

Course Name: EM526: Constraints Management
Credits: 3
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On-Call as needed, quick response by e-mail,
meetings on request
Meeting Times: Wednesdays, 5:15 – 7:45pm, Pacific Time



Course Description: Every system is constrained in some way. The constraint or limiting factor determines the rate of growth, the expansion of the system or the accomplishment of the objective. This course introduces the engineering management student to the Theory of Constraints (TOC). Students learn how to find and the limiting factor in any system and use that knowledge to make significant improvements.

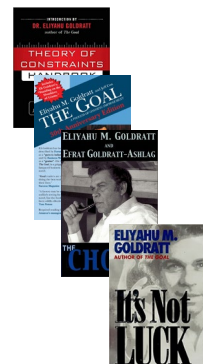
Improvement implies change. As we know, every improvement comes from a change, but not every change leads to an improvement. Therefore, the engineering manager must be able to discern the answers to 3 questions to tilt the odds in his or her favor to create the kind of change that translates into improvement:

1. What to change? Students learn how to convert their intuition into logic, distinguish core causes from their effects, and identify the performance-limiting constraints.
2. To what to change? Students learn how to craft a robust solution that removes the limitation and blocks potential undesirable side effects.
3. How to cause the change? Transitioning from the current to the future state requires both planning and communication. Students will learn how to proactively identify obstacles and how to overcome them as the basis for their implementation plan. They will also learn how to gain the active collaboration of the various stakeholders needed.

The theoretical material is applied to cases in a variety of systems and organization types. Students will learn how to apply the concepts and tools in day-to-day situations and in a significant work-related application.

Required Material:

- *Theory of Constraints Handbook*, James F. Cox III and John G. Schleier, Jr., McGraw Hill (2010), ISBN 978-0-07-166554-4
- *The Goal: A Process of Ongoing Improvement*, 30th Anniversary Edition, Eliyahu M. Goldratt, North River Press, ISBN: 978-088427-195-6 (2014)
- *It's Not Luck: Marketing, Production and the Theory of Constraints*, Eliyahu M. Goldratt, North River Press, ISBN 978-056607-627-5, (2002)
- *The Choice*, Revised Edition, Eliyahu M. Goldratt and Efrat Goldratt-Ashlag, North River Press (2008), ISBN 978-088427-193-2



Other Resources Used in the Class

You will need software to build and submit the various logical maps (TOC Thinking Processes) that you will be doing in the course. Please use any of the following:

- Flying Logic, available <http://flyinglogic.com/>. Student discount of 40% will apply, use this code: WSU202
- Microsoft Visio
- Microsoft PowerPoint

Additional Suggested Reading

- *Thinking for a Change: Putting the TOC Thinking Processes to Use*, Lisa J. Scheinkopf, CRC St. Lucie Press (1999), ISBN 1-57444-101-9
- *TOC Thinking: Removing Constraints for Business Growth*, Yishai Ashlag, North River Press (2014), ISBN 978-088427-206-9
- Kristen Cox and Yishai Ashlag, *Stop Decorating the Fish*, North River Press (2018), ISBN 978-088427-284-7, 99 pages.
- Kristen Cox and Yishai Ashlag, *The World of Decorating the Fish*, The North River Press Publishing Corporation (2019), ISBN 978-088427-286-1, 119 pages.
- Daniel Kahneman, *Thinking, Fast and Slow*, Farrar, Straus and Giroux (2011), ISBN 978-0-374-27563-1, 499 pages
- H. William Dettmer, *The Logical Thinking Process: A Systems Approach to Complex Problem Solving*, ASQC Quality Press (2007), ISBN 978-0-87389-723-5, 444 pages.

Course Approach: Class meets Wednesdays from 5:15pm to 7:45pm Pacific time in the Blackboard Learn online classroom, according to the WSU Academic Calendar. There is no 'live' class on WSU holidays (class pre-recorded) or during break week. Course Content is posted to appropriately labeled sections of the online classroom and reviewed during 'live' and pre-recorded sessions. Class participation, reading assignments, and team and individual assignments successively build capability and confidence in the course material. Students demonstrate mastery of the course objectives through open book quizzes, assignments, and the application project.

Communication Methods

We use Tools within the Blackboard Learn online classroom (<https://learn.wsu.edu/>), including Zoom (for real-time class sessions), online Discussions, and Send Email (sends to @wsu.edu email). Please also check your WSU assigned email (@wsu.edu) daily for communications from the Engineering Technology Management (ETM) department, your faculty advisor, course instructors, and Blackboard Learn.

Tips for Being Successful in an Online Program

The most important step for being successful in an online graduate course is to schedule several hours per each class hour, each week, for class work – spread over multiple days. This time is needed to attend class (or listen to the class recording), complete the class reading and all related class assignments, to meet with team members, to perform additional research, and to review feedback received. Students should plan to dedicate up to 150 hours outside of class time per graduate course, to be successful; for condensed summer courses this equates to a nearly double time investment while the class is in session. Other tips include learning from each other; keeping an open mind and becoming an advocate for online learning; and building a support structure of folks who will help you achieve your learning goals.

Library Access

All students enrolled in WSU distance courses can use the WSU Libraries online databases at <http://libraries.wsu.edu>. Login with your WSU username and password if prompted. Students may also receive reference and research assistance from the online university services and borrow books and other circulating material and receive photocopies of journal articles. Visit the online university resources at <http://libguides.libraries.wsu.edu/global> for library support information and access to the online library tour for global campus students.

Global Campus Tech Support

Global campus tech support is available should you run into any technical difficulties related to the course:

- Phone: 509-335-4320 or 800-222-4978
- Email: wsuonline.support@wsu.edu, web: online.wsu.edu/techhelp

For information on technology requirements for accessing BB learn and attending class, see: <https://online.wsu.edu/currentstudent/tech-support/tech-requirements/>. To receive notifications about Blackboard outages please visit <http://lists.wsu.edu/join.php> and select the Blackboard-alerts option from the dropdown menu.

Objective and Learning Outcomes:

Students will gain a foundation in theory of constraints, improving their ability to think, focus, make decisions and communicate. Students will:

1. Describe the purpose and goal of a business system
2. Understand the impact of their decisions and actions on the performance of the system in which they work
3. Execute the TOC Five Focusing Steps to improve performance of a system
4. Utilize various TOC Thinking Process tools to solve day-to-day challenges
5. Utilize various TOC based methods to understand and gain collaboration from various stakeholders
6. Apply the TOC Thinking Processes systematically to a significant problem set and find the answers to the 3 questions of change: What to Change, To What to Change, and How to Cause the Change

Grading Distribution*

Participation / In-Class & Online Activities	15%
Individual Assignments	10%
Team Assignments	10%
Application Project	50%
Final Presentation	15%
TOTAL	100%

(*Please note assignments are submitted to a web-based anti-plagiarism system.)

Participation / In-Class & Online Activities

Participation covers a variety of modes. Participation shall include live class participation as well as contributions in the discussion board. Exercises will be given in class to be worked on individually or as a group. If a student misses a class, classwork may also be done asynchronously by watching the recording and uploading the classwork in Blackboard. Missed classwork should be submitted no later than a day prior to the next class session.

Individual and Team Assignments

Weekly homework sets will be assigned and posted on Blackboard. Assignments include but are not limited to the lecture topic and discussion, quizzes, and milestones toward your application project.

Application Project

Students will complete a major application project during the course. This project applies the TOC Focusing Steps and Thinking Processes to an important, significant topic in an area where the student has both intuition and energy. Ideally, the project addresses a real-time problem set in the student's place of employment and solving the problem set will be meaningful for both the student and the student's organization. The project will be submitted over several phases throughout the course.

Final Presentation

Instead of a final exam, each team will make a presentation that will cover key insights gained due to their participation in the course. Guidelines for the presentation will be provided during the second half of the semester.

Attendance

Although attendance is not required, students are responsible for fulfilling and timely submission of ALL requirements of the course, including classwork during the live sessions.

Student Effort

For each hour of lecture equivalent, students should expect to have a minimum of two hours work outside class. Schedule approximately 6-8 hours per week for course work, spread over multiple days.

Grading Scale

Final course grades are based on the student's performance as follows:

A	94 – 100	C+	77 - 79
A-	90 - 93	C	73- 76
B+	87- 89	C-	70 - 72
B	83 - 86	D	60 - 69
B-	80 - 82	F	0 - 59

All coursework MUST be completed and submitted by the designated due dates, in the designated Blackboard location. No credit is earned for late assignments unless explicitly stated as policy in the online classroom or in cases where the student has arranged an extension ahead of time with me (and that is quite possible, I try to be flexible with everyone's challenging circumstance and time constraints); with rare exceptions based on individual circumstances (inability to communicate with me ahead of time based on an emergency, for example).

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Course Schedule

#	Class	Reading Before Class	Class Topics	Course Work*
1	20 Jan	The Goal Handbook, Ch 1	Introduction to TOC	CW, HW Week 1
2	27 Jan	The Goal, 317-319, 74-75	5 Focusing Steps Throughput, Inventory, Operating Expense	CW, HW Week 2
3	3 Feb	It's Not Luck Handbook, Ch 25	Domain for your project UnDesirable Effects Current Reality Tree	CW, HW Week 3
4	10 Feb	Handbook, Ch 25 It's Not Luck, Ch 10	Current Reality Tree Core Conflict	CW, HW Week 4
5	17 Feb	The Choice (focus Ch 5-10)	Core Conflict Criteria for Solution	CW, HW Week 5
6	24 Feb		Invited Lecture: Stop Decorating the Fish Kristen Cox and Dr. Yishai Ashlag	CW, HW Week 6
7	3 Mar	Handbook Ch 25 It's Not Luck, Ch 8	Future Reality Tree Negative Branches	CW, HW Week 7
8	10 Mar	Handbook Ch 25	4 Quadrants of Change Negative Branches	CW, HW Week 8
	17 Mar	Spring Break		
9	24 Mar	Handbook, Ch 25 The Choice, P 169-223	Obstacles, Prerequisite Tree	CW, HW Week 9
10	31 Mar	Handbook, Ch 20	Layers of Resistance Transition Tree Introduction to S&T	CW, HW Week 10
11	7 Apr	Handbook, Ch 25 Handbook, p 444-445	When reality meets the plan: Mystery Analysis Evaporating Clouds	CW, HW Week 11
12	14 Apr	The Choice Handbook, Ch 24	TOC Thinking, Day to Day	CW, HW Week 12
13	21 Apr		Invited Lecture: The Role of a Leader Ret. General Andrew Busch	CW, HW Week 13
14	28 Apr		Invited Lecture: Dr. Alan Barnard	Final Project Due
15	5 May	Final Presentations		

* CW: Classwork may be given in class; HW: Homework assigned weekly
All assignments are due by midnight Pacific Time prior to class
Schedule is subject to change

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General Course Policies

Below are additional reminders about academic policies intended to create clear communication between faculty and students, and fair and equitable conditions of teaching and learning. The full text of all academic regulations is available at: <https://registrar.wsu.edu/academic-regulations/>.

Copyright Notice

The content of this program and the video transmissions of the classes are the property of Washington State University and are to be viewed and used only by persons currently enrolled in this course. The materials provided in this program are copyrighted and unauthorized duplication is not allowed without permission of the copyright holders. Any other use requires the express written consent of the Instructor.

Academic Integrity

Academic integrity is the cornerstone of higher education. As such, all members of the university community share responsibility for maintaining and promoting the principles of integrity in all activities, including academic integrity and honest scholarship. Academic integrity will be strongly enforced in this course. Students who violate WSU's Academic Integrity Policy (identified in Washington Administrative Code (WAC) 504-26-010(4)) will receive a zero on the assignment; further consequences range from failing the course, being placed on academic probation, or being dismissed from WSU. Students will not have the option to withdraw from the course pending an appeal and will be reported to the Center for Community Standards.

Cheating includes, but is not limited to, plagiarism and unauthorized collaboration as defined in the Standards of Conduct for Students, WAC 504-26-010(3). You need to read and understand all [the definitions of cheating](#). If you have any questions about what is and is not allowed in this course, you should ask course instructors before proceeding.

If you wish to appeal a faculty member's decision relating to academic integrity, please use the form available at <https://communitystandards.wsu.edu>. Make sure you submit your appeal within 21 calendar days of the faculty member's decision.

ETM mandates students to include the following statement on exams and other course assignments as required by the Instructor:

I commit myself to Washington State University's high standards to uphold academic honesty and scholarly values as established by the WSU's Standards of Conduct. I affirm that I have not given or received any unauthorized assistance on this assignment/examination, that the work product presented here is the work of the author(s) [myself or all team members listed], and that all materials from other sources (including books, articles, Internet, or other media), whether quoted or paraphrased, have been properly cited.

<signature>

Typing my name above serves as my signature

Academic Freedom

WSU supports the faculty's academic freedom, right to freedom of expression, and responsibility to fulfill course objectives that are approved by the Faculty Senate. This is fundamental to who

we are as an institution. Along with these rights comes the responsibility to protect the freedom of expression of all members of our community.

Communication

Please be reminded that we also recognize the importance of courtesy and decorum during all discussions – in class, in chat rooms, email, and other conversations. All official WSU email communication must be sent through the student’s WSU email address.

Professional Oral and Written Presentations

The WSU ETM Master’s degree is a professional graduate program. It is expected that student work be presented neatly and with correct English spelling, grammar, and punctuation. There are numerous software packages available to help student. Also, the Graduate and Professional Writing Center is available to help on-line students. Visit-

<https://writingprogram.wsu.edu/graduate-writing-center/> and
<https://writingprogram.wsu.edu/graduate-writing-center/professional-editing-service-center/> for services.

Incomplete Policy

An incomplete (I) grade is given to a student who, for reasons beyond the student’s control, is unable to complete the course requirements within the enrolled semester. An incomplete will only be considered if at least 50% of point assignments required in the course are completed and submitted by the end of the enrolled semester. The incomplete must be cleared and completed within one year following the semester in which the “I” grade was assigned. If the incomplete is not completed and a grade change is not submitted by the deadline, the grade will automatically change to an “F”.

A student may not simply repeat the course to remove an Incomplete grade. A student must have a written permission from their faculty advisor to register for future semesters if the student has two or more Incomplete grades on their transcripts. If a student intends to graduate less than one year following the semester in which the ‘I’ grade was assigned, the student must clear the incomplete before the end of the semester that they intend to graduate or receive a certificate. A student will not be allowed to graduate or receive a certificate with an Incomplete grade on their transcript.

A student who desires an Incomplete grade must:

- (1) Notify the professor in writing,
- (2) Provide sufficient reason for the incomplete request,
- (3) Complete and submit an Incomplete Grade Agreement Form found at <http://registrar.wsu.edu/ropubs>.

COVID-19 Policy (if/when on campus)

Students are expected to abide by all current COVID-19 related university policies and public health directives, which could include wearing a cloth face covering, physically distancing, self-attestations, and sanitizing common use spaces. All current COVID-19 related university policies and public health directives are located at <https://wsu.edu/covid-19/>. Students who do not comply with these directives may be required to leave the classroom; in egregious or repetitive cases,

students may be referred to the Center for Community Standards for university disciplinary action.

WSU Safety Statement

Classroom and campus safety are of paramount importance at Washington State University and are the shared responsibility of the entire campus population. WSU urges students to follow the “Alert, Assess, Act,” protocol for all types of emergencies and the **“Run, Hide, Fight”** response for an active shooter incident. Remain ALERT (through direct observation or emergency notification), ASSESS your specific situation, and ACT in the most appropriate way to assure your own safety (and the safety of others if you are able).

Please sign up for emergency alerts on your account at MyWSU. For more information on this subject, campus safety, and related topics, please view the FBI’s **Run, Hide, Fight video** and visit the **WSU safety portal**.

Full details can be found at <https://provost.wsu.edu/classroom-safety/>

Students with Disabilities:

Reasonable accommodations are available for students with documented disabilities or chronic medical or psychological conditions. If you have a disability and need accommodations to fully participate in this class, please visit your campus’ Access Center/Services website to follow published procedures to request accommodations. Students may also contact their campus offices to schedule an appointment with a Disability Specialist. All disability related accommodations are to be approved through the Access Center/Services on your campus. It is a university expectation that students visit with instructors (via email, Zoom, or in person) to discuss logistics within two weeks after they have officially requested their accommodations. **Students are responsible for initiating requests for reasonable accommodations and services that they need.**

For more information contact a Disability Specialist on your home campus:

- Pullman, WSU Global Campus, Everett, Bremerton, and Puyallup: 509-335-3417 [Access Center](https://www.accesscenter.wsu.edu) (https://www.accesscenter.wsu.edu) or email at access.center@wsu.edu
- Spokane: 509-358-7816 [Access Services](https://spokane.wsu.edu/studentaffairs/access-resources/) (https://spokane.wsu.edu/studentaffairs/access-resources/) or email j.schneider@wsu.edu
- Tri-Cities: [Access Services](http://www.tricity.wsu.edu/disability/) (http://www.tricity.wsu.edu/disability/) or email g.hormel@wsu.edu
- Vancouver: 360-546-9238 [Access Center](https://studentaffairs.vancouver.wsu.edu/student-wellness-center/access-center) (https://studentaffairs.vancouver.wsu.edu/student-wellness-center/access-center) or email van.access.center@wsu.edu

Student Grievance Process

If a WSU Online student has a complaint or problem, the University offers several remedies as outlined below. See: <http://online.wsu.edu/nonResidentComplaintProcess.aspx>

Academic Complaint Procedures (Academic Rule 1 04)

Students having complaints about instruction or grading should refer them first to the instructor. If

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the complaint is not resolved, then the student may refer the complaint in writing to the Chair of the department in which the course is offered by the end of the last day of the following semester (excluding summer term). The Chair's decision shall be rendered within 20 business days. After the Chair's decision, the student or the instructor may appeal to the Dean's Office. Complaints must be presented in writing to the Dean within 20 business days of the Chair's decision. The written statement should describe the complaint, indicate how it affects the individual or unit, and include the remedy sought from the Dean. The decision of the Dean is the final step and shall be made within 20 business days. The University Ombudsman is available at any stage for advice or assistance in resolving academic complaints. At the branch campuses, the procedure is identical except that the academic area coordinator shall substitute for the department chair and the campus dean shall substitute for the college dean.

Policy Prohibiting Discrimination and Sexual Harassment (Faculty Manual, p. 30).

This policy expresses WSU's commitment to maintaining an environment free from discrimination, including sexual harassment. This policy applies to all students, faculty, staff, or others having an association with the University.

Additional information may be found in the Code WAC 504-26-220,-222, and -227. Relevant WSU policies and procedures can be located at <https://ccr.wsu.edu/policies/>. Complaints about discrimination or/sexual harassment can be directed to WSU's Compliance and Civil Rights, <https://ccr.wsu.edu/file-a-complaint/>. For WSU graduate students, procedures can also be found at <https://gradschool.wsu.edu/documents/2017/07/gs-grievance-procedures.pdf/>. Visit the Office of Compliance and Civil Rights (<https://ccr.wsu.edu>) for more information.

Accommodation for Religious Observances or Activities

Washington State University reasonably accommodates absences allowing for students to take holidays for reasons of faith or conscience or organized activities conducted under the auspices of a religious denomination, church, or religious organization. Reasonable accommodation requires the student to coordinate with the instructor on scheduling examinations or other activities necessary for course completion. Students requesting accommodation must provide written notification within the first two weeks of the beginning of the course and include specific dates for absences. Approved accommodations for absences will not adversely impact student grades. Absence from classes or examinations for religious reasons does not relieve students from responsibility for any part of the course work required during the period of absence. Students who feel they have been treated unfairly in terms of this accommodation may refer to Academic Regulation 104 - Academic Complaint Procedures. See also Rule 82.

Academic Calendar

Students should refer to the academic calendar to be aware of critical deadlines throughout the semester. The WSU Online academic calendar can be found at <http://registrar.wsu.edu/academic-calendar/>.