

達姆施塔特工業大學返國報告書

26-1 學校簡介

達姆施塔特工業大學(TU Darmstadt)位於德國黑森邦的科學之城達姆城，鄰近美因河畔法蘭克福，不到一小時的車程即可抵達法蘭克福國際機場。達姆工大以理工為強項，是德國九所卓越理工大學聯盟(TU9)的一員，機械系與電機系等工程相關科系在德國排名均位於前三名。

26-2 國外研修之課程學習（課內）

體驗德國的上課情況，小班上課或大班上課我皆有體會過，歐洲的學生勇於表達自己想法，喜歡問老師問題以及與老師互動。在 TUD，每學期只會在學期末有一次考試，大部分科日期末考分數佔學期總成績 100%，每一科考試總共有三次機會，如果三次機會皆未通過，則不可繼續就讀該學科相關的科系。因此學生都在自己準備充足以後才會註冊考試，尤其必修課都有一定難度，大部分的學生往往第一次考試都沒辦法通過。

以機械系而言，德國大部分學校的機械系中，學士與碩士皆為德文學程。TUD 的機械系也是如此，學士課程皆為德文授課，碩士課程會有少部分的英文授課，但主要還是以德文為主。

以我在 TUD 修的其中兩門機械系的課程舉例，一門是研究所英文授課的課程，課程名稱為航天力學，另一門為大學部德文授課的課程，課程名稱為材料力學。

航天力學是研究所的課程，少數的一門英文授課，這門課的授課老師 Dr. Markus Landgraf 同時也任職於歐洲太空總署(ESA)。這門課的課程內容為二體問題、軌道問題、剛體動力學、空間軌跡、地球軌道與火箭動力學等。由於內容太多太廣，以及上課時數不夠，老師把許多他自己錄製的課程影片上傳至網路上供大家自己回家學習，上課時老師會做各個單元的總結與補充，並幫學生解答疑問以及與學生分享討論一些實際案例。

材料力學則為機械系大學部的必修課，因此為德文授課。這門課的課程內容為應力應變、剪切應力、軸向負荷、扭矩等。這門課我在台灣已經修過，但為了加強德文，我又旁聽一遍，上課內容與台灣大致相同，但德文授課比德文的生活對話快速且困難許多，並且需要另外背許多專有名詞。這門課是大學部必修課程，所以為大班級上課，總共有 900 多位學生一同在大講堂聽課。

26-3 國外研修之生活學習（課外）

除了學校課程外，在週末我也常常參加學生在自己宿舍舉辦的 Party，認識來自世界各地的朋友。德國因為位在中歐，到歐洲各國旅遊相當方便，且因為達姆工大離法蘭克福國際機場非常近，皆有廉價航空可以搭乘。飲食方面通常自己煮會比外食便宜許多，城內有許多超市都買的到食材，也有亞洲超市可以買些食材做家鄉菜。

26-4 交換/研修之具體效益（請條列式列舉）

- 1.增進外語能力(德文)
- 2.適應力變強
- 3.廚藝進步
- 4.自信心增加

26-5 感想與建議

在德國的生活步調不像台灣那麼快，生活環境好，空氣品質也非常好。達姆工大是間全球知名的大學，有許多世界各地的學生在此就讀，剛好讓我有機會交流與認識各國優秀的人才。經歷過在德國一年的生活，我覺得自己成長了不少，獨立生活、語言能力、問題溝通與解決以及拓展自己的視野。尤其體會到語言的重要性，在德國除了旅遊景點或大城市以外，許多地區的德國人是不會或不願意講英文的，因此多少會一點德文在德國還是很吃香的。德國政府機關的行政效率也不像台灣那麼好，因此許多事需要事先計畫以及安排好，以免臨時到行政單位辦事時吃閉門羹。在德國的生活步調不像台灣那麼快，生活環境好，空氣品質也非常好。建議有想要到德國的同學盡早開始學習德文，對於前往德國生活一定有非常大的幫助。

26-6 相片



Darmstadt 市中心，同時也是交通樞紐。



TU Darmstadt 圖書館與教學大樓。



機械系系館門口的大齒輪。

26-7 英文心得

I have been to Technical University of Darmstadt in Germany as an exchange student for one year. TU Darmstadt is one of Germany's leading university. TU Darmstadt is located in Darmstadt, a science city in Hessen, and it is close to Frankfurt am Main. TU Darmstadt is famous of its engineering and natural sciences. TU Darmstadt is one of Germany's leading university.

I have taken courses taught in English and German. Every courses for bachelor's degree in the department of mechanical engineering are taught in German. There are a few courses taught in English for master's degree. At TU Darmstadt, there will only be one exam at the end of the semester and it will be 100% of the total score of the semester. There are only three chances to pass one subject, and you need to prepare well before you take the exam. I will take the examples of two courses I have taken in the department of mechanical engineering. One is space flight mechanics and the other one is mechanics of materials.

Space flight mechanics is taught in English. The teacher of space flight mechanics, Dr. Markus Landgraf, also works at the European Space Agency (ESA). The course contents are the two-body problem, the orbital problem, the Kepler problem, the rocket equation and staging, and relative motion. The course is targeted towards students of the department of mechanical engineering. Basic mathematical and mechanics knowledge is required. The teacher also upload some videos for the course to the Internet, because there are too many details that he don't have time to mention in the course. During the class, the teacher summarized every chapter and answered the questions from students. He also shared and discussed some practical cases with students.

The other subject is mechanics of materials. It is a compulsory course for the bachelor of the department of mechanical engineering and it is taught in German. I have finished the course while I was in Taiwan. I took the course again to improve my German listening. The contents of the course are almost as same as the course in Taiwan. There are stress, strain, bending, shear stress, torsion, and energy methods. However, the teacher's German speaking was really fast. And I had to memorize the German vocabularies. The course was too hard for me to understand.

There were a lot of parties held by students in the flats every weekend, I have made a lot of foreign friends by enjoying the parties. Because Germany is located at the central of Europe, I also got chances to travel around in Europe by bus or plane. I have improved my German and my cooking skill, and I also met a lot of people from different countries to understand different cultures. I am also more confident after I stay in Germany for one year, because they encourage everyone to show their own opinions and respect the opinions. It will be better to speak German in Germany, because they may not understand English.

It is a really good opportunity and experience to study and live in Germany for one year. The days during the stay in Germany will be part of the most beautiful memory in my life forever.