# NORTHERN ARIZONA UNIVERSITY

## Office of the Provost

**Do class meeting times impact student academic performances measured in DFW rate?**
**1/18/2019**

Conventional wisdom assumes that classes scheduled in early morning or late afternoon or evening may have negative impacts on student overall academic performance measured in DFW rate since some students may not be ready yet for early morning classes or could be simply tired for late afternoon or evening classes.

This report examines the relationship between class meeting patterns and class DFW rate. Classes that meet the following criteria are included in this study: 1) offered in 6 main semesters (fall and spring semesters) of the past three years from fall 2015 to spring 2018; 2) each class with at least 10 students enrolled; 3) each class with three (3) units and 4) all are regular M16 session classes (or 15 weeks in instruction). Both undergraduate (100 to 400 levels) and graduate classes (500 to 700 levels) are included in this study.

Research findings
- The number of classes and total enrollment was 6,565 and 273,282, respectively based on the list of class meeting days and times of specific interest (Table 1), which accounted for about 54.8% of all classes and 60.8% of total enrollment over the past three years.
- The following class meeting patterns had noticeably higher DFW rates:
  - MWF 08:00 AM to 08:50 AM (18.4%);
  - 12:40 PM to 1:30 PM (15.6%);
  - TTH: 07:00 PM to 08:15 PM (23.4%, the highest);
  - MW: 05:30 PM to 06:45 PM (15.0%); and
  - 07:00 PM to 08:15 PM (23.0%, the second highest) (Table 1).
- Classes scheduled on Friday on average had the lowest DFW rate but only 30 classes in total were provided on these two specific meeting times (Table 1).
- The lower division (100- & 200-level) classes overall had the highest DFW rate, followed by upper division (300- & 400-level), and graduate classes (500- through 700-level) (Table 2). In general, this trend does not depend on the class meeting days and times. Also, the DFW rate of graduate classes essentially did not depend on class meeting days and times.
- Furthermore, the overall DFW rate decreased as the increase of class academic levels: the 100-level had the highest DFW rate, followed by 200-level, 300-level, 400-level and 500- through 700-levels (the lowest DFW rate) based on all classes that meet the above criteria over the 6 main semesters of three past years (Table 3).

Conclusions
- Class meeting days and times did have noticeable impacts on class DFW rate. Classes scheduled in early morning between 08:00 AM and 08:50 AM, and evening between 07:00 PM and 08:15 PM tended to have higher DFW rates.
- The noticeable impact of class patterns on DFW rate primarily occurred in undergraduate classes, especially lower division classes. The graduate level classes had lower DFW rates than

undergraduate classes, and they essentially had nothing to do with the class meeting days and times.

**Table 1.** Distribution of specific class meeting days and times, and their number of classes, total enrollment and DFW rate statistics in 6 main semesters of three past years. (The DFW rate is defined as the number of students with the grades of D, F and W divided by the total number of students enrolled in a given class.)

| Meeting Days | Timeframe | # Class Sections | Total Enrolled | Average DFW% | Min of DFW%* | Max of DFW%* | StdDev of DFW% |
|---|---|---|---|---|---|---|---|
| **MWF** | **08:00 AMTO08:50 AM** | **163** | **7,123** | **18.4%** | **0.0%** | **53.1%** | **13.7%** |
| | 09:10 AMTO10:00 AM | 398 | 17,115 | 14.5% | 0.0% | 75.0% | 11.2% |
| | 10:20 AMTO11:10 AM | 428 | 18,499 | 13.8% | 0.0% | 51.9% | 11.1% |
| | 11:30 AMTO12:20 PM | 339 | 14,832 | 14.6% | 0.0% | 48.6% | 11.0% |
| | **12:40 PMTO01:30 PM** | **123** | **5,441** | **15.6%** | **0.0%** | **46.2%** | **12.3%** |
| | | | | | | | |
| **TTH** | 08:00 AMTO09:15 AM | 346 | 14,155 | 13.9% | 0.0% | 51.9% | 11.6% |
| | 09:35 AMTO10:50 AM | 785 | 32,171 | 11.4% | 0.0% | 56.5% | 10.1% |
| | 11:10 AMTO12:25 PM | 758 | 32,242 | 11.5% | 0.0% | 52.6% | 10.1% |
| | | | | | | | |
| **TTH** | 02:20 PMTO03:35 PM | 663 | 27,062 | 10.7% | 0.0% | 55.6% | 10.6% |
| | 04:00 PMTO05:15 PM | 309 | 13,440 | 10.8% | 0.0% | 44.2% | 10.1% |
| | 05:30 PMTO06:45 PM | 81 | 3,418 | 14.6% | 0.0% | 57.1% | 11.4% |
| | **07:00 PMTO08:15 PM** | **12** | **263** | **23.4%** | **5.6%** | **57.9%** | **15.0%** |
| | 12:45 PMTO02:00 PM | 647 | 26,116 | 11.0% | 0.0% | 58.3% | 10.1% |
| | | | | | | | |
| **MW** | 02:20 PMTO03:35 PM | 564 | 22,586 | 11.1% | 0.0% | 56.7% | 10.1% |
| | 04:00 PMTO05:15 PM | 338 | 15,579 | 12.3% | 0.0% | 71.9% | 11.5% |
| | **05:30 PMTO06:45 PM** | **116** | **4,243** | **15.0%** | **0.0%** | **46.2%** | **10.7%** |
| | **07:00 PMTO08:15 PM** | **16** | **607** | **23.0%** | **2.9%** | **46.7%** | **15.1%** |
| | 12:45 PMTO02:00 PM | 449 | 17,863 | 11.0% | 0.0% | 45.8% | 9.6% |
| | | | | | | | |
| **F** | 02:20 PMTO04:50 PM | 5 | 106 | 5.7% | 0.0% | 17.4% | 7.1% |
| | 12:45 PMTO03:15 PM | 25 | 421 | 7.8% | 0.0% | 23.5% | 7.7% |
| **Total** | | **6,565** | **273,282** | | | | |

**[Note]: The above list of specific class meeting days and meeting times was provided by VPTLDA on 1/10/2019, which represents the most common classes with most students enrolled.**

**\*class section DFW rate**

**Table 2.** The distribution of classes, enrollment and DFW rate statistics by the list of class meeting days and times of specific interests over the past three years, breaking down by class academic levels.

| Days | Timeframe | Class Level | # Classes | Total Enrolled | Average DFW% | Min of DFW%* | Max of DFW%* | Std Dev DFW% |
|------|-----------|-------------|-----------|----------------|--------------|--------------|--------------|--------------|
| MW | 02:20 PMTO03:35 PM | 100 level | 121 | 6,789 | 12.8% | 0.0% | 41.1% | 9.5% |
| | | 200 level | 164 | 6,638 | 12.8% | 0.0% | 56.7% | 10.5% |
| | | 300 level | 174 | 6,067 | 11.2% | 0.0% | 52.0% | 10.3% |
| | | 400 level | 93 | 2,886 | 5.9% | 0.0% | 39.6% | 7.4% |
| | | 500 level | 10 | 180 | 8.9% | 0.0% | 44.4% | 12.9% |
| | | 600 level | 1 | 14 | 0.0% | 0.0% | 0.0% | - |
| | | 700 level | 1 | 12 | 8.3% | 8.3% | 8.3% | - |
| | 04:00 PMTO05:15 PM | 100 level | 83 | 5,558 | 14.5% | 0.0% | 52.0% | 10.0% |
| | | 200 level | 91 | 4,915 | 15.9% | 0.0% | 71.9% | 11.1% |
| | | 300 level | 99 | 3,286 | 10.9% | 0.0% | 50.0% | 11.4% |
| | | 400 level | 53 | 1,572 | 7.7% | 0.0% | 61.5% | 12.2% |
| | | 500 level | 4 | 132 | 1.8% | 0.0% | 4.3% | 2.2% |
| | | 600 level | 7 | 105 | 0.0% | 0.0% | 0.0% | 0.0% |
| | | 700 level | 1 | 11 | 0.0% | 0.0% | 0.0% | - |
| | 05:30 PMTO06:45 PM | 100 level | 34 | 1,168 | 19.3% | 0.0% | 40.0% | 9.4% |
| | | 200 level | 35 | 1,517 | 18.1% | 0.0% | 46.2% | 10.6% |
| | | 300 level | 27 | 1,067 | 12.9% | 0.0% | 34.0% | 9.8% |
| | | 400 level | 17 | 440 | 5.2% | 0.0% | 30.0% | 7.6% |
| | | 500 level | 3 | 51 | 6.0% | 0.0% | 17.9% | 10.3% |
| | 07:00 PMTO08:15 PM | 100 level | 8 | 280 | 25.2% | 2.9% | 45.8% | 15.9% |
| | | 200 level | 8 | 327 | 20.7% | 3.4% | 46.7% | 15.0% |
| | 12:45 PMTO02:00 PM | 100 level | 90 | 5,172 | 14.7% | 0.0% | 41.2% | 9.1% |
| | | 200 level | 134 | 6,165 | 13.8% | 0.0% | 44.3% | 9.7% |
| | | 300 level | 127 | 3,737 | 9.6% | 0.0% | 45.8% | 9.2% |
| | | 400 level | 78 | 2,423 | 5.8% | 0.0% | 33.3% | 7.3% |
| | | 500 level | 13 | 218 | 5.7% | 0.0% | 22.2% | 7.5% |
| | | 600 level | 7 | 148 | 0.0% | 0.0% | 0.0% | 0.0% |
| | | | | | | | | |
| TTH | 02:20 PMTO03:35 PM | 100 level | 126 | 7,792 | 13.4% | 0.0% | 51.5% | 10.4% |
| | | 200 level | 164 | 8,280 | 13.6% | 0.0% | 55.0% | 10.2% |
| | | 300 level | 209 | 7,073 | 9.4% | 0.0% | 55.6% | 10.1% |
| | | 400 level | 139 | 3,484 | 8.2% | 0.0% | 46.2% | 11.0% |
| | | 500 level | 12 | 222 | 2.6% | 0.0% | 12.5% | 4.1% |
| | | 600 level | 13 | 211 | 2.7% | 0.0% | 12.5% | 4.5% |
| | 04:00 PMTO05:15 PM | 100 level | 63 | 3,977 | 14.3% | 0.0% | 43.9% | 9.7% |
| | | 200 level | 79 | 4,115 | 15.1% | 0.0% | 43.5% | 10.8% |
| | | 300 level | 101 | 3,590 | 8.3% | 0.0% | 36.4% | 8.1% |

| Days | Timeframe | Class Level | # Classes | Total Enrolled | Average DFW% | Min of DFW%* | Max of DFW%* | Std Dev DFW% |
|------|-----------|-------------|-----------|----------------|--------------|--------------|--------------|--------------|
| | | 400 level | 57 | 1,599 | 7.1% | 0.0% | 44.2% | 9.5% |
| | | 500 level | 6 | 124 | 1.1% | 0.0% | 6.7% | 2.7% |
| | | 600 level | 2 | 25 | 3.6% | 0.0% | 7.1% | 5.1% |
| | | 700 level | 1 | 10 | 0.0% | 0.0% | 0.0% | - |
| | 05:30 PMTO06:45 PM | 100 level | 18 | 859 | 19.3% | 0.0% | 57.1% | 13.4% |
| | | 200 level | 30 | 1,568 | 15.5% | 0.0% | 31.1% | 7.4% |
| | | 300 level | 15 | 539 | 12.7% | 0.0% | 46.2% | 11.3% |
| | | 400 level | 16 | 417 | 10.4% | 0.0% | 50.9% | 14.1% |
| | | 500 level | 2 | 35 | 4.2% | 0.0% | 8.3% | 5.9% |
| | 07:00 PMTO08:15 PM | 100 level | 3 | 79 | 31.7% | 17.1% | 57.9% | 22.7% |
| | | 200 level | 2 | 59 | 15.4% | 6.7% | 24.1% | 12.4% |
| | | 300 level | 6 | 107 | 24.9% | 6.3% | 35.3% | 11.0% |
| | | 400 level | 1 | 18 | 5.6% | 5.6% | 5.6% | - |
| | 12:45 PMTO02:00 PM | 100 level | 130 | 8,755 | 15.4% | 0.0% | 44.0% | 9.3% |
| | | 200 level | 173 | 7,095 | 13.0% | 0.0% | 50.7% | 10.4% |
| | | 300 level | 208 | 6,743 | 9.4% | 0.0% | 40.0% | 9.1% |
| | | 400 level | 111 | 3,125 | 7.9% | 0.0% | 58.3% | 10.3% |
| | | 500 level | 17 | 274 | 3.8% | 0.0% | 12.5% | 5.3% |
| | | 600 level | 7 | 110 | 0.0% | 0.0% | 0.0% | 0.0% |
| | | 700 level | 1 | 14 | 7.1% | 7.1% | 7.1% | - |
| | | | | | | | | |
| TTH | 08:00 AMTO09:15 AM | 100 level | 63 | 3,660 | 15.6% | 0.0% | 42.7% | 9.5% |
| | | 200 level | 108 | 4,714 | 18.1% | 0.0% | 49.0% | 11.0% |
| | | 300 level | 98 | 3,387 | 12.3% | 0.0% | 47.7% | 12.0% |
| | | 400 level | 67 | 2,195 | 9.6% | 0.0% | 51.9% | 11.3% |
| | | 500 level | 6 | 147 | 0.8% | 0.0% | 2.7% | 1.3% |
| | | 600 level | 4 | 52 | 2.3% | 0.0% | 9.1% | 4.5% |
| | 09:35 AMTO10:50 AM | 100 level | 190 | 12,339 | 13.3% | 0.0% | 56.5% | 9.1% |
| | | 200 level | 235 | 9,524 | 14.1% | 0.0% | 48.3% | 10.3% |
| | | 300 level | 186 | 5,848 | 11.5% | 0.0% | 45.5% | 10.8% |
| | | 400 level | 135 | 3,671 | 6.0% | 0.0% | 42.2% | 8.0% |
| | | 500 level | 27 | 562 | 4.9% | 0.0% | 20.0% | 5.8% |
| | | 600 level | 12 | 227 | 1.4% | 0.0% | 10.0% | 3.4% |
| | 11:10 AMTO12:25 PM | 100 level | 165 | 11,440 | 15.9% | 0.0% | 52.6% | 9.9% |
| | | 200 level | 205 | 9,603 | 13.0% | 0.0% | 41.1% | 9.7% |
| | | 300 level | 239 | 7,500 | 10.2% | 0.0% | 52.2% | 9.8% |
| | | 400 level | 125 | 3,237 | 7.2% | 0.0% | 44.4% | 9.1% |
| | | 500 level | 22 | 432 | 3.6% | 0.0% | 14.8% | 4.4% |
| | | 600 level | 2 | 30 | 11.5% | 0.0% | 23.1% | 16.3% |
| | | | | | | | | |

| Days | Timeframe | Class Level | # Classes | Total Enrolled | Average DFW% | Min of DFW%* | Max of DFW%* | Std Dev DFW% |
|------|-----------|-------------|-----------|----------------|--------------|--------------|--------------|--------------|
| MWF | 08:00 AMTO08:50 AM | 100 level | 34 | 1,512 | 19.7% | 0.0% | 53.1% | 13.7% |
| | | 200 level | 65 | 3,847 | 21.6% | 0.0% | 51.5% | 13.9% |
| | | 300 level | 47 | 1,322 | 16.2% | 0.0% | 46.2% | 12.0% |
| | | 400 level | 11 | 364 | 11.3% | 0.0% | 42.6% | 16.3% |
| | | 500 level | 3 | 44 | 11.6% | 0.0% | 21.4% | 10.8% |
| | | 600 level | 3 | 34 | 3.0% | 0.0% | 9.1% | 5.2% |
| | 09:10 AMTO10:00 AM | 100 level | 121 | 6,571 | 16.8% | 0.0% | 59.5% | 10.8% |
| | | 200 level | 125 | 5,229 | 16.1% | 0.0% | 54.5% | 11.1% |
| | | 300 level | 104 | 4,051 | 11.9% | 0.0% | 42.9% | 9.4% |
| | | 400 level | 38 | 1,094 | 11.4% | 0.0% | 75.0% | 15.0% |
| | | 500 level | 5 | 96 | 5.2% | 0.0% | 8.7% | 3.6% |
| | | 600 level | 5 | 74 | 1.2% | 0.0% | 5.9% | 2.6% |
| | 10:20 AMTO11:10 AM | 100 level | 136 | 7,701 | 14.7% | 0.0% | 50.0% | 10.2% |
| | | 200 level | 133 | 6,082 | 15.9% | 0.0% | 48.3% | 12.1% |
| | | 300 level | 113 | 3,716 | 12.3% | 0.0% | 51.9% | 10.7% |
| | | 400 level | 35 | 850 | 10.4% | 0.0% | 40.0% | 10.3% |
| | | 500 level | 7 | 96 | 5.4% | 0.0% | 13.0% | 5.3% |
| | | 600 level | 4 | 54 | 3.3% | 0.0% | 7.1% | 3.9% |
| | 11:30 AMTO12:20 PM | 100 level | 97 | 5,278 | 18.1% | 0.0% | 47.8% | 10.9% |
| | | 200 level | 104 | 4,797 | 17.1% | 0.0% | 48.6% | 10.8% |
| | | 300 level | 94 | 3,741 | 11.6% | 0.0% | 47.3% | 9.8% |
| | | 400 level | 34 | 895 | 8.6% | 0.0% | 33.3% | 9.5% |
| | | 500 level | 9 | 109 | 4.4% | 0.0% | 11.1% | 5.2% |
| | | 600 level | 1 | 12 | 0.0% | 0.0% | 0.0% | - |
| | 12:40 PMTO01:30 PM | 100 level | 43 | 2,548 | 14.5% | 0.0% | 44.0% | 12.0% |
| | | 200 level | 36 | 1,584 | 20.2% | 0.0% | 42.9% | 11.7% |
| | | 300 level | 24 | 945 | 17.7% | 0.0% | 46.2% | 11.6% |
| | | 400 level | 16 | 313 | 8.6% | 0.0% | 42.9% | 11.3% |
| | | 500 level | 1 | 11 | 0.0% | 0.0% | 0.0% | - |
| | | 600 level | 3 | 40 | 2.1% | 0.0% | 6.3% | 3.6% |
| | | | | | | | | |
| F | 02:20 PMTO04:50 PM | 400 level | 2 | 63 | 11.2% | 5.0% | 17.4% | 8.8% |
| | | 600 level | 3 | 43 | 2.0% | 0.0% | 5.9% | 3.4% |
| | 12:45 PMTO03:15 PM | 200 level | 7 | 147 | 12.6% | 0.0% | 23.5% | 8.5% |
| | | 300 level | 5 | 96 | 13.7% | 4.2% | 20.0% | 6.1% |
| | | 400 level | 6 | 89 | 4.1% | 0.0% | 12.5% | 5.1% |
| | | 500 level | 3 | 37 | 2.6% | 0.0% | 7.7% | 4.4% |
| | | 600 level | 4 | 52 | 1.7% | 0.0% | 6.7% | 3.3% |

*class section DFW rate

**Table 3.** The class DFW rate statistics based on class academic levels for all classes over the 6 main semesters of the past three years that meet the criteria of this study

| Class Academic Level | # Class Sections | Total Enrolled | Average of DFW% | Min of DFW%* | Max of DFW%* | StdDev of DFW% |
|---|---|---|---|---|---|---|
| 100 level | 2,977 | 147,215 | 16.5% | 0.0% | 66.7% | 10.9% |
| 200 level | 2,826 | 124,973 | 15.3% | 0.0% | 71.9% | 11.0% |
| 300 level | 3,252 | 108,056 | 10.7% | 0.0% | 64.0% | 10.2% |
| 400 level | 1,941 | 51,548 | 7.0% | 0.0% | 75.0% | 9.6% |
| 500 level | 475 | 8,519 | 5.4% | 0.0% | 44.4% | 7.5% |
| 600 level | 491 | 9,173 | 3.8% | 0.0% | 50.0% | 7.0% |
| 700 level | 26 | 345 | 5.8% | 0.0% | 16.7% | 6.0% |
| **Grand Total** | **11,988** | **449,829** | **12.1%** | **0.0%** | **75.0%** | **11.0%** |

**\*class section DFW rate**