Academic Year	2021-2022	**Semester**	2
Course Coordinator	Dr Geraldine Song		
Course Code/s	CY0001		
Course Title	Writing Across The Disciplines		
Pre-requisites	None		
No of AUs	3		
Contact Hours	3 hours per week, seminar 39 hours total TBL (Team-Based Learning)		

Course Aims

This course has two aims.

The first supports you in thinking, reading and writing critically about concepts found in the various disciplines of the humanities. Writings in the humanities contain abstract concepts that often turn into scientific and technological reality. It is important for you as a scholar to learn how concepts in STEM disciplines have roots that go back to the humanities. It is also relevant for you to understand how scientific and engineering innovations have objectives that promote the quality of life for all members of our human race. You will learn to identify different methodologies and approaches to texts and discuss the rhetoric and reasoning employed in these texts. You will then apply these approaches to the real world of scientific and engineering technologies and events.

The second aim is to support your communication and presentation of scientific and technical concepts to the lay public. You will learn to explain technical terms in STEM fields in language that the non-scientific public can understand. You will learn to write and present persuasively, so that the lay public will be convinced of the scientific findings and results. This is important for you as a STEM scholar, as you will be facing policy makers and politicians in your career, and you should acquire the skills and techniques of persuasion and rhetoric.

Intended Learning Outcomes (ILO)

By the end of this course, you (as a student) would be able to:

1. define the philosophical concepts in the discipline of humanities.
2. apply the concepts you have learned from the humanities to issues and events faced in the STEM fields.
3. write a blog article with descriptions and explanations of scientific and/or engineering concepts and findings in plain English.
4. explain the scientific and/or engineering possibilities and impossibilities in selected sci-fi films to the lay public.
5. present (in your group) your chosen emerging field of science and/or technology to the lay public.

Course Content

Topics:

Why write? For whom and to whom?
Dissemination of scientific and engineering knowledge
Knowing your audience
Giving constructive criticism
Receiving criticism with confidence

The 21st century engineer and scientist
Educating the public
The role of humanities in STEM and policy
Emerging scientific and engineering fields
Presenting scientific and engineering ideas to the public
Interpreting science and technology in films

Assessment (includes both continuous and summative assessment)

Component	**Course LO Tested**	**(Grad Attributes – 3 Cs)**	**Weighting**		**Assessment rubrics**
			Indiv	**Team**	
1. Individual Readiness Assurance tasks (iRAs)	--	Individual and Team Work; (Ethical Reasoning - Character)	5%		--
2. Team Readiness Assurance tasks (tRAs)	1, 2	Individual and Team Work; (Cognitive Agility, Competence)		5%	--
3. Application Exercises (AEs)	1, 2	Life-long Learning; (Cognitive Agility, Competence)		10%	Appendix 1
4. Blog: Describing and promoting your favourite scientific or engineering topic	1, 2, 3	(Ethical Reasoning – Character)	30%		Appendix 2
5. Essay: Analyse a film for its scientific and engineering possibilities and impossibilities	4	Life-long Learning; (Cognitive Agility, Competence)	30%		Appendix 3
6. Presenting emerging scientific and/or engineering concepts to the lay public	5	Self-discipline & Disciplinary Depth – (Competence)	10%	10%	Appendix 4
Total			75%	25%	

1. <u>Individual Readiness Assurance Tasks (iRAs)</u>
Individually, you will answer eight to ten questions in multiple choice format.

2. <u>Team Readiness Assurance Tasks (tRAs)</u>
In your groups, you discuss the same questions as in the iRA, and decide on the answer to those questions. This activity may be an open-book activity, according to your teacher's instruction for that week.

3. <u>Application Exercises (AEs)</u>

This activity involves application exercises on the concepts learned for the week. Application Exercises are given in the form of questions for discussion, or you may be given a paragraph from the readings, and specific questions are asked based on the paragraph. Your answers to these AEs should be in paragraph form, and sometimes in bullet points. It may also include screenshots and images from your research during this activity. You are required to be an active member of this group activity, whether or not you are the group leader for the week.
Exercises may include the following:
[a] searching for real-life examples similar to those mentioned in the readings.
[b] searching for films/novels/poetry that portray or exemplify the concepts in the readings.
[c] suggesting possible answers to problems mentioned in the readings (occasionally you are asked to compose creative pieces too).

4. Writing a Scientific or Technical Blog
You are required to choose your favourite scientific or engineering topic and write a blog to educate the public about how science and/or engineering is relevant to us individuals on this planet.

5. Analysing a sci-fi film
You will describe the scientific and/or engineering innovations in the film's story and analyse the possibilities and impossibilities of the film's portrayal of futuristic technologies.

6. Presenting Scientific Concepts to the Non-Scientific Public
Your group will pick one emerging scientific or engineering field and describe the technical aspects to the lay public. You will also consider the human and environmental impact of this emerging field.

Formative feedback

Feedback will be given in the following ways:

1. Clarifying lecture after iRA and tRA. The two Readiness Assurance tasks will identify where most of the points have not been understood or misunderstood.
2. Oral feedback after AEs.
3. Written feedback blogs
4. Conferencing on topics.
5. Oral feedback on Presentation.

Learning and Teaching approach

Approach	**How does this approach support students in achieving the learning outcomes?**
TBL (Team-Based Learning)	- **Individual Readiness Assurance Task – iRA** This task is undertaken to assure the student that s/he has understood the concepts and prepares the student for team-based assessments. - **Team Readiness Assurance Tasks – tRA** The group is assessed as a team, and this is done immediately after the iRA. *The questions in this task are exactly the same as the ones in the iRA*. This is to ensure that the group members will be able to discuss and analyse the *same* philosophical concepts and approaches found in the text that they have read. They may also discuss the rhetoric and reasoning employed in these texts.

	- **Clarifying Lecture** The tRAs will have revealed which concepts were not understood, or misunderstood, and a mini lecture will be conducted to clarify these areas. - **Application Exercises – AEs** These exercises build on concepts and ideas gleaned from the tRAs completed earlier. AEs are designed to assure the students that *after* they have identified, differentiated and explained the concepts, they are able to analyse various primary readings *using the knowledge of the concepts learned*.

Reading and References

Aines, Roger D., and Amy L. Aines. *Championing Science: Communicating Your Ideas to Decision Makers*. California: UC Press, 2019.

Barthes, Roland. "An Almost Obessive Relation to Writing Instruments." *Le Monde*, Sep 27, 1973: 177-182. Web.

Ben-Haim, Yakov. "Why The Best Engineers Should Study Humanities." *International Journal of Mechanical Engineering Education*, Vol. 8 No. 3: 195-200. Web.

Chambers, Harry E. *Effective Communication Skills for Scientific and Technical Professionals*. Cambridge MA: Perseus, 2001.

Deresiewicz, William. "How College Sold Its Soul … and surrendered to the market." *Harpers*, Sep 2015: 24-32. Web.

Derrida, Jacques. "The Principle of Reason: The University in the Eyes of Its Pupils." *Diacritics*, Vol. 13 No. 3 (Autumn 1983): 2-20. Web.

Dick, Philip K. *The Minority Report*. New York: Pantheon Publishing, 2002.

Foucault, Michel. ""Panopticism" from *Discipline & Punish: The Birth of the Prison.*" *Race/Ethnicity: Multidisciplinary Global Contexts*, 2.1 (2008): 1-12. *Project Muse.* Web.

Fussell, Paul. "An Anatomy of the Classes." *Everyday Theory*. Eds. Becky McLaughlin and Bob Coleman. New York: Pearson Longman, 2005.

Illingworth, Sam, and Grant Allen. *Effective Science Communication: A Practical Guide to Surviving as a Scienitst*. Bristol, UK: IOP Publishing, 2016.

Krahn, Timothy, Andrew Fenton, and Letitia Meynell. "Novel Neurotechnologies in Film: A Reading of Stephen Spielberg's *Minority Report*." *Neuroethics*, 3 (2010): 73-88. Web.

Riemer, Mark J. "Communication Skills for the 21st Century Engineer." *Global J. of Engng. Educ*, Vol. 11 No. 1 (2007): 89-100. Web.

Robinson, Douglas K.R., Lu Huang, Ying Guo, and Alan L. Porter. "Forecasting Innovation Pathways (FIP) for new and emerging science and technologies." *Technological Forecasting and Social Change*. Vol. 80 (2013): 267-285. Web

Said, Edward. "The Politics of Knowledge." *Raritan: A Quarterly Review*, Vol. 11 Issue 1 (Summer 1991): 1-9. Web.

Sanitt, Nigel. *Culture, Curiosity and Communication in Scientific Discovery: The Eye in Ideas*. London; New York: Routledge, 2019.

Sartre, Jean-Paul. "Why Write?" *Everyday Theory*. Eds. Becky McLaughlin and Bob Coleman. New York: Pearson Longman, 2005.

Spielberg, Stephen, dir. *Minority Report*. 2002.

Zhou, Yuan, Fang Dong, Dejing Kong, and Yufei Liu. "Unfolding the Convergence Process of Scientific Knowledge for the Early Identification of Emerging Technologies." *Technological Forecasting and Social Change*. Vol. 144 (2019): 205-220.

Course Policies and Student Responsibilities

(1) General

You are expected to complete all assigned pre-class readings and activities, attend all seminar classes punctually and undertake all scheduled assignments and tasks by due dates. You are expected to take responsibility to follow up with course notes, assignments and course related announcements for seminar sessions they have missed. You are expected to participate in all seminar discussions and activities.

(2) Absenteeism

TBL requires you to be in class to contribute to team work. In-class activities make up a significant portion of your course grade. Absence from class without a valid reason will affect your overall course grade. Valid reasons include falling ill supported by a medical certificate and participation in NTU's approved activities supported by an excuse letter from the relevant bodies. There will be no make-up opportunities for in-class activities.

If you miss a seminar session, you must inform your team members and me via email (include email address) prior to the start of the class. Students who miss tRAs and team in-class activities with valid reasons will keep the team score. Students who miss iRAs or tRAs without valid reasons will not be given the grade.

Academic Integrity

Good academic work depends on honesty and ethical behaviour. The quality of your work as a student relies on adhering to the principles of academic integrity and to the NTU Honour Code, a set of values shared by the whole university community. Truth, Trust and Justice are at the core of NTU's shared values.

As a student, it is important that you recognize your responsibilities in understanding and applying the principles of academic integrity in all the work you do at NTU. Not knowing what is involved in maintaining academic integrity does not excuse academic dishonesty. You need to actively equip yourself with strategies to avoid all forms of academic dishonesty, including plagiarism, academic fraud, collusion and cheating. If you are uncertain of the definitions of any of these terms, you should go to the academic integrity website for more information. Consult your instructor(s) if you need any clarification about the requirements of academic integrity in the course.

Course Instructor

Instructor	Office Location	Phone	Email
Dr Geraldine Song	HSS-04-29	93638683	GSSong@ntu.edu.sg

Planned Weekly Schedule

Wk	Topic	LO	Readings	Activities/Notes
1	- Intro to Course	1, 2	Readings: The four short articles are on NTULearn.	Please bring your tablets or laptops every week
2	- Why write? To and for whom?	1,2	- Jean-Paul Sartre - Roland Barthes	
3	- Oriented research: Dissemination of scientific and engineering knowledge - Knowing your audience	1, 2	- Aines and Aines Chp 1 pp3-9 Championing the Sciences - Aines and Aines Chp 3 pp14-26 Extracting the Essence - Aines and Aines Chp 4 pp27-41 Who's Listening? - Jacques Derrida	IRA and TRA
4	- Giving constructive criticism - Receiving criticism with confidence	1, 2	- Harry E. Chambers Chapter 4 Giving and Receiving Criticism - Edward Said	Presentations
5	- The 21st century engineer and scientist	1, 2, 3	- Mark J Riemer - William Deresiewicz	IRA and TRA
6	- Educating the public		- Illingworth and Allen Chapter 7	Looking at Assignment Q
7	- The role of humanities in STEM and policy	1, 2	- Illingworth and Allen Chapter 8 Science and Policy - Michel Foucault	IRA and TRA

Recess Week				
8	- Emerging scientific and engineering technologies	3	- Chambers Chapter 6 Communicating Technical Info to Non-Techies - Robinson et al - Zhou et al	AEs
9	- Presenting scientific and engineering ideas to the lay public	4, 5	- Aines & Aines pp 57-60, 79-84 Telling a Story - Sanitt Chapter 8 Science and Literature - Sanitt Chapter 10 Science and Art	AEs
10	- Interpreting science and engineering in film and fiction	4,	- Krahn et al - Philip K. Dick - *Minority Report*, film	AEs
11	- Presentation of proposals (group)	5	--	
12	- Consultations and feedback	--	- Bring along your drafts for feedback and peer review	
13	- Group presentations	5	--	

Appendix 1: Assessment Criteria for Application Exercises

Standards	Criteria
A+ / A	Clear, concise, scrupulously accurate, polished, and sometimes innovative or original language used to express complex and abstract ideas and information.
A-	Clear, concise, mostly accurate, polished, and with good language & scholastic expression used to convey complex and abstract ideas and information.
B+ / B	Correct but occasionally stilted, or awkwardly expressed, although meaning is generally retained.
B- / C+	Partially correct and awkwardly expressed, rendering the answer simplistic and feeble.
C / D+ / D	Awkwardly expressed with oversimplified expression resulting in overall lack of clarity of meaning.
F	Didn't hand in answer.

Appendix 2: Assessment Criteria for Blog

Standards	Criteria
A+ / A	○ Introduction fulfils both clearly and succinctly: background, context. ○ Structure fulfils all four clearly and succinctly: objectives, research findings, recommendations, benefits. ○ Audience awareness fulfils all three: people-centred, political correctness, appropriate tone. ○ Explaining jargon and technical terms in identifiable layman's language, using concrete, identifiable, everyday examples. ○ Language requirements fulfills all four: succinct sentencing, active voice, positive phrasing, and perfect grammar.
A-	○ Introduction fulfils both clearly and succinctly: background, context. ○ Structure fulfils all four clearly and succinctly: objectives, research findings, recommendations, benefits. ○ Audience awareness fulfils all three: people-centred, political correctness, appropriate tone. ○ Explaining jargon and technical terms in identifiable layman's language, using some concrete, identifiable, everyday examples. ○ Language requirements fulfills at least two, including perfect grammar: succinct sentencing, active voice, positive phrasing.
B+ / B	○ Introduction fulfils both fairly clearly but not succinctly: background, context. ○ Structure fulfils at least two or three clearly and succinctly: objectives, research findings, recommendations, benefits. ○ Audience awareness fulfils at least two: people-centred, political correctness, appropriate tone. ○ Explaining jargon and technical terms in identifiable layman's language, using very few concrete, identifiable, everyday examples. ○ Language requirements fulfills at least two, with a few grammar errors: succinct sentencing, active voice, positive phrasing.
B- / C+	○ Introduction doesn't provide background, context not explained fully. ○ Structure and explanations of objectives, research findings, recommendations, and benefits are unclear, or not discussed. ○ Unaware of being people-centred, some evidence of political incorrectness, and use of inappropriate tone. ○ Not explaining jargon and technical terms in identifiable layman's language, using very few or no concrete, identifiable, everyday examples. ○ Language requirements fulfills at least one, with a few grammar errors and typos: succinct sentencing, active voice, positive phrasing.
C / D+ / D	○ Introduction no background, context unclear. ○ Structure and explanations of objectives, research findings, recommendations, and benefits are unclear, or not discussed. ○ Unaware of being people-centred, full of political incorrectness, and use of inappropriate tone. ○ Not explaining jargon and technical terms in identifiable layman's language, using no concrete, identifiable, everyday examples. ○ Language requirements fulfills at least one, with shocking grammar errors and typos: succinct sentencing, active voice, positive phrasing.

Appendix 3: Assessment Criteria for Essay

Standards	Criteria
A+ / A	○ Detailed close reading of film, inclusion of specific textual evidence (not just summary and description). ○ Clear explanations in layman's terms of scientific and technical processes in the film. ○ Clear and logical explanations of the possibilities and impossibilities of science and engineering in the film. ○ Good attention to audience, including respectful tone. ○ Excellent use of simple and concise English, no grammatical errors. ○ Consistent scholarly format and documentation. No typos.
A-	○ Detailed close reading of film, inclusion of general textual evidence (not just summary and description). ○ Clear explanations in layman's terms of scientific and technical processes in the film. ○ Logical explanations of the possibilities and impossibilities of science and engineering in the film. ○ Good attention to audience, including respectful tone. ○ Excellent use of simple and concise English, very few grammatical errors. ○ Consistent scholarly format and documentation. One or two typos.
B+ / B	○ Detailed reading of film, inclusion of general textual evidence (not just summary and description). ○ Mostly clear explanations in layman's terms of scientific and technical processes in the film. ○ Logical explanations of the possibilities and impossibilities of science and engineering in the film. ○ Some attention to audience, including respectful tone. ○ Use of simple and concise English, although sometimes awkwardly written, some grammatical errors. ○ Fairly consistent scholarly format and documentation. Some typos.
B- / C+	○ Simple reading of film, inclusion of general textual evidence (mostly summary and description). ○ Vague explanations and heavy use of technical terms. ○ Fuzzy explanations of the possibilities and impossibilities of science and engineering in the film. ○ Some attention to audience, condescending tone. ○ Use of grandiose or complicated English, awkwardly written, many grammatical errors. ○ Inconsistent scholarly format and documentation. Many typos.
C / D+ / D	○ Simple reading of film, no textual evidence (mostly summary of film). ○ Vague explanations and heavy use of technical terms. ○ Fuzzy explanations of the possibilities and impossibilities of science and engineering in the film. ○ Ignoring the audience, condescending tone. ○ Use of grandiose or complicated English, awkwardly written, many grammatical errors. ○ Inconsistent non-scholarly format. Dreadful typos.

Appendix 4: Assessment Criteria for Presenting Scientific Concepts to a non-Scientific Audience
In this presentation assignment, you are to pick one emerging scientific or engineering field and present according to the rubric in the assignment question.

Grades	Criteria for Group Work	Criteria for Individual Presentation
A+ / A	○ Using the story structure clearly: identity of group; their learning journey, their problems and how they surmounted them; their research results and recommendations ○ Recommending strong questions for useful further research ○ Reinforcing all key items on graphs and simplifying all wedges ○ Explaining all equations in layman's terms ○ Providing context of all photographs and pictures, and pointing to important features in them.	○ Confident body language: posture, use of space, eye contact etc ○ Clear voice projection ○ Enthusiastic and persuasive
A-	○ Using the story structure clearly: identity of group; their learning journey, their problems and how they surmounted them; their research results and recommendations ○ Recommending some questions for useful further research ○ Reinforcing some key items on graphs and simplifying some wedges ○ Explaining some equations in layman's terms ○ Providing context of some of the photographs and pictures, and pointing to important features in them. ○	○ Confident body language: posture, use of space, eye contact etc ○ Clear voice projection ○ Enthusiastic and persuasive
B+ / B	○ Using some parts of the story structure: identity of group; their learning journey, their problems and how they surmounted them; their research results and recommendations ○ Weak recommendations for further research ○ Reinforcing some key items on graphs and simplifying some wedges ○ Explaining some equations in layman's terms, and using too many equations (instead of explanations) ○ Providing context of some of the photographs and pictures, and pointing to a few important features in them.	○ Confident body language in some areas: posture, use of space, eye contact etc ○ Voice not projected half the time. ○ Enthusiastic but unpersuasive

B- / C+	○ Hodge-podge structure: identity of group; their learning journey, their problems and how they surmounted them; their research results and recommendations ○ Weak or no recommendations for further research ○ Reinforcing some key items on graphs and simplifying some wedges ○ Explaining some equations in layman's terms, and using too many equations (instead of explanations) ○ Providing context of some of the photographs and pictures, and pointing to a few important features in them.	○ Poor body language ○ Poor voice projection ○ Timid and unpersuasive
C / D+ / D	○ No structure ○ No recommendations for further research ○ Too many technical graphs and complicated wedges ○ Explaining some equations in layman's terms, and using too many equations (instead of explanations) ○ Photographs and pictures are not given context in layman's terms	○ Poor body language ○ Poor voice projection ○ Poor attitude