

# MA20226 Statistics 2A

2011/12 Semester I

## Contacts

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- **Unit homepage:** <http://people.bath.ac.uk/masss/ma20226.html>
- **Lecture notes:** <http://people.bath.ac.uk/masss/ma20226/notes.pdf>

Week	Monday 15:15, EB1.1	Thursday 12:15, EB1.1	A: Monday 11:15, 3E3.11/3E3.1 B: Tuesday 17:15, 1WN3.11/3E3.1 C: Tuesday 13:15, 1WN3.23/EB0.9 D: Wednesday 12:15, 8W1.33/3E3.1 E: Thursday 10:15 8W2.6/EB0.9 F: Wednesday 10:15, 1WN3.23/EB0.9 G: Wednesday 11:15 1W4.39/3E3.1 H: Thursday 09:15, 8W1.33/EB0.9
1 (03 Oct 11)	Lecture 1	Lecture 2	No tutorials
2 (10 Oct 11)	Lecture 3	Lecture 4	Question Sheet One out
3 (17 Oct 11)	Lecture 5	Lecture 6	Practical Sheet One out Question Sheet One in
4 (24 Oct 11)	Lecture 7	Lecture 8	Question Sheet Two out Practical Sheet One in
5 (31 Oct 11)	Lecture 9	Lecture 10 Assessed coursework Coursework Sheet One out	Question Sheet Three out Question Sheet Two in
6 (07 Nov 11)	Lecture 11	Lecture 12	Lab on Coursework Sheet One Question Sheet Three in
7 (14 Nov 11)	Lecture 13	Lecture 14 Coursework Sheet One in	Question Sheet Four out
8 (21 Nov 11)	Lecture 15	Lecture 16 Assessed coursework Coursework Sheet Two out	Question Sheet Five out Question Sheet Four in
9 (28 Nov 11)	Lecture 17	Lecture 18	Lab on Coursework Sheet Two Question Sheet Five in
10 (05 Dec 11)	Lecture 19	Lecture 20 Coursework Sheet Two in	Question Sheet Six out
11 (12 Dec 11)	Lecture 21	Lecture 22	Question Sheet Seven out Question Sheet Six in

## Anticipated lecture content

- **Lecture 1 (03 Oct 11):** Introduction, §1 Point estimation: introduction, estimators and estimates.
- **Lecture 2 (06 Oct 11):** Sampling distribution, maximum likelihood estimation.
- **Lecture 3 (10 Oct 11):** Log-likelihood, examples of mle for Poisson and Normal distribution.
- **Lecture 4 (13 Oct 11):** §2 Evaluating point estimates: bias.
- **Lecture 5 (17 Oct 11):** Mean square error, relative efficiency.
- **Lecture 6 (20 Oct 11):** Consistency, robustness, measures of location.
- **Lecture 7 (24 Oct 11):** Trimmed mean, §3 Interval estimation: principle of interval estimation.
- **Lecture 8 (27 Oct 11):** Pivot, confidence interval, confidence interval for normal mean (variance known).
- **Lecture 9 (31 Oct 11):** Chi-squared distribution, confidence interval for normal variance.
- **Lecture 10 (03 Nov 11):** t-distribution, confidence interval for normal mean §4 Hypothesis testing: null and alternative hypothesis.
- **Lecture 11 (07 Nov 11):** Critical region, Type I and Type II errors, significance level.
- **Lecture 12 (10 Nov 11):** Power of a test, Neyman-Pearson lemma, examples of use of Neyman-Pearson lemma (normal mean, exponential).
- **Lecture 13 (14 Nov 11):** One-sided alternative hypotheses, uniformly most powerful test.
- **Lecture 14 (17 Nov 11):** Two-sided alternative hypotheses, duality between hypothesis test and confidence interval.
- **Lecture 15 (21 Nov 11):** Power function, §5 Inference for normal data: investigating the variance in one -sample problems.
- **Lecture 16 (24 Nov 11):** Investigating  $\sigma^2$  in one-sample problems (known variance).
- **Lecture 17 (28 Nov 11):** p-value for one and two-sided tests.
- **Lecture 18 (01 Dec 11):** Investigating  $\sigma^2$  in one-sample problems (unknown variance): t-tests.
- **Lecture 19 (05 Dec 11):** Comparing paired samples.
- **Lecture 20 (08 Dec 11):** Unpaired data, F-distribution, investigating the variance for unpaired data.
- **Lecture 21 (12 Dec 11):** Investigating the means for unpaired data (known and unknown variances), pooled sample variance.
- **Lecture 22 (15 Dec 11):** §6 Goodness-of-fit tests: multinomial distribution, Pearson's chi-square statistic.