

Chapter 8

Program Criteria

The program criteria for Metallurgical and Similarly Named Engineering Programs indicate the following:

8.1 Curriculum

The program must demonstrate that graduate have:

- a. An ability to apply advanced science (such as chemistry and physics) and engineering principles to engineering systems,
- b. An integrated understanding of the scientific and engineering principles underlying the four major elements of the field: structure, properties, processing and performance related to material systems,
- c. The ability to apply and integrate knowledge from each of the four major elements of the field to solve materials selection and design problems,
- d. An ability to utilize experimental, statistical and computational methods consistent with the goals of the program,

8.2 Faculty

The Faculty expertise for the professional area must encompass the above four major elements of the field.

These criteria are met, as can be seen by a comparison of the Metallurgical Engineering criteria with our program specific educational objectives. Table L compares our objectives 1 – 5 with the Met E criteria, showing specific correlation between the two.

Similarly, the Met E criteria map specifically to our specialty Met E courses. This alignment is shown in Table M.

The Metallurgical Engineering faculty have ample experience with the four elements of the field. All Met E faculty are involved in research and are well acquainted with structure/property/processing relationships. Also, 3 Met E faculty members have or have had research interactions and development contracts with industry, cementing their knowledge of real applications of ceramic materials. Overall, practical knowledge of materials applications among the faculty as a whole would be rated quite high.

Table L: Alignment of Met E Criteria with Program Specific Objectives

| Met E Criteria | Ability to apply adv. sci and engr principles to engr systems | Integrated underst of sci and engr principles underlying field | Ability to apply and integrate knowledge from elements of field | Ability to use experimental statistical and comp methods |
|--|---|--|---|--|
| Educational objectives | | | | |
| Apply advanced science to engineering systems | X | | | |
| Apply the science and engr principles underlying structure, properties, processing and applications of materials systems | X | X | X | |
| Solve materials selection and design problems | X | X | X | X |
| Use experimental, statistical and computational methods | | | X | X |
| Use hands on labs to solve real engineering problems | X | | | X |

Table M: Alignment of Met E Criteria with Met E specialty courses

| Cer E Criteria | Ability to apply adv sci & engr principles to engr systems | Integrated underst. of sci & engr principles underlying field | Ability to apply & integrate knowledge from elements of field | Ability to use experimental, stats and comp methods |
|--------------------------|--|---|---|---|
| Specialty Courses | | | | |
| MetE 421 | X | | X | X |
| MetE 461 | X | X | X | |
| MetE 462/465 | X | X | X | X |
| MetE 463 | X | X | X | X |
| MetE 464 | X | X | X | X |