There have been a few changes to the syllabus for the October 2013 exam.
I have posted a free supplement on my webpage www.howardmahler.com/Teaching
It covers all of the changes.
I have included a discussion of each of the new topics, as well as problems to do.
At the end of the supplement are a new Practice Exam and new Seminar Style Slides, covering the new material.
This supplement was revised on August 11, 2013,
in order to include the new SOA Sample Questions,
and to fix errors on pages: 90-91, 214- 217,
and in solutions: Sim.7, Sim.16-17, Sim.21, Sim.23, Sim.25, Sample Exam #14.
The choices in question Sim.7 have been revised.
The second random number in question Sim.21 has been changed to 0.149.
This supplement was revised on September 1, 2013,
to correct errors on pages 59-61 and the corresponding slide on page 187.

1, p. 18, last line: q = (**0.3**)(2/3) = 0.2.

1, p.198, last line of 4th paragraph: $\beta = e^{\delta t} - 1$.

1, p. 320, solution 17.11, in the comment: intergral from zero to **one** is

2, p. 42, Sol.3.5: $\frac{E[X^4] - 4 E[X] E[X^3] + 6 E[X]^2 E[X^2] - 3 E[X]^4}{\text{Variance}^2}$. Final solution is correct.

2, p. 60, Q.5.6: Determine E[X $\wedge$ **25,000**]

2, p. 248: Single Parameter Pareto Distribution is described in Appendix A.**5**.1.4

2, p. 423, 5th line from bottom: E[Min[Max[X , a] , b]**]**

2, p. 564: $LER(x) = \frac{\int_0^x S(t)\,dt}{E[X]}$

2, p. 566: the excess ratio is **de**creasing and concave upwards (convex).

2, p. 599, exercise:

Prior to inflation, $E[X \wedge 5 \text{ million}] = (240{,}151 / 0.702)\{1 - (240{,}151/5{,}240{,}151)^{.702}\}$ = 302,8**07**.

Prior to inflation, the average loss contributes: $E[X \wedge 5 \text{ million}] - E[X \wedge 1 \text{ million}]$ =
302,8**07** - 234,04**5** = 68,7**62**, to this layer.

2, pages 733-737, 891: To be consistent with prior pages, G rather than H should have been used as the subscript denoting the mixture.

2, page 846, sol. 417: $F(\mathbf{2}) = \int_0^2 \frac{617{,}400}{218\,(10 + x)^4}\,dx = \frac{617{,}400}{218}\left\{\frac{1}{(3)\,(10^3)} - \frac{1}{(3)\,(12^3)}\right\} = 0.3977.$

S(**2**) = 1 - 0.3977 = 0.6023.

4, p. 37, altenarte solution 4.2: $\mu + \sigma\, \phi[z_p] / (\mathbf{1 - p})$

5, pages 87 & 169: If applying the Chi-Square Goodness of Fit Test to data with total claims and exposures by year, then the number of degrees of freedom is the number of years **minus the number of fitted parameters**.

5, page 154: $(1 - e^{-\lambda})/\lambda \cong 1 - \lambda/2 \mathbf{+} \lambda^2/6$.

Therefore, the equation for method of moments becomes: $1 - \lambda/2 \mathbf{+} \lambda^2/6 \cong 1/1.08223$.

5, page 276: For θ = **10**

6, page 199, Sol. 7.14: Sorting the 15 values from smallest to largest:
198, 200, 203, 208, 209, 210, 210, 212, 215, 215, 216, 220, 221, 223, 224.

((0.75)(15 + 1) = 12. $\Rightarrow$ **220** is the estimated 75th percentile.

6, page 199, Sol. 9.31: Variance is: $336{,}559 - 451.5^2 = 132{,}707$.
Matching the mean and variance, results in two equations in two unknowns:

$\alpha\theta = 451.5.$ $\alpha\theta^2 = 132{,}707.$

Divide the second equation by the first equation: θ = 132,707 / 451.5 = **294**.
Therefore, the letter choices in the question need to be changed.

6, p.724 near the bottom, p. 794, p. 945 & p. 946, should have had superscript 2 after θ rather than before: $\dfrac{\mathbf{-1}}{\mathbf{n\ E\ [\partial^2 \ln f(x)\ /\ \partial\theta^2]}}$

6, page 832: Var[$\hat{\theta}$] = 6.91 x 10^9.

6, page 916, Q.31.2: Choice A is the same as C, and choice B is the same as D.
Reverse the inequalities in choices A and B.

7, p. 282, Q. 9.1-9.3: Use the product limit estimator.

7, p. 284, Q. 9.8-9.9: Use the product limit estimator. Estimate $q_{78}'^{\,(death)}$ and $q_{79}'^{\,(surrender)}$.

7, p. 285, Q. 9.16: estimate ${}_{10}p'^{(d)}_{20}$, ${}_{10}p'^{(a)}_{20}$, and ${}_{10}p'^{(n)}_{20}$, where (d) refers to death from all causes

9, page 101: There are two questions labeled 4.32. Therefore, **the solutions are off by one**.
For example, the solution to 4.43 is labeled 4.44, the solution to 4.50 is labeled 4.51.

9, page 220: $\int_{0.1}^{0.3} 2\lambda\, e^{-x\lambda}\, d\lambda = (2)\{-\lambda\, e^{-x\lambda}\ /\ \mathbf{x}\ -\ e^{-x\lambda}\ /\ \mathbf{x^2}\ \Big]_{\lambda=0.1}^{\lambda=0.3}\ \}$

9, page 256, sol. 6.24: A Normal Distribution with mean 65 and variance v has a density of:

$$\exp[-\frac{(x - 65)^2}{2v}] \frac{1}{v^{1/2} \sqrt{2\pi}}.$$

Thus the chance of the observation is proportional to: $\exp[-\frac{\sum(x_i - 65)^2}{2v}] \frac{1}{v^{40}}$.

$\pi(v) = 1/v$, $v > 0$.

Thus the posterior distribution of v is proportional to: $\exp[-\frac{\sum(x_i - 65)^2}{2v}] \frac{1}{v^{41}}$, $v > 0$.

Therefore, the posterior distribution of v is Inverse Gamma with:

$\alpha + 1 = 41$, and $\theta = \sum(x_i - 65)^2/2$.

$\sum(x_i - 65)^2 = \sum x_i^2 - 130 \sum x_i + (n)(65^2) = (80)(4400) - (130)(80)(66) + (80)(65^2) =$ 3600.

The posterior distribution of v is Inverse Gamma with $\alpha = 41 - 1 = 40$,

and $\theta = 3600/2 = 1800$.

The mean of this Inverse Gamma is: 1800 / (40 - 1) = 46.15.

The estimate the variance of this test is **46.15**.

9, page 435, sol. 9.31: K = EPV / VHM = 0.04548/0.**0**00216 = **211**.

There are a total of 100 exposures, so Z = 100/(100 + 211) = 32.2%.

Observed frequency is 4/100. Prior mean is 0.048.

Estimated future frequency is: (32.2%)(0.040) + (1 - 32.2%)(0.048) = **4.54%**.

9, p. 523: For example, the first marksman with $\mu = 20$ and $\sigma = 12$, has a probability density function

$$f(x) = \frac{\exp[-\frac{(x-20)^2}{288}]}{12\sqrt{2\pi}}.$$

Thus the density function at 18 for the first marksman is $f(18) = \frac{\exp[-\frac{(18-20)^2}{288}]}{12\sqrt{2\pi}} = 0.0328$.

10, page 64, first formula: $\int_0^\infty t\, e^{-t/\theta}\, dt = \theta^2$.

10, page 89, Q. 4.34, line 2: **W**hat

10, page 95, Q. 4.62: Each policyholder has a frequency that is Poisson with mean μ.

10, pages 266 and 267: $f(m) = \dfrac{\exp[-\dfrac{(m-7)^2}{(2)\ (2^2)}]}{2\sqrt{2\pi}}$.

13, p. 196, 3rd line: $y^2\ p(1-p) / \{n\ f(\Pi_p)^2\} = k^2 \Pi_p^2$.

13, p. 202, Q.12.14, the values of $X_{(b)}$ should have been different, matching those in the solution:

Number of Runs	Estimate of median	a	X(a)	b	X(b)
1,000	$1306	463	$1207	537	**$1362**
2,000	$1272	947	$1193	1053	**$1311**
3,000	$1312	1436	$1274	1564	**$1340**
4,000	$1321	1926	$1309	2074	**$1336**