

# Grade Inflation at the University of Waterloo

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“the issue of grade inflation has been discussed for many years but debates on the issue are usually restricted by a lack of data”

Anglin, P., Meng, R., *Evidence on Grades and Grade Inflation at Ontario's Universities*. Canadian Public Policy, 16/3, 2000

# Acknowledgments

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# Outline

1. Background
2. Evidence
3. Impact
4. Sources
5. Solutions
6. Grade Variation at UW
7. Conclusion

# Background

## Section I

# Background

- no consensus on how Grade Inflation (GI) is defined
- I will define GI as:

*An increase in grades in one or more academic departments over time.*

- no requirements on the student performance on the GI

# Evidence of Grade Inflation at UW

## Section 2

# Evidence of GI at UW

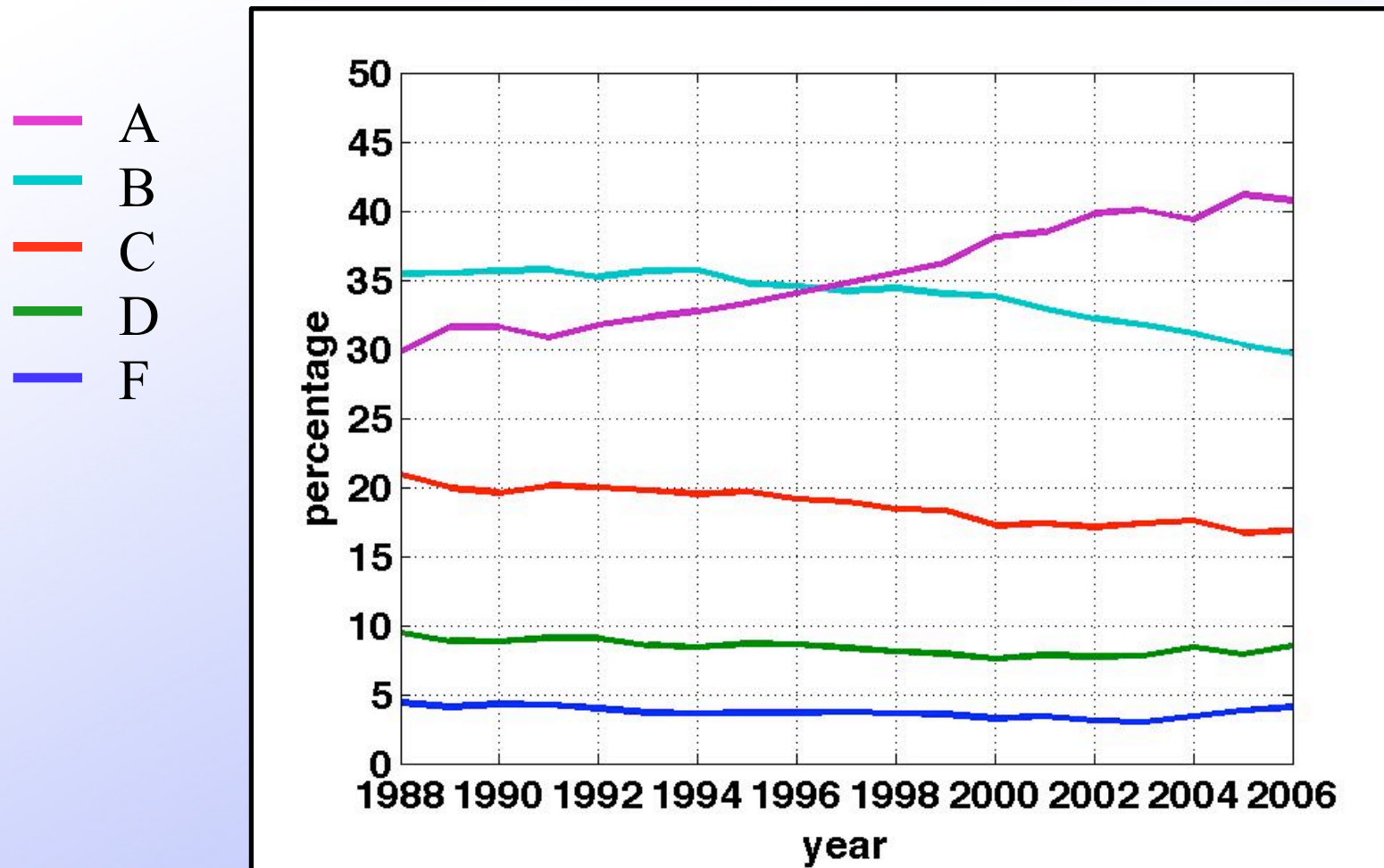
## Obtained data:

- every grade given in every undergraduate course, all faculties
- data ranges from 1988/89 to 2006/07 (19 years)
- grades stored as either letter grade or integer grade (0 to 100)
- prior to Fall 2001, many grades stored only as letters (F- through A+)

## For each entry in the data I only have:

- grade (letter, integer, or no grade)
- year
- course number
- course name
- department
- faculty

# Grade Inflation at UW



From 1988/89 to 2006/07, over all faculties and academic levels:

- 11.02% increase in undergraduate A grades
- A's increased at a rate of  $0.656 \pm 0.062$  % per year ( $R^2 = 0.9633$ )



# The Impact of Grade Inflation

## Section 3

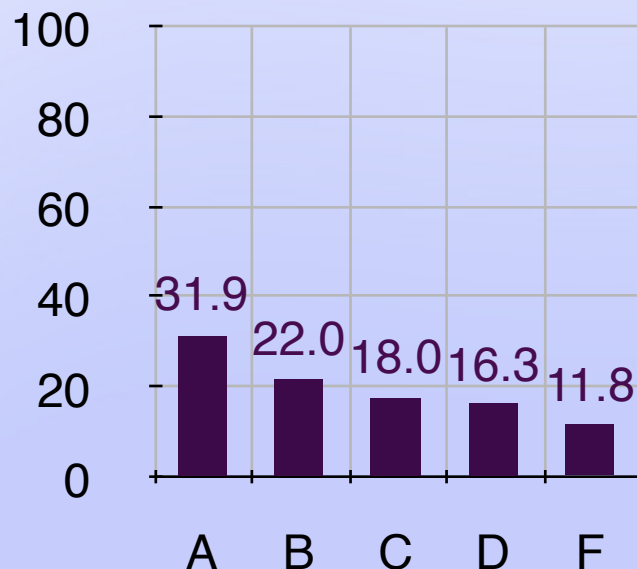
# The Purpose of Grading

The purpose of grading may be to [3]:

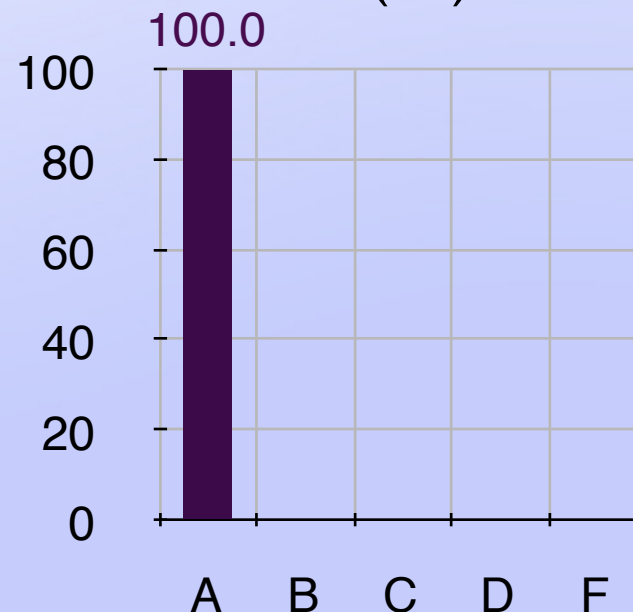
1. provide students with feedback
2. weed out students
3. motivate students
4. inform prospective employers and admissions committees

## 2006/07 Grade Distributions

100 level MATH  
(11042)



400 level Fine Arts  
(50)



# Impact of GI

The purpose of grading may be to [3]:

1. provide students with feedback
2. weed out students
3. motivate students
4. inform prospective employers and admissions committees

Suppose a department gave A's to all students at the 400 level every year.

Two cases:

- 1) A's are given regardless of student performance,  
the purpose of grading students would be lost
- 2) Every student demonstrates outstanding performance  
no consensus on the impact of GI in this case [4,5]

# Sources of Grade Inflation

## Section 4

# Sources of GI

## Student Ability Increased?

- entirely possible
- no evidence of increase in mathematical preparedness of first year students at UW from 1991 to 1999 [6]

## Maintain Departmental or Faculty “Standards”

- in the past, administrators at UW have pressured for higher grades [6]
- FAUW newsletters documents case when a math dean adjusted grades without the consent or authorization of the instructor [9]

## There are Many other Possible Sources of GI

- see [11]

# Solutions to Grade Inflation at UW

## Section 5

# Solution

## 1. Enhance Undergraduate Transcripts [7,10,11]

- include additional statistics, such as:
  - course averages or course medians
  - class sizes
- helps anyone who relies on transcripts to put grades into perspective
- but does not address grade inflation directly

## 2. University-wide Fixed Grade Distributions

- has been implemented at Princeton [4]
- proposed many times in the GI literature (for example, [3,7,8,11])
- controls GI
- but final grades depend on who is enrolled in a course

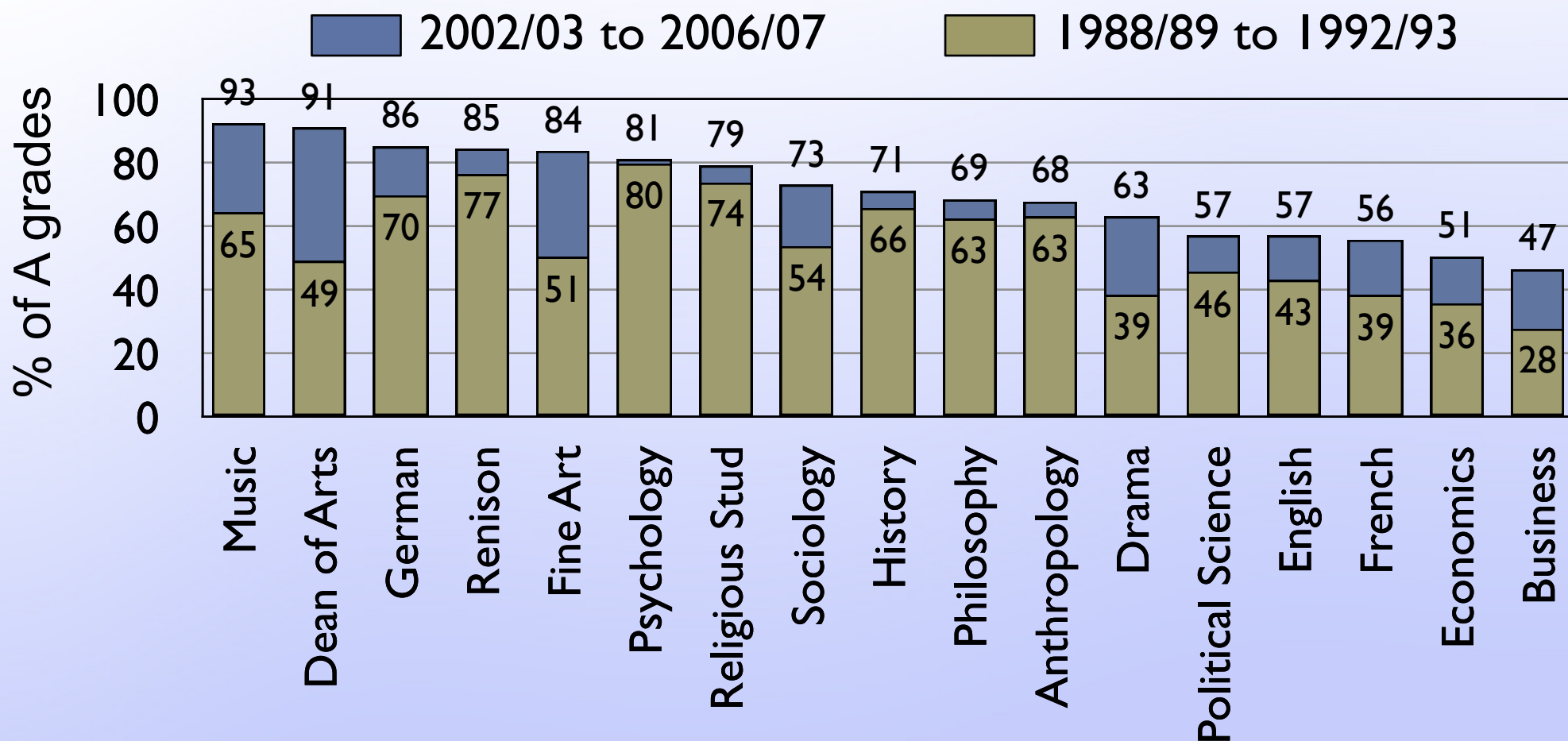
# Grade Variation at UW

## Section 6



# Grade Variation at UW

## Faculty of Art, 400 Level Grades



# Conclusions

## Section 7

# Conclusions

## Grading patterns observed at UW

- 1988 to 2006: over all undergraduate student grades at UW, proportion of A's increased by 11.02% (linear inflation rate of 0.656% per year)

## Future Work

- expand on previous results [6] to investigate why UW has experienced grade inflation

# Bibliography

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- [2] University of Waterloo Performance Indicators 2005, 2006, 2007, <http://www.uwaterloo.ca/accountability/>
- [3] Hunt, L., Afterword: Focusing on the Big Picture. In: Grade Inflation, Academic Standards in Higher Education, Lester Hunt (editor), State University of New York Press, Chapter 10, 2008
- [4] Kamber, R, Combating Grade Inflation: Obstacles and Opportunities. In: Grade Inflation, Academic Standards in Higher Education, Lester Hunt (editor), State University of New York Press, Chapter 9, 2008
- [5] Schrag, F, From Here to Equality: Grading Policies for Egalitarians. In: Grade Inflation, Academic Standards in Higher Education, Lester Hunt (editor), State University of New York Press, Chapter 6, 2008
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- [7] Johnson V, Grade Inflation, Springer, 2003
- [8] Côté J, Allahar A, Ivory Tower Blues, University of Toronto Press, 2007
- [9] FAUW Forum (<http://www.uwfacass.uwaterloo.ca/>), issues 104, 105, 106, 111, 112, 113, 116
- [10] Beito D, Nuckolls C W, Grade Distortion, Bureaucracy, and Obfuscation at the University of Alabama. In: Grade Inflation, Academic Standards in Higher Education, Lester Hunt (editor), State University of New York Press, Chapter 10, 2008
- [11] Rosovsky H, Hartley M, Evaluation and the academy: Are we doing the right thing? Cambridge, MA: American Academy of Arts and Sciences, 2002

# Appendix: Linear Regressions By Faculty

Linear model:  $P_{f,n} = r_f t_n + b_f$ ,  $f = 1, 2, \dots, 6$

where

$P_{f,n}$  = proportion of A grades for faculty  $f$  at point  $n$

$r_f$  = rate of change of  $P_f$

$t_n$  = time (in years),  $n = 1, 2, 3, \dots, 19$

$b_f$  = constant

## All 100 Level Grades

	f	$r_f$	$R^2$	t
AHS	1	$0.71 \pm 0.30$	0.57	4.73
ART	2	$0.56 \pm 0.09$	0.89	12.00
ENV	3	$0.69 \pm 0.34$	0.50	4.14
ENG	4	$0.76 \pm 0.23$	0.72	6.56
MAT	5	$0.51 \pm 0.16$	0.71	6.53
SCI	6	$0.38 \pm 0.23$	0.36	3.08

## All 400 Level Grades

	f	$r_f$	$R^2$	t
AHS	1	$1.33 \pm 0.30$	0.82	8.80
ART	2	$0.92 \pm 0.18$	0.87	10.47
ENV	3	$0.83 \pm 0.20$	0.79	7.91
ENG	4	$1.22 \pm 0.30$	0.72	8.23
MAT	5	$0.38 \pm 0.15$	0.62	5.27
SCI	6	$1.04 \pm 0.19$	0.87	10.82

$R^2$  is the coefficient of determination

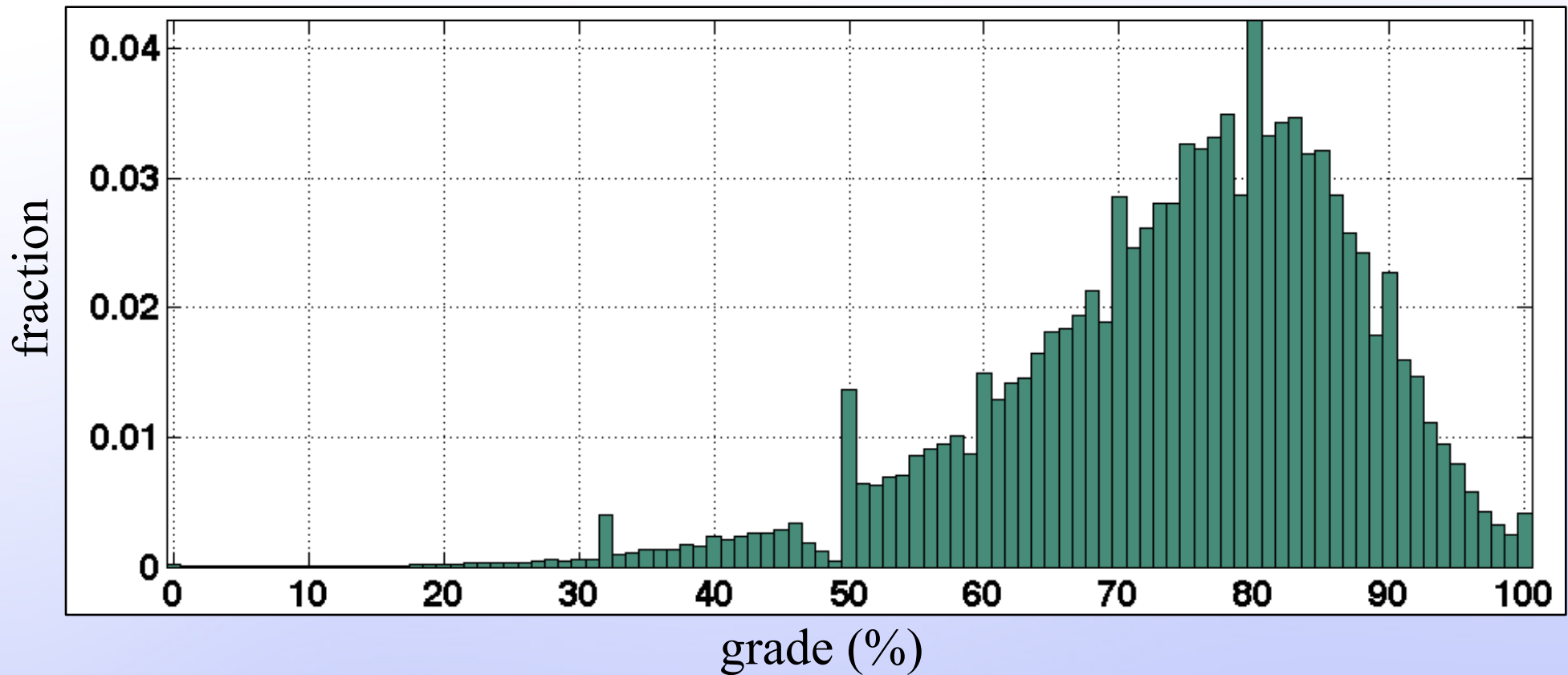
F-test calculated at 99%, all measures of  $r_f$  significant

# Appendix: Grading Systems at UW

Letter Grade	Percentage Range	Value
A+	90-100	95
A	85-89	89
A -	80-84	83
B+	77-79	78
B	73-76	75
B-	70-72	72
C+	67-69	68
C	63-66	65
C-	60-62	62
D+	57-59	58
D	53-56	55
D-	50-52	52
F+	42-49	46
F	35-41	38
F-	0-34	32

- Some grades prior to 2001 recorded only as a letter grade
- UW used this table to convert percentages into letters
- no way of converting letters back to original percentages

# Appendix: 2006/07 Grade Distribution

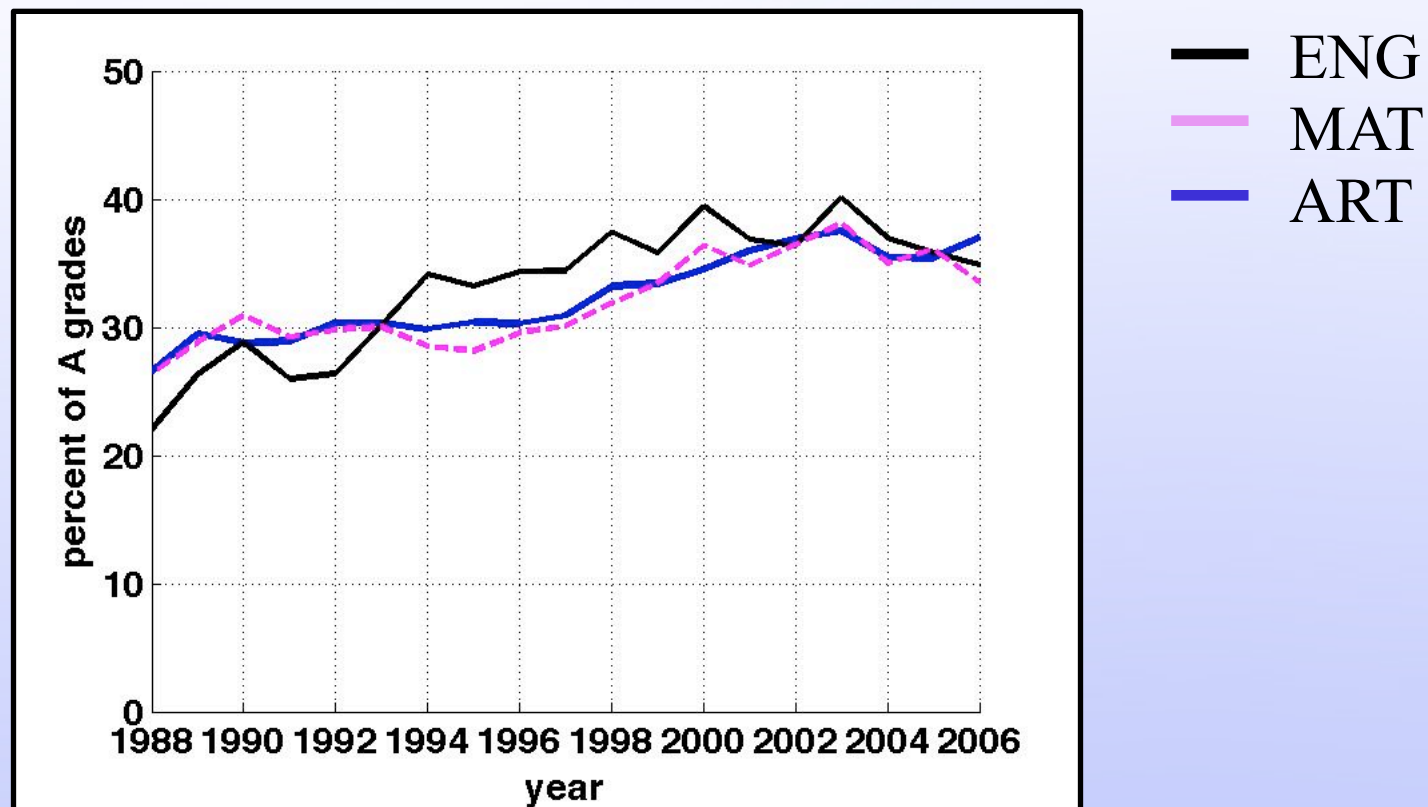


## Observations:

1. Grades do not have a normal distribution
2. Peaks at 60% 70%, 80%, and 90%

# Appendix: Proportion of A's by Faculty

## 100 Level Courses



- increase from 1988-2003 in ENG and MATH
- decrease from 2003-2006 in ENG and MATH
- linear regressions: statistically significant increase in proportion of A's at the 100 and 400 level in all six faculties