatics - Surveying	6	0	3
HC Management - Clinical	12	6	3
Mechanical Eng Tech	9	3	3
HC Management - Admin	16	10	4
Electrical Engineering (KF)	7	1	4
Electrical Engineering (PM)	7	1	4
Professional Writing	7	1	4
Applied Math	9	3	6
Biology-Health Sciences	9	3	6
Respiratory Care	9	3	6
Respiratory Care (Completion)	9	3	6
Computer Eng Tech	10	4	7
Embedded Systems Eng Tech	10	4	7
Software Eng Tech	10	4	7
Electronics Eng Tech	10	4	7
Renewable Energy Eng (KF)	10	4	7
Renewable Energy Eng (PM)	10	4	7
Diagnostic Medical Sonography	10	4	7
Echocardiography	10	4	7
Nuclear Medicine	10	4	7
Radiologic Science	10	4	7
Vascular Technology	10	4	7
DMS (Completion)	10	4	7
Echocardiography (Completion)	10	4	7
Rad Science (Completion)	10	4	7
Vascular Tech (Completion)	10	4	7
Mechanical Engineering	13	7	7
Business - Management	12	6	7
Business - Marketing	12	6	7
HC Management - Rad Sci	18	12	9
Technology and Management	14	8	9
Health Informatics	16	10	10
Information Technology	15	9	10
Operations Management	15	9	10
Business - Accounting	12	6	10
Cybersecurity	15	9	13

Detail of sources of credit hour pressure

The table on the subsequent page attempts to identify the sources of credit pressure in the GERAC model for all curriculum maps. The pressures can be classified into the following categories

- **No statistics** – Program doesn't contain a statistics requirement or an undifferentiated math block than can be repurposed for the Quantitative Literacy – Statistics requirement
- **Stats option** – Program contains a requirement that includes courses meeting the Quantitative Literacy – Statistics requirement as an option, but not the only option (e.g. Professional Writing has a requirement for "MATH 111 or MATH 243"). If narrowed to only statistics courses from this category's list, the curriculum map would meet this requirement.
- **MA 465 – Quantitative Literacy** – Statistics requirement would be met if MA 465 (Mathematical Statistics) were added to the list of courses satisfying this requirement. This option has been discussed and met with generally favorable response with some members of the QL ESLO committee and the Mathematics department
- **No QL-"Finance"** – Program doesn't require a course from the Quantitative Literacy-"Finance" list or an undifferentiated math/science elective block that can be repurposed for this requirement.
- **No QL-"Finance" (w/ECO)** – Program requires one, both, or either of ECO 201 and/or ECO 202, which could be used to either fulfill the QL-"Finance" requirement or an IA-Social Science Requirement (but not both simultaneously). Strictly speaking, the requirement not met by these curriculum maps could be interpreted as either QL-"Finance" or IA-Social Science depending on how the ECO course is applied.
- **ACC 325** – Program (all are in the Management department) which requires at least one other course that fulfills the QL-"Finance" requirement (such as ECO 201/202), but all such courses are needed to meet other requirements (such as IA-Social Science). In these curricula, the QL-"Finance" requirement would be met if ACC 325 (Finance) is added to this list; this course was suggested for this list by members of the Management Department.
- **3rd Comm** – Because the program has specified its 3rd Communication elective with a course that doesn't already appear on the Diverse Perspectives – Communication list (i.e. WRI 327, WRI 350, WRI 410, the inclusion of that category would amount of a credit hour pressure on the curriculum map.
- **PSY 347** – Program (all are in the Management department) which requires PSY 347 (Organizational Behavior) to fulfill one of the current Social Science requirements; allowing PSY 347 to count as Diverse Perspectives – Social Science would avoid 3 hours of credit pressure.

The above pressures fall into two categories: Those that can be resolved without changes to program's curriculum map, but simply by adding a course to the approved list for a category; and those that can only be resolved with changes to curriculum maps. ("Stats opt" falls into an intermediate category in this regard, as it's would require a change to curriculum maps, but would not create any credit hour pressure outside that already existing requirement.)

		QL-Statistics			*QL – "Finance"*			*DP-COM*	*DP-SS*	*IA-NS*
Program	Credit Hour Pressure	No stats	Stats opt	MA 465	No QL-F	No QL-F (ECO)	ACC 325	3rd Com	PSY 347	1 NS
Applied Psychology	1		X							
Medical Laboratory Science	3				X					
Civil Engineering	3				X					
Dental Hygiene (Completion)	3				X					
Environmental Sciences	3					X				
Geomatics - GIS	3							X		
Geomatics - Surveying	3							X		
Mechanical Eng Tech	3							X		
HC Management - Admin	4									X
Electrical Engineering (KF)	4			X						
Electrical Engineering (PM)	4			X						
Professional Writing	4		X							
HC Management - Clinical	6						X		X	
Applied Math	6				X			X		
Biology-Health Sciences	6				X			X		
Respiratory Care	6*		X		X					
Respiratory Care (Completion)	6*		X		X					
Computer Eng Tech	7		X	*				X		
Embedded Systems Eng Tech	7			X				X		
Software Eng Tech	7			X				X		
Electronics Eng Tech	7			X				X		
Renewable Energy Eng (KF)	7			X		X				
Renewable Energy Eng (PM)	7			X		X				
Diagnostic Med. Sonography	7	X			X					
Echocardiography	7	X			X					
Nuclear Medicine	7	X			X					
Radiologic Science	7	X			X					
Vascular Technology	7	X			X					
DMS (Completion)	7	X			X					
Echocardiography (Completion)	7	X			X					
Rad Science (Completion)	7	X			X					
Vascular Tech (Completion)	7	X			X					
Mechanical Engineering	7			X				X		
Business - Management	7								X	X
Business - Marketing	7								X	X
HC Management - Rad Sci	9						X	X	X	
Technology & Management	9						X	X	X	
Health Informatics	10							X	X	X
Information Technology	10							X	X	X
Operations Management	10							X	X	X
Business - Accounting	10							X	X	X
Cybersecurity	13						X	X	X	X

* Impact in Respiratory Care programs is 1 credit less due to a 1 credit Math/Science/Social Science block within the current curriculum maps.

If the credit hour pressures that are resolvable either by adding a course to those that can fulfill a requirement or by adjusting a requirement that currently allows for statistics, the remaining credit hour pressures are:

		Quantitative Literacy			*IA-NS*
Program	Remaining credit pressure	No stats	No QL-F	No QL-F (ECO)	1 NS
Medical Laboratory Science	3		X		
Civil Engineering	3		X		
Dental Hygiene (Completion)	3		X		
Applied Math	3		X		
Biology-Health Sciences	3		X		
Respiratory Care	2*		X		
Respiratory Care (Completion)	2*		X		
Renewable Energy Eng (KF)	3			X	
Renewable Energy Eng (PM)	3			X	
Environmental Sciences	3			X	
Business - Management	4				X
Business - Marketing	4				X
Health Informatics	4				X
Information Technology	4				X
Operations Management	4				X
Business - Accounting	4				X
Cybersecurity	4				X
HC Management - Admin	4				X
Diagnostic Medical Sonography	7	X	X		
Echocardiography	7	X	X		
Nuclear Medicine	7	X	X		
Radiologic Science	7	X	X		
Vascular Technology	7	X	X		
DMS (Completion)	7	X	X		
Echocardiography (Completion)	7	X	X		
Rad Science (Completion)	7	X	X		
Vascular Tech (Completion)	7	X	X		

* Impact in Respiratory Care programs is 1 credit less due to a 1 credit Math/Science/Social Science block within the current curriculum maps.

Possible mechanisms for relieving credit hour pressures

Management programs – Natural Science requirement

For management programs who currently have only one Natural Science course required in their curriculum maps, 4 credit hours could be found either through reallocating 4 credits of electives to this requirement, or by reconsidering the mathematics requirements for these programs.

Note: The free elective category in many of these majors supports transfer-friendliness of these degrees; eating into this category does pose some potential cost in number of transfer credits applied. However, many transfer students already bring multiple natural science classes as part of their set of transfer courses. In the transfer study described in a later section, 7 management students transfer courses were analyzed from the programs below. Of those, the majority (4/7) had natural sciences courses beyond the one course already required in these programs that were currently not applied to degree requirements and listed on their degree audit as "fallthrough" courses.

Number of free electives in management programs without 2 lab sciences:

- Business – Management – 18 credits free electives; 18 credits program electives
- Business – Marketing – 12 credits free electives, 15 credits program electives
- Health Informatics – 6 credits free electives
- Information Technology – 31 credits focused sequence electives
- Operations Management – 30 credits free electives
- Business – Accounting – 15 credits free electives
- HC Management – Admin – 18 credits free electives, 21 credits program electives
- Cybersecurity – 0 electives

Other programs – free or technical electives

In the case of a number of other programs, one plausible means of accommodating additional requirements is by reallocating free or technical electives:

- Civil Engineering – 15 credits technical electives
- Dental Hygiene (Completion) – 3 credits free electives
- Applied Math – 39 credits free electives, 16 credits focused electives
- Biology-Health Sciences – 23 credits health biology electives, 12 credits free electives
- Renewable Energy Eng (KF) – 15 credits technical electives
- Renewable Energy Eng (PM) – 15 credits technical electives
- Environmental Sciences – 26 credits technical emphasis electives

Several programs, however, do not appear to have free or technical electives available for reallocation. Incorporating the GERAC model into these programs would require either alteration of programmatic requirements. In some cases, preliminary discussions with these departments have yielded ideas for potential resolutions or partial resolutions:

- Respiratory Care – 0 credits electives
- Respiratory Care (Completion) – 0 credits electives

  In preliminary discussion with the Respiratory Care department, possible means of adjusting programmatic requirements by 2 credit hours were identified.

- all 9 Medical Imaging Technology programs – 0 electives

  In preliminary discussion with the Medical Imaging department, faculty have indicated some willingness to reexamine the current BUS requirement in the curriculum map; while valuing the health care management elements of this requirement, some willingness has been expressed to revisit or refashion this requirement in a way that more clearly addresses QL outcomes and/or incorporates content in finance and/or statistics. This adjustment, if reached, would potentially ease 3 credits of the 7 credit pressure in Medical Imaging programs.

- Medical Laboratory Science – 0 free electives

  No preliminary discussions have yet occurred with the MLS department regarding possible adjustments to curricular requirements.

Adjustments to model requirements

Along with adjustments to curriculum maps, it would also be possible to address the pressures from by adjusting the requirements of the Essential Studies model surrounding the Quantitative Literacy pathway.

One possible option would be to alter the requirement of:

- QL-Statistics (4 credits)
  AND
- QL-"Finance" (3 credits)

To:

- MATH > 100 (4 credits)
  AND
- QL-Statistics OR QL-"Finance" (3 or 4 credits)

This modification would relieve credit hour pressures in all programs except:

- Dental Hygiene (Completion) – because no math other than statistics would be required

- Communication Studies (where a new 3 credit pressure would be added) - because no math other than statistics would be required
- All 9 Medical Imaging Technology programs (although this pressure would be reduced to 3-4 credits).

Although such an adjustment would run the risk of weakening the Quantitative Literacy pathway, it would preserve a formal role for the mathematics department and mathematics coursework in general education requirements. However, the "MATH > 100" requirement would be only loosely connected to the outcomes framework that motivates the remainder of Essential Studies requirements.

Additionally, while data from the National Survey of Student Engagement (NSSE) has shown that Oregon Tech students report progress behind that of peer institutions on outcomes associated with Ethical Reasoning and Diverse Perspectives (the other arguably brand-new requirements within the Essential Studies model), related data shows no comparable deficiency in Quantitative Literacy skills; the case for a more extensive new pathway for this outcome is arguably fewer.

Staffing analysis

In order to present a sustainable model for general education, it should be clear whether Oregon Tech has the faculty capacity to teach the courses required under this model, and whether we have this capacity at each of our diverse sites and modes (in particular: Klamath Falls, Portland-Metro, Online, and Seattle). If we do not currently have this capacity, a pathway to reaching this capacity should be outlined. Such a path could include:

- Reallocation of teaching load for existing faculty.
    - When load is reallocated, it should be clear where this load will come from.
- Hiring of additional faculty (full-time, or adjunct, as appropriate) to teach needed load.
    - When new faculty are hired, it should be made clear who will see less demand as a result.

Transfer assumptions

Modeling anticipated demand is complicated by the fact that Oregon Tech both enrolls a high percentage of transfer students and sees a high degree of attrition prior to graduation. To model this, even approximately, this analysis relies on existing demand for current general education courses that are required by all or almost all programs already.

At the two extremes are:

- ***high-transfer*** foundational general education courses such as WRI121 and SPE111 that are frequently transferred in to Oregon Tech, but are also taken by many students who ultimately leave Oregon Tech before graduation.
- ***low-transfer*** upper-division general education courses such as SPE321 that are much less frequently transferred into Oregon Tech, but which are typically taken much closer to graduation.

These two extremes provide data points which can be used to approximately anchor estimates of demand. For the 2017-2018 academic year, enrollment and capacity of these courses across sites and modes were:

		CM-WRI121	CM-WRI122	CM-SPE111	TW - SPE321	Demand Range (High-T)	Demand Range (Low-T)
Klamath	Total Enrolled	250	324	333	421		
	Total Capacity	241	367	370	428	240	420
Online	Total Enrolled	32	70	31	99		
	Total Capacity	62	90	36	100	30	100
Seattle	Total Enrolled	3	9	0	0		
	Total Capacity	35	70	0	0	5	10
Portland-Metro	Total Enrolled	25	47	70	127		
	Sum of Capacity	49	49	112	144	50	130

Under the GERAC model, each category of required general education courses can be identified as high-transfer (Inquiry & Analysis Humanities, Social Science, and Natural Science categories) – those categories where a relatively large list of courses could potentially satisfy requirements, plus WRI121, SPE111, and WRI122) or low-transfer (the remainder; categories where a short list of courses could satisfy requirements).

Further refinements to this admittedly approximate analysis are almost certainly possible, but may be challenging to validate.

Curricular assumptions and preliminary GERAC analysis

As noted alongside course lists above, optimal incorporation of the Essential Studies requirements into curriculum maps seems virtually certain to require some "double-tagging" of courses. However, for the sake of curriculum analysis, since "double-dipping" is not an element of the model, each course must be assigned to one category for demand analysis. In this analysis, courses double-tagged across categories are assigned to the non-Inquiry & Analysis category, with the exception of ECO 201 (this is to balance the high enrollment in ECO 201/202 across the two categories where it can apply.

FTE Shortages for GERAC model implementation Based on 2017-2018 Capacity

		IA-H (2)	IA-SS (3)	IA-NS (2)	DP-CM	DP-SS	CM	ER	QL-ST	QL-FIN	Total
	Transfer Assumption	HIGH T	HIGH T	HIGH T	LOW T	HIGH T	LOW T	LOW T	LOW T	LOW T	
	Credits	3	3	4	3	3	3	3	4	3	
	Students per section	30	30	30	30	30	30	30	30	30	
Klamath	Already Tagged Only:	0.24			0.75			0.85	0.53	0.74	
	Already Tagged + Potential:				0.48			0.76	0.53	0.74	2.02
Online	Already Tagged Only:	0.06			0.07						
	Already Tagged + Potential:				0.07						0.07
Seattle	Already Tagged Only:		0.01		0.03						
	Already Tagged + Potential:				0.03						0.03
P-Metro	Already Tagged Only:	0.28			0.36	0.07		0.25	0.29	0.28	
	Already Tagged + Potential:	0.12			0.36	0.07		0.25	0.29	0.28	1.08

This analysis yields this following staffing impacts:

- Inquiry & Analysis – Humanities (~0.1 FTE)
- Diverse Perspectives – Social Sciences (~0.1 FTE)
  - In both of these cases, this analysis reveals the potential for a minimal need for staffing these courses for Portland-Metro; however, this is well within the margin of error for this study, given the assumptions made. The Wilsonville General Education Director and HSS department will, as they currently do, continue to work closely to ensure that student needs at the Portland-Metro campus are being met.
- Diverse Perspectives – Communication (~1.0 FTE, ~0 FTE with proper redevelopment of tech comm courses)
  - Demand for a second technical communication course, currently required by many programs, could eventually decrease. However, the background and expertise needed for Diverse Perspectives courses such as Intercultural Communication may be different from that needed to teaching technical communication courses.

    Subsequent discussion with Communication department leadership and members of the technical communication subgroup within that department have revealed a willingness to bend the redevelopment of current technical communication courses – an effort that is already underway – in such a way that Diverse Perspectives requirements are met. If this is done, current staffing would be sufficient to meet this need. This activity would be the most significant course redevelopment in order to meet the requirements of the Essential Studies model, and professional development, release, or summer stipend support to facilitate this activity would support its success.
- Ethical Reasoning (~0.6 FTE if HUM is included on ER list; ~1.0 FTE if HUM is included)
  - Increased demand for Ethical Reasoning courses would be counterbalanced by decreased demand for other humanities courses (or a reduction in humanities transfer credit accepted).
  - However, the Humanities and Social Science department currently has one faculty member whose professional background lies in this area; in order to adequately staff this area, they would require 1-2 additional staff with background in ethics/philosophy before full ramp-up of Essential Studies requirements (demand for these courses would be markedly higher by 1-2 years into curriculum map implementation of essential studies, around AY 2021-2022. The HSS department has been developing a proposal to use such additional staffing develop a dual major in philosophy that would both broaden course offerings in the humanities, offer a value-add for students who chose to pursue this program, and integrate with department growth goals.
- Quantitative Literacy – Statistics (~0.8 FTE if MATH 465 is not included; ~0.1 FTE if it is)
  - The two courses on this list are taught exclusively by the Mathematics department; there are unlikely to be other reductions in demand for math courses to counterbalance these, unless the management department's reconsideration of math/science requirements results in a reduction of math

demand from those majors. Even without such adjustment, the mathematics department has expressed confidence in their ability to absorb increase statistics demand if, for example, all Medical Imaging students had a statistics course added to their curriculum maps.

- Quantitative Literacy – Finance (~1.0 FTE)
  - The bulk of courses in this category are taught out of the Management department; there are unlikely to be other reductions in demand for management courses to counterbalance these. However, the management department has not expressed concern about handling increased demand for these courses. The management department has also already begun to explore ways to broaden and more flexible offer personal finance coursework, which could also become options for completion of this requirement.

Staffing impacts under revised GERAC analysis

With potential additions to course lists contemplated explicitly in the previous section (adding HUM 125 to ER list; adding PSY 347 to DP-SS list; adding MATH 465 to QL-Stats list, shifting "second tech comm" courses WRI 327, 350, and 410 to DP-COM lists to reflect redevelopment of tech comm courses), capacity pressures can be recalculated:

FTE Shortages for GERAC model implementation Based on 2017-2018 Capacity
(**With** Course List Additions)

		IA-H (2)	IA-SS (3)	IA-NS (2)	DP-CM	DP-SS	CM	ER	QL-ST	QL-FIN	Total
	Transfer Assumption	HIGH T	HIGH T	HIGH T	LOW T	HIGH T	LOW T	LOW T	LOW T	LOW T	
	Credits	3	3	4	3	3	3	3	4	3	
	Students per section	30	30	30	30	30	30	30	30	30	
Klamath	Already Tagged Only:	0.24			0.75		0.25	0.85	0.53	0.74	
	Already Tagged + Potential:						0.25	0.43	0.04	0.74	1.46
Online	Already Tagged Only:	0.06			0.07						
	Already Tagged + Potential:										0.00
Seattle	Already Tagged Only:		0.01		0.03						
	Already Tagged + Potential:				0.03						0.03
P-Metro	Already Tagged Only:	0.28			0.36	0.07	0.18	0.25	0.29	0.28	
	Already Tagged + Potential:	0.12			0.09		0.18	0.12		0.28	0.79

The remaining significant pressures (> 0.25 FTE) here are:

- Advanced Communication – (~0.5 FTE)
  - A pressure emerges here because of the shift of "second technical communication" courses to the Diverse Perspectives – Communication category; however, this is likely manageable within the load-balancing that would already occur in that department as courses are redeveloped.
- Ethical Reasoning (~0.6 FTE if HUM is included on ER list; ~1.0 FTE if HUM is included)
  - As discussed above.
- Quantitative Literacy – Finance (~1.0 FTE)
  - As discussed above.

In order to adequately staff this model, a request of an additional 1-2 HSS faculty to staff the Ethical Reasoning requirement, over the next ~3 years, would be required. This would yield a stable core of ~2-3 HSS faculty to support this requirement, as well as the programmatic application of Ethical Reasoning.

Transfer Impact analysis

In Spring 2016, an analysis of how transfer students would be affected by the GERTF model was conducted and presented to GEAC and various interested parties. Of particular interest in this study was the number of credit hours potentially "lost" (that is, not applied to degree requirements in a degree audit) as a result of changes to general education requirements.

This study, conducted with 90 students (30 from each of the three groups below), revealed the following credit hour loss:

	Percentage of new degree-seeking undergraduates (2016-2017)	Average credit loss under GERTF model
Group A – First-time first-year students with 1-36 transfer credits	~ 15 %	1.7 credits/student
Group B – Transfer students with < 90 transfer credits	~ 20%	3.1 credits/student
Group C – Transfer students with 90+ transfer credits (excluding post-bacs)	~ 37%	7.4 credits/student

Transfer study parameters

Because Group C above – transfer students with 90 or more transfer credits – constituted the largest proportion of the Oregon Tech student population, and because it saw the highest impact in the previous transfer study, it was decided that this population should be the focused for a transfer study of the GERAC model.

Because follow-up questions from the previous transfer study often focused on particular subpopulations, a stratified sampling approach was adopted to ensure that questions pertaining to various student populations should be addressed.

At the highest level, sampling was done to ensure representation across the following populations:

	Number of 2018 "Group C" Transfer Students	Number Sampled
HAS – Online	77	10
ETM – Klamath	59	10
ETM – Portland-Metro	55	10
HAS – Klamath	51	10
ETM – Online	23	6
HAS – Chemeketa	15	4
HAS – Portland-Metro	12	4
ETM – Seattle	3	3

Within each sample, stratified sampling of subsamples was conducted to ensure that the majors of students selected also represented each population proportionately (for example, if between 10% and 20% of HAS – Online students were Dental Hygiene students, then sampling ensured that at least 1, but no more than 2, of the students selected for that sample were Dental Hygiene majors.

Transfer Rules

It was also necessary to establish a set of transfer "rules" to govern which transfer courses would be applied to requirements, both within the GERTF and GERAC models. Drawing upon preliminary discussions on this topic that ESLO committees have engaged in over the past several years, the following criteria were used.

(It should be noted that these should not be taken as formally adopted criteria; those should be developed collaboratively between ESLO committees (who provide subject area expertise in the outcome), department chairs (who are the formal authority for transfer equivalencies under Oregon Tech's current practices), and the Registrar's Office (who will be primarily responsible for implementing these policies).

GERTF model:

- Inquiry & Analysis – Humanities – Foundation (3 credits)
  - Same as current humanities requirement (including allowing application of 1 performance credit).
- Inquiry & Analysis – Humanities – Essential Practice (3 credits)
  - Same as current humanities requirement (including allowing application of 1 performance credit), but must be upper-division or clearly a subsequent course in a sequence.
- Inquiry & Analysis – Social Science – Foundation (3 credits)
  - Same as current social science requirement
- Inquiry & Analysis – Natural Science – Foundation (4 credits)
  - Same as current lab science requirement
- Inquiry & Analysis – Sciences – Essential Practice (3-4 credits)
  - Same as current social science or lab science requirement, but must be upper-division or clearly a subsequent course in a sequence.
    - To meet the stipulation that this must come from "outside of areas that traditionally support the major," for majors in engineering, health, and sciences, this must be a social science; for majors in management, social sciences, and communication, this must be a natural science.
- Ethical Reasoning – Foundation (3 credits, with "program-integrated option")
  - Assumed in all cases that this requirement would be met through the "program-integrated foundation" option in the GERTF model.
- Ethical Reasoning – Essential Practice (3 credits)
  - Course must be equivalent to an OIT 300-level applied ethics course, or must be a PHIL course dedicated to ethics.
- Communication – WRI 121, 122, SPE 111 (3 credits)
  - Courses must be equivalent to existing Oregon Tech courses
- Communication – Essential Practice (3 credits)

        - Courses must be equivalent to WRI 227 (which is what most programs currently prescribe to fulfill this requirement).
    - Teamwork – SPE 321 (3 credits)
        - Course must be equivalent to existing Oregon Tech course
    - Quantitative Literacy – Foundation (3 credits)
        - Course must be equivalent to a course approved for this list.
    - Quantitative Literacy – Essential Practice (3 credits)
        - Course must be equivalent to a course approved for this list.
    - Diverse Perspectives – Foundation (3 credits)
        - Course title must explicitly refer to non-Western/non-majority cultures (e.g. History of Japan; Native American Literature), or to human social interactions (e.g., Sociology, Human Relations, Interpersonal Communication etc.)
    - Diverse Perspectives – Essential Practice (3 credits)
        - Same as Diverse Perspectives – Foundation, except that course must be upper-division or clearly a subsequent course in a sequence.

* Note: The GERTF model explicitly allowed 2 of the "Essential Practice" requirements to be "double-dipped" – that is, met by the same course simultaneously. Because of the difficulty of integrating this in curriculum maps alongside the transfer study, this rule was not taken into account for the transfer analysis (it is taken into account in the curriculum map analysis). Although any impact of ignoring this rule in the transfer analysis would be minimal given the infrequency of Essential Practice courses being transferred in, it would be in favor of more application of courses to Essential Studies requirements under the GERTF model, not less.

GERAC model:

- Inquiry & Analysis – Humanities (6 credits)
    - Same as current humanities requirement (including allowing application of 3 credits of performance).
- Inquiry & Analysis – Social Sciences (9 credits)
    - Same as current social science requirement.
- Inquiry & Analysis – Natural Science (8 credits)
    - Same as current lab science requirement.
- Ethical Reasoning – Essential Practice (3 credits)
    - Course must be equivalent to an OIT 300-level applied ethics course, or must be a PHIL course dedicated to ethics.
- Communication – WRI 121, 122, SPE 111 (3 credits each)
    - Courses must be equivalent to existing Oregon Tech courses.
- Advanced Communication (3 credits)
    - Courses must be equivalent to WRI 227 (which is what most programs currently prescribe to fulfill this requirement).
- Teamwork – SPE 321 (3 credits)
    - Course must be equivalent to existing Oregon Tech course.
- Quantitative Literacy – Statistics (4 credits)
    - Course must be equivalent to a course approved for this list.

- Quantitative Literacy – “Finance” (3 credits)
  - Course must be equivalent to a course approved for this list, or clearly be a personal finance-oriented course.
- Diverse Perspectives – Social Science or Humanities (3 credits)
  - Course must fall under a Social Science or Humanities prefix and must explicitly refer to non-Western/non-majority cultures (e.g. History of Japan; Native American Literature), or to human social interactions (e.g., Sociology, etc.). [*Note that here, this analysis has incorporated the option to broaden the Diverse Perspectives requirement to allow humanities to apply. However, the majority of applications of this requirement do come from social science courses.]
- Diverse Perspectives – Communication (3 credits)
  - Course must fall under a Communication prefix and be specifically focused on interpersonal/intercultural communication or communication targeted towards specific audiences.

Transfer Impacts

The table on the subsequent page outlines the impacts of transition to the GERTF and GERAC models on the 57 students drawn for this transfer study. Under the GERTF model, for this sample population, impacts ranged from a gain of 3 more transfer credits applied to a loss of 15 fewer credits applied, with a median impact of 6 credits and an average impact of 5.2 credits. Under the GERAC model, impacts ranged from a gain of 2 credits to a loss of 6, with a median impact of 0 credits and an average impact of 1.1 credits.

College – Site	Major	Credits Applied			Credits "Lost"	
		Current	GERTF	GERAC	GERTF	GERAC
HAS – Online	Echocardiography	83.5	76	83.5	7.5	0
HAS – Online	Echocardiography	99.5	92	99.5	7.5	0
HAS – Online	Echocardiography	127	118	124	9	3
HAS – Online	Dental Hygiene	130	127	130	3	0
HAS – Online	Diagnostic Medical Sonography	91	87	91	4	0
HAS – Online	Diagnostic Medical Sonography	94	94	94	0	0
HAS – Online	Respiratory Care	119	115	118	4	1
HAS – Online	Vascular Technology	109	94	103	15	6
HAS – Online	Applied Psychology	96	84	90	12	6
HAS – Online	Pre-Dental Hygiene	47	41	44	6	3
ETM - Klamath	Electrical Engineering	77	65	74	12	3
ETM - Klamath	Electrical Engineering	44	36	44	8	0
ETM - Klamath	Civil Engineering	24	21	21	3	3
ETM - Klamath	Civil Engineering	24	24	24	0	0
ETM - Klamath	Software Engineering Tech	66	59	65	7	1
ETM - Klamath	Mechanical Engineering	42.5	38	41	4.5	1.5
ETM - Klamath	Embedded Systems Engineering Tech	64	49	61	15	3
ETM - Klamath	Embedded Systems Engineering Tech	24	19	24	5	0
ETM - Klamath	Renewable Energy Engineering	24	15	21	9	3
ETM - Klamath	Business - Management Option	56	53	56	3	0
ETM - Portland	Renewable Energy Engineering	24	21	24	3	0
ETM - Portland	Renewable Energy Engineering	39	33	39	6	0
ETM - Portland	Electrical Engineering	29	23	29	6	0
ETM - Portland	Electrical Engineering	24	18	21	6	3
ETM - Portland	Mechanical Engineering Technology	38	26	35	12	3
ETM - Portland	Mechanical Engineering Technology	75	77	77	-2	-2
ETM - Portland	Information Technology	25	25	25	0	0
ETM - Portland	Mechanical Engineering	45	39	45	6	0
ETM - Portland	Health Informatics	30	30	30	0	0
ETM - Portland	Technology and Management	66	66	66	0	0
HAS - Klamath	Diagnostic Medical Sonography	46	37	46	9	0
HAS - Klamath	Pre-Medical Imaging Technology	47	41	47	6	0
HAS - Klamath	Radiologic Science	49	37	46	12	3
HAS - Klamath	Radiologic Science	65	56	59	9	6
HAS - Klamath	Vascular Technology	46	37	43	9	3
HAS - Klamath	Applied Psychology	86	86	86	0	0
HAS - Klamath	Dental Hygiene	59	50	56	9	3
HAS - Klamath	Medical Lab Science - Early Admission	59	53	59	6	0
HAS - Klamath	Environmental Sciences	29	26	29	3	0
HAS - Klamath	Echocardiography	55	43	55	12	0
ETM – Online	Information Technology	41	39	41	2	0
ETM – Online	Information Technology	45	42	45	3	0
ETM - Online	Technology and Management	86	89	86	-3	0
ETM - Online	Operations Management	80	80	80	0	0
ETM - Online	Health Care Management - Rad Science	114	111	114	3	0
ETM - Online	Health Informatics	31	31	31	0	0
HAS - Portland	Medical Laboratory Science	90	78	87	12	3
HAS - Portland	EMS Management	17	17	17	0	0
HAS - Portland	Pre-Medical Laboratory Science	61	55	61	6	0
HAS - Portland	Applied Psychology	84	84	84	0	0
HAS - Chemeketa	Dental Hygiene	62	56	56	6	6
HAS - Chemeketa	Dental Hygiene	63	63	63	0	0
HAS - Chemeketa	Dental Hygiene	59	50	56	9	3
HAS - Chemeketa	Dental Hygiene	49	46	49	3	0
ETM - Seattle	Manufacturing Engineering Technology	59.5	52	59.5	7.5	0
ETM - Seattle	Manufacturing Engineering Technology	35	35	35	0	0
ETM - Seattle	Mechanical Engineering	56	50	56	6	0

Average impacts broken down by subpopulation are as follows:

College – Site	Credits Applied			Credits "Lost" (Compared to Current)	
	Current	GERTF	GERAC	GERTF	GERAC
Online HAS	99.6	92.8	97.7	6.8	1.9
Klamath ETM	44.6	37.9	43.1	6.7	1.5
Portland-Metro ETM	39.5	35.8	39.1	3.7	0.4
Klamath HAS	54.1	46.6	52.6	7.5	1.5
Online ETM	66.2	65.3	66.2	0.8	0.0
Portland HAS	63.0	58.5	62.3	4.5	0.8
Chemeketa HAS	58.3	53.8	56.0	4.5	2.3
Seattle ETM	50.2	45.7	50.2	4.5	0.0

No alteration of general education requirements can be expected to come without some transfer cost to some students. However, the relaxation of the requirement for "Essential Practice"-level courses, particularly in the Inquiry & Analysis pathway, provides opportunities for many additional credits to apply to students degree maps. An average impact of less than 1 course lost, with the majority of students seeing no impact on acceptance of transfer credits, seems to lie well within the realm of viability.

Additionally, several practices can accompany rollout of the Essential Studies model which could further enhance Oregon Tech's transfer-friendliness:

- During curriculum mapping, programs can be asked to reconsider and justify any specification of general education courses beyond the elective list. In a number of cases, programs have incorporated specific requirements for reasons well-aligned with one of Oregon Tech's new ESLO's – for instance, requiring HUM 125 or PHIL 331 to support ethical reasoning goals, or requiring PSY20x or SOC 204 to meet diverse perspectives goals. Programs should be prompted to consider whether, in light of ESLO-aligned requirements, such specifically is necessary, and, if so, what minimal specification would meet program goals. Any broadening of requirements, particularly broadening beyond one particularly allowed course, would increase transfer flexibility and student scheduling flexibility, and wouldn't preclude programs from advising students towards those courses most relevant to their major.
- Clear guidelines for which transfer courses meet particular requirements – both in terms of individual course equivalencies, but also in terms of "rules" for recognizing courses that would apply to meet requirements – can and should be articulated publicly on the Oregon Tech website, as an aid to potential transfer students in their course selection at other institutions prior to transferring to Oregon Tech.

Registrar's Office Impacts

Implementation of outcome-aligned course requirements will require a number of activities within the Registrar's Office to prepare Oregon Tech's systems for implementation of a new general education model. These fall into four broad categories:

(1) **Retagging of Oregon Tech courses** – Once course lists for each requirement in the general education model are finalized, each Oregon Tech course must be given a proper attribute in our course database. This is a relatively straightforward task, as it involves creating a new field and a systematic set of attributes, and applying them to the ~100 or so courses that will potentially fulfill general education requirements.

(2) **Updating curriculum maps** – Just as degree audits in Degree Works must be updated when curriculum maps change through the normal CPC process, updating general education requirements will require similar sorts of changes. Although updating degree audits for every program,

(3) **Updating articulation agreements** – Given new degree requirements, articulation agreements with community colleges will have to be updated. Currently, articulation agreements typically have a "lifespan" of three years – students must be enrolled in a community college during the year that an articulation degree applies, and transfer to Oregon Tech within three years in order for the articulation agreement to be valid. Thus, refreshing and updating of articulation agreements would already happen in Oregon Tech's natural cycle of articulation work.

    This work would also already be affected by the Major Transfer Maps (essentially, statewide articulation agreements) being created at the state level as mandated by HB2998; these Major Transfer Maps may end up forming the basis for future Oregon Tech articulation agreements as they are created across various disciplines.

(4) **Updating transfer tables** – Oregon Tech's transfer equivalency tables list tens of thousands of courses from other institutions and how they transfer in to Oregon Tech, whether as specific OIT courses or as fulfilling specific categories of general education requirements. These tables would have to be updated to align with new general education categories, particularly for courses from institutions that Oregon Tech regularly receives transfer students from.

    In order to do this, a consistent and reliable set of "rules" must be developed, as discussed in the Transfer Study section. As recommended above, the Registrar's Office, ESLO committees, and relevant department chairs will have to be involved in the development of these rules, which must balance honoring the intents of the outcome with being practically implementable given the information that is available. As rules are developed and applied to this database of courses, borderline or ambiguous cases may have to be referred back for further discussion and potential refinement or clarification of transfer "rules." Because it is a new outcome to Oregon Tech's curriculum and potentially also encompasses a broad set of courses, developing rules for the Diverse Perspectives outcome may be the most challenging out of all 6 ELSO.s

Because this database of courses is large, this is the most laborious of the 4 tasks described here. However, it can also be readily prioritized so that the most impactful elements are done quickly – Oregon community colleges form the university's largest transfer student population, and the AAOT outcome lists that already exist at these colleges and have been incorporated into the structure of the CTM may provide a useful reference for this work. Work can then proceed ordered by frequency with with Oregon Tech receives transfer students from that institution – and institutions from which Oregon Tech has very rarely (e.g. only once) received a transfer student may, as a practical matter, not need to be re-examined at all.

While these demands do pose additional burdens on the registrar's office, the first three items are relatively straightforwardly incorporated into the ordinary flow of work with minimal disruption or additional burden; the fourth is the most time-consuming and intensive. There have been ongoing conversations about providing staffing to the registrar's office to handle technical work currently done by staff in Academic Partnerships; if this new staffing within the Registrar's Office were to be created, primary responsibility for this work could fall on this person as one of their early job responsibilities.

Step 3: ESSE pilot process

GERAC's report recommend further evaluation and exploration of the ESSE (Essential Studies Synthesis Experience) prior to eventual adoption. In the time since the ESSE concept was first proposed, it has intrigued a number of members of the Oregon Tech community.

Such experiences have the potential to contribute to students' career preparedness and readiness to tackle other life challenges. As noted in AAC&U's regular survey of employers: (Hart Research Associates. 2015. *Falling Short? College Learning and Career Success.* Washington, DC: Association of American Colleges and Universities.)

- Nearly all employers (91 percent) agree that for career success, a candidate's demonstrated capacity to think critically, communicate clearly, and solve complex problems is more important than his or her undergraduate major."
- "Nearly all employers (96 percent) agree that all college students should have experiences that teach them how to solve problems with people whose views are different from their own."
- "Nearly all employers (90 percent) give hiring preference to college graduates with skills that enable them to contribute to innovation in the workplace."

Exciting and frequently-mentioned features of the ESSE which support these and related goals:

- A junior-level course in which students both draw upon developed disciplinary knowledge but gain experience in preparation for senior projects and capstone experiences.
- Interdisciplinary in character, whether by virtue of faculty instruction, student participation, or the nature of the problems tackled.
- Incorporates, exhibits and integrates all six of Oregon Tech's ESLO's.
- Leads to the creation of showcase "signature work" – experiences in which a student uses "his or her cumulative learning to pursue a significant project related to a problem he or she defines." (*The LEAP Challenge: Signature Work for All Students*. 2015. Washington, DC: Association of American Colleges and Universities)
- Leads to the creation of work with value that extends beyond the classroom – fostering an "entrepreneurial mindset so [students] can create personal, economic, and societal value" (KEEN Network framework; engineeringunleashed.com), thus offering opportunities for engagement with external community or industry partners.
- Provides a curricular home for extraordinary experiences that might otherwise be difficult to incorporate into other more rigid or more traditional course requirements.

More detail on the inspiration for the ESSE can be found in Appendix L of the original GERTF report.

ESSE logistics: staffing and enrollment

During the past two years, the informal ESSE team has endeavored to move towards ESSE pilots. Because of the difficulty of coordinating team-taught ESSEs within the existing workload models (a model requiring coordination of at least two faculty members, their department chairs, and the department(s) in which the ESSE is formally listed), the following should be considered in moving

- Because of the high level of logistical complexity in coordinating a team-taught ESSE, non-team-taught ESSE pilots be explicitly permitted, but pilot efforts should also include both team-taught and team-developed ESSEs (in a "team-developed" ESSE, multiple faculty from different disciplines might be involved in the creation of the course, but might not necessarily receive workload credit for its delivery).
- A model for incentivizing and rewarding ESSE pilots should be clearly identified. The Provost's Office provided a workload model for incentivizing team-taught ESSEs that could be continued or modified; stipends for development of pilot ESSEs by individual faculty members or teams (comparable to the stipends offered for the development of new online course offerings) would also support ESSEs developed and delivered primarily by individual faculty or in different ways.

In order to garner student enrollment, ESSEs will need to count for requirements in students' degree maps. Pilot ESSEs could be designed to explicitly also count for a current general education requirement (e.g. Communication, Social Science, etc.); this has been done for the Catalyze Klamath class. However, this adds additional complexity and approval steps to what should ideally be a nimble pilot process.

GEAC could also explicitly permit pilot ESSEs to count in any open general education elective slot (essentially treating an ESSE as a "wild card" with respect to general education requirements, with a limit of only one ESSE counting in this way per student).

ESSE committee

To further exploration of the ESSE, in the short term, the informal ESSE committee should be formalized in a manner parallel to ESLO committees. The ESSE committee should include representation from:

- The historic, informal "ESSE" group that attended the 2016 Institute on Project-Based Learning at Worcester Polytechnic Institute and the 2017 D.School Workshop at Stanford.
- Groups that have participated in KEEN activities/conferences, as KEEN's objectives are in strong alignment with many of the ESSE's goals.
- Faculty who have taught (or are eager to teach) ESSE-like experiences already, such as the class accompanying the Catalyze Klamath competition.
- At least one member of the General Education Advisory Committee.
- Academic leadership at the department chair level or higher, potentially including a dean or associate dean.

The ESSE committee's initial charges from the Provost and GEAC should be formalized, and should include:

- Drawing upon existing materials and work on the ESSE to identify flexible ideal defining characteristics for approval of pilot ESSEs.
- Set goals for the number and timeline for pilot ESSEs and key modes or features which should be represented in pilot ESSEs (e.g. online, industry partnerships, team-developed, multi-site, etc.).
- Proposing to GEAC flexible ways in which ESSEs could count for degree requirements – both under the current model and under the Essential Studies model, in order to generate student enrollment.
- Collaborating with the Provost's Office on a viable incentive structure for pilot ESSEs.
- Set key benchmarks on a path towards eventual incorporation of ESSEs as a requirement for all students (e.g. what threshholds would have to be met at what point; what outcomes would have to be demonstrated in order to create a compelling case for the viability of a university-wide requirement, what resources would have to be obtained and what are reasonable).

To support faculty in the development of such experiences, and to begin to spread faculty expertise in this area:

- CCT should pursue, and the institution should look for internal and external funding to support, professional development activity (such as a workshop) for faculty seeking to design ESSE-like experiences, whether as pilot ESSEs or as elements of existing courses.

Step 4: Formalization of Program Integration

A key facet of the GERTF model was "program integration" – the expectation that programs would create/identify and systematically embed in their curricula experiences in which each of Oregon Tech's six ESLO's are exhibited and brought into a disciplinary context. In many ways, this is the natural counterpart to the foundational course requirements taught by "general education faculty" – while those courses lay a foundation in key knowledge and skills, the program-integrated courses (as well as the ESSE, capstone, and relevant professional responsibilities) reflect, in part, what these experiences help to prepare students *for.*

During the period between the GERTF final report and the creation of GEAC, GEAC generally envisioned "approval" of program-integrated courses proceeding similarly to approval of foundational courses – faculty would submit documentation, including a course syllabus, exemplar assignment, and narrative, illustrating how the outcome was manifested in the course. [Note that a key distinction between these levels has been that while foundational courses provide instruction in an area, program-integrated courses provide disciplinary application – this recognizes the complementary roles and strengths of "general education faculty" and "disciplinary faculty."

GERAC's recommendations endorse moving forward with implementation of program-integration after implementation of ESLO-aligned foundational course requirements. GERAC also explicitly recognized that Oregon Tech's current assessment processes already take steps in this direction by asking that each program provide student work from an assignment in a disciplinary course in which that year's outcome is exhibited. Beginning in 2018-2019 with the Ethical Reasoning outcome, the Office of Academic Excellence is also systematically collecting both student work samples and the assignment prompts that produced them.

Recommendation for program-integration

Upon the completion of the "Collect" year for all outcomes in current six-year assessment cycle (2020-2021 for Quantitative Literacy), programs will have identified courses, identified assignments, and provided student work for all six learning outcomes. At this point in time, these assignments and courses can be collated, any gaps that exist can be filled in, and programs can be asked to commit to consistently implementing those activities if they do not already.

Rather than requiring formal approval of such courses, the quality of assignments and the effectiveness with which programs build upon foundational knowledge and skills can be assessed and improved through the regular ESLO assessment process.

Before this time, the Assessment Executive Committee should design its ESLO assessment activities to effectively prepare for this eventual formalization of program integration. Any move to formalize program integration as a required element of curriculum beyond the assessment process should be originated by GEAC.

Implementation Timeline

January 2019

Under Oregon Tech's current structures, formal curricular authority lies with the Provost upon the recommendation of faculty bodies. With respect to general education requirements, the relevant advisory body is GEAC (the General Education Advisory Council).

A path forward, therefore, must gain the clear endorsement of these two groups. Because of the pending departure of Oregon Tech's current Provost, as well as the substantial impact of general education reform on the university as a whole, it is also prudent to seek the explicit endorsement of a path forward from Oregon Tech's President.

Upon receipt of this report, each of these groups should move expeditiously to determine whether the path forward that they can endorse. For the sake of clarity across the institution, these endorsements should be communicated clearly and publicly to the university as a whole, and should reflect strong commitment to a clear direction, but should also not be taken as precluding modest adjustments and refinements, especially as a number of policies and implementation questions will still have to be resolved moving forward. However, these endorsements should reflect a sincere belief that a path forward has been identified that is sustainable for the university and beneficial for students.

Early Winter 2019: Short term policy questions

The subsequent timeline assumes that the path forward endorsed by the President, Provost, and GEAC is substantially similar to the path outlined in this report.

During Winter 2019, GEAC and other groups will have to formally contemplate a number of policy questions surrounding the model:

- **"Double-tagging"** – As the GERAC recommendation does not suggest double-tagging, should double-tagging be allowed in the general education model? If so, how wide should this double-tagging be (fairly common or fairly rare?)
    - Major pros: Allows for additional flexibility in incorporation of the model into curriculum maps; improves student scheduling and transfer flexibility.
    - Major cons: Could drive student enrollment strongly towards those courses; more complex to implement in degree audits.
    - Input from: Department chairs, ESLO committees, GEAC; Registrar's office

- **Broadening DP-SS**: Should the Diverse Perspectives – Social Science requirement be broadened to allow Diverse-Perspectives – Humanities courses as well?
    - Major pros: Allows greater transfer flexibility, student scheduling flexibility and alignment with HB2998 Core Transfer Map, potentially mitigates some IA-Hum credit loss due to Ethical Reasoning requirement.
    - Major cons: Risks somewhat compromising total social science course demand.
    - Input from: Diverse Perspectives ESLO committee, HSS department

- **Performance-based humanities** – Should the IA-H category explicitly permit (and limit students to) 3 credits of performance-based humanities?
    - Major pros: Greater transfer and course flexibility; continuity with current practices.
    - Major cons: Risks some compromise to I&A outcome, depending on how meaningfully the outcome is manifested in performance courses.
    - Input from: Inquiry & Analysis ESLO committee, HSS department:

- **Smaller or wider ethical reasoning list** (should HUM 125 be included?) –
    - Major pros to smaller list: More robust Ethical Reasoning pathway, stronger argument for staffing to support outcome.
    - Major cons to a smaller list: Narrower transfer rules and student scheduling flexibility, less need for staffing to support outcome.
    - Input from: Ethical Reasoning ESLO committee, HSS department:

- **Naming of "Advanced Communication" block**: This block was named by the author in this report and doesn't reflect any judgment on what this block should actually be called.
    - Input from: Communication ESLO committee, Communication department

- **Naming of QL-"Finance" list:** This block was named informally in GERAC's work and doesn't necessarily reflect a list on which ECO201/202 might appear.
    - Input from: Quantitative Literacy ESLO committee, Management department:

- **Tentative course lists**:
  Prior to a call to general education departments for submission of general education courses for review, the lists provided above should be reviewed for completeness or areas of concern.
    - Input from: ESLO committees, department chairs, Deans

Winter 2019 and forward: Implementation logistics

Beginning in early winter 2019 and proceeding into spring 2019, some more significant curriculum questions will have to be completed, particularly surrounding how the Essential Studies requirements would integrate into curriculum maps

- **Solicitation of courses for Essential Studies lists:**
  After a review of tentative course lists, GEAC should solicit course submissions from general education departments and faculty, beginning with those courses that are critical for curriculum maps. This can begin in Winter 2019. ESLO committee review and any necessary-back-and-forth can extend into subsequent terms, but should be essentially completed by Winter 2020 so that the course lists can be finalized for catalog implementation in that term.

- **Program review of curriculum maps**: As part of the curriculum map and transfer studies described above, tentative curriculum maps were developed (and are provided as Appendix A to this report). These will need to be reviewed by programs, with broad faculty involvement in each program and department. Possible questions within this review could include:

- Accuracy – Do the maps as transcribed from the 2018-2019 catalog correctly describe the program? Do they reflect any other changes that the program wishes to incorporate?
- Compliance with Essential Studies requirements – Are the Essential Studies requirements incorporated fully and properly? What adjustments to curriculum maps (and therefore conversations with other departments) might be necessary to achieve full compliance.
- Sensibility of placement of Essential Studies requirements – Are Essential Studies requirements included in a reasonable order? [GEAC may wish to recommend a suggested "ordering" for requirements – which should be placed earlier in curriculum maps vs. later, etc.]
- Necessity of constraints on Essential Studies requirements – When a program specifies a particular course or courses within an Essential Studies category, is that constraint the minimal one needed to achieve programmatic goals?
- Input from: GEAC, Programs, General Education departments

While this review may take longer for some programs than for others, it can be begun (even before all questions above are fully answered) during winter term. The start of spring term at the latest as a deadline for this would provide sufficient time during the academic year for GEAC to read, reflect on, and make any necessary adjustments in response to this input. Because of the experiences learned in conducting program mapping in Fall 2016, it is recommended that GEAC members be present for program discussions to answer questions and to hear feedback.

- **Quantitative literacy pathway**: Because QL requirements result in potentially challenging credit hour pressures in several programs (most notably the programs in Medical Imaging), there may be consideration needed of whether the pathway as articulated in the GERTF and GEAC models is viable or whether it might need refinement. Review of program's responses to their review of curriculum maps (above) could inform this; questions posed of programs during this review could also inform consideration of possible changes to this pathway.
  - Input from: GEAC, programs, Mathematics Department, Management Department, Quantitative Literacy ESLO committee

- **Process for changes to curriculum maps**: It would be incredibly burdensome to ask each program to prepare a unique and full CPC proposal for each curriculum map change, especially when the rationale behind each change is essentially similar. The collaborative development of a more streamlined process for reviewing and approving these changes and delivering the needed information to the Registrar's Office in the most useful form would mitigate this burden. It would also be ideal if this work on the part of CPC and programs could fall outside of the typical winter term "busy season" for CPC.
  - Input from: GEAC, CPC, Registrar's Office

- **Development of transfer "rules"** – As described alongside the transfer study, reliable and straightforward rules for recognizing transfer courses as applying to Essential Studies requirements will need to be developed and tested (and then likely refined). This work may continue beyond spring 2019
  - Input from: GEAC, General education department chairs, Registrar's Office

Departmental and other impacts

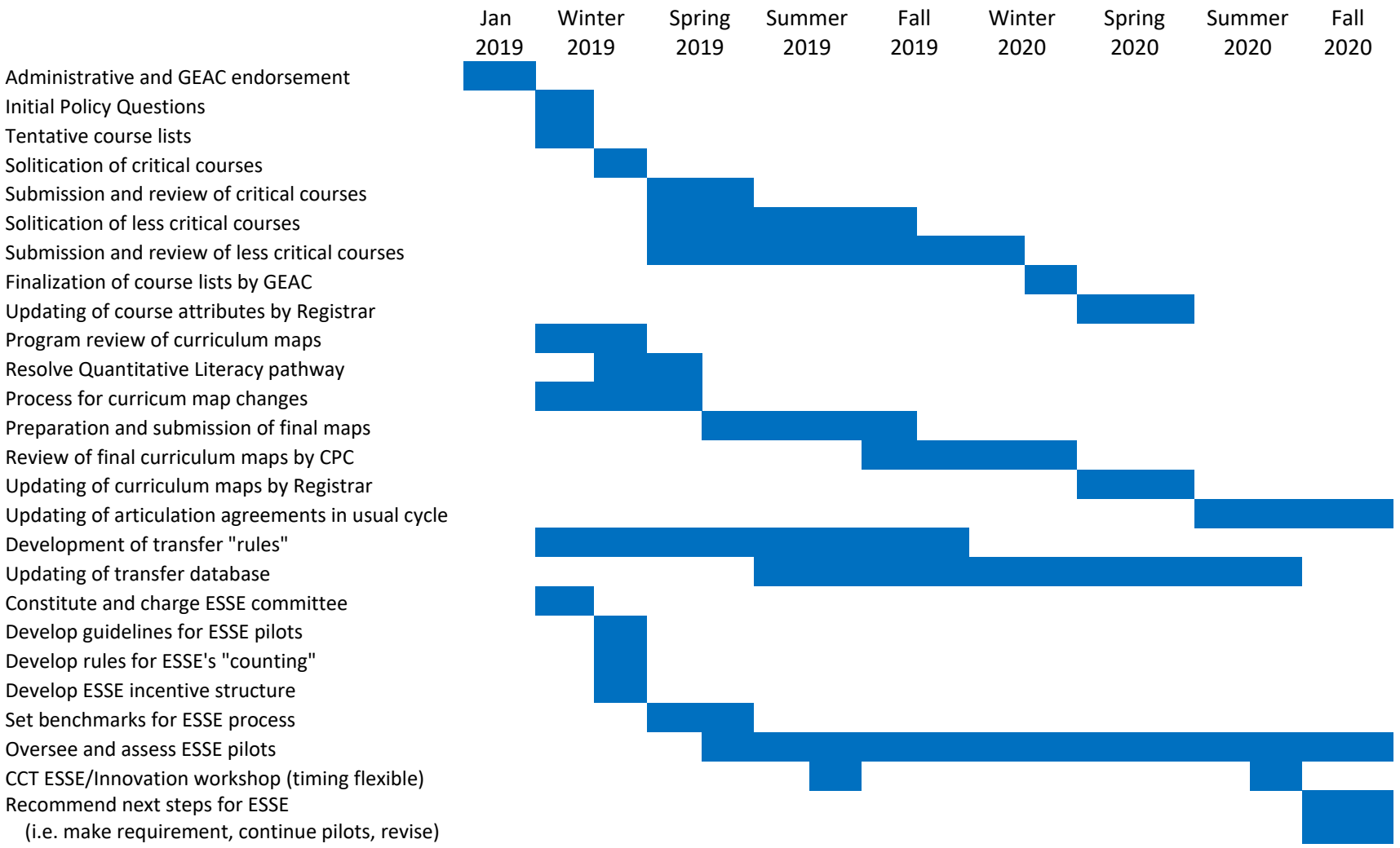
- **Communication course redevelopment** – In order to align redevelopment of technical communication courses to fulfill the Diverse Perspectives – Communication requirement in the GERAC model, significant work will be required by the technical communication work in the communication department. Fortunately, this work is well-timed with current efforts by the technical communication group to redevelop these courses towards greater relevance for programs, and with the "Engage" year for the Communication ESLO in the current six-year ESLO assessment cycle.

  For optimal timing with curriculum map revisions and review, a rollout of new options for technical communication course concepts by Convocation 2019 would be ideal; this would be facilitated by some degree of institutional support for this significant development activity.

- **Natural Science course offering expansion –** Because so few Oregon Tech students take natural science courses to fulfill general education requirements, few natural science courses exist that are explicitly targeted towards this student population, and those few that do (e.g. BIO 101, 102) typically suffer from low enrollment. With a likely increase in demand for these course from students in the management department, the opportunity exists for development of new science courses targeted for non-STEM majors – an opportunity which has already been recognized by the Natural Sciences Department and would be welcomed by the Management Department.

- **Additional transfer modules -** Similar analysis to that done for the Oregon Core Transfer Map should be done with respect to other key regional transfer blocks (particularly those from Washington state, but also from California, Hawaii, and elsewhere). As the model is finalized, GEAC should take up consideration of how these models could be transferred in to Oregon Tech. Similarly, the Interstate Passport structure, a nationwide transfer model, previously examined by GEAC in 2016-2017, should be reexamined once the Essential Studies model is finalized.

The subsequent page provides a summary chart of many of the critical elements for moving forward towards a catalog implementation of general education requirements similar to those in the GERAC model by Fall 2020 – an ambitious, but still achievable timeline so long as endorsement of a path forward is obtained in January 2019.


Jan 2019
Winter 2019
Spring 2019
Summer 2019
Fall 2019
Winter 2020
Spring 2020
Summer 2020
Fall 2020
Administrative and GEAC endorsement
Initial Policy Questions
Tentative course lists
Solitication of critical courses
Submission and review of critical courses
Solitication of less critical courses
Submission and review of less critical courses
Finalization of course lists by GEAC
Updating of course attributes by Registrar
Program review of curriculum maps
Resolve Quantitative Literacy pathway
Process for curricum map changes
Preparation and submission of final maps
Review of final curriculum maps by CPC
Updating of curriculum maps by Registrar
Updating of articulation agreements in usual cycle
Development of transfer "rules"
Updating of transfer database
Constitute and charge ESSE committee
Develop guidelines for ESSE pilots
Develop rules for ESSE's "counting"
Develop ESSE incentive structure
Set benchmarks for ESSE process
Oversee and assess ESSE pilots
CCT ESSE/Innovation workshop (timing flexible)
Recommend next steps for ESSE
(i.e. make requirement, continue pilots, revise)