

**Timetronix: A Department-Base Timetable for Faculty Course Load using
Constraint Satisfaction Problem (CSP) Framework for
Mindanao State University Main Campus**

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ABSTRACT

The Mindanao State University-Main Campus's existing manual approach for scheduling the course offers and faculty assignments has produced inefficiencies and potential mistakes. College department chairpersons and faculty members collaborate on the manual assigning process, but there is no automated way to speed up and improve scheduling. Due to this inefficiency, there are several course offerings, conflicts with faculty schedules. The researchers suggest using an algorithm called Timetronix that is adapted to the unique requirements of the university in order to overcome these difficulties. This approach has the potential to greatly increase faculty satisfaction, dramatically increase course scheduling efficiency, and significantly lessen the effort for department chairpersons. The researchers want to address the present difficulties of faculties at Mindanao State University-Main Campus are now experiencing and raise the overall standard of the course scheduling procedure by putting this innovative idea into practice.

The efficiency of the Timetronix method was assessed using numerous test cases. According to test and performance results of the research shows that the algorithm for resolving scheduling conflicts varies in effectiveness based on constraint settings. Test cases without preferred time demonstrate gradual conflict reduction but still result in relatively high percentages (39.39% and 35.48%). Test cases with all morning or all afternoon preferred time show repeated conflicts (45.95% and 51.22%). However, when faculties have preferred time, the algorithm performs best, achieving a low peak of 33.33% and significant reduction to 23.8% after multiple runs. Incorporating faculty preferences improves scheduling efficiency and minimizes conflicts.

The results showed that Timetronix is effective at creating timetables that adhere to the demands and limitations of the university. The manual scheduling procedure was successfully automated by the algorithm, which decreased mistakes. It gave a thorough rundown of the schedules and took into account faculty's preferences. To further increase the usefulness of the algorithm, recommendations include increasing error handling mechanisms, switching to a system-based implementation, and investigating further optimization techniques.

Keywords: *Timetronix, faculty, course, scheduling, faculty preference, conflict percentage*