



Scheduling Sports

One of the greatest baseball players ever, Ted Williams, said, “I think without question the hardest single thing to do in sport is to hit a baseball.” Yet it may be even harder to make sure that there are teams at the stadium to play each other in the first place. Scheduling games for a league’s entire season (in baseball it’s 30 teams playing 162 games each in six months) involves meeting many constraints, such as each team having the same number of home games, and not having too many consecutive days off or consecutive days playing. Graph theory, linear algebra, and integer programming are among the mathematical subjects that make scheduling a season possible and faster. The results are schedules that satisfy fans, players, owners, and broadcasters.

The schedules are economically advantageous, too, boosting television revenue by having desirable matchups on desirable days, and holding down travel costs. Some

Slot	Clem	Duke	FSU	GT	UMD	UNC	NCSt	UVA	Wake
Dec	UMD	UVA	UNC	NCSt	@Clem	@FSU	@GT	@Duke	Bye
1/3	UNC	@UMD	@NCSt	Bye	Duke	@Clem	FSU	Wake	@UVA
1/7	@Wake	NCSt	@UMD	@UNC	FSU	GT	@Duke	Bye	Clem
1/10	Bye	@FSU	Duke	Wake	@NCSt	UVA	UMD	@UNC	@GT
1/14	FSU	@Wake	@Clem	@UVA	UNC	@UMD	Bye	GT	Duke
1/17	@Duke	Clem	@GT	FSU	@Wake	Bye	@UVA	NCSt	UMD
1/21	UVA	Bye	Wake	UMD	@GT	@NCSt	UNC	@Clem	@FSU
1/24	@UMD	@UVA	@UNC	@NCSt	Clem	FSU	GT	Duke	Bye
1/28	@UNC	UMD	NCSt	Bye	@Duke	Clem	@FSU	@Wake	UVA
1/31	NCSt	GT	Bye	@Duke	UVA	@Wake	@Clem	@UMD	UNC
2/4	@GT	@UNC	@UVA	Clem	Bye	Duke	Wake	FSU	@NCSt
2/7	Wake	@NCSt	UMD	UNC	@FSU	@GT	Duke	Bye	@Clem
2/11	Bye	FSU	@Duke	@Wake	NCSt	@UVA	@UMD	UNC	GT
2/14	@FSU	Wake	Clem	UVA	@UNC	UMD	Bye	@GT	@Duke
2/18	Duke	@Clem	GT	@FSU	Wake	Bye	UVA	@NCSt	@UMD
2/21	@UVA	Bye	@Wake	@UMD	GT	NCSt	@UNC	Clem	FSU
2/25	@NCSt	@GT	Bye	Duke	@UVA	Wake	Clem	UMD	@UNC
2/28	GT	UNC	UVA	@Clem	Bye	@Duke	@Wake	@FSU	NCSt

Image: Courtesy of Michael Trick.

scheduling algorithms set up all the home and away dates first, then fill in the teams, while others reverse those steps. One commonality is subdividing the main problem into smaller clusters that are both easier to solve and able to be fit back together consistently. These techniques, part of a field called *combinatorial optimization*, aren’t just for fun and games either—they’re also used to create efficient delivery routes and to design experiments to test new drugs.

For More Information: “Graph Theory and Sports Scheduling,” Richard Hoshino and Ken-ichi Kawarabayashi, *Notices of the AMS*, June/July 2013.

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