Peer Teaching Evaluation of Dr. Dustin Gilbert

The peer teaching evaluation of Dr. Dustin Gilbert took place in March to May of 2022. During this time, his instruction in the course MSE 120/127: *Impact of Materials on Society*, was observed a total of five times. The members of the peer teaching evaluation committee were Dr. David Mandrus (MSE department, committee chairman), Dr. Gerd Duscher (MSE), and Dr. James Ostrowski (ISE). The following evaluation summary addresses the five stated review criteria from the COE Peer Teaching Review Procedure. The committee was provided with access to the Canvas website for the course which contained the syllabus, course timeline, and lecture slides. The committee also met with the students one day after class for about ten minutes.

Below, we address each of the five COE criteria for the Peer Teaching Evaluation.

1. Appropriateness of course content to departmental expectations for the course and its position in the curriculum for appropriate degree programs.

MSE 120/127 seeks to provide insights into how materials and materials science have impacted the trajectory of society. Examples emphasize the use of the materials science paradigm (processing → structure → properties → performance), identifying how new processing techniques make new materials that transform society, or new demands by society motivate new processing. Changes in society can include labor issues, economics, ethics, morals, behavior, war, geopolitics, environmentalism, gender and racial inequality, religion, policy and law, quality of life and community structure. Specific examples are provided, when available. The class follows chronologically from ancient times to modern materials (stone → clay → wood → furs and textiles → copper → bronze → steel → ceramics/glass → cement → aluminum → polymers → oil → energy materials → electronic materials → GMO, agrimaterials and foodstuffs).

Distinguishing this class from traditional science and engineering classes, material will also focus on the larger social context surrounding the materials performance; distinguishing this class from a traditional social science class, the materials will be presented and discussed with technical detail of the underlying materials science and quantitative support for the social impact.

Two textbooks were assigned: "*Substance of Society*" by Stephen Sass; and "*The Social Life of Materials*" by Adam Drazin. These books are popular accounts and are aimed at a non-specialist audience. This is appropriate given the class aims.

2. Appropriateness of course content and expected skill development with respect to course goals and objectives.

The stated learning objectives of the course are:

- Students will develop a working knowledge of the Materials Science Paradigm with specific examples of key materials.
- Students will demonstrate the ability to describe fundamental principles and chief discoveries through appropriate use of the basic vocabulary of a course's discipline.

- Students will demonstrate the ability to identify the scientific dimensions of contemporary issues.
- Students will identify and critique claims about human behavior and the dynamics of individual, political, and social issues.
- Students will demonstrate knowledge of appropriate and ethical methods, technologies, and data that social scientists use to investigate and describe the human condition.

As judged by the syllabus and assigned readings and homework, all of these objectives are being met or exceeded.

3. Consistency of course evaluation techniques with respect to expected learning outcomes for students.

The grading scheme for the class was as follows:

- Notes on the Weekly Reading (**20**%)
- 2 page reflection essay: "What if a critical material was different, how would society be different?" (**25**%)
- 2 page research essay about a material/society correlation not discussed in class (**25**%)
- Socratic Group Discussion "What is the Most Important Material and Why" (**30**%)

There were no tests, and the student workload was quite light. It is clear that the class was meant to be a "fun" class for the students, and not too demanding. The committee thought that the evaluation techniques were appropriate.

4. Teaching methodologies

The evaluation team collectively observed six different classes. The following comments are general and based on the classroom observations:

Prof. Gilbert started promptly. He spoke at a volume that was sufficient to be heard by all students in the classroom. His voice is animated. He delivered the lecture with an appropriate level of emphasis and not in a monotone.

Prof. Gilbert was well prepared. He had a suite of Powerpoint slides prepared. The slides were a combination of graphics, equations, text, and short videos designed to provide the framework of the lecture but not designed to be read. The slides were obviously created by Prof. Gilbert and contained carefully rendered, multidimensional graphics that were annotated to drive home his points.

Prof. Gilbert frequently revered back to past lectures and so integrated the material in a larger frame. From the responses of students, it was evident that the material was well retained.

Prof. Gilbert had a good level of interaction and classroom participation. He repeatedly invited questions from the class. Sometimes the questions elicited no response from the students, but in

some instances, he halted the lecture until he received a reply from at least one student in the classroom. His lectures would possibly benefit by integrating some "active learning" modules.

Prof. Gilbert effectively uses demos to enhance student learning. One day he brought in pieces of chocolate and a hot plate to demonstrate how different polymorphs have different properties.

5. Recognition of innovative pedagogical approaches by faculty member if applicable.

Prof. Gilbert has designed and implemented several memorable demos for the class to illustrate basic principles of materials science. These demos were highly praised by the students.

6. Summary

In summary, the instruction by Dr. Dustin Gilbert and the course content for MSE 120/127 are appropriate to the department expectations and the course objectives. The course is correctly placed in the curriculum. The teaching methodology and student learning evaluation instruments are effective. The instructor has the appropriate respect of and rapport with the students. The students enjoyed Professor Gilbert's lecture style and especially his demos. Overall, Prof. Gilbert's lectures were straightforward and well-organized. The level and depth of the material is appropriate for an introductory-level class.