ASSIGNMENTS and ANSWERS
dcm 12/2/2014

Except as noted, all problem numbers refer to the 2nd edition of the textbook (Fitts 2013).
Brown text gives equivalent problem numbers for the 1st edition of the textbook (Fitts 2002).

<table>
<thead>
<tr>
<th>week</th>
<th>notes</th>
<th>assignment</th>
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</thead>
</table>
| 1    |       | 1-7, 1-8, 1-9, 1-11, 1-12  
      |       | 1-1, 1-2, 1-3, 1-6, 1-8  
      |       | → For 1-11(a) and 1-12(a), derive equation with lecture Method #1. |
| 2    | Lab #1 | 2-3, 2-15, 2-17, 2-20, 2-21, 3-1, 3-4, 3-5  
      |       | 2-2, 2-7, 2-9, 2-11, 2-12, 3-1, 3-3, 3-4 |
| 3    |       | (see handout) |
| 4    |       | 7-16, 7-17, 7-18, 3-3, 3-6, 3-13, 3-14, 3-17  
      |       | 6-11, 6-12, 6-13, 3-2, 3-5, 3-9, 3-10, 3-13 |
| 5    |       | 6-1, 6-7, 6-8, 6-12, 6-13, 6-16, 6-18, 6-20, 6-21  
      |       | 5-1, 5-2, 5-3, 5-7, 5-8, 5-9, 5-11, 5-12, 5-13 |
| 6    | 1st Midterm | (see handout) |
| 7    |       | (see handout) |
| 8    | Lab #2 | (see handout) |
| 9    |       | 7-1, 7-2, 7-6, 7-10, 7-11  
      |       | 6-1, 6-2, 6-5, 6-6, 6-7 |
| 10   |       | (see handout) |
| 11   | 2nd Midterm | 10-1, 10-2, 10-4, 10-11(a-c)  
      |       | 9-1, 9-2, 9-3, 9-7(a-c)  
      |       | → Plus article summary on groundwater contamination (see HW#7) |
| 12   |       | (see handout) |
| 13   |       | (see handout) |
| 14   | Lab #3 | (see handout) |

Answers (not in “Back of Book”)
These partial answers will help determine whether you are on track. Some have been rounded.

Week 1
1-12, minimum G = $5.36 \times 10^4$ m$^3$ in April, maximum G = $8.88 \times 10^5$ m$^3$ in November.

Week 2
2-3, at lake bottom, density $\rho = 1.0026$ g/cm$^3$
2-17, hints, (a) flow from high head to low head, (b) flow seeks path of least resistance
2-21, head at Well C is 476.69 m.
3-1, $K = 2.8 \times 10^{-3}$ cm/s
Week 4
7-18, \( Q = 210 \text{ ft}^3/\text{d} \pm 20\% \)
3-3, *hint*, think about the “no slip boundary condition” in fluid mechanics
3-14(a), \( T = 35 \text{ ft}^2/\text{d} \)

Week 5
6-8, *hints*, (a) where is the sediment thickest? (b) where are the farms?
6-12, *hint*, compressive soil rapidly drains to sand above, but does not drain to sand below
6-16, maximum depth \( d = 10.9 \text{ ft} \)
6-21, \( \Delta h = -1.7 \text{ m} \)

Week 6
Problem 2(f), \( h_P = 118 \text{ m} \)
Problem 2(g), \( v = 0.0015 \text{ m/d} \) at 82° south of east

Week 7
7-20(c), \( x_{\text{divide}} = 42.8 \text{ ft} \)

Week 8
9-8, the bottom row of the 10x10 \( h(x,y) \) grid is as follows [m]:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>BC</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC</td>
<td>200</td>
<td>200.9</td>
<td>201.7</td>
<td>202.5</td>
<td>203.3</td>
<td>203.8</td>
<td>204.3</td>
<td>206.3</td>
<td>209.9</td>
<td>213.4</td>
<td>216.7</td>
</tr>
</tbody>
</table>

9-9, *hint*, use the default porosity of 0.25, and assume aquifer thickness \( b = 1.00 \text{ m} \).

Week 9
7-2, \( Q = 549 \text{ m}^3/\text{d} \)
7-10, 1976 \( \text{ ft}^2/\text{d} \)

Week 10
8-2, \( K_h = 3.5 \text{ m/d} \)

Week 11
10-1, *hints*, (a) more salt, more TDS (b) more time, more TDS
10-2, *hint*, think about the water in relation to its surroundings
10-11(b), total cations 8.91 meq/L, total anions 9.20 meq/L

Week 12
11-11, PCE \( K_d = 0.56 \text{ L/kg} \) with data from 0-350 d, and 0.97 L/kg with data from 350-650 d.
11-16(a), diffusive flux 0.66 mg/m²/d
11-16(b), advective flux 4500 mg/m²/d
11-17, macrodispersive flux 220 mg/m²/d

Week 13
11-20(c), \( dh/dx = -3.4 \times 10^{-3} \)
11-21, \( D_{mx} = 0.032 \text{ m}^2/\text{d} \), \( D_{my} = 0.0035 \text{ m}^2/\text{d} \), \( D_{mz} = 0.0021 \text{ m}^2/\text{d} \)

Week 14
Problem 1(c), \( I_x/L_x = 0.1 \) and \( I_y/L_y = 0.2 \)